Environmental Assessment

for

Cheatgrass Treatments for Natrona and Converse Counties

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WY-060-EA11-197

BLM

Wyoming High Plains District – Casper Field Office

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INTRODUCTION

1.1 Background

Cheatgrass (*Bromus tectorum L.*) is an abundant, invasive annual grass species that commonly establishes into disturbed sagebrush-grassland communities. Inventories have indicated that cheatgrass is dominant on more than 6.8 million hectares (ha) of the sagebrush ecosystem (Pellant and Hall 1994) and more than 40 million ha throughout the Intermountain West (Whisenant 1990). While native perennial plant species are present in these areas the overall productivity and value to livestock and wildlife has been greatly reduced because of the presence of this invasive species.

The Bureau of Land Management (BLM), Casper Field Office (CFO) in coordination with local land owners, county weed and pest districts and the Wyoming Game and Fish Department (WGFD) are proposing to use chemical herbicides to treat cheatgrass-infested areas in Natrona and Converse counties to ensure the continued viability of sagebrush grassland habitats and the species these habitats support.

Healthy sagebrush grassland habitats are integral to the long-term viability and survival of sagebrush obligate wildlife. Common sagebrush obligate wildlife species include mule deer, pronghorn antelope, sage grouse, ferruginous hawk, Brewer's sparrow, sage sparrow, and sage thrasher, among others. Many of these species are listed as Wyoming BLM Sensitive Species and the greater sage grouse is further listed as a candidate species according to the Endangered Species Act (ESA).

Cheatgrass is a non-native annual grass that has become a problem on many western rangelands including Wyoming. Cheatgrass can reduce the productivity and diversity of native grass communities. It is a prolific seed producer which gives it a competitive advantage over native vegetation (Hulbert 1955). Cheatgrass is able to germinate in the fall and spring (Martens and others 1994) before native grasses, which also makes it very competitive with native plant species. It is tolerant of grazing and increases with fire (Klemmedson and Smith 1964).

Cheatgrass is very flammable and when abundant can increase the fire frequency of ecosystems. Historically the return interval for wildfires in western shrublands was long-term and generally ranged from 50 to 150 years or more. The wildfire return intervals in rangelands infested with cheatgrass have been greatly reduced. Pellant (1990) found the wildfire return intervals in some southern Idaho rangelands infested with cheatgrass are now less than five years.

Chemical herbicide treatments to control cheatgrass regularly occur on state and private lands, but public lands often go untreated, as the BLM has not completed National Environmental Policy Act (NEPA) analysis to permit treatments. This environmental assessment (EA) analyzes the potential impacts that could result with implementation of the Proposed Action and complies with the NEPA. A "Finding of No Significant Impact" (FONSI) documents why implementation of the selected action would not result in environmental impacts that would significantly affect the quality of the human environment.

This document will be used to prepare a determination of NEPA adequacy (DNA) treatment evaluation and Decision Record (DR) for site-specific treatments. Individual treatments would be nominated and evaluated using an inter-disciplinary team process (IDT). In addition, site-specific cultural and wildlife clearances would be completed for each individual treatment area, and the information would be incorporated into the DNA and DR.

1.2 Purpose and Need for the Proposed Action

The purpose of this action is to improve the health of sagebrush-grassland communities located in Natrona and Converse counties. Controlling cheatgrass invasion and expansion will allow native perennials and shrubs to rebound and expand by removing competition; thus, the healthy ecological processes within the sagebrush-grassland vegetative communities will begin to re-establish. Further, the active management of cheatgrass would reduce the threat of wildfire, improve livestock forage, and enhance the overall habitat quality for sagebrush obligate wildlife species, particularly the greater sage grouse.

The need for the nonindigenous invasive vegetation treatment is established by the BLM's responsibility under the Federal Land Policy and Management Act of 1976 (FLPMA), as amended, to manage public lands in a manner that will provide food and habitat for wildlife and domestic animals. In addition, the Federal Noxious Weed Act of 1974 requires federal agencies implement cooperative agreements with state agencies to coordinate management of undesirable plants on federal lands and the control and management of nonindigenous weeds that injure or have the potential to injure the interests of agriculture and wildlife resources.

Decision to be Made: *The BLM will decide whether to authorize the vegetative treatment, and if so, under what terms and conditions.*

1.3 Relationship to Statutes, Regulations, Plans, or Other Environmental Analyses

The following statutes, regulations, and plans apply to the Proposed Action:

- NEPA of 1969 (Pub. L 91-190; 42 U.S.C. 4321 et seq.)
- Taylor Grazing Act of June 28, 1934, as amended (43 U.S.C. 315 through 315r)
- The Public Rangelands Improvement Act of 1978 (43 U.S.C. 1901, et seq.)
- FLPMA of 1976, as amended (Pub. L. 940579); 90 Stat.2743; 43 U.S.C. 1701 et seq.)
- ESA of 1973, as amended (16 U.S.C. 1531 et seq.)
- Federal Noxious Weed Act of 1974 7 U.S.C. §§ 2801-2814, as amended 1988 and 1994
- National Historic Preservation Act (NHPA) of 1966, as amended (Public Law 89-665; 16 U.S.C. 470 et. seq.)
- Interagency Cooperation Regulations (50 CFR 402)
- The Record of Decision for the *Vegetative Treatments Using Herbicides on Bureau of Land Management Lands in 17 Western States Programmatic EIS* (2007).
- Standards for Healthy Rangelands and Guidelines for Livestock Grazing Management for the Public Lands Administered by the BLM in the State of Wyoming, December 2004

1.4 Conformance with Land Use Plan

As required by 43 CFR 1610.5, the *Record of Decision (ROD)/Approved Resource Management Plan (RMP)* for the Casper Field Office (December 2007), has been reviewed to determine that the Proposed Action conforms to the land use plan terms and conditions. Specifically, the Proposed Action conforms to the above land use plan as identified in the following decisions of the ROD:

3008: Utilize an integrated management technique approach (defined as prescribed fire, mechanical, chemical, or biological, followed by desired reseeding) to reduce fuels to protect high priority areas or resource values…wildlife habitats.

