

**STATEWIDE PROGRAMMATIC BIOLOGICAL
ASSESSMENT: BLOWOUT PENSTEMON**
(Penstemon haydenii)

BLM



**Submitted by:
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Acronyms and Abbreviations

ACEC	Area of Critical Environmental Concern
AML	Appropriate Management Level
APD	Application for Permit to Drill
APHIS	Animal and Plant Health Inspection Service
ATV	All-Terrain Vehicle
BA	Biological Assessment
BLM	Bureau of Land Management
BMP	Best Management Practice
CMA	Cooperative Management Area
COA	Condition of Approval
CSU	Controlled Surface Use
DPC	Desired Plant Community
EPA	U.S. Environmental Protection Agency
ESA	Endangered Species Act of 1973
EIS	Environmental Impact Statement
FO	Field Office
GIS	Geographic Information Systems
HMA	Horse Management Area
IM	Instruction Memorandum
IMP	Interim Management Policy
MW	Megawatt
NAAQS	National Ambient Air Quality Standards
NAIP	National Agriculture Imagery Program
NEPA	National Environmental Policy Act
NNL	National Natural Landmark
NREL	National Renewable Energy Laboratory
OHV	Off-Highway Vehicle
OSM	Office of Surface Mining
PSD	Prevention of Significant Deterioration
RAAT	Reduced Agent Area Treatment
R&PP	Recreation and Public Purpose Act of 1954
RMP	Resource Management Plan
RMPPA	Resource Management Plan Planning Area
ROW	Right-of-Way
SD/MA	Special Designation/Management Area
SRMA	Special Recreation Management Area
SSS	Special Status Species
TMA	Travel Management Area
USFWS	U.S. Fish and Wildlife Service
VRM	Visual Resource Management
WDEQ	Wyoming Department of Environmental Quality
WHAA	Wildlife Habitat Management Area
WSA	Wilderness Study Area
WSGS	Wyoming State Geologic Survey
WSR	Wild and Scenic River
WYNDD	Wyoming Natural Diversity Database

1.0 INTRODUCTION

Purpose

This programmatic biological assessment (BA) assesses the potential effects to blowout penstemon (*Penstemon haydenii*), a Federally listed endangered species, from management actions included in four Resource Management Plans (RMPs) approved by the Wyoming Bureau of Land Management (BLM). The objectives of this BA are to:

- Summarize the biology of blowout penstemon, including its known and potential distribution in Wyoming;
- Review pertinent RMPs and RMP amendments, and identify management actions with the potential to affect blowout penstemon or its habitat;
- Assess the potential effects of programmatic actions proposed in the Rawlins, Casper, Lander, and Green River RMPs on blowout penstemon and its habitat;
- Prepare an effects determination on blowout penstemon for each of the proposed programmatic actions identified in the four RMPs; and
- Recommend conservation strategies to minimize or eliminate adverse effects on the species.

Organization of Report

This BA is organized into the following sections:

- 1.0 Introduction – describes the purpose of the analysis, the scope of the biological assessment, the action area, and the methods used for this BA.
- 2.0 Species Information – summarizes the current listing status, species ecology, abundance and distribution in Wyoming, and threats to blowout penstemon.
- 3.0 Analysis of the RMPs – provides descriptions of all management actions and effects analysis combined over all the field offices (FOs) to reduce repetition throughout the document. Separate effects determinations were prepared for each FO because of differences in occupied and potential habitat between FOs.
- 4.0 Conservation Strategies – provides a list of binding Conservation Measures and non-binding Best Management Practices (BMPs) that are designed to minimize potential negative effects to blowout penstemon and its habitat. These recommended measures were prepared in coordination with the U.S. Fish and Wildlife Service (USFWS) office in Cheyenne, Wyoming using the best science available and are intended to be targeted, yet comprehensive, for blowout penstemon.
- 5.0 References – provides a list of documents reviewed for the preparation of this report.

Methods

Literature was reviewed to gather information on the biology and habitat characteristics associated with blowout penstemon. BLM biologists from the Casper, Lander, Rawlins, Rock Springs, Kemmerer, Pinedale, Buffalo and Newcastle FOs were contacted to gather FO specific information for the plant. Current data on species occurrences and habitat distribution was provided by the Wyoming Natural Diversity Database (WYNDD). The *Endangered and Threatened Wildlife and Plants: Final Rule to Determine Penstemon Haydenii (Blowout Penstemon) To Be an Endangered Species* was reviewed (USFWS 1987), and USFWS personnel were contacted to provide updated information on listing status.

Map 1 (inset) depicts the distribution of all Aeolian sand deposits in Wyoming showing the range of potential base habitat for blowout penstemon in the state. However, blowout penstemon has specific habitat requirements, preferring microsites that are sparsely vegetated, steep or newly created (blowouts), and not every location with these characteristics is considered suitable habitat. Thus, a much smaller subset of the Aeolian sand deposits distributed across the state are actually considered potential habitat. Fertig (2001) identified potential habitat for blowout penstemon in the Killpecker Sand Dunes of north-central Sweetwater County (Rock Springs FO), the Green Mountains in southeast Fremont County (Lander FO), the Sandhills in southwestern Carbon County and the Ferris Mountain/Seminole Mountain area in northern Carbon County (Rawlins FO) based on geologic substrate (Love and Christiansen 1985) and elevation ranges of documented occupied habitat as of 2001. Currently in Wyoming, blowout penstemon populations occur in northwestern Carbon County on BLM and Bureau of Reclamation federally administered public lands and State of Wyoming administered public lands within or proximate to the ACEC boundaries (**Map 1**) (WYNDD 2011).

Three different FO RMPs are associated with occupied and potential habitat for blowout penstemon as identified by Fertig (2001), including the Rawlins, Lander and Rock Springs FOs. Additionally, the Casper FO RMP was analyzed because of the close proximity to known populations, prevailing wind direction from west to east, and the presence of Aeolian surface geology. RMPs for the Worland and Cody FOs were not included because no potential blowout penstemon habitat exists within these planning areas. The Kemmerer, Pinedale, Buffalo and Newcastle FO RMPs also were not included because field surveys for new populations have resulted in negative results or aerial photointerpretation and BLM expert opinion has determined Aeolian sand deposits do not meet specific habitat requirements for the plant. As with any federally listed species, should new populations of blowout penstemon be discovered the conservation measures incorporated in the blowout penstemon statewide BA will be adhered to and RMPs updated to come into compliance under the ESA by reinitiating consultation with the USFWS.

The Endangered Species Act of 1973 (ESA) does not prohibit incidental take of listed plant species and sections 7(b)(4) and 7(o)(2) of the ESA generally do not apply to listed plant species. Limited protection of listed plants from take is provided to the extent that the ESA prohibits the removal, reduction in habitat, and possession of federally endangered plants, as well as the malicious damage of these plants in areas under Federal jurisdiction. Programmatic management actions in the RMPs for the selected FOs were analyzed for their potential to directly or indirectly affect blowout penstemon. The binding Conservation Measures listed in the Conservation Strategies section (section 4) were considered to be operant in the analysis of effects and determinations. The results of the effects analysis were then used to develop a determination of effects for blowout penstemon. The following categories are possible effects determinations:

- **No effect (NE);**
- May affect, but is **not likely to adversely affect (NLAA)** due to:
 - **Beneficial** effects (NLAA-b),

- **Discountable** effects (NLAA-d),
- **Insignificant** effects (NLAA-i); or;

➤ May affect, is **likely to adversely affect (LAA)**.

“No effect” means there are absolutely no effects to the species and its critical habitat, either positive or negative. A “no effect” determination does not include small effects or effects that are unlikely to occur. If effects are insignificant (in size) or discountable (extremely unlikely), a determination of “not likely to adversely affect” is appropriate.

“Not likely to adversely affect” means that all effects to the species and its critical habitat are either “beneficial,” “insignificant,” or “discountable.” Determinations of “not likely to adversely affect” require written concurrence from the USFWS.

Beneficial effects have concomitant positive effects to the species and no adverse effects. For example, “balancing” of positive and negative effects, such that the benefits of the action outweigh the negative effects would be an incorrect determination.

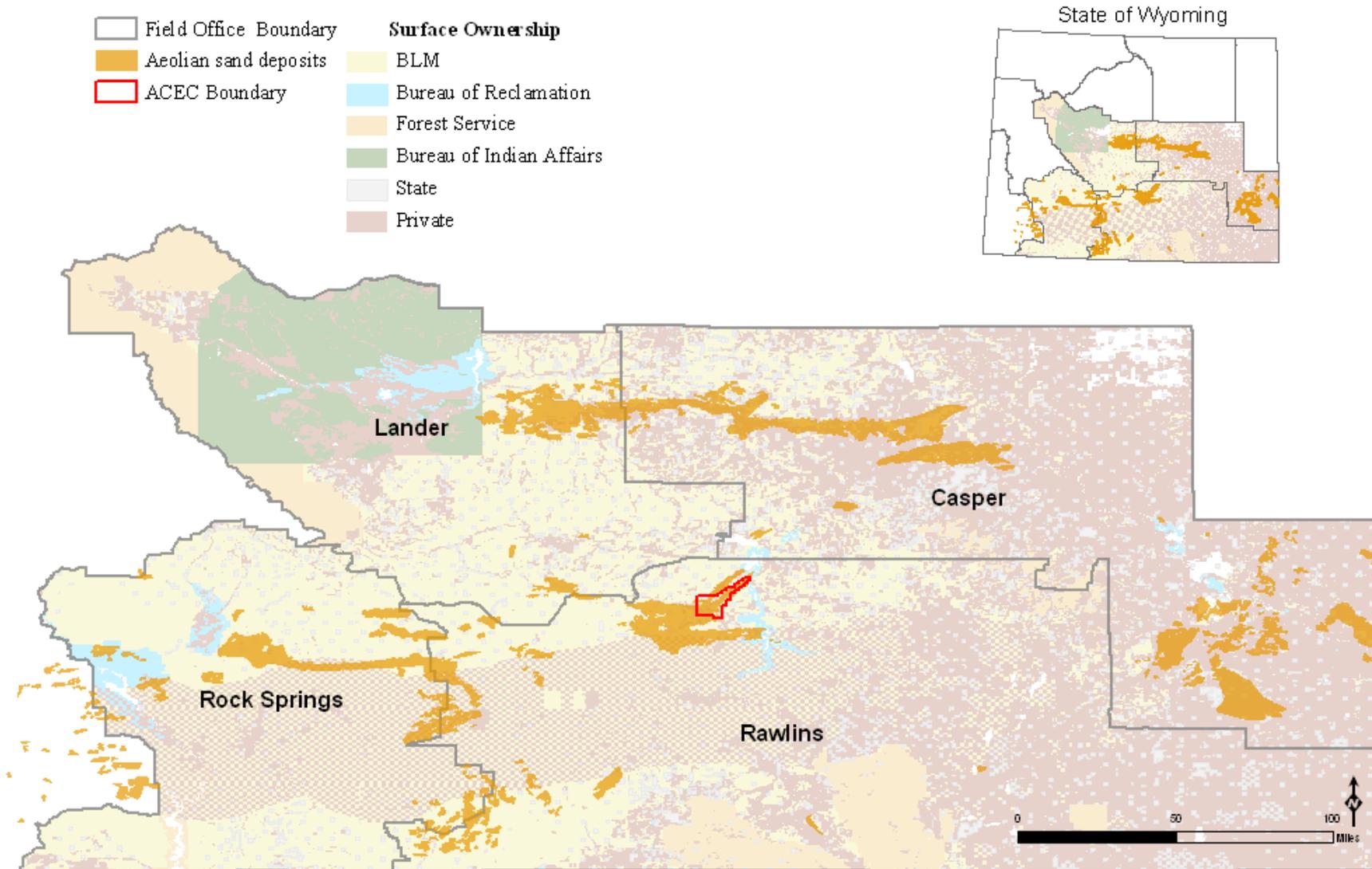
Insignificant effects relate to the size of the impact. Based on best judgment, a person would not be able to meaningfully measure, detect, or evaluate insignificant effects

Discountable effects are considered extremely unlikely to occur. Based on best judgment, a person would not expect discountable effects to occur.

“Likely to adversely affect” means that the action would have an adverse effect on the species. Any action that would result in take of an endangered or threatened species is considered an adverse effect. A combination of beneficial and adverse effects is still considered “likely to adversely affect,” even if the net effect is neutral or positive.

These determinations are defined in more detail in the USFWS Endangered Species Consultation Handbook (USFWS 1998).

Map 1 - Wyoming Aeolian sand deposits and blowout penstemon ACEC boundary



2.0 SPECIES INFORMATION

Listing Status

Blowout penstemon (*Penstemon haydenii*) was listed as endangered under the ESA on October 1, 1987 (USFWS 1987). The Natural Heritage rank is G1 and S1. A ranking of G1 signifies that a species is critically imperiled globally because of extreme rarity (often known from five or fewer extant occurrences or very few remaining individuals) or because some factor of a species' life history makes it vulnerable to extinction. The state rank (S1) also means that the species is considered imperiled because of rarity, often known from five or fewer extant occurrences or very few remaining individuals. WYNDD lists blowout penstemon as a regional endemic and high conservation priority plant species (Fertig and Heidel 2008).