4001: Utilize current research, management and conservation plans and other research and related directives, as appropriate, to guide habitat management for vegetation, fish, wildlife and special status species.

4008: Manage actively, where INPS occurs, to contain or eradicate them using an integrated management approach and cooperative agreements with county weed and pest control districts, and private landowners across all vegetative communities.

4009: Utilize an integrated management approach (i.e., mechanical, chemical, biological, prescribed fire, or livestock grazing) to manipulate seral stages within vegetative communities to achieve objectives defined by the range, forestry, wildlife, watershed, and INPS.

4037: Manage 630,183 acres of sagebrush communities toward DPC.

4038: Manage 46,779 acres of mountain shrub communities toward DPC.

4053: Within the Bates Hole Management Area, the areas will have priority for vegetative treatments to improve sage grouse habitats and for vegetation monitoring to ensure residual herbaceous vegetation is maintained for nesting cover on public lands.

5008: Cultural resource inventories and site evaluations within the planning area are in direct response to specific land-use proposals in accordance with Section 106 of the National Historic Preservation Act (NHPA). Additional inventory is carried out, when resources permit, to comply with Section 110 of the NHPA.

6079: Grazing leases will be adjusted where an evaluation of monitoring, field observations, or other data indicates changes, and either increases or decreases, in forage allocation are needed or when necessary or required by other applicable law or regulation.

6081: Prevent downward trend in all allotments.

7021: Management actions to conserve and (or) improve greater sage grouse habitats are described in the Special Status Species section.

7024: Surface-disturbing activities and disruptive activities are subject to a CSU stipulation, restricting or prohibiting surface occupancy unless the proponent and surface management agency arrive at an acceptable plan for mitigation for impacts.

7036: Restoration projects will focus on improving wildlife and fisheries habitats and recreational opportunities.

2.0 PROPOSED ACTION AND ALTERNATIVES

2.1 Proposed Action – Authorize Chemical Treatment of Cheatgrass

Conduct chemical treatments to prevent, control, and manage cheatgrass *(Bromus tectorum)* invasions in Natrona and Converse counties to ensure the continued viability of sagebrush grasslands. Treatments would involve chemical application of up to 8 oz. per acre of imazapic, also known by the trade name Plateau®. Chemical applications would be applied aerially (fixed-wing aircraft or helicopter) or by ground application methods (foot or vehicle-mounted sprayer). All chemical applications would be made in accordance with label instructions. Chemical treatments would begin in 2012 and would continue as funding allows through 2025. Additionally, the following treatment specifications would be adhered to, to ensure the protection and conservation of sensitive resources.

<u>Treatment Specifications</u>

- Treatments would not exceed 100,000 acres per year to ensure effective implementation and monitoring.
- Vehicles would be restricted to existing roads and trails, unless otherwise designated.
- Herbicide application would be conducted only by licensed applicators.
- No chemical applications would be authorized within .25 mile of a private residence without written authorization of the landowner.
- Chemical applications would be applied in the fall between August 1 and October 31 when native herbaceous vegetation is generally dormant.
- Chemical applications would be avoided when rainfall is forecasted to occur within 48 hours.
- To control drift, aerial applications would be prohibited when winds exceed 15 mph.
- No chemical treatments or mixing would occur within a 150-foot buffer of any live water resources (e.g. springs, wetland/riparian areas, reservoirs, or streams).
- Livestock would not be present within the treatment area when applying herbicides without written consent of livestock operator.
- To protect federally listed plant species no chemical treatments swould occur within 300 feet (aerial applications) or 150 feet (ground applications).
- Herbicide applications would not occur when high temperatures (over 85º Fahrenheit) can cause volatilization.
- Equipment used to apply herbicide would not be rinsed, cleaned, or drained into any water source. Excess herbicide or fluid used in cleaning equipment will be disposed of in authorized facilities.
- Applicators would be required to be certified, wear required personal protective equipment (PPE), and comply with specimen label requirements.

- To protect special status plant and animal species, implement all conservation measures present in the *Vegetation Treatments on Bureau of Land Management Lands in 17 Western States Programmatic Biological Assessment* (BA).
- No chemical treatment would occur within ¼ mile of any Native American petroglyph or pictograph site.
- No chemical treatment would occur within any known Native American traditional cultural property (TCP).
- Treatment areas would be assessed annually to determine treatment effectiveness.

2.2 No Action Alternative – Do Not Authorize Chemical Treatment

Under the No Action Alternative, the Proposed Action would not be implemented. Cheatgrass would continue to pose a serious threat to the health and viability of sagebrush-grassland communities in Natrona and Converse counties. Some treatments would likely continue on state and private lands, but the treatments would probably be unsuccessful given the intermingled landownership pattern. Many treatments would not even occur if public lands could not be treated. The unmanaged expansion of cheatgrass would significantly increase the risk of wildfire, and would threaten the health and continued existence of sagebrush-grassland communities found throughout the area. The value of these communities for wildlife, especially sagebrush obligate wildlife species, would diminish, resulting in population declines and potentially the local extirpation of species.

2.3 Alternatives Considered, but not Analyzed in Detail

Mechanical, livestock grazing, and other chemical treatments have been shown to be somewhat effective for treating cheatgrass. However, using these methods may exacerbate the problem and could be detrimental to native vegetation and other resource values.

Mechanical treatment would neither eliminate cheatgrass nor reduce seed set. The disturbance associated with mechanical treatments could instead exacerbate the infestation and facilitate to the spread of cheatgrass into new, uninfested areas. Mechanical treatments would potentially damage cultural values and economically, the cost per acre would be much higher.