There is no critical habitat designated for blowout penstemon under the ESA (USFWS 1987), but there is a recovery plan in place (USFWS 1992). However, at the time of the recovery plan publication in 1992, there were no known occurrences of blowout penstemon in Wyoming. Consequently, the 1992 recovery plan focuses solely on recovery of the species in Nebraska. A *5-year Review: Summary and Evaluation* (2012) document was created by the USFWS to evaluate progress of blowout penstemon towards recovery as well as to summarize current scientific research and survey data. The 5-year review includes both Nebraska and Wyoming population survey and monitoring data.

Ecology

Description of Species

Blowout penstemon is a member of the figwort family (*Scrophulariaceae*). The plant is a hairless perennial herb ranging from 30 to 70 cm in height (USFWS 1987). Vegetative stems are usually less than 30 cm tall and have greenish-blue, waxy, linear leaves 2.5 to 12 cm long and 0.3 to 1.0 cm wide (Fertig and Heidel 2008). Flowering stems have narrow, linear leaves at the base, and broad, clasping, waxy leaves that taper to a narrow tip. The inflorescence is 6 to 16 cm long with 6 to 10 compact, leafy whorls of milky-blue to pale lavender flowers (Heidel 2005). The individual flowers are 23 to 25 mm long with tubular, bi-lobed, vanilla-scented corollas and nectar guidelines that may be either present or absent (Heidel 2005). Anther sacs are glabrous and range between 1.8 to 2.0 mm long, while the sterile staminode can be either glabrous or hairy (Heidel 2005). The fruits are 13 to 16 mm long capsules with light-brown, disc-shaped seeds and winged margins (Heidel 2005, Fertig and Heidel 2008). The plant generally flowers in Wyoming from June to July and fruits from July to August. The flowers have a strong, persistent fragrance that lures several kinds of bees and other pollinators (Tepedino et al. 2007). The fruit (capsule) matures and splits in early to mid-August and the seeds either fall near the base of the plant or are transported primarily by wind to other areas within the blowout or outside of the blowout. All healthy flowering plants are thought to produce seed (USFWS 1992). Most blowout penstemon plants begin to bloom at 2 to 3 years of age (Stubbendieck *et al.* 1993) and have been successfully cultivated in the greenhouse (Flessner and Stubbendieck 1989, 1992). Flowering in Wyoming occurs later than in Nebraska (late June to early July), probably in response to drier and cooler climatic conditions (Fertig 2001).

Similar species include large beardtongue (*Penstemon grandiflorus*) and broadbeard beardtongue (*Penstemon angustifolius* var. *angustifolius* and *Penstemon angustifolius* var. *caudatus*) (Heidel 2005). *Penstemon grandiflorus* has ovate to spoon-shaped leaves, corollas that are non-aromatic and greater than 35mm in length, and fruits over 16 mm long (Heidel 2005). *Penstemon angustifolius* var. *angustifolius* has narrow, lance-shaped stem leaves over 7 times as long as they are wide (commonly less than 1 cm

wide) and corollas that are less than 25 mm long (Heidel 2005). *Penstemon angustifolius* var. *caudatus* also has corollas less than 25 mm in length (Heidel 2005).

Description of Habitat

In the Great Divide Basin of Wyoming, the plant is found mainly on the rim and lee slopes of blowouts, the rim and steep faces of sandy slough slopes and in micro-sites that are zones of sand accumulation (Heidel 2005). Occupied habitat of blowout penstemon spans elevations of 1786 to 2270m (Heidel 2005). The plant is a primary invader of sparsely vegetated, shifting sand dunes and blowouts and does not persist when its preferred habitat becomes stabilized by a denser vegetative community (USFWS 1987, Heidel 2005). On unstable, windward slopes, blowout penstemon is typically found with communities of blowout grass (*Redfieldia flexuosa*), lemon scurf-pea (*Psoralidium lanceolatum*), and thickspike wheatgrass (*Elymus lanceolatus* var. *lanceolatus*) with less than five percent vegetative cover (Fertig 2001). Populations on more stable, lee slopes occur in similar communities with vegetative cover between 0 and 40 percent (Fertig 2001, Heidel 2005). Some populations may also be found on choppy dunes associated with silver sagebrush (*Artemisia cana*) and thickspike wheatgrass, or on barren slopes above stands of chokecherry (*Prunus virginiana*) and stinging nettle (*Urtica dioica*) associated with seeps (Fertig 2001, Fertig and Heidel 2008).

Distribution

Blowout penstemon is a regional endemic species of the Sand Hills of west-central Nebraska and the northeastern Great Divide Basin in Carbon County, Wyoming (Fertig 2001, Fertig and Heidel 2008). The earliest record of blowout penstemon in Wyoming occurred during the Hayden expedition from Casper to Rawlins in 1877 (Fertig 2001). It was rediscovered by BLM Rawlins FO wildlife biologist Frank Blomquist in June 1996, on public lands near the west foothills of Bradley Peak in northwestern Carbon County, WY (Fertig 2001, Heidel 2005). The identity of Blomquist's discovery was confirmed by voucher specimens sent to plant identification specialists at the New York Botanical Garden and University of Nebraska in 1999 and blowout penstemon is a recognized species in the current edition of *The Vascular Plants of Wyoming* by Robert. D. Dorn (3rd Edition 2001).

Blowout penstemon comprises three occurrences (populations) in Wyoming. All populations reside within the Rawlins FO on federal and state surface lands. It is also likely that blowout penstemon occurs on private lands adjacent to occupied habitat on public lands; however, minimal surveys have been conducted on private lands to confirm/negate its presence. The occurrences are comprised of 19 separate subpopulations (dunes/blowouts) occupying approximately 226 acres (WYNDD 2011). In the Rawlins RMP an Area of Critical Environmental Concern (ACEC) 17,050 acres in size (**Map 1**) was designated to protect known and potential blowout penstemon habitat with the objective "to ensure the continued existence of the plant and to allow for continued research" on public lands (BLM 2008a). Ground surveys conducted in 2011 resulted in the discovery of 3 new sub-populations in northwestern Carbon County, 2 of which lie just outside the ACEC boundaries (WYNDD 2011).

Threats

Survey, census and monitoring data (Fertig 2001, Heidel, 2005, 2007, Heidel and Handley 2010, WYNDD 2011) has been collected for blowout penstemon populations in Wyoming; however no long-term, consistent trend data is available for any of the known occurrences. Population fluctuations from year to year, diversity in occupied habitat between sub-populations and differences in browse and flowering levels make it difficult to infer about the stability and resiliency of blowout penstemon populations in the state. The cause of the sharp decline in the Nebraska populations is unknown, although stabilization of dune habitat as a result of wildfire control and improvements in range management, leveling of sand dunes, severe drought and outbreaks of pyralid moths have all been

identified as probable causes (Stubbendieck et al. 1997). Threats to the viability of the species in Wyoming include: changes in habitat quality, livestock and wildlife grazing and trampling, over-collection, weeds, and surface disturbing activities (USFWS 1992, Fertig 2001, Heidel 2005).

In Wyoming blowout penstemon colonizes early succession sand dune/blowout habitat, characterized as being sparsely vegetated across varying slopes and topography (Fertig and Heidel 2008, Fertig 2001, Heidel 2005). Vegetative succession, which involves the vegetative stabilization of shifting sand dunes and blowouts, is a natural threat to existing populations of blowout penstemon and is influenced by activities such as fire management. Historically, fire helped maintain early succession habitat by periodically removing sand stabilizing vegetation, thereby increasing the potential for wind erosion and the occurrence of blowouts. Within the boundaries of the Rawlins RMP blowout penstemon ACEC, wildfire activities are to be managed to maintain early succession plant communities (BLM 2008a), thereby facilitating the movement of dunes and the creation of blowouts on public lands. However, on state and private lands with different management objectives the use of fire as a land management tool is less common, which could decrease the migration of blowout penstemon populations by allowing for vegetation stabilization of adjacent dune habitat.

Blowout penstemon is palatable to cattle and wildlife. Grazing could be beneficial to blowout penstemon populations through the removal and stress of adjacent competing vegetation. Also, hoof action during grazing or trailing could maintain and create colonizing habitat for the plant. Yet, grazing or trampling of blowout penstemon during its reproductive phase could have negative impacts to population stability over time if plants are unable to produce seed. Also, grazing or trampling could lead to increased mortality by making plants more susceptible to burial (Heidel 2005). Between 17 to 89% of plants were observed to have some degree of browsing during a 3-year monitoring study conducted on the Bradley Peak and Bear Mountain – Junk Hill complex populations in Wyoming (Heidel 2007). Further, in years with lower than normal precipitation ungulates have been observed to closely graze almost every available plant when more favorable forage is limited, and uncertainties associated with climate change could exacerbate drought conditions. It is unknown if high levels of grazing/browsing or trampling are detrimental to blowout penstemon persistence and vigor over time. Livestock and wildlife presence in occupied or potential blowout penstemon habitat could also increase the spread of noxious and invasive weeds if seeds are introduced through excrement or carried in on the coats of the animals, although currently there is no verification that weed seed introductions are occurring in these ways.

Invasive and noxious weeds have potential to threaten populations of blowout penstemon as a result of competition for resources such as habitat and water. Russian knapweed (*Centaurea repens*) and cheatgrass (*Bromus tectorum*) have been observed near occupied blowout penstemon habitat in Wyoming. Impacts of herbicides on blowout penstemon are unknown, but it is likely that broadleaf weed killers would negatively impact populations of this species (USFWS 1992). Because of the sparse vegetation cover associated with blowout penstemon habitat, herbicide application proximate to occupied habitat is expected to be minimal.

As a result of its showy appearance and fragrant flowers, blowout penstemon is vulnerable to over-collection of seed for garden/landscape stock. In Wyoming, there is no protection afforded to blowout penstemon from commercially collecting seed or digging plants on state and private lands under the Endangered Species Act. However, most of the known locations of the species in Wyoming are remote and inaccessible making this threat less severe than threats associated with Nebraska populations located near state highways (USFWS 1992, Fertig 2001, Heidel 2005). In Nebraska, blowout penstemon seed is subject to herbivory by small mammals. It remains unknown if seed of Wyoming populations are likewise threatened.

Insect herbivory has not been noted for Wyoming blowout penstemon populations, though Nebraska populations have been subject to herbivory by spider mites, grasshoppers, and penstemon aphids (USFWS 1992). The most serious pest problem for Nebraska populations results from the larvae of Pyralid moths, which bore into the stems and rootcrowns of blowout penstemon to pupate and results in individual plant death (Stubbendieck et al. 1997). The use of insecticides for insect pests could have indirect and/or negative impacts on pollinators associated with blowout penstemon (USFWS 1992, Fertig 2001, Heidel 2005). Fungal infections have been observed on flowers of blowout penstemon in Wyoming, yet these infections did not seem to affect flowering activities, such as seed production (Heidel 2005). Fungal root rot has caused mortality in Nebraska populations (USFWS 1992), yet no incidents have been recorded for Wyoming populations.

Occupied blowout penstemon habitat located on BLM federally administered public lands is protected from being exchanged or sold under the Rawlins RMP blowout penstemon ACEC (BLM 2008a). Management actions associated with the blowout penstemon ACEC state that acquisition of lands, easements or exchanges will be pursued to manage blowout penstemon habitat (BLM 2008a). Minimal surveys for blowout penstemon on private land adjacent to occupied public land have not been conducted. Activities on both state and private lands that destabilize dune vegetation and increase potential for wind erosion could benefit blowout penstemon populations by increasing the potential for habitat creation. In contrast, activities on private and state lands that result in dune stabilization or increase weed spread could ultimately have negative effects for blowout penstemon populations by decreasing the range and potential for plant migration to new habitat.

There are a range of activities associated with the use and management of BLM public lands that are characterized as surface disturbing. Such activities include the construction and maintenance of roads and trails, energy exploration and associated infrastructure developments, rangeland fence building and maintenance, recreational uses such as OHVs, hiking and camping, and activities associated with fire management and suppression including prescribed burns and fuel reduction actions. While this list is not exhaustive, it exemplifies the multitude of surface disturbing activities that continually take place on BLM-administered public lands.

Surface disturbing activities that result in the destabilization of sand dunes and increase the potential for wind erosion could benefit blowout penstemon through the creation of suitable habitat for colonization. However, surface disturbing activities that directly damage plant tissues or increase the likelihood of plants becoming buried could result in mortality. Additionally, the use of off-highway vehicles (OHVs) and other vehicular traffic associated with BLM management activities could exacerbate the spread of weeds into both occupied and potential blowout penstemon habitat on public lands. The spread of weed communities is likely to decrease blowout penstemon populations through resource competition and habitat reduction. Currently there are no protections afforded to blowout penstemon from surface disturbing activities on state and private lands in Wyoming. For occupied habitat on BLM federally administered public lands, protections are afforded to the plant under the Rawlins RMP (BLM 2008a), which restricts or prohibits surface disturbing activities that could cause direct (mortality) or indirect (weed spread) harm to blowout penstemon populations and habitat.

Of the potential renewable energy to be produced in the state, wind energy is the most probable and poses the largest threats to blowout penstemon populations and habitat. Southern Wyoming is recognized as having premium wind capacity capable of supporting utility-scale wind energy developments (BLM 2005, Parady et al. 2009). Of the 1,776 megawatts (MW) of potential wind energy that could be produced in the state from existing wind developments, approximately 84% (1486 MW) originates from projects completed since 2008 (Phadke et al. 2009, WSGS 2011). Furthermore, another 3,709 MW of potential wind energy development in the state (2,014 turbines) is either under construction or in the pre-permitting/proposal phase (WSGS 2011). The majority of wind energy produced in Wyoming is

projected to be sold to entities outside the state (NREL 2000), requiring the installation of transmission lines. There are many miles of transmission lines, consisting of high voltage interstate and collector systems, proposed for development in Wyoming within the next decade (NREL 2011). The Wind Energy Programmatic Environmental Impact Statement (EIS) established that wind development would be excluded from all designated ACECs (BLM 2005), however this policy was changed in 2008 by an Instruction Memorandum (IM) that directed wind energy development within ACECs would be considered on a case-by-case basis (BLM 2008b).

Overall, the effects of wind energy development projects on blowout penstemon and its habitat remain largely unknown. Construction activities associated with wind turbines and transmission lines that disturb dune stabilizing vegetation could benefit blowout penstemon by facilitating wind erosion and maintaining or creating habitat. Yet, enhanced wind erosion also increases the potential for plant mortality as plants become buried by blowing sand deposits, particularly young plants and seedlings. The fragmentation, leveling and grading of the landscape for placement of roads, towers and transmission corridors may result in the direct loss of blowout penstemon habitat. Construction and maintenance of wind energy infrastructure could introduce weeds or exacerbate their spread, diminishing blowout penstemon habitat quality as a consequence of resource competition and dune stabilization. In arid landscapes, such as those of southern Wyoming, fugitive dust generation from construction and maintenance activities can disrupt plant physiological processes such as photosynthesis and transpiration, eventually impacting plant population vigor and persistence (BLM 2005). Greater access to blowout penstemon populations on public lands from turbine access roads could increase vehicular traffic, which could result in direct mortality to blowout penstemon populations.

Wind turbines authorized by the BLM generally range up to 180 feet in height with turbine diameters that are approximately 80 feet in length and each is approximated to have a potential surface disturbance of 1.2 acres (BLM 2005, 2008a). Turbines can alter the local environment as a result of vertical mixing of the air and the generation of turbulence (Baidya Roy and Traiteur 2010), which has been observed to increase the evaporation rate of moisture from the soil (Baidya Roy and Pacala 2004). These “wake effects” have been simulated with models to occur up to 12 miles downwind of wind energy developments (Baidya Roy 2011). The loss of excess soil moisture from an existing xeric environment could have negative impacts on the germination, fecundity and population viability of blowout penstemon. Further, turbine potential to induce chaotic wind patterns near the ground could increase the potential for plants to become buried and also affect blowout penstemon seed dispersal. Distinct differences have been observed in vertical wind speeds at the hub-height levels of turbines (Baidya Roy and Pacala 2004), which could restrict the movement of sand and the creation of suitable blowout penstemon habitat. Localized turbulence at the ground surface and shadow flicker, or moving shadows caused by blade rotations, could also interfere with the behavioral activities of plant pollinators through avoidance or altered flight patterns.

Environmental Baseline

The environmental baseline describes past and current factors in the state that may have contributed to the current status of the species and protective measures that are currently in place.

Three occurrences of blowout penstemon are known to occur in the state of Wyoming. All three are found on BLM, Bureau of Reclamation, and state surface lands within sparsely vegetated and sometimes steep sections of sand dunes, the lee side of active blowouts, or at the base of mountains in Carbon County. Sub-populations vary greatly in size and distribution across habitats and all populations on BLM federally administered public lands are under the jurisdiction of the Rawlins FO.

The plant was thought to be confined to sand dune habitat in northwestern Nebraska until a BLM wildlife biologist rediscovered the species in south-central Wyoming in 1996. Blowout penstemon receives no habitat protection under state laws in Wyoming. For this reason, a 17,050 acre blowout penstemon ACEC was designated under the Rawlins RMP (**Map 1**), to provide for the continued existence of the plant on public lands by restricting or excluding certain management actions within ACEC boundaries (BLM 2008a). In addition to the ACEC protections and conservation measures committed to by the BLM as part of the Rawlins RMP consultation (BLM 2008a), endangered plant species habitat can fall under the No Surface Occupancy (NSO) Guideline for surface disturbances under the *Wyoming BLM Mitigation Guidelines for Surface Disturbing and Disruptive Activities*, if other mitigation measures are determined to be inadequate to protect the plant and its habitat (BLM 2008a).

All populations of blowout penstemon have been and continue to be grazed by both livestock and wildlife, with varied grazing frequencies, intensities and seasons of grazing. Noxious and invasive weeds, such as Russian knapweed and cheatgrass, have been observed in the vicinity of occupied blowout penstemon habitat, however no broad-scale treatments of the weeds (mechanical, chemical, or biological) have yet to occur in these areas. At this time, no significant impacts have been observed. OHV use has been noted in occupied habitat, however it is unknown if the tracks are associated with authorized necessary tasks or recreational use.

The USFWS conducted an analysis using Geographic Information Systems (GIS) to update the Section 7 range of the blowout penstemon. The analysis compiled and analyzed geology and land cover data to delineate the range of suitable habitat. That range was combined with National Agriculture Imagery Program (NAIP) imagery and infrared bands to remove any features that were not identified as dunes.

Although blowout penstemon is only found in one county in the state, under the jurisdiction of the Rawlins FO, potential Aeolian sand deposits with preferred habitat characteristics (slope and vegetative cover) are distributed across portions of surface lands in other FOs, including the Casper, Rock Springs, and Lander FOs. In the absence of criteria for accurately defining suitable habitat for blowout penstemon in Wyoming systematic ground surveys based on photointerpretation of potential habitat have been completed in some of these FOs within the past decade (Heidel 2005, 2011). Some of the known populations of blowout penstemon are small and isolated and not every possible area with potential habitat in the Casper, Rock Springs and Lander FOs has been surveyed, suggesting that the possibility exists for occupied habitat outside of the Rawlins FO. Therefore, given the remote possibility that blowout penstemon exists in the Casper, Lander, and Rock Springs FO, each respective RMP (Casper, Lander, and Green river) will be included and addressed in this programmatic BA. As further surveys are conducted, previous and current factors affecting areas with blowout penstemon will be addressed.

3.0 RMP MANAGEMENT PROGRAM DESCRIPTIONS, EFFECTS ANALYSES AND DETERMINATIONS

Introduction

Each of the FO RMPs included in the statewide biological assessment for blowout penstemon describes management goals, objectives and actions to be applied to BLM federally administered public lands. These documents further serve to guide future management actions. Only the Rawlins RMP (BLM 2008a) and Casper RMP (BLM 2007) include conservation measures specific to blowout penstemon. The 1987 Lander RMP is in the process of being revised and there is a working draft with a preferred alternative that is being prepared for approval (BLM 2011). Per consultations with USFWS personnel and Lander FO biologists, the management programs and actions for the preferred alternative in the draft RMP were analyzed in this BA. However, should any changes be made to the preferred alternative prior to approval, these changes will then be incorporated into this statewide BA and re-consultation with the USFWS will take place. **Table 1** below outlines key characteristics associated with the Rawlins, Casper, Lander and Rock Springs FOs.

Field Office	Location	Counties	Total acres (millions)	Public Land Surface (million acres)	Federal Mineral Estate (million acres)
Rawlins	South-central	Albany, Carbon, Laramie, Sweetwater	11.2	3.4	1.2
Casper	East-central	Converse, Goshen, Natrona, Platte	8.5	1.4	4.7
Lander	Central	Carbon, Fremont, Hot Springs, Natrona, Sweetwater	6.6	2.5	2.7
Rock Springs	Southwestern	Fremont, Lincoln, Sublette, Sweetwater, Uinta	5.4	3.6	3.5

The following section describes management programs and actions common to all FO RMPs that may affect blowout penstemon. Specific management program information can be found in each FO RMP, and can be accessed online at the Wyoming BLM website under the “Planning” tab. The management actions have been combined in this section to more efficiently discuss the general types of activities and management actions that occur programmatically throughout the Wyoming BLM FOs. Effect determinations were considered individually by FO, because of difference in potential and occupied blowout penstemon habitat between the FOs.

Air Quality

Management Actions

The management objectives of air quality management are to maintain or enhance air quality and minimize emissions that could result in atmospheric deposition, violations of air quality standards, or reduced visibility. The BLM air quality program includes monitoring efforts in coordination with the USFWS, Wyoming Department of Environmental Quality (WDEQ) and the U.S. Environmental

Protection Agency (EPA). Concentrations of air contaminants must be within limits of Wyoming ambient air quality standards (WAAQS) and National Ambient Air Quality Standards (NAAQS). New sources of air pollutants or modifications to sources must comply with the new source performance standards and prevention of significant deterioration (PSD). The PSD program is used to measure air quality to ensure that areas with clean air do not significantly deteriorate, while maintaining a margin for industrial growth.

Monitoring for air quality components (i.e. carbon monoxide, nitrogen dioxide, sulfur dioxide, ozone, etc.) is conducted from various facilities around Wyoming. Air quality management actions typically are associated with limiting, reducing, and monitoring pollutant levels and dust during other BLM management actions. Special requirements (i.e. stipulations, mitigation measures, conditions of approval, etc.) to alleviate air quality impacts will be identified on a case-by-case basis and included in use authorizations. Examples of such requirements include: limiting emissions, spacing of source densities, requiring the collection of meteorological and air quality data, covering conveyors at mine sites (to lower dust emissions), and restricting natural gas flaring (to reduce sulfur emissions).

Activities associated with air quality management include gathering of meteorological and air quality data for air quality components and concentrations and conducting dust control inspections. These activities require travel to monitoring sites located throughout the state.

Effects Analysis

There are no air quality monitoring stations positioned in either occupied or potential habitat of blowout penstemon in any of the FOs. It is not likely that placement of air quality monitoring stations would occur in either occupied or potential habitat of blowout penstemon as the nature of shifting sands would not provide a stable foundation for such structures. Further, a conservation measure prohibits ground disturbing activities within 0.25 miles of occupied habitat.

Most air quality management actions, across FOs are likely to result in secondary benefits to blowout penstemon as a result of decreased contaminants in the air. Particularly, controls on dust abatement for activities that occur near occupied habitat will minimize impacts to critical plant physiological functions from accumulation of dust particles on plant tissues.

Determinations

For FOs that address air quality under other management programs, the determinations listed below will apply to those activities under whichever management program includes air quality management actions.

Rawlins RMP

Implementation of air quality management actions as presented in the Rawlins RMP (BLM 2008a), may affect, but is **not likely to adversely affect** blowout penstemon, due to **insignificant effects**. This determination is based on the low likelihood that projects and activities associated with air quality management would occur in potential blowout penstemon habitat and conservation measures that restrict ground disturbing activities within occupied habitat.

Casper RMP

Implementation of air quality management actions as presented in the Casper RMP (BLM 2007) will have **no effect** to blowout penstemon. This determination is based on the absence of blowout penstemon in the planning area and it is not expected that air quality management actions will occur in potential blowout penstemon habitat. Further, should new populations be discovered, there are conservation measures in place, including but not limited to #14, which prohibit ground disturbing activities within occupied habitat.

Lander RMP

Implementation of air quality management actions as presented in the Lander RMP (BLM 2011) will have **no effect** to blowout penstemon. This determination is based on the absence of blowout penstemon in the planning area and the low likelihood that air quality management actions would occur in potential habitat for the plant. Further, should new populations be discovered, there are conservation measures in place, including but not limited to #14, which prohibit grounds disturbing activities within occupied habitat.

Green River RMP

Implementation of air quality management actions as presented in the Green River RMP (BLM 1997a) will have **no effect** to blowout penstemon. This determination is based on the absence of blowout penstemon in the planning area and the low likelihood that air quality management actions would occur in potential habitat for the plant. Further, should new populations be discovered, there are conservation measures in place, including but not limited to #14, which prohibit grounds disturbing activities within occupied habitat.