Livestock grazing has been demonstrated to be effective in controlling cheatgrass if it is done when the plant is near flowering to the soft dough stage of seed maturation (Smith and Enloe, 2006). Grazing effectiveness is directly related to intensity and duration within a given area. Given the amount of acres currently infested, and the varied terrain and level of grazing intensity required, livestock grazing would not be a practical alternative to control cheatgrass. Cheatgrass could increase by this method as livestock can facilitate the spread of seeds into uninfested areas.

Other chemical herbicides (e.g., 2-4-D) could be used to kill the cheatgrass, but these chemicals could also unintentionally kill nontarget species. Therefore, these methods will not be analyzed further.

3.0 THE AFFECTED ENVIRONMENT

3.1 Introduction

The proposed treatment areas encompass public lands located in Natrona and Converse counties. Treatment areas would generally be restricted to upland sites, especially southern and western aspects, or other areas where cheatgrass dominates the herbaceous understory. The intent of this EA is to determine the impact of applying the herbicide imazapic on public lands infested with cheatgrass. Table 1 is a summary of landownership within the project area, while table 2 summarizes the ownership by county.

Table 1
Landownership within the Project Area
(in acres)

BLM	State	Private	Forest Service
1,253,026	618,576	3,561,543	202,051
Department of Defense	**Bureau of Reclamation**	**Fish and Wildlife Service**	**Water Bodies**
9,324	7,578	7,449	21,641

Table 2
Landownership by County Jurisdiction
(in acres)

Natrona County	Converse County	Total
3,017,154	2,728,234	5,745,388
BLM 1,124,415 (37%)	BLM 128,611 (5%)	Public (BLM) Land (22%)

Average precipitation within the project area is variable. In places, it ranges from 5 to 9 inches per year and in other places it ranges from 10 to 14 inches per year. The proposed vegetation treatments target habitats that consist primarily of sagebrush-grassland vegetative communities.

The following critical elements are not present within the project area and will not be analyzed further:

Air quality
Areas of critical environmental concern (ACEC)
Environmental justice
Prime or unique farmlands
Flood Plains
Hazardous or solid wastes
Mineral Resources
Native American religious concerns
Paleontology

Recreation
Visual resource management
Wild and scenic rivers
Wilderness values

3.2 Soils

The soils found in the project area are primarily loams, clay loams, and clays. They vary from very deep soils located along the stream terraces and alluvial fans to very shallow soils located on upper slopes and ridge tops. They are all well-drained and are derived primarily from siltstone, sandstone, and shale. The loam soils generally have moderate permeability with medium rates of runoff. The risk of water erosion for the loam soils is generally slight to moderate, and the risk of wind erosion is moderate to severe. The clay loam and clay soils have slow to moderate permeability with medium to rapid rates of runoff. The risk of water erosion for the clay loam and clay soils is severe, and the risk of wind erosion is moderate.

The soil survey for Wyoming published by the United States Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) contains a complete description of soil types and their properties.

3.3 Livestock Grazing

The Casper RMP allocated lands as available for domestic livestock grazing during the land use planning process. All lands currently open for livestock grazing would be authorized. The purpose of the Proposed Action is to promote healthy sustainable rangeland ecosystems through the efficient and effective administration of grazing on public rangelands. Grazing would continue to be permitted, subject to the terms and conditions of the individual grazing lease.

3.4 Vegetation

There are 11 principal ecological sites found within the area, as identified by the NRCS for the 5- to 9-inch Wind River Basin and the 10- to 14-inch High Plains Southeast major resource land areas (MLRA). These include Loamy, Shale, and Saline Lowland sites within the Wind River Basin MLRA and Loamy, Loamy Overflow, Steep Loamy, Shallow Loamy, Shallow Clayey, Saline Lowland, Saline Upland, and Shallow Breaks sites within the High Plains Southeast MLRA.

Native vegetation commonly found on the Loamy, Loamy Overflow, Steep Loamy, Shallow Loamy, and Shallow Clayey sites include: western wheatgrass, bluebunch wheatgrass, mutton bluegrass, needle-and-threadgrass, Sandberg bluegrass, Indian ricegrass, prairie Junegrass, green needlegrass, threadleaf sedge, winterfat, western yarrow, fringed sagewort, fleabane, clovers, Hood’s phlox, and big sagebrush.

Native vegetation commonly found on the Saline Lowland sites include: alkali sacaton, basin wildrye, western wheatgrass, inland saltgrass, Sandberg bluegrass, woody aster, princesplume, milkvetch, greasewood, Gardner’s saltbush, rubber rabbitbrush, and birdfoot sagebrush. On

these sites, shrubs such as greasewood, Gardner's saltbush, and rabbitbrush often appear to be the dominant plant species.

Native vegetation commonly found on the Shale and Saline Upland sites include western wheatgrass, Indian ricegrass, squirreltail, inland saltgrass, Gardner's saltbush, princesplume, woody aster, and Hood's phlox. Gardner's saltbush often makes up 50 percent of the plant community on these sites.

Native vegetation commonly found on Sallow Breaks sites include juniper, limber pine, big sagebrush, black sagebrush, bluebunch wheatgrass, needle-and-threadgrass, Indian ricegrass, Sandberg bluegrass, prairie Junegrass, scarlet globemallow, buckwheat, western yarrow, and asters. Juniper on the shallow breaks site can make up 40 to 50 percent of the community. The frequency of each plant species found on these sites varies with differences in precipitation, soils, aspect, percent slope, and present and past grazing use. According to state and transition models found within the NRCS's ecological site descriptions cheatgrass-occupied vegetation communities are considered a degraded habitat condition which compromises the future existence and viability of the present native species. The technical site guides for Wyoming published by the NRCS contain a complete description of the native plant communities typically found on these ecological sites.