Cultural Resources

Management Actions

The objectives of cultural resource management include the protection and preservation of cultural resources and historic trails to ensure they are available for use by present and future generations. Cultural resources receive full consideration in all BLM land-use planning and management decisions to reduce threats from natural- or human-caused deterioration and conflicts with other resources and values. The BLM actively seeks listing of sites for eligibility on the National Register of Historic Places in coordination with the Wyoming State Historic Preservation Office.

Cultural resource management actions include conducting inventories and data collection for documenting and developing mitigation plans prior to surface disturbing activities often associated with other resource programs. During inventory activities, the BLM inventories, categorizes, and preserves cultural resources, conducts field activities, performs excavations, maps and collects surface materials, researches records, and photographs sites and cultural resources. The intensity and length of cultural resource inventories varies on a case-by-case-basis, and temporary campsites may be set up to facilitate inventory activities.

Land management actions associated with cultural resources involve managing sites for scientific, public and sociocultural use. Activities may include developing interpretive sites, restricting certain land uses, closing areas to exploration, prohibiting or restricting surface disturbing activities and preparing interpretive materials. The cultural resource program may also install fences to protect resources such as historic trail segments, stabilize deteriorating buildings and other cultural structures, pursue land access or withdrawals when necessary, designative avoidance areas, or construct scenic overlooks, signs and walking trails. Some of the activities and actions associated with cultural resource inventories and management involve the use of hand and power tools, motorized vehicles and heavy equipment.

Effects Analysis

It is unlikely that cultural resource management actions will occur in occupied blowout penstemon habitat as activities associated with this management program are generally not located in sand dune areas and furthermore would be precluded by a conservation measure that prohibits ground disturbing activities within 0.25 miles of occupied habitat. Additionally, prior to ground disturbing activities being

authorized, pre-construction presence or absence surveys would need to be conducted to ensure protection of other resources, including threatened and endangered plant species. If blowout penstemon plants were found during pre-construction surveys the same conservation measure listed above would be adhered to.

Determinations

For FOs that address cultural resources under other management programs, the determinations listed below will apply to those activities under whichever management program includes cultural resources management actions.

Rawlins RMP

Implementation of cultural resource management actions, as presented in the Rawlins RMP (BLM 2008a), may affect, but is **not likely to adversely affect** blowout penstemon, due to **insignificant effects**. This determination is based on the absence of blowout penstemon plants near cultural resources, such as historic trails or National Historic Places and conservation measures in place to restrict ground disturbing activities within occupied habitat.

Casper RMP

Implementation of cultural resource management actions, as presented in the Casper RMP (BLM 2007), may affect, but is **not likely to adversely affect** blowout penstemon, due to **discountable effects**. This determination is based on the absence of known blowout penstemon populations in the planning area and the unlikely event that cultural resource management actions will occur in potential blowout penstemon habitats. Also, conservation measures that restrict ground disturbing activities within occupied habitat would be adhered to if the plant were found during presence/absence surveys.

Lander RMP

Implementation of cultural resource management actions, as presented in the Lander RMP (BLM 2011), may affect, but is **not likely to adversely affect** blowout penstemon, due to **discountable effects**. This determination is based on the absence of known blowout penstemon populations in the planning area and the unlikely event that cultural resource management actions will occur in potential blowout penstemon habitats. Also, conservation measures that restrict ground disturbing activities within occupied habitat would be adhered to if the plant were found during presence/absence surveys.

Green River RMP

Implementation of cultural resource management actions, as presented in the Green River RMP (BLM 1997a), may affect, but is **not likely to adversely affect** blowout penstemon, due to **discountable effects**. This determination is based on the absence of known blowout penstemon populations in the planning area and the unlikely event that cultural resource management actions will occur in potential blowout penstemon habitats. Also, conservation measures that restrict ground disturbing activities within occupied habitat would be adhered to if the plant were found during presence/absence surveys.

Fire and Fuels Management

Management Actions

The objectives of fire management are to restore the natural role of fire in fire dependent ecosystems and to protect life, property, and resource values from wildfire. There are two major categories of activities involved in the BLM fire management program, prescribed fire and wildland fire suppression.

Prescribed fire is a management tool used to restore natural fire regimes and enhance rangeland habitat for livestock and wildlife. Fire is also considered as a fuels treatment management tool and can be used

for the disposal of timber slash, seedbed preparation, reduction of hazardous fuel, or the control of disease or insects. The BLM evaluates areas for prescribed burns, prepares fire breaks and coordinates with interested parties to write activity plans prior to conducting treatments.

Wildland fire suppression objectives are to protect life, property and resources values from wildland fire. The BLM has identified site-specific fire management practices for sites within FO planning areas for wildland fire suppression actions. Planning is done in advance to determine the kinds of suppression activities that will be allowed in a planning unit, where they will be allowed, and what kinds of equipment will be used. Full suppression is a strategy requiring immediate and aggressive attack of a fire and typically relies on mechanized equipment on or off roads. In contrast, limited fire suppression is a less aggressive strategy, and used to keep a fire within a specified area. In the event that a wildfire requiring immediate suppression has the potential to impact a threatened and endangered species or its habitat, the USFWS will be contacted for emergency consultation and all conservation measures that do not hinder protection of human life and property will be applied.

There are a multitude of activities associated with the fire and fuels management program. Hand and mechanized equipment ranging from pulaskis to chain saws to bulldozers may be used to reduce fuel loads or prepare fire breaks. Ground access to a site may be by trail, road or cross-country and can occur on foot, truck or OHV, depending on the severity of the fire and need for immediate suppression. Water and chemical fire retardants are dispersed during prescribed and wildland fires using either backpacks, engine pumps or air tanker water drops. Fire personnel crews can range in size from a few individuals to many, and may require the establishment of temporary campsites with areas large enough to accommodate personnel, cooking facilities, and equipment storage areas. "Mop-up" operations involve activities such as extinguishing burning embers or tree snags with tools or water. Rehabilitation after a fire is conducted on a case-by-case basis and can involve activities such as planting to restore previous vegetative cover.

Effects Analysis

Wildland and prescribed fires are not expected to directly impact occupied or potential blowout penstemon habitat. Preferred habitat for the plant is sparsely vegetated sand dunes, which generally do not burn and it is not likely that fires associated with fuels or rangeland management will be prescribed in such areas. A natural disturbance such as fire could enhance blowout penstemon habitat by removing sand stabilizing vegetation from adjacent areas increasing the potential for wind erosion and new blowouts. The use of prescribed fire is listed as a special management action to be used for maintenance of early succession habitat within the Rawlins RMP blowout penstemon ACEC.

It is possible that damage to occupied blowout penstemon plants could occur during wildland fire suppression if equipment and travel to fires occurs in occupied habitat. If occupied habitat were to be affected by wildland suppression activities, at the earliest possible time emergency consultation with the USFWS would be initiated. As many conservation measures as possible would be applied to suppression actions, to minimize impacts to the plant, that do not interfere with fire suppression safety objectives.

Determinations

For FOs that address fire and fuels resources under other management programs, the determinations listed below will apply to those activities under whichever management program includes fire and fuels management actions.

Rawlins RMP

Implementation of fire and fuels management actions, as presented in the Rawlins RMP (BLM 2008a), may affect, but is **not likely to adversely affect** blowout penstemon, due to **insignificant effects**. This

determination is based on the improbability for fires to occur in occupied or potential blowout penstemon habitat due to the low fuel load present in the sand dune habitat occupied by the species. Conservation measure #8 is in place to protect occupied habitat in the event wildfire suppression actions were to occur in occupied habitat.

Casper RMP

Implementation of fire and fuels management actions, as presented in the Casper RMP (BLM 2007), may affect, but is **not likely to adversely affect** blowout penstemon, due to **discountable effects**. This determination is based on the unlikely event a prescribed fire is conducted or wildland fire would occur in potential blowout penstemon habitat and the lack of known occurrences of this species in the planning area.

Lander RMP

Implementation of fire and fuels management actions, as presented in the Lander RMP (BLM 2011), may affect, but is **not likely to adversely affect** blowout penstemon, due to **discountable effects**. This determination is based on the unlikely event a prescribed fire is conducted or wildland fire would occur in potential blowout penstemon habitat and the lack of known occurrences of this species in the planning area.

Green River RMP

Implementation of fire and fuels management actions, as presented in the Green River RMP (BLM 1997a), may affect, but is **not likely to adversely affect** blowout penstemon, due to **discountable effects**. This determination is based on the unlikely event a prescribed fire is conducted or wildland fire would occur in potential blowout penstemon habitat and the lack of known occurrences of this species in the planning area.

Fish and Wildlife Resources

Management Actions

The general objectives for fish and wildlife management actions are to maintain and enhance habitat for a diversity of fish and wildlife species and provide habitats for special status species in compliance with the ESA, approved species recovery plans and BLM Manual 6840. Fish and wildlife program actions may include inventorying, surveying, monitoring, habitat improvement projects, and predator control.

Fish and wildlife inventory, survey and monitoring actions often include sampling and documenting populations, habitat occurrence and habitat conditions. Techniques include, but are not limited to; satellite imagery mapping and interpretation, measurement of resource transect parameters on the ground, and data collection for laboratory analysis. These activities often include off-road field travel, but generally no significant surface disturbance activities.

Habitat development and improvement projects may include, but are not limited to, developing water sources, managing resources to maintain rangeland forage productivity and quality, treating vegetation chemically, mechanically or biologically, and constructing and maintaining fences in accordance with the BLM Fencing Manual Handbook (H-1741-1, Fencing, Rel1-1572, 1989). Together these actions may require the use of hand tools, heavy and/or mechanical equipment, hauling and transportation of materials (road/trail construction), and removal of vegetation. Development of water sources can be labor intensive and cause extreme surface disturbance as a result of earth moving activities.

The BLM develops stipulations and protective measures to enhance fish and wildlife habitat. These can include authorizing withdrawals of specific areas from surface disturbing activities, restricting use of

OHVs, snowmobiles, and horses, imposing road closures, and restricting access to public lands for recreational uses. The BLM may also acquire land or easements to protect habitat.

There are a variety of restoration techniques used by the fish and wildlife resource program, which are used on site-specific and case-by-case basis. These techniques can vary in size and intensity of ground disturbance. Distributing information to landowners and developing public education programs are additional activities authorized under the program.

Predator control methods include trapping, snaring, denning, dog tracking, calling, ground shooting and predicide applications. Rodent controls involve the use of rodenticides, burrow gassing, shooting and occasionally trapping and can be delegated to local or county weed and pest agents, or recreational shooters. Predator and rodent control efforts can take days or months, until the predator control objectives are met.

Effects Analysis

Fish and wildlife habitat where management actions are likely to occur, in general are quite distinct from the preferred early succession sand dune habitat of blowout penstemon. Thus the likelihood for management actions associated with the program to occur in blowout penstemon habitat is low. Further, there are conservation measures in place that prohibit ground disturbing activities within 0.25 miles of occupied habitat. Additionally, fish and wildlife management actions, such as access restrictions or road closures, could be beneficial for occupied and potential blowout penstemon habitat by minimizing human presence and threats associated with recreational use of public lands.

Wildlife species, primarily elk, mule deer, and pronghorn, are known to intermittently browse blowout penstemon plants. It is uncertain to what effect, negative, neutral or positive, wildlife browsing has on long-term blowout penstemon population viability. Fencing around occupied habitat is impractical because of the unstable and shifting sandy substrate, potential for fence burial over time, and the difficulty and expense associated with fence maintenance. Yet, there is a conservation measure in place meant to influence the movement of wildlife away from occupied habitat by restricting the placement of new water sources and supplemental feed within 1.0 mile of occupied habitat.

The presence of wildlife in blowout penstemon habitat can be beneficial as disturbance associated with hoof action maintains or creates preferred habitat for the plant to expand or migrate to. Yet, the introduction of weeds is a potential impact associated with wildlife presence in occupied blowout penstemon habitat. Should weed infestations be found to be a significant ecological threat to the species, ground applications of herbicides may be authorized in areas with blowout penstemon plants on a case-by-case basis.

Determinations

For FOs that address fish and wildlife resources under other management programs, the determinations listed below will apply to those activities under whichever management program includes fish and wildlife management actions.

Rawlins RMP

Implementation of fish and wildlife management actions, as presented in the Rawlins RMP (BLM 2008a), may affect, but is **not likely to adversely affect** blowout penstemon, due to **insignificant effects**. This determination is based on the low likelihood that fish and wildlife management actions would take place in occupied or potential blowout penstemon habitat and conservation measures that restrict ground disturbing activities and placement of new water sources and feed supplements within occupied habitat.

Casper RMP

Implementation of fish and wildlife management actions, as presented in the Casper RMP (BLM 2007), may affect, but is **not likely to adversely affect** blowout penstemon, due to **discountable effects**. This determination is based on the unlikely event that fish and wildlife management actions would take place in potential habitats for the plant and the lack of known occurrences within the planning area. If the plant is found, conservation measures that restrict ground disturbing activities and placement of new water sources and feed supplements within occupied habitat will be adhered to.