3.5 Noxious Weeds and Invasive, Non-native Plant Species

The project falls within the boundary of Natrona and Converse County weed and pest districts. Through an annual assistance agreement with BLM each agency is responsible for treating noxious and invasive weeds throughout their respective area of responsibility. Wyoming weed and pest districts use an integrated pest management approach to control noxious and invasive species. Natrona and Converse counties have stated that cheatgrass (*Bromus tectorum L.)* is a "declared weed" under Wyoming Statute W.S 11-5-105(b)(vi). Cheatgrass is found throughout both counties and in some areas is the dominate herbaceous species.

3.6 Riparian and Water Resources

Water resources within the project area include perennial and intermittent streams, springs, and reservoirs. The North Platte, Powder, and Cheyenne River systems encompass the 4th order streams of the area. Fourth order streams are medium streams while anything larger (up to 12th order) is considered a river. No segments of these stream drainages are classified as wild and scenic rivers.

Surface water quality and quantity is variable within the planning area. Relatively few perennial or intermittent stream segments exist on public lands compared to private and state lands. Most of the drainages on public lands are ephemeral. The area managed by the CFO, located in the North Platte and Powder River watersheds, includes class 1 and class 2 reaches. The Cheyenne River watershed includes some class 2 stream segments.

Cheatgrass treatments would occur on upland areas adjacent to perennial, intermittent, and ephemeral drainages.

3.7 Wildlife and Special Status Species

As discussed in the 2007 Casper RMP, a variety of wildlife species occur throughout the project area, including small and big game, trophy game, furbearing animals, predatory animals, migratory and nonmigratory game birds, nongame wildlife, fish, and special status species wildlife.

More specifically, Natrona and Converse counties provide seasonal habitats for a number of sagebrush obligate species including mule deer **(***Odocoileus hemionus***),** pronghorn antelope (*Antilocapra Americana*), white-tailed prairie dog (*Cynomus leucurus*), greater sage grouse (*Centrocercus urophasianus*), Brewer's sparrow (*Spizella breweri*), loggerhead shrike (*Lanius ludovicianus*), sage sparrow (*Amphispiza belli*), sage thrasher (*Oreoscoptes montanus*), and the ferruginous hawk (*Buteo regalis*). With the exception of mule deer and pronghorn antelope, all of these species are classified as Wyoming BLM sensitive species (BLM 2010). Sagebrush obligate species are typically found in grassland, sagebrush shrubland, semi-desert scrub, and adjacent agricultural lands. These species occur throughout both counties and are relatively common inhabitants in areas of suitable habitat.

The WGFD manages mule deer and pronghorn antelope populations within multiple herd units as described in the 2009 WGFD job completion reports. Based on these reports, mule deer populations within these herd units are generally 15 to 25 percent below established population objectives. Within the same regions pronghorn antelope populations appear to be more stable, with populations generally being at or slightly above established population objectives (WGFD 2009). Although there are numerous confounding factors that affect population fluctuations, habitat fragmentation and declining range conditions are cited as common causes for population declines. Within Natrona and Converse counties, there are 957,784 acres of delineated crucial big game winter range, of which approximately 85 percent is classified as sagebrush grassland.

The U.S. Fish and Wildlife Service (FWS) has determined that listing the greater sage grouse under the ESA is warranted but is precluded by the need to take action on other species facing more immediate and severe extinction threats. Presently there are approximately 189 known sage grouse leks in Natrona and Converse counties. The project area also encompasses 2,001,694 acres of "core area" for sage grouse as designated by the state of Wyoming (WY EO 2008-2). This designation is consistent with the sage grouse conservation strategy outlined in BLM Instruction Memorandum No. WY-2010-012 and executive order WY EO 2011-5 issued by the governor of Wyoming. Further, 480,349 acres are delineated as winter sage grouse habitat. Sage grouse lek attendance has trended downward in recent years and populations range-wide continue to decline (WGFD 2008)
.
The area provides suitable nesting habitat for a variety of raptor species, including ferruginous hawks. No sufficient data sets exist to determine population trends for the project area, but populations are believed to be closely tied to availability of suitable nesting habitat and prey abundance.

White-tailed prairie dogs *(Cynomys leucurus)* occur throughout the western extent of Natrona County although no current colony mapping exists. Based on anecdotal observations by BLM

and WGFD staff, it is believed that many of colonies in the area experienced a plague event, which resulted in localized reductions of prairie dog populations.

Brewer's sparrow, loggerhead shrike, sage sparrow, and sage thrasher inhabit suitable habitats throughout Natrona and Converse counties. No specific data exists regards population trends here; however, since 2002 the Rocky Mountain Bird Observatory has been monitoring birds in the CFO area. According to "Monitoring Wyoming Birds" (RMBO 2009) the sage thrasher, sage sparrow, and Brewer's sparrow were detected on point count monitoring transects. Population trends should become available through the continued development of these datasets. However, the Wyoming Partners in Flight bird conservation plan has identified these species as level 1 priority bird species for shrub-steppe habitats based on problems associated with these habitats (Nicholoff 2003).

3.8 Threatened and Endangered (T&E) Species

A database review was completed for all T&E species listed on the FWS species list dated June 2011. Based on this information, the BLM determined that the Proposed Action would not affect any federally listed species. Therefore, project development will have a "no effect" on federally listed species. As such, T&E species will not be discussed further in this document.

3.9 Socioeconomics

Agriculture and energy development are the dominant economic activities in the area. The entire project area is important to each of the grazing operators using the area. The presence of cheatgrass has lowered overall productivity and value of the area for livestock use. Cheatgrass also complicates reclamation of energy development projects, often inhibiting and delaying reclamation of disturbed habitats. Hunting and wildlife viewing are also popular recreational activities that contribute significantly to local economies.