Lander RMP

Implementation of fish and wildlife management actions, as presented in the Lander RMP (BLM 2011), may affect, but is **not likely to adversely affect** blowout penstemon, due to **discountable effects**. This determination is based on the unlikely event that fish and wildlife management actions would take place in potential habitats for the plant and the lack of known occurrences within the planning area. If the plant is found, conservation measures that restrict ground disturbing activities and placement of new water sources and feed supplements within occupied habitat will be adhered to.

Green River RMP

Implementation of fish and wildlife management actions, as presented in the Green River RMP (BLM 1997a), may affect, but is **not likely to adversely affect** blowout penstemon, due to **discountable effects**. This determination is based on the unlikely event that fish and wildlife management actions would take place in potential habitats for the plant and the lack of known occurrences within the planning area. If the plant is found, conservation measures that restrict ground disturbing activities and placement of new water sources and feed supplements within occupied habitat will be adhered to.

Forest Resources

Management Actions

The objectives of forest management are to maintain and enhance the health, productivity, and biological diversity of forest and woodland ecosystems and to provide a balance of natural resource benefits and uses, including opportunities for commercial forest production. Forest management involves timber harvesting, cutting, removal and spraying of diseased trees, and spraying of grasses and shrubs. Timber harvesting may occur on forestlands with slopes less than 45%, and commercial operations are authorized under sale contracts or permits. Clearcuts, slash disposal, commercial thinning, logging and skidder-type or cable yarding may be allowed during timber harvesting by the BLM. Other commercial uses include post and pole harvest and the removal of wildlings for transplanting. Individual authorized clearcuts are restricted in size and proximity to surface to water. Slash is to be lopped and scattered, roller chopped or burned. During restoration efforts following timber harvest, the BLM ensures site regeneration and stand replacement.

Non-commercial timber harvests are allowed under individual permits for collection or cutting of firewood, Christmas trees, and posts or poles. Additionally, BLM forest management activities include assessment of the effects of prescribed burning, grazing, and recreation on forest resources.

There are many actions related to forest management that can cause surface disturbance, including, but not limited to the following: timber harvesting, rehabilitation surveys, artificial regeneration (planting harvested areas), fencing regenerated areas, collection of firewood and non-commercial timber harvests road and landing construction, chemical applications to diseased trees, grasses and shrubs, erosion control techniques, or recontouring of the landscape after harvest. All of these actions require the use of vehicles and human presence, and may require the use of heavy machinery.

Effects Analysis

Blowout penstemon is associated with sparsely vegetated sand dunes that are geographically distinct and isolated from forest communities. Forest management actions will primarily occur in upland coniferous forests, which are not considered suitable habitat for blowout penstemon. Therefore, occupied and potential blowout penstemon habitats are not expected to experience any impacts as a result of forest management actions.

In the rare event forest management actions were to take place in sand dune systems, conservation measures would prohibit ground disturbing activities within 0.25 miles of occupied blowout penstemon habitat. Further, there are conservation measures that restrict the use of pesticide applications within occupied habitat, should forest management actions require application of such chemicals.

Determinations

For FOs that address forest resources under other management programs, the determinations listed below will apply to those activities under whichever management program includes forest management actions.

Rawlins RMP

Implementation of forest management actions, as presented in the Rawlins RMP (BLM 2008a), will have **no effect** on blowout penstemon. This determination is based on the absence of forest management areas near occupied or potential blowout penstemon habitat in the planning area and conservation measures that restrict ground disturbing and pesticide application activities within occupied habitat.

Casper RMP

Implementation of forest management actions, as presented in the Casper RMP (BLM 2007), will have **no effect** on blowout penstemon. This determination is based on the absence of forest management areas near potential blowout penstemon habitat and the lack of known blowout penstemon occurrences in the planning area. If the plant is found, conservation measures that restrict ground disturbing and pesticide application activities within occupied habitat would be adhered to.

Lander RMP

Implementation of forest management actions, as presented in the Lander RMP (BLM 2011), will have **no effect** on blowout penstemon. This determination is based on the absence of forest management areas near potential blowout penstemon habitat and the lack of known blowout penstemon occurrences in the planning area. If the plant is found, conservation measures that restrict ground disturbing and pesticide application activities within occupied habitat would be adhered to.

Green River RMP

Implementation of forest management actions, as presented in the Green River RMP (BLM 1997a) will have **no effect** on blowout penstemon. This determination is based on the absence of forest management areas near potential blowout penstemon habitat and the lack of known blowout penstemon occurrences in the planning area. If the plant is found, conservation measures that restrict ground disturbing and pesticide application activities within occupied habitat would be adhered to.

Lands and Realty

Management Actions

The objectives of the lands and realty program are to manage the acquisition, disposal, withdrawal and use of public land to meet the needs of the BLM and the public and to develop and maintain a land

ownership pattern that provides for more efficient access to and protection of public lands (BLM 2008a). The lands and realty management program responds to requests for land use authorizations, sales and exchanges, withdrawals, and designates right-of-way (ROW) access to serve administrative and public needs.

Public land tracts that are not critical to current management objectives can be disposed of through the lands and realty program. These lands will be considered for sale or disposal on a case-by-case basis when a definite need for the land is identified, the proposal meets the requirements of the Recreation and Public Purpose Act of 1954 (R&PP), and local land use laws. Generally lands with special status species are not eligible for disposal and are retained in Federal ownership. Protective withdrawals of Federal lands may be established to preserve important resource values.

All BLM federally administered public lands will be open to consideration for utility, transportation, communication, and renewable energy ROW developments, with the exception of WSAs, and some special designation and management areas (SD/MAs). Most ROWs require the use of medium to heavy equipment and human presence during construction and maintenance. Areas with important resource values will not be selected for ROWs. However, if utility/transportation systems or communication sites are necessary in avoidance areas, effects of placement will be subject to mitigation measures and be intensively managed. Proposals for renewable energy developments will be considered on a case-by-case basis.

The lands and realty program also pursues cooperative agreements, develops recreation site facilities, considers offsite mitigation proposals, minimizes access in wildlife habitat, fences, revegetation sites, blocks linear ROWs to vehicle use, considers temporary-use permits, and leases acres for public uses such as landfills. Access management of non-Federal lands is generally in support of other resource management programs. Non-Federal lands may be acquired through exchange, sale or easement negotiations in areas with potential for recreation development or in areas containing important wildlife, cultural, scenic, natural, open space or other resource values.

Effects Analysis

Public lands occupied by blowout penstemon, which exist only in the Rawlins FO RMPPA, are not considered for disposal under the lands and realty program. A conservation measure and the BLM Special Status Species Manual (BLM 2008c) specify that Federal lands occupied by blowout penstemon, a listed endangered species, are to remain in Federal ownership making it extremely unlikely that public lands with blowout penstemon will be considered for disposal.

Prior to the authorization of ROWs, leases and temporary-use permits, assessments for the presence of occupied or potential blowout penstemon habitat must be completed. If habitat is found within proposed project areas, stipulations or other conditions will be amended to the project design or location to minimize negative impacts. Additionally, conservation measures are in place that restricts the placement of ROWs within 0.25 miles of occupied blowout penstemon habitat. For existing ROWs, access and maintenance activities would not be precluded. Access to existing ROWs is limited to conducting authorized activities within the ROW which have not resulted in any documented instances of impact to date and new impacts are not expected to occur. Additionally, a conservation measures has been included to provide education for ROW maintenance specialists as to the avoidance and protection of both individual blowout penstemon plants as well as how to recognize and carefully traverse suitable habitat for the species. These minimization measures will ensure future maintenance and inspection activities are extremely unlikely to occur.

Renewable energy projects will be reviewed on a case-by-case basis with individual restrictive measures applied to proposed projects to minimize negative impacts to the plant. Under the lands and realty program, wind energy developments pose the largest threat to blowout penstemon habitat. Potential impacts from construction and maintenance activities associated with wind energy developments, such as weed introductions, fugitive dust generation and increased public access will be minimized through conservation measures restricting ground disturbing activities (excluding wind turbines, see below) within 0.25 miles of occupied habitat and conditions applied to reduce dust generation.

In addition to potential impacts from construction and maintenance of wind energy developments, operating wind turbines act as energy sinks, altering wind speeds and patterns in their wakes, which has been shown to create localized turbulence (Baidya Roy and Traiteur 2010) and exacerbate soil moisture loss (Baidya Roy and Pacala 2004). These impacts have been shown to peak at the downwind edge of wind energy developments, after which impacts begin decreasing reaching upwind development conditions within 12 miles (Baidya Roy 2011). To minimize potential impacts from operating wind turbines, a conservation measure prohibits placement of wind turbines within 1.0 mile of occupied habitat. However, there is still much uncertainty concerning the long-term effects of wind energy developments on downwind vegetation communities. As new technologies and scientific studies develop the conservation measure restricting placement of wind energy developments will be amended as needed.

Determinations

For FOs that address lands and realty resources under other management programs, the determinations listed below will apply to those activities under whichever management program includes lands and realty management actions.

Rawlins RMP

Activities associated with the land and realty resource management program, as presented in the Rawlins RMP (BLM 2008a), may affect, but are **not likely to adversely affect** blowout penstemon, due to **discountable and insignificant effects**. This determination is based on conservation measures that restrict placement of ROW developments and surface disturbing activities within occupied habitat and prohibit Federal lands with occupied habitat from being considered for disposal.

Casper RMP

Implementing lands and realty program management actions, as presented in the Casper RMP (BLM 2007), will result in **no effect** to blowout penstemon. This determination is based on the absence of blowout penstemon in the planning area and conservation measures that prevent placement of ROW developments within occupied habitat should the plant be found in the future.

Lander RMP

The actions associated with ROW and corridor activities are unlikely to occur in blowout penstemon habitat as no known populations have been identified in the Lander planning area despite searches in suitable habitat. Implementation of the lands and realty program, as presented in the Lander RMP (BLM 2011), may affect, but is **not likely to adversely affect** blowout penstemon, due to **discountable effects**. This determination is based on a lack of known occurrence of blowout penstemon in the planning areas and conservation measures that are in place restrict placement of ROW developments within 0.25 miles of occupied habitat should the plant be found in the future.

Green River RMP

Implementation of the lands and realty program, as presented in the Green River RMP (BLM 1997a), will result in **no effect** to blowout penstemon. This determination is based on the absence of blowout

penstemon in the planning areas and conservation measures that restricts placement of ROW developments within occupied habitat should the plant be found in the future.

Livestock Grazing

Management Actions

The main objective of livestock grazing management is to maintain, restore and enhance livestock grazing on public lands to meet Wyoming Standards for Healthy Rangelands. The BLM will utilize livestock grazing management techniques to attain desired plant communities (DPCs) and ecosystem functions in coordination with grazing permittees and the public. The livestock grazing management program is comprised of livestock management, vegetation treatment and rangeland improvement management actions.

All public lands are open to livestock grazing with the exceptions of recreation, excluded wetland/riparian and specific SD/MA areas. Cattle are the predominant class of livestock grazed on public lands, but sheep, horses, goats and bison are also authorized. Grazing systems used on public lands consist of year-long, season-long, early-season, late-season, split-season, and rotational grazing management systems. Grazing management systems will be designed to maintain healthy rangelands and achieve livestock management goals to meet the Wyoming Standards for Healthy Rangelands. These standards, which include watershed, wetland/riparian, vegetation, water quality, and air quality health, provide the basis for assessing and monitoring rangeland conditions and trends. If livestock are found to be a cause for non-attainment of a standard(s), management guidelines and practices are implemented to ensure progress is being made towards meeting standard(s) attainment. Standard 4 of the *'Standards for Healthy Rangelands and Guidelines for Livestock Grazing Management for the Public Lands Administered by the State of Wyoming'* (1997b) addresses grazing practices and the role they play in managing and conserving threatened and endangered species and their associated habitats.

Livestock management includes authorizing livestock grazing and grazing systems, and adjusting season of use, distribution, kind, class and number of livestock. Additionally, placement of supplemental feed, minerals and water sources is managed as the location of these supplements greatly influences livestock concentrations and distributions. Most livestock operations require the use of OHVs, trucks, or horses to access allotments, patrol and maintain fence lines, and trail or herd livestock. Rangeland management activities can include: prescribed fire, new fence development, existing fence maintenance, seeding (aerial, drilling, disking), fertilizing, pesticide applications, plowing, or off-stream water development, construction and maintenance.

Effects Analysis

All of the documented occurrences of blowout penstemon reside within the Rawlins RMPPA and no occupied habitat is currently excluded from livestock grazing. Livestock have been observed to graze blowout penstemon plants in those populations that are accessible and trampling damage can occur during grazing and trailing activities. Fencing around blowout penstemon habitat is impractical as a consequence of the unstable and shifting substrate, potential for fence burial over time, and the difficulty and expense associated with maintenance. Some existing livestock fences currently traverse occupied or potential habitats of the blowout penstemon. Maintenance of these fences, including associated vehicular access (i.e., OHV, trucks, or horses) could result in crushing or other damages to individual plants, but loss of individual plants from these activities alone would represent an insignificant impact to the overall population and conservation measure #16 would be implemented to minimize the likelihood of impacts to individuals through education of permittees and fencing crews.