3.10 Cultural Resource and Traditional Cultural Properties

Over 8,300 recorded prehistoric and historic sites have been located within the study area as of November 1, 2011. In Natrona County, there have been 4,987 sites recorded; in Converse County, there have been 3,369 sites recorded. Collectively, these sites represent the entire range of prehistoric periods (over 11,000 years) and site types known in the region. Further, the historic site types include all of the significant historic period eras from the time of first Euro-American presence in the region until present.

Significant prehistoric sites are predominantly important for the scientific information they may contain. The management strategy is to conserve these sites for future scientific use; therefore, they are generally left intact. Significant historic period sites are more apt to be important for their association to people, places, and events rather than for their scientific data. Finally, both significant prehistoric and historic sites may have landscape as one of the important values they possess. Examples of these are the historic emigrant trail corridors and Cedar Ridge TCP.

4.0 ENVIRONMENTAL EFFECTS: PROPOSED ACTION

4.1 Direct and Indirect Effects

The chemical treatments would affect the vegetative communities, wildlife, and livestock that use them. The direct effect would be a reduction in the amount of cheatgrass present. Larger animals such as antelope, mule deer, and elk would avoid the area during treatment. Indirect effects would take from one to two years after the treatment as native vegetation responds to the reduction in competition from these two species. The *Vegetation Treatments Using Herbicides on Bureau of Land Management Lands in 17 Western States Programmatic EIS* and *Final Biological Assessment for Vegetation Treatments* provide an in-depth analysis of direct and indirect effects of herbicide treatments on resources found on public lands.

4.2 Soils

Cheatgrass has been found to be an efficient user of soil water in the upper soil profile. Cline and others (1977) reported that a cheatgrass community was more efficient at using water to a soil depth of 0.5 meter (m) than was a native bluebunch wheatgrass community. Reducing the amount of cheatgrass would remove competition for water and other nutrients for native plants. In the absence of this competition, the vigor of native plants would improve. In time, native plants should begin to fill in areas vacated by cheatgrass resulting in an overall increase in ground cover. Unlike perennial grasses and forbs, cheatgrass has a shallow root system that is not conducive to holding soil in place during runoff. Replacing cheatgrass with perennial species should reduce erosion across treated areas over time. However, in the short term there may be a temporary increase in the amount of soil erosion, sedimentation, and deposition within stream channels until the treated areas revegetate.

The use of ATVs when applying chemicals could cause some soil disturbance. As long as soils are not extremely wet or ATVs are not driven over the same tracks numerous times the impact on soils from using these vehicles should be negligible.

Imazapic (Plateau®) is characterized as “moderately persistent in soil” with the time required for its concentration in soil to reduce by half set at 7 to 150 days, although it lasts longer in dry climates. It is described as having “limited mobility in soil,” with binding a consequence of soil pH, texture, and organic matter content. In nine soil dissipation studies, imazapic residues were found as deep as 61 centimeters (cm) (24 inches). The binding of imazapic to soil has been observed to increase with time with little lateral movement in soil. Imazapic does not volatilize from the soil surface, and there is negligible photolysis on the soil surface. The major route of imazapic loss from soil is through microbial degradation (BASF Human Health and Safety file).

4.3 Livestock Grazing

Livestock grazing is permitted on public lands throughout the CFO area, except for 6,016 acres that incorporate sensitive resource values (BLM 2007). However, the forage quality and digestibility of cheatgrass limits the use by livestock. The period that cheatgrass is palatable and nutritious for herbivore consumption is considerably shorter than for most native herbaceous

plants (Klemmedson et al in Pellant 1996). Forage quality declines as cheatgrass mature; therefore, early spring to early summer grazing provides the greatest nutritional benefits to livestock (Murray in Pellant 1996). Because of the characteristics of cheatgrass, the quality and quantity of forage is reduced and may result in future adjustments in the grazing lease to address rangeland health concerns.

The proposed chemical treatments of cheatgrass would address associated rangeland health and are expected to benefit livestock grazing. The Proposed Action may cause minor adjustments to an operators grazing regime, as grazing would be deferred for a minimum of one growing season post treatment. In certain situations (e.g. wildfire, severe drought), grazing deferment may be extended to two or more growing. This period of rest allows the successful establishment of perennial grasses and forbs in the interspaces previously occupied by the invasive annuals. In most situations, the livestock operator would simply adjust the rest-rotation schedule to accommodate this requirement. In some situations however, it may be necessary for the operator to lease additional grazing lands or purchase hay to supplement forage. Acquiring additional livestock forage may indirectly impose additional expenses on the livestock operator. To insure treatment success, it will be necessary to coordinate and consult with the livestock operator early in the IDT treatment nomination and evaluation process.

Livestock would not normally be in an area during treatment application. If livestock were present during aerial application, they could become excited and spooked by the low-flying aircraft. Excited livestock would likely flee and may inadvertently be herded into or through fences, which could result in injury to livestock. In accordance to the label and material safety data sheets (MSDS), imazapic is not toxic to mammals; therefore, no adverse effects are anticipated in the event livestock were to in ingest, inhale, or experience dermal contact of the herbicide.

4.4 Vegetation

When applied at recommended rates and product label specifications the chemical treatments would be effective in reducing the amount of cheatgrass while having minimal effect on native vegetation. Because cheatgrass is competitive and has prolific seed production capability, cheatgrass would reestablish over time. The treatments would allow native plant species to improve vigor and to fill in openings in the communities vacated by cheatgrass. Over time and with proper grazing management native plant communities should be more competitive with cheatgrass and more resistant to future infestations. The overall productivity of native vegetation within treated areas should increase, and forage quality should improve.