Although the overall effect of livestock grazing on blowout penstemon population stability is unknown, grazing and trampling does increase the likelihood for mortality as plants become more susceptible to burial. However, grazing of adjacent vegetation in blowout penstemon habitats could benefit the species by reducing or stressing competing vegetation and hoof action maintains shifting sand substrate preferred by the plant. Under the Wyoming Standards for Healthy Rangelands, habitats that support special status species are to be maintained or enhanced, and livestock grazing management will be modified should livestock grazing be found to be a cause for the loss or degradation of habitat. Additionally, conservation measures prohibit placement of supplemental feed, mineral, and new water sources within 1.0 mile of known populations to influence the distribution and concentration of livestock away from occupied habitat. Further, another conservation measure specifies that increases in livestock stocking levels on grazing allotments with occupied blowout penstemon habitat will only be authorized by the BLM in coordination with the USFWS.

Livestock and livestock operation management actions have the potential to introduce noxious and invasive weed species into occupied or potential blowout penstemon habitat. There are various methods for weed introductions; including livestock excrement or OHV use associated with fence maintenance and livestock management operations; however there is no verification that weeds are being spread in these ways. Conservation measures require that all supplemental feed stocks be certified as weed-free. Should weeds pose a threat to the integrity of blowout penstemon habitat, on a case-by-case basis ground applications of herbicides will be allowed to preserve or restore occupied habitat for the plant.

Revegetation projects to increase native rangeland forage for livestock could decrease blowout penstemon habitat quality through the stabilization of sand dunes. To maintain the open to sparsely vegetated habitat preferred by the plant, a conservation measure prohibits revegetation projects within 0.25 miles of occupied blowout penstemon habitat.

Determinations

For FOs that address livestock grazing resources under other management programs, the determinations listed below will apply to those activities under whichever management program includes livestock grazing management actions.

Rawlins RMP

Activities associated with livestock grazing management, as presented in the Rawlins RMP (BLM 2008a), are **likely to adversely affect** blowout penstemon. This determination is based on the likelihood, that livestock grazing and associated management actions (including OHV use associated with fence maintenance) will take place within occupied habitat and the low possibility that fencing enclosures will be erected around occupied habitat to prevent grazing. Conservation measures are in place to minimize impacts associated with livestock grazing and management operations, but do not explicitly prohibit grazing within occupied habitat.

Casper RMP

Implementing livestock grazing management actions as presented in the Casper RMP (BLM 2007) may affect, but is **not likely to adversely affect** blowout penstemon, due to **discountable effects**. This determination is based on the absence of blowout penstemon in the planning area and the unlikely event that livestock grazing will occur in potential blowout penstemon habitats in the Casper RMPPA. If new habitat is discovered, there are conservation measures are in place to minimize impacts associated with livestock grazing and management operations, but do not explicitly prohibit grazing within occupied habitat.

Lander RMP

Implementation of livestock grazing management actions as presented in the Lander RMP (BLM 2011) may affect, but is **not likely to adversely affect** blowout penstemon, due to **discountable effects**. This determination is based on the absence of blowout penstemon in the planning area and the unlikely event that livestock grazing will occur in potential blowout penstemon habitats in the Lander RMPPA. If new habitat is discovered, there are conservation measures in place to minimize impacts associated with livestock grazing and management operations, but they do not explicitly prohibit grazing within occupied habitat.

Green River RMP

Implementation of livestock grazing management actions as presented in the Green River RMP (BLM 1997a) may affect, but is **not likely to adversely affect** blowout penstemon, due to **discountable effects**. This determination is based on the absence of blowout penstemon in the planning area and the unlikely event that livestock grazing will occur in potential blowout penstemon habitats in the Green River RMPPA. If new habitat is discovered, there are conservation measures in place to minimize impacts associated with livestock grazing and management operations, but do not explicitly prohibit grazing within occupied habitat.

Minerals (leasable, locatable, salable)

Management Actions

Objectives of minerals management are to make public lands and federal mineral estate available for efficient and orderly development while minimizing the impacts to the environment, public health and safety and other resource uses and values. The development of minerals, salable, locatable, or leasable must comply with Federal mineral law and occurs through leasing, location or sale. All mineral developments are determined through land use planning. Surface disturbing activities associated with mineral exploration and extraction will be intensively managed, such that proper distance restrictions, mitigation stipulations, seasonal or timing restrictions, rehabilitation standards, reclamation measures, BMPs and the application of the Wyoming Mitigation Guidelines for Surface Disturbing and Disruptive Activities will be applied.

Leasable Minerals

Leasable minerals are grouped into fluid and solid minerals. Leasable fluid minerals include oil, gas, and geothermal resources. All public lands are open to oil and gas leasing, except those that have been determined to possess land uses or resource values that can only be protected by closing the lands to leasing. Oil and gas leases are administered by the BLM and may include reasonable measures (conditions of approval) to operational aspects of oil and gas development, including modification of siting, facility design, or timing of operations and specification of interim or final reclamation measures to control the pace and manner of development. Leases are disposed of through a competitive and non-competitive bidding process and are granted for 10-year terms or as long as oil or gas is produced.

Indirect or direct methods can be used to explore for oil and gas resources. Overall these methods involve ground disturbing activities such as road construction, OHV use, drilling, and construction of facilities. Oil and gas production also involves many of the same activities and developments associated with exploration, but may include other surface uses necessary for the extraction of the resource, such as pumps and engines. Discovery of a producing area may result in additional wells being drilled and establishing a pipeline system to transport the oil or gas to a storage facility or terminal. The size of disturbance associated with oil and gas production varies greatly. Water is a byproduct with oil and gas production. Water that is unable to be discharged to the surface must be treated and re-injected, which requires the construction of water treatment facilities. When wells are no longer used, reclamation actions such as recontouring and reseeding of native vegetation are required.

Geothermal resources are available for exploration, development and production under the Geothermal Steam Act of 1970 and are subject the same surface disturbing restrictions applied to oil and gas exploration, development, and production. The oldest and most widespread geothermal resource is water in hot springs. Geothermal energy in the form of hot water can be acquired in two ways; drilling a well to an aquifer containing hot water and bringing the water to the surface, or pumping liquid (usually water) down a well, letting the warm rock heat the liquid and then pumping the heated liquid to the surface for use. The most probable uses of geothermal energy will be in direct use applications, which are likely to be local and not result in large areas of ground disturbance.

Leasable solid minerals include coal and trona. In Wyoming, coal is generally extracted using surface mining methods. Coal leases are administered by the BLM, permits by the State, and the Office of Surface Mining (OSM) approves mine plans. Surface mining involves large areas of surface disturbance as a consequence of topsoil removal, stockpiling, and the construction of roads for haul truck usage. These activities often require the use of large equipment. Once an area is mined, reclamation must begin and can include activities such as: reconstruction of drainages, recontouring of disturbed land surfaces, vegetation reseeding and monitoring to assess that habitat is useable.

The largest reserve of trona in the world is located in Wyoming. Trona is used in baking soda, glass, toothpaste, soaps, ceramic tiles, porcelain fixtures, paper, water softeners and pharmaceuticals. This mineral is generally mined underground and surface disturbing activities associated with mining trona include road and facility construction.

Locatable Minerals

All public lands are open to exploration for locatable minerals under the 1872 Mining Law, except those withdrawn to protect other resource values and uses. Locatable minerals include gypsum, silver, gold, platinum, cobalt, and other precious and base minerals. Bentonite and uranium are also locatable except on acquired lands. Activities related to locatable mineral exploration or extraction that cause surface disturbance within the Rawlins RMP blowout penstemon ACEC boundaries will require plans of operations to be written regardless of the size of disturbance (BLM 2008a).

Salable Minerals

Varieties of sand, gravel, sandstone, shale, limestone, dolomite, and granite rock are identified as salable minerals and are generally used for road maintenance. Prior to the issuance of contracts or use-permits for salable minerals, the BLM conducts appropriate environmental analyses and resource inventories, which includes studies or inventories of threatened and endangered plant and wildlife species. Based on the results of the analyses and inventories, stipulations or permit conditions may be included on a case-by-case basis to provide natural resource protection and ensure reclamation of the land following project completion.

In general, salable minerals are extracted using heavy equipment and moved using large haul trucks. All reclamation proposals must conform to state agency requirements and be approved by the BLM. Activities associated with reclamation include removing surface debris, recontouring, reducing steep slopes, or planting vegetation.

Effects Analysis

No areas designated as having potential for coal or geothermal developments reside within or near occupied blowout penstemon habitat, but oil and gas developments are likely to occur in areas surrounding occupied or preferred blowout penstemon habitat. The placement of perpetual structures such as access roads, drill pads and facilities in sand dune areas if approved, could result in the direct loss

of blowout penstemon habitat. Also, improved access to areas near occupied habitat could increase the potential for collection of blowout penstemon plants and/or seed on public lands that would have otherwise been protected due to their remoteness. However, it is not likely that these types of developments will be sited in habitat preferred by the plant, which often contain steep and unstable characteristics that are not conducive for most developments associated with the minerals management program. Additionally, there are conservation measures in place that restrict the placement of ROWs within 0.25 miles of occupied habitat. Increased traffic and human presence could introduce or intensify the spread of noxious and invasive weeds, which could diminish habitat quality. However, there is a conservation measure in place specifying that ground applications of herbicides may be authorized within occupied habitat in those areas where weeds are found to pose a significant ecological threat to the plant and its habitat.

There are additional measures in place to minimize impacts to blowout penstemon associated with minerals resource management on public lands. A controlled surface use (CSU) stipulation will be applied to all new oil and gas leases, prohibiting all surface disturbances within 0.25 miles of known populations. For existing leases, a condition of approval (COA) will be applied to all applications for permit to drill (APDs) for sites within 0.25 miles of occupied blowout penstemon habitat. Similarly, another conservation measure prohibits the disposal of salable minerals, which includes sand, within 0.25 miles of occupied habitat. Further, plans of operations are required for locatable federal mineral exploration and development, irrespective of the size of the proposed project, within the boundaries of the Rawlins RMP blowout penstemon ACEC (BLM 2008a).

Determinations

For FOs that address mineral resources under other management programs, the determinations listed below will apply to those activities under whichever management program includes minerals management actions.

Rawlins RMP

Implementation of mineral management actions, as presented in the Rawlins RMP (BLM 2008a), may affect, but is **not likely to adversely affect** blowout penstemon, due to **insignificant effects**. This determination is based on conservation measures in place that prohibit or restrict ground disturbing activities associated with minerals management within occupied habitat and additional protections afforded to the plant and its habitat under the blowout penstemon ACEC.

Casper RMP

Implementing minerals management actions as presented in the Casper RMP (BLM 2007), may affect, but is **not likely to adversely affect** blowout penstemon, due to **discountable effects**. This determination is based on the absence of known populations in the planning area and conservation measures that would be adhered to should populations be discovered in the planning area in the future.

Lander RMP

Implementation of minerals management actions, as presented in the Lander RMP (BLM 2011), may affect, but are **not likely to adversely affect** blowout penstemon, due to **discountable effects**. This determination is based on the absence of known populations in the planning area and conservation measures that would be adhered to should populations be discovered in the planning area in the future.

Green River RMP

Implementation of minerals management actions, as presented in the Green River RMP (BLM 1997a), may affect, but are **not likely to adversely affect** blowout penstemon, due to **discountable effects**. This

determination is based on the absence of known populations in the planning area and conservation measures that would be adhered to should populations be discovered in the planning area in the future.

Off-Highway Vehicles and Travel Management Areas

Management Actions

The management objective of OHV use on public lands is to provide an adequate and safe OHV network while preventing or minimizing resource damage resulting from OHV use. OHV road networks on public lands are used for both recreational and non-recreational purposes and serve a fundamental role in public land management. Typical OHV recreational uses include all-terrain vehicles (ATVs), motorcycle trail riding, trail competitions and snowmobiling. OHVs can also provide access for non-motorized recreational purposes such as fishing, hunting, or primitive camping. Non-recreational OHV uses on public lands include livestock operations and mineral management and development, and necessary tasks related to public lands management.

Travel management areas (TMAs) are delineated within FOs and include areas designated as closed, limited use or open. Areas designated as limited use have restrictions placed on OHV use, including seasonal or spatial travel restrictions or a combination of both. These limited use areas can be further grouped into geographic subareas in which specific roads or routes are designated as opened/closed. This subarea designation process is determined by criteria such as current OHV use, areas with sensitive resources, areas with special management restrictions (i.e. ACECs), wildlife habitat management areas, and/or special recreation management areas (SRMAs). Further, in localized areas temporary closures may occur for public health and safety concerns and for the protection of resources.

Bureau of Land Management OHV management actions include designating and maintaining use areas within TMAs, posting signs and developing maps or brochures, permitting OHV rallies, cross-country races and outings, monitoring OHV recreational uses, and performing necessary tasks requiring OHV use.

Effects Analysis

The only known blowout penstemon populations reside within or adjacent to the Rawlins RMPPA blowout penstemon ACEC. OHV travel within occupied habitat can result in blowout penstemon tissue damage if plants are crushed and increase the likelihood for mortality since crushed plants are more susceptible to burial. Within the blowout penstemon ACEC, motorized vehicle use is restricted to existing roads and trails, with the exception of authorized necessary tasks, to protect the plant and its habitat. Similarly, outside of the blowout penstemon ACEC a statewide conservation measure restricts OHV use to designated roads and trails within 1.0 mile of occupied habitat, also with the exception of authorized necessary tasks. It is possible that OHV use proximate to occupied habitat could either introduce or increase the spread of weeds. Yet, there is a conservation measure in place that allows for the authorization of ground applications of herbicides within occupied blowout penstemon habitat should weed infestations be found to pose a serious ecological threat to the species or its habitat.

The Dune Ponds Cooperative Management Area (CMA) authorized under the Rawlins RMP (BLM 2008a) is managed as an OHV recreation site with areas designated as open to OHV use. The shortest distance between the Dune Ponds CMA and blowout penstemon ACEC is approximately 2 miles, but land ownership patterns between the two areas is fragmented and topography can be steep, thus travel between the two sites would be difficult and access limited. Within the blowout penstemon ACEC intermittent and isolated OHV tracks have been observed off existing trails and roads, however it is uncertain if these tracks are associated with authorized necessary tasks or unauthorized recreational use of the area.

Determinations

For FOs that address OHV and TMA resources under other management programs, the determinations listed below will apply to those activities under whichever management program includes OHV and TMA management actions.

Rawlins RMP

Implementation of OHV resource management actions, as presented in the Rawlins RMP (BLM 2008a), may affect, but is **not likely to adversely affect** blowout penstemon, due to **discountable effects**. This determination is based on OHV use restrictions associated with the blowout penstemon ACEC, statewide conservation measures to protect occupied habitat, and unlikelihood that OHV recreational users will consistently migrate into occupied habitat.

Casper RMP

Implementing OHV use management actions as presented in the Casper RMP (BLM 2007), may affect, but is **not likely to adversely affect** blowout penstemon, due to **discountable effects**. This determination is based on the absence of blowout penstemon in the planning area and conservation measures that will be adhered to restricting OHV use in areas with occupied habitat, should the plant be found in the planning area in the future

Lander RMP

Implementation of OHV management actions as presented in the Lander RMP (BLM 2011), may affect, but is **not likely to adversely affect** blowout penstemon, due to **discountable effects**. This determination is based on the absence of blowout penstemon in the planning area and conservation measures that will be adhered to restricting OHV use in areas with occupied habitat, should the plant be found in the planning area in the future.

Green River RMP

Implementation of OHV management actions as presented in the Green River RMP (BLM1997a), may affect, but is **not likely to adversely affect** blowout penstemon, due to **discountable effects**. This determination is based on the absence of blowout penstemon in the planning area and conservation measures that will be adhered to restricting OHV use in areas with occupied habitat, should the plant be found in the planning area in the future.

Paleontological Resources

Management Actions

The objective of paleontological resources management is to manage paleontological resources that are part of the BLM-administered public land surface estate for their informational, educational, scientific, public and recreational uses. Paleontological resources, usually referred to as fossils, includes the bones, teeth, body remains, traces or imprints of plants and animals preserved in the earth through geologic time. A paleontological collecting permit is required before collecting fossils on BLM-administered public lands, whether for scientific or hobby collection purposes.

Management of paleontological resources involves actions related to inventory and preservation of resources. During inventory and categorizing actions, the BLM conducts field surveys, performs excavations, maps and collects surface materials and photographs sites. These actions are generally undertaken to document and develop mitigation plans prior to surface-disturbing activities associated with other resource management programs. Hand tools, power tools, or heavy machinery can be used during inventories.

To protect paleontological resources, area closures, restrictions or other mitigation measure will be used on a case-by-case basis. The BLM will pursue withdrawal of areas from exploration and development of locatable minerals and designate avoidance areas to minimize impacts and maintain the integrity of paleontological resources. Interpretive sites may be developed to manage paleontological resources for scientific and public use.

Effects Analysis

Paleontological resource management is unlikely to affect blowout penstemon or its potential habitat. Inventories must be completed in accordance with the BLM and USFWS guidelines to verify the presence or absence of blowout penstemon before any ground disturbance takes place. In the event that an occurrence of blowout penstemon is identified within a proposed project area, a conservation measure specifies that ground disturbing activities will be prohibited within 0.25 miles of occupied habitat.

Determinations

For FOs that address paleontological resources under other management programs, the determinations listed below will apply to those activities under whichever management program includes paleontological management actions.

Rawlins RMP

Implementation of paleontological resource management actions, as presented in the Rawlins RMP (BLM 2008a), will have **no effect** to blowout penstemon. This determination is based on the requirement that surveys for the plant are to be completed prior to ground disturbing activities and conservation measures that will be adhered to should the plant be found within a proposed project area.

Casper RMP

Implementing paleontological resources management actions as presented in the Casper RMP (BLM 2007), may affect, but is **not likely to adversely affect** blowout penstemon, due to **discountable effects**. This determination is based the absence of known blowout penstemon populations in the planning area, and on conservation measures that require proposed actions authorized under the paleontological program will be amended to minimize negative impacts in those areas with occupied habitat.

Lander RMP

Implementation of paleontological resource management actions, as presented in the Lander RMP (BLM 2011), are relatively small in scope, of short duration, and unlikely to occur in blowout penstemon habitat. Actions associated with paleontological resources may affect, but is **not likely to adversely affect** blowout penstemon, due to **discountable effects**. This determination is based on a lack of known occurrence of blowout penstemon in the planning areas, the requirement that surveys for the plant are to be completed prior to ground disturbing activities and conservation measures that will be adhered to should the plant be found within a proposed project area.

Green River RMP

Implementation of paleontological resource management actions, as presented in the Green River RMP (BLM 1997a), will have **no effect** to blowout penstemon. This determination is based on the absence of the plant in the planning area, the requirement that surveys for the plant are to be completed prior to ground disturbing activities and conservation measures that will be adhered to should the plant be found within a proposed project area.

Recreation Resources

Management Actions

The objectives of recreation resources management are to ensure the continued availability of outdoor recreational opportunities on lands administered by the BLM while providing for visitor health, safety, and services and minimizing conflicts with other resource values. Recreational activities allowed by the BLM include hiking, hunting, mountain biking, boating, fishing, OHV use, horseback riding, and camping. Most recreation use on public lands is dispersed human use by low numbers of individuals and occurs on or near existing trails or roads. However, larger concentrated human uses of public lands occur during certain activities, such as formation of hunting camps in the fall. Additionally, large recreational events may be issued Special Recreation Permits and the BLM can authorize commercial recreation uses.

Special recreation management areas (SRMAs) are areas designated by the BLM that require explicit recreation management to achieve recreation objectives and provide specific recreation opportunities. SRMAs are located throughout all the FOs and each SRMA has particular management actions and restrictions associated with it to protect recreational uses and resources.

Recreation management actions include, but are not limited to, allowing recreational access and use by the public, developing recreational areas, imposing restrictions on use of recreational areas, and assessing the effects of recreational use to other resources and resource values. The BLM monitors recreational use, develops management plans, and evaluates and updates recreation potential of areas. Recreational site development includes maintaining or developing recreational sites and facilities, developing campgrounds, providing fishing and floating opportunities, installing and maintaining interpretive markers and sites, installing protective fencing, and constructing roads and trails for access to recreational sites. Other actions associated with recreation resource management includes placing boundary signs, identify hazards on rivers and trails, limiting motorized vehicle and OHV use, updating facilities to blend with the natural environment, conducting field inventories, and patrolling high-use areas.

Effects Analysis

Blowout penstemon prefers habitat that is unstable and often steep characteristics that are not conducive for most recreational uses, with the exception of OHV use (see OHV and Travel Management Program). Further, it is unlikely that recreational facilities, boundary fencing, interpretive signs or markers will be placed in sand dune areas that would be considered potential habitat because of the difficulties and costs associated with construction and long-term maintenance. Additionally, there are conservation measures in place to protect the plant from ground disturbing activities associated with recreational resource management. Within the Rawlins RMP blowout penstemon ACEC recreational use and placement of recreational facilities is prohibited in occupied habitat. For areas outside of the ACEC, a conservation measure restricts ground disturbing activities within 0.25 miles of occupied habitat, a measure that will be adhered to should new populations be found in other FOs.

There is potential that recreational use of lands adjacent to occupied blowout penstemon habitat could increase or introduce noxious or invasive weeds. This is unlikely since most recreational activities are not expected to occur in habitat preferred by the plant. However, there is a conservation measure in place that specifies ground applications of herbicides may be authorized in occupied habitat should weeds be found to pose a significant ecological threat to blowout penstemon and its habitat.

Determinations

For FOs that address recreation resources under other management programs, the determinations listed below will apply to those activities under whichever management program includes recreation management actions.

Rawlins RMP

Implementation of recreation and visitor services resource management actions, as presented in the Rawlins RMP (2008a), may affect, but is **not likely to adversely affect** blowout penstemon, due to **insignificant effects**. This determination is based on the low potential for recreational use and management actions to occur in blowout penstemon habitat and conservation measures and ACEC restrictions that prohibit ground disturbing activities in habitat occupied by the plant.

Casper RMP

Implementing recreational management actions as presented in the Casper RMP (BLM 2007), may affect, but is **not likely to adversely affect**, blowout penstemon due to **discountable effects**. This determination is based on the absence of blowout penstemon in the planning area, the unlikely event of recreational use occurring in potential habitats, and conservation measures in place to protect the species from ground disturbing activities.

Lander RMP

Implementation of recreation management actions, as presented in the Lander RMP (BLM 2011), may affect, but is **not likely to adversely affect** blowout penstemon, due to **discountable effects**. This determination is based on the absence of blowout penstemon in the planning area, the unlikely event of recreational use occurring in potential habitats, and conservation measures in place to protect the species from ground disturbing activities.

Green River RMP

Implementation of recreation resource management actions, as presented in the Green River RMP (BLM 1997a), may affect, but is **not likely to adversely affect** blowout penstemon, due to **discountable effects**. This determination is based on the absence of blowout penstemon in the planning area, the unlikely event of recreational use occurring in potential habitats, and conservation measures in place to protect the species from ground disturbing activities.

Special Designations and Management Areas

Management Actions

The resource management objectives of special designations/management areas (SD/MAs) are to ensure continued public use and enjoyment of recreation activities while protecting and enhancing natural and cultural values, improving opportunities for high-quality outdoor recreation and visitor services. There are a variety of designations and management areas under the SD/MA program including Wildlife Habitat Management Areas (WHMAs), Wilderness Study Areas (WSAs), ACECs, Wild and Scenic Rivers (WSRs), National Natural Landmarks (NNLs), National Back Country Byways, and other management areas that are determined to have unique resources, management objectives and use restrictions.

WHMAs are designated to protect important wildlife resources and habitat. Each WHMA has its own set of management goals and objectives and associated management and use restrictions. Wildlife program projects may include surveying, monitoring, or habitat improvement activities. The BLM develops stipulations and protective measures to enhance wildlife and fisheries habitat within WHMAs which can include authorizing withdrawals of certain areas from minerals entry, limiting access of OHVs,

snowmobiles, horses, and pedestrians, imposing road closures, acquiring critical habitat through exchanges or easements, and recording inventories and occurrences of potential habitat and special status species.

WSAs are managed as single use resources, and in Wyoming managed under the Interim Management Policy (IMP) until they retain their Congressional designation as wilderness. WSAs are managed to maintain and protect wilderness values, which includes features such as naturalness, absence of roads, primitive recreation uses, and other significant ecological or educational values. Activities related to the WSA program may include inventories to identify wilderness areas, public involvement with wilderness study processes, authorization of mining claims under unique circumstances, or evaluations of proposed actions to determine potential impacts to known or potential wilderness values. The designation of WSA status is simply a designation, however BLM management of WSAs are in accordance with decisions issued by Congress, and in general these management directives are beneficial to wildlife and plant species.

ACECs are areas designated by the BLM where special management attention is needed to protect important and relevant resource values. Special management refers to management prescriptions that are included or amended to an RMP to protect the important resources in an area from potential effects of actions permitted by the RMP, including those actions considered to be in compliance with the terms, conditions and decisions approved in the RMP. These special management measures would not be necessary or prescribed if the critical or important resources or features were not present. Generally, ACEC status conveys beneficial impacts to wildlife and plant species. In the Rawlins RMP (BLM 2008a), a blowout penstemon ACEC was designated for 17,050 acres of public surface lands, which includes restrictive management actions for surface disturbing activities. A management plan specific to the blowout penstemon ACEC is in the process of being drafted by BLM personnel.