The imazapic (Plateau®) treatments should reduce the risk of fire in the area by reducing the amount of cheatgrass. Imazapic selectively kills cheatgrass from more fire resistant bunch grass and shrub communities. Western bunchgrass and forb tolerance trials have shown imazapic to be an acceptable tool for release of desirable plant species in areas infested by annual bromes (Foy 2003). Removing cheatgrass helps eliminate an ignition fuel as well as the main fire carrier (Vollmer 2008). Fire modeling of imazapic-treated areas using the BehavePlus fire model has shown significant reduction of flammable biomass as well as decreased flame height and length

(Kury 2003). At application rates above eight ounces per acre (oz/acre), imazapic has been found to injure or kill many perennial cool season grasses (Smith 2006).

The imazapic treatment is not expected to adversely affect shrubs. Trials conducted near Douglas, Wyoming, on a true mountain mahogany site found no adverse effects from a fall treatment with imazapic using application rates at six or nine 9 oz/acre. Antelope bitterbrush tolerance research conducted east of Laramie, Wyoming found no mortality and no evidence of treatment at six and eight oz/acre rates of imazapic with and without methylated seed oil (MSO) surfactant. Similarly, tolerance studies conducted on three different species of sage (silver sagebrush, fringed sagewort, and Wyoming big sagebrush) found no injury caused by applying imazapic at 2 to 12 oz/acre rates with or without MSO surfactant (Vollmer 2008).

Buffer distances would be applied when treating near riparian areas and federally listed plant species. Drift from ground and aerial applications may potentially affect plants in nontarget areas. Based on data contained on the label and MSDS, the proposed 300-foot buffer is expected to be sufficient to prevent impacts to these nontarget areas.

If vehicles are used during ground applications, some plants are likely to be crushed. This would affect shrub species more than grasses and forbs. The woody parts of shrubs are more apt to be broken, and injury or mortality to the plant could occur. The number of plants affected is expected to be small and should not have an impact on the plant communities, as vehicles would be restricted to existing roads and trails.

The Proposed Action indicates that livestock grazing would be deferred for a minimum one growing season post treatment. Historically, the Wyoming BLM has deferred livestock grazing for two growing seasons to ensure successful vegetation re-establishment after treatment while allowing for some exceptions. One growing season deferment would be adequate for most treatments, as imazapic specifically targets annual grasses and has little to no effect on perennial vegetation. Grazing deferment facilitates perennial vegetation establishment in spaces previously occupied by cheatgrass. Livestock grazing deferment would be extended to two or more growing seasons for treatments following catastrophic events (e.g. wildfire, severe drought). Post treatment livestock deferment would ultimately be based on the environmental conditions present for each treatment area. A review of treatment literature offered no grazing standard regarding livestock deferment after treatment and often, if mentioned, only recommended appropriate grazing management. Grazing management and other practices that contributed to plant invasion need to be changed in order to further rangeland improvement and to make the site less susceptible to re-infestation (DiTimaso et. al. 2010).

There would be no net loss of sagebrush grassland habitats because of applying imazapic chemical herbicide. Native perennial grasses and forbs should quickly expand into interspaces, taking advantage of water and nutrients. In conclusion, impacts associated with proposed chemical treatments tend to benefit native vegetation.

4.5 Riparian and Water Resources

Imazapic may contaminate water through drift of spray and has the potential for runoff for several months after application (BASF). However, adequate buffers have been proposed for mixing. The label further indicates that well maintained vegetative buffer strip would be adequate to protect against water contamination. Therefore, protective buffer zones would be provided along riparian habitat not designed to be treated and along streams, rivers, lakes, and wetlands. These buffers should be a minimum 150-foot buffer for ground applications and extended out to 300 feet for aerial applications. Additionally the label recommends avoiding application when rainfall is forecasted to occur within 48 hours, to minimize rainfall runoff potential and to increase product effectiveness.

4.6 Wildlife and Special Status Species

The WGFD, Western Association of Fish and Wildlife Agencies (WAFWA 2009, 2009a), Wyoming Partners in Flight (Nicholoff 2003), Wyoming Interagency Vegetation Committee (2002) among others, recognize that cheatgrass poses a serious threat to our sagebrush grasslands and conversely the sagebrush obligates habitats. All have made management recommendations to manage and control cheatgrass by applying chemical herbicides.

The primary effect of these treatments on wildlife would be through habitat modification. Reducing cheatgrass would improve the health of vegetative communities and make them less susceptible to fire. The quantity and forage quality of native vegetation would greatly improve native rangeland and wildlife habitats. The presence of cheatgrass within a sagebrush grassland system is considered a degraded habitat and threatens the continued viability of the habitat for sagebrush obligate species. The risk assessment for imazapic indicates that it is not toxic to terrestrial animals, fish or aquatic invertebrates (BLM 2006a). The information identified during the literature review for *The Vegetation Treatments Using Herbicides on Bureau of Land Management Lands in 17 Western States Programmatic EIS* indicates that imazapic is not highly toxic to terrestrial animal species. Since the herbicide rapidly metabolizes and is excreted in urine and feces, imazapic does not bioaccumulate in animals. In mammals, pesticide registration studies found that exposure to imazapic does not frequently cause adverse effects, even at relatively high dose level.

Toxicity tests indicate that imazapic has low toxicity to fish species and does not appreciably bioconcentrate in fish tissue (BASF). No data were found to evaluate the toxicity of imazapic to amphibians. Most studies reported that aquatic invertebrates were unaffected by imazapic concentrations of 100 mg/L; however, one unverifiable report suggested that chronic toxicity to aquatic invertebrates may occur at concentrations as low as 0.18 mg/L.

Based on risk assessments (BLM 2006a), if wildlife ingest treated foliage, the risk assessments predict the negative health effects would be negligible. At the proposed rate, imazapic would selectively target invasive annual grasses so there would be minimal impact on seasonal dietary requirements for big game animals and other wildlife. Forage quality and quantity should improve, as native species become more vigorous and more abundant, which would benefit sagebrush obligate wildlife.

Wildlife, particularly big game animals, would readily flee areas during herbicide applications. It is possible some animals could be accidentally sprayed during aerial application. However, the likelihood of an accidental direct spray is low, as wildlife would likely flee to adjacent untreated areas. Disturbance from aerial treatment would be minor, as it is expected that one aircraft could only effectively treat approximately 200-300 acres daily. Ground application of herbicides would likely take approximately as much as 5 times longer to complete. However, ground applications would be used to only treat small infestations, such as spot treatments along access routes, rather than large acreage blocks. Ground application of hundreds of infested acres would be inefficient and ineffective due to the time, expense, and labor involved.

Human presence associated with herbicide applications in raptor or other bird species habitat may create a minor disturbance. Impacts are expected to be minimal, as treatments would occur August – October, outside sensitive breeding and nesting seasons. Considering the short duration the disturbance associated with aerial applications, it is reasonable to expect that any disturbed bird would immediately return to the pre-disturbance activity. It is unlikely that a raptor or other bird species would be sprayed with herbicides inadvertently, as they would likely flee the area. Nonetheless, if direct spray occurs it could potentially result in negative health effects to birds, according to the risk assessments found in the *Vegetation Treatments Using Herbicides on Bureau of Land Management Lands in 17 Western States Programmatic EIS Biological Assessment*.

The Proposed Action is expected to result in improved sagebrush grassland habitat, and subsequently sage grouse fitness should improve for populations occurring in the project vicinity. Reducing the threat of fire in sagebrush communities and improving the overall health of native plant communities would be beneficial to sage grouse and big game alike. As WAFWA (2009a) concluded in a white paper recently: "Xeric sagebrush communities, largely made up of Wyoming big sagebrush, are not adapted to fire and are characterized as having a high severity fire regime. Natural fire rotation in these settings appears to be measured in centuries not decades. Invading species such as cheatgrass have further raised the stakes for permanent vegetation type conversion from sagebrush stands to exotic annual grass/forb communities as a result of fire, particularly where understory herbs are already depressed."

The project area is within delineated key habitat (Wyoming Core Breeding Area) for sage grouse. Since the Proposed Action does not involve a change or loss of sagebrush habitats, it was determined that a project impacts analysis area (PIAA) analysis in accordance with IM-WY-2010-012 is not required. This determination is also consistent with Wyoming Executive Order (EO) 2011-5.

4.7 Socioeconomics

These treatments would have a positive effect on the economics of the livestock grazing operations. Reducing cheatgrass on the public lands would benefit adjacent private and state lands. Without treatment, cheatgrass is likely to expand and in some areas could become a monoculture. Annual grass monoculture sites produce reduced and lower quality forage for both livestock and wildlife. This could affect the economics of livestock operations, as ranchers would potentially have to reduce numbers, lease other pasture, or purchase supplemental forage

to account for reduced and poorer quality forage. On antelope and mule deer crucial winter range, this could have some effect on the health of these populations, which might affect the local economy from reduced hunter and tourism use.

Historically, the Wyoming BLM has applied a two growing season livestock grazing deferment to ensure successful establishment post treatment. Economically a two-year deferment is not feasible given the severity of cheatgrass infestations and scattered landownership patterns present in Natrona and Converse counties. Many grazing allotments contain only a fraction of public landownership, often in scattered parcels. Allotments often contain public, private, and state lands, and it is often unfeasible for an operator to adjust his grazing schedule to accommodate a two-year deferment. Conversely, failure to treat cheatgrass infestations result in degraded habitats that are less productive for wildlife and livestock. Untreated areas would continue to expand, often outcompeting native vegetation and spreading onto adjacent habitats. This situation results in higher treatment costs and lower success rates. Additionally, unmanaged cheatgrass expansion results in increased wildfire susceptibility.

Wildfires are common in cheatgrass infested areas, as fire return interval is generally only three to five years, which substantially increases wildland fire suppression and other costs imposed on the local economy that result from loss of habitat (livestock forage, tourism, etc.). Therefore, in order for the BLM to implement a successful strategy to control and manage cheatgrass infestations, the BLM would require a one growing season deferment. Livestock grazing deferment may extend if situations warrant based on treatment effectiveness and environmental conditions affecting perennial vegetation establishment.

4.8 Cultural Resources and Traditional Cultural Properties

Through NEPA and the National Historic Preservation Act (NHPA), among others, project effects to cultural resources must be taken into account during all stages of actions. From the earliest planning stages to the final implementation of any action, effects to cultural resources are considered. When the effects are adverse, as defined under NHPA, plans to lessen or mitigate the effects are developed. The Wyoming BLM has developed a state protocol agreement (BLM 2006) between the Wyoming State Historic Preservation Office and Wyoming BLM that articulates how BLM will meet its responsibilities under the NHPA. Appendix B of the protocol agreement (Item 24) states that "**Herbicide application where it would be unlikely to affect rock art or traditional Native American plant gathering areas**" (emphasis added) would be exempt from a case-by-case review. Several other items also exclude actions in which there will be no surface-disturbing activity. The proposed treatments described in this EA fall under these exemptions. The likelihood of affecting any cultural properties is minimal.

Within the study area, there are no known traditional Native American plant gathering areas. However, there is at least one identified TCP and several other known rock art sites. As stated under the Proposed Action, no chemical treatment would occur on or within ¼ mile of these site types. Further, as stated in the background section of this EA, site-specific cultural resource clearances would be completed for each individual treatment area. Finally, all vehicle traffic under this action would be restricted to existing roads and trails, unless otherwise designated, which would further reduce any potential effect to any cultural resources.

The majority of significant prehistoric sites is typically protected by soil or plant cover. While the specific effects of applying chemicals over time on datable organic material are unknown, it is highly unlikely any adverse effects would occur. It is more likely that the cumulative effects to cultural resources, as a whole, would be beneficial as the goal of the project is to enhance the generation of native vegetation. The increase of native vegetation over a large area would benefit the landscape value of these resources.