Under the Wild and Scenic Rivers Act, the BLM studies segments of streams throughout the state to determine their suitability and eligibility for designation as WSRs in the National Wild and Scenic River System. Suitable designations are based on the uniqueness and diversity of the land and water resources as well as their regional and national significance. Management objectives associated with the WSR designation include protection of river resources and provision of river-related outdoor recreation opportunities in a primitive setting. These objectives are met in part through restrictions placed on management, recreation and resource exploration actions or activities that take place within the eligible segments of designated rivers. Plants and wildlife associated with designated WSR segments are likely to benefit from management actions and restrictions that maintain the primitive functions and characteristics of the area.

NNLs are managed to protect the geological significance and integrity of sites with unique features. Management and public use restrictions will be applied on a case-by-case basis to ensure adequate resource protections.

Wyoming National Back Country Byways were created to provide opportunities for the public to view and enjoy unique scenic and historical features on public lands. Back Country Byways generally traverse through remote back country providing primitive landscape settings and access routes range from paved roads to unmaintained single track routes. The use of vehicles, ranging from cars to OHVs and the presence of humans are associated with use of National Back Country Byways in Wyoming.

Effects Analysis

Many of the actions related to management of SD/MAs involve management and public use restrictions in order to prevent undue harm to cultural, environmental and natural resources and values. These

management restrictions with objectives such as protecting ecosystem functions or plant and wildlife habitat will likely have positive effects to blowout penstemon by limiting public access to sites and restricting ground disturbing activities. Specifically, the blowout penstemon ACEC designated in the Rawlins FO (BLM 2008a), which encompasses the majority of occupied habitat for the plant, specifies management restrictions for resource programs such as minerals, lands and realty and OHV travel, which are programs with authorized activities that could cause the greatest harm to the plant.

Determinations

For FOs that address SD/MA resources under other management programs, the determinations listed below will apply to those activities under whichever management program includes SD/MA management actions.

Rawlins RMP

Implementation of SD/MAs resource management actions, as presented in the Rawlins RMP (2008a), may affect, but is **not likely to adversely affect** blowout penstemon, due to **beneficial effects**. This determination is based on the establishment of the blowout penstemon ACEC under the Rawlins RMP, which provides special management protections to occupied and potential habitat on public lands.

Casper RMP

Implementing SD/MAs management actions as presented in the Casper RMP (BLM 2007), may affect, but is **not likely to adversely affect**, blowout penstemon, due to **beneficial effects**. This determination is based on absence of blowout penstemon in the planning area and the potential that actions associated with SD/MAs resource management will limit disturbance and maintain or protect potential blowout penstemon habitat.

Lander RMP

Implementation of SD/MAs resource management actions, as presented in the Lander RMP (BLM 2011), may affect, but is **not likely to adversely affect** blowout penstemon, due to **beneficial effects**. This determination is based on absence of blowout penstemon in the planning area and the potential that actions associated with SD/MAs resource management will limit disturbance and maintain or protect potential blowout penstemon habitat.

Green River RMP

Implementation of SD/MAs resource management actions, as presented in the Green River RMP (1997a), may affect, but is **not likely to adversely affect** blowout penstemon, due to **beneficial effects**. This determination is based on absence of blowout penstemon in the planning area and the potential that actions associated with SD/MAs resource management will limit disturbance and maintain or protect potential blowout penstemon habitat.

Transportation and Access Management

Management Actions

Transportation and access resource management objectives include the maintenance or modification of the public land transportation system to provide for public health and safety and adequate access to public lands. Existing roads will be maintained or expanded if necessary and those roads determined to be redundant or unnecessary will be closed and reclaimed if possible. Transportation planning will be conducted to manage access roads in a manner that ensures compatibility with resource values and management objectives.

The transportation and access management program and associated activities are generally in support of other resource management programs. The main activity related to transportation and access management includes the acquisition of access easements.

Effects Analysis

It is unlikely that transportation and access resource management actions will affect blowout penstemon or its habitat. Currently, there are no roads that give direct public access to known blowout penstemon populations. It is also unlikely that major access roads will be proposed in potential blowout penstemon habitat because of the shifting and unstable nature of sand dunes and the difficulties and costs associated with construction and maintenance. Further, conservation measures prohibit ground disturbing activities within 0.25 miles of occupied blowout penstemon habitat.

Determinations

For FOs that address transportation and access resources under other management programs, the determinations listed below will apply to those activities under whichever management program includes transportation and access management actions.

Rawlins RMP

Implementation of transportation and access resource management actions, as presented in the Rawlins RMP (BLM 2008a), may affect, but is **not likely to adversely affect** blowout penstemon, due to **insignificant effects**. This determination is based on the lack of existing major public access roads near blowout penstemon habitat and conservation measures that restrict ground disturbing activities proximate to areas with occupied habitat.

Casper RMP

Implementation of transportation and access resource management actions, as presented in the Casper RMP (BLM 2007), may affect, but is **not likely to adversely affect** blowout penstemon, due to **discountable effects**. This determination is based on the absence of known blowout penstemon populations in the Casper RMPPA and the low potential that actions associated with developing or expanding access would occur in potential blowout penstemon habitat.

Lander RMP

Implementation of transportation and access resource management actions, as presented in the Lander RMP (BLM 2011), may affect, but is **not likely to adversely affect** blowout penstemon, due to **discountable effects**. This determination is based on the absence of known blowout penstemon populations in the Lander RMPPA and the unlikely event that actions associated with developing or expanding access would impact potential blowout penstemon habitat.

Green River RMP

Implementation of transportation and access resource management actions, as presented in the Green River (BLM 1997a), may affect, but is **not likely to adversely affect** blowout penstemon, due to **discountable effects**. This determination is based on the absence of known blowout penstemon populations in the Green River RMPPA and the unlikely event that actions associated with developing or expanding access would impact potential blowout penstemon habitat.

Vegetative Resources

Management Actions

The objectives of vegetation resource management are (1) to maintain or improve the diversity of plant communities to achieve desired plant communities (DPCs) to support timber production, livestock needs, wildlife habitat, watershed protection, and acceptable visual resources; (2) to enhance essential and important habitats for special status plant species on BLM-administered public land surface and to prevent the need for any special status plant species being listed as threatened and endangered; (3) to reduce the spread of noxious and invasive weeds.

DPCs portray the land or resource values that would exist in the future if vegetation management goals were achieved. The length of time to reach DPCs varies, depending on the resources involved, management actions required and the speed at which resources can change. Actions taken to achieve DPCs are numerous across upland and wetland/riparian communities, ranging from manipulation of species composition to increase rangeland forage productivity to developing a mixed-age stand of willows by altering the grazing system along a streambed to restore ecosystem functions. DPC objectives will be established by each FO using site-specific activity and implementation planning and will be updated as ecological site inventories are conducted and data is analyzed. Use of heavy machinery, hand tools, mechanical tools, and OHVs are often used in inventories, monitoring, and restoration towards DPCs. Additionally, seeding of native species with various techniques is used to initiate and restore native ecosystem functions.

Special status species (SSS) are those officially listed, proposed for listing or candidates for listing as threatened or endangered under the provisions of the ESA, or those plant species designated by the Wyoming BLM state director as sensitive. The BLM manages public lands to conserve and/or improve habitats for SSS. Management prescriptions for special status plant species will be developed on a case-by-case basis in consultation with the USFWS so the continued existence of the species on public lands is not jeopardized (BLM Manual 6840). Management actions taken by the BLM to provide habitat and protect known populations includes conducting surveys, closing known locations to surface-disturbing activities and mineral material sales, prohibiting or limiting OHV use or delineating SD/MAs in FO RMPs.

Weeds are those species (noxious, invasive, and native or non-native) growing in an area where they are not wanted. Noxious weeds are those that have been designated by a federal or state government and can be native to the US or the planning areas where they are growing. Invasive weeds include those plant species that have been introduced to an area, but unlike noxious weeds, are not native to the US or planning areas where they are growing and they are not formally designated by a Federal or State government.

There are three types of control measures are used by the BLM on public lands in order to minimize the spread and impact of noxious and invasive weeds including chemical, biological, and mechanical methods. Chemical controls include pesticides (herbicides and insecticides), which are applied using ground, vehicle, or aircraft applications, depending on the size and adjacent resources of the area to be treated. Only federally approved chemicals are to be used and applied using the minimum toxicity level appropriate for the project. Buffer zones will be maintained along streams, rivers, lakes, and riparian areas and areas with known special status plant species. Insect and fungal biological controls are generally applied by hand. Ungulate biological controls, such as goats or livestock, can be herded or fenced into treatment areas. Hand-pulling, digging, tractors, mowers, brush hogs, and prescribed fire are commonly used mechanical controls for noxious and invasive weeds. All biological and mechanical

control treatments are prescribed in a way to achieve DPC objectives and minimize impacts to sensitive plant species.

Effects Analysis

Activities associated with DPC management are not likely to affect blowout penstemon. Conservation measures buffer ground disturbing activities and native revegetation projects proximate to occupied habitat. Additionally, the BLM is required to manage public lands to maintain or enhance habitat for SSS species. This can result in further restrictions placed on ground disturbing activities and public use of BLM-administered lands, such as the designation of the blowout penstemon ACEC.

Noxious and invasive weeds have potential to threaten blowout penstemon through resource and habitat competition and weeds have been observed near, but not in, habitat occupied by the plant. For weed invasions that pose a severe threat to blowout penstemon populations, ground applications of herbicides may be authorized in occupied habitat on a case-by-case basis to protect the plant and its habitat from further degradation. For weed invasions that do not pose a threat to blowout penstemon populations, all herbicide applications are prohibited within 0.25 miles of occupied habitat and aerial applications must be planned to prevent drift within this same buffer distance. Biological controls for noxious and invasive weeds will not be used in occupied habitat until it has been determined that the control agent will not cause harm to blowout penstemon.

Insect herbivory is a threat for blowout penstemon in Nebraska, but has not been noted for the species in Wyoming. However, per a conservation measure should insects pose a threat to blowout penstemon populations in the future targeted insecticides may be authorized within occupied habitat on a case-by-case basis. In those areas outside of occupied habitat where insects are deemed to be a threat to resources other than blowout penstemon, there is a conservation measure in place that prohibits the use of insecticides within 1.0 mile of occupied habitat to minimize effects to pollinators associated with blowout penstemon.

Fungal infections have been noted on blowout penstemon plants in Wyoming, however, these infections have not been observed to affect the fecundity of the species in the state (Heidel 2005). In Nebraska, fungal root rot has resulted in plant mortalities, but no such incidents have been recorded in Wyoming populations. Should fungal infections be found to be detrimental to blowout penstemon viability, on a case-by-case basis fungicides may be authorized in occupied habitat.

Determinations

For FOs that address vegetative resources under other management programs, the determinations listed below will apply to those activities under whichever management program includes vegetative management actions.

Rawlins RMP

Implementation of vegetation management actions, as presented in the Rawlins RMP (BLM 2008a), may affect, but is **not likely to adversely affect** blowout penstemon, due to **insignificant effects**. This determination is based on BLM policy for protection of SSS plants and habitat and conservation measures that restrict the use of chemical and biological pest controls in occupied blowout penstemon habitat. If treatments are needed, there are conservation measures in place to control noxious and invasive weeds in coordination with USFWS consultation.

Casper RMP

Implementation of vegetation management actions, as presented in the Casper RMP (BLM 2007), may affect, but is **not likely to adversely affect** blowout penstemon, due to **discountable effects**. This

determination is based on the absence of blowout penstemon in the planning area and conservation measures in place to protect the plant from ground disturbing activities and chemical and biological pest treatments should populations be found in the future within the planning area.

Lander RMP

Implementation of vegetation management actions, as presented in the Lander RMP (BLM 2011), may affect, but is **not likely to adversely affect** blowout penstemon, due to **discountable effects**. This determination is based on the absence of blowout penstemon in the planning area and conservation measures in place to protect the plant from ground disturbing activities and chemical and biological pest treatments should populations be found in the future within the planning area.

Green River RMP

Implementation of vegetation management actions, as presented in the Green River RMP (BLM 1997a), may affect, but is **not likely to adversely affect** blowout penstemon, due to **discountable effects**. This determination is based on the absence of blowout penstemon in the planning area and conservation measures in place to protect the plant from ground disturbing activities and chemical and biological pest treatments should populations be found in the future within the planning area.

Visual Resource Management

Management Actions

The objective of Visual Resource Management (VRM) is to minimize adverse effects to visual resources while maintaining the effectiveness of land-use allocations. A visual resource inventory and classification process is used by the BLM as a qualitative analysis of visual resources throughout FO planning areas. There are four VRM classes (I, II