Under the Proposed Action, the cultural resource specialist would review each action for all known sites within a specific treatment area and unless certain site types are encountered (such as rock art, TCP's, or traditional plant gathering areas) the application action would proceed as planned and result in a "no" to "negligible" effect on any cultural resources. If sensitive site types were encountered, the action would be redesigned to avoid such sites.

In summary, the Proposed Action is unlikely to affect any sensitive or significant cultural resources.

4.9 Public Health and Safety

Risk assessments have been done for imazapic (Plateau®). The product has been found to be nontoxic to humans providing proper application rates and methods as prescribed by the specimen labels and MSDS recommendations are followed.

4.10 Cumulative Effects

Cumulative effects of the proposed treatments would be evident over time, from months to years after completion. There would be a decrease in the amount of cheatgrass and over time an increase in native plant species. Removing cheatgrass would lessen the risk of fire in the big sagebrush-grassland communities and help maintain the historic fire cycle interval. With improved vegetative community health, soil erosion would be stabilized. This in turn could benefit riparian and fisheries habitats. Over time, the quantity and quality of forage would improve for livestock and wildlife.

Other vegetative treatments have occurred in the area. Prescribed fire has been used in shrub communities to improve wildlife habitat and to meet livestock management objectives. Mechanical treatments were used in conjunction with prescribed fire and chemical treatments to reduce cheatgrass and improve health of native communities. Both weed and pest districts regularly employ an integrated pest management approach to prevent, treat, and educate the public about noxious and invasive species. The impacts associated with these treatments are generally determined to be beneficial, as invasive and noxious weeds threaten the health and value of our native ecosystems. The effects identified with this project would add to similar effects associated with other projects in the area.

4.11 Residual Effects

The benefits associated with the proposed treatments would remain.

Imazapic would degrade though time and toxicity levels would dissipate. The herbicide is only moderately persistent in soils and has not been found to move laterally with surface water. Imazapic has a half-life of 120 days in soil due to photolysis and a half-life of 31 to 233 days in soil due to microbial degradation (American Cyanamid Company 2000 *cited in* Tu et al. 2001). In aquatic systems, imazapic has been found to rapidly photodegrade, with a half-life of 1 to 2 days (Tu et al. 2001).

5.0 MITIGATION AND MONITORING

The application of herbicides is tightly controlled by state and federal agencies. The BLM is required to follow all state and federal laws and regulations applicable to the application of herbicides. The following mitigation measures will be followed when applying herbicides:

1. Applicators will have a commercial pesticide applicator license and the licensed applicator will maintain pesticide use logs. All requirements on herbicide specimen labels and MSDS will be followed.

2. Herbicide active ingredients and formulations shall be applied for uses, and at application rates, specified on the herbicide specimen label and will comply with all state registration requirements.

3. Herbicide application operations will be suspended when any of the following conditions exist on the treatment areas:

    a. Herbicide application wind velocity exceeds 6.0 miles per hour for applications of liquids or 15 miles per hour for the application of granular herbicides, or as specified on the product label.

    b. Chemical applications would be avoided when rainfall is forecasted to occur within 48 hours.

    c. Fog significantly reduces visibility.

    d. Herbicide applications would not occur when high temperatures (over 85º Fahrenheit) can cause volatilization.

4. All individuals involved in handling herbicides or application of herbicides will be instructed on safety and spill procedures by licensed applicators.

5. Equipment used to apply herbicide shall not be rinsed, cleaned, or drained into any water source. Excess herbicide or fluid used in cleaning equipment will be disposed of in authorized facilities.

6. Applicators would be required to be certified, wear required personal protective equipment (PPE), and comply with specimen label requirements.

7. Applicators shall provide the BLM with a pesticide use report at the end of the season. Send the report to the Bureau of Land Management, Casper Field Office, 2987 Prospector Drive, Casper, Wyoming 82604-2968.

8. Avoid direct spray or spills in any water sources, important wildlife features or to animals.

9. Protective buffer zones will be provided along riparian habitat and along streams, rivers, lakes and wetlands. For ground application, a minimum **150-foot buffer** will be established along the riparian corridors. For aerial application, a minimum **300-foot buffer** will be established along these corridors.

10. To protect special status raptor nesting habitats, activities or surface use will not be allowed from February 1st through July 31st.

11. Surface-disturbing and disruptive activities should be designed in a manner that avoids prairie dog towns and complexes. Where this is impractical, the disturbance should be located in a manner where it will have the least amount of impact to prairie dogs.

12. Occupied sage grouse leks will have a 4-mile buffer. Within this buffer, surface development or wildlife disturbing activities will be restricted March 15th through July 15th.

13. No surface-disturbing and wildlife-disturbing activities are allowed from November 15 through April 30 on crucial big game winter ranges. The authorized officer can grant exceptions.

14. To protect special status plant and animal species, implement all conservation measures presented in the *Vegetation Treatments on Bureau of Land Management Lands in 17 Western States Programmatic Biological Assessment.*

15. To promote and ensure successful establishment of vegetation after treatment, livestock grazing will not be allowed for one complete growing season following treatment. This requirement may be lengthened based on environmental conditions and management objectives consistent with Wyoming's standards for healthy rangelands.

16. The area should be assessed annually to determine effectiveness of the treatment.

6.0 TRIBES, INDIVIDUALS, ORGANIZATIONS, OR AGENCIES CONSULTED

Wyoming Game and Fish Department
Wyoming Office of State Lands and Investments
Natrona County Weed and Pest
Converse County Weed and Pest

7.0 LIST OF PREPARERS

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7.1 Reviewers

Casper Field Office Planning and Environmental Coordinator
Casper Field Office Rangeland Management Specialist
Casper Field Office Weed Management Specialist
Casper Field Office Archeologist
Casper Field Office Hydrologist

8.0 REFERENCES

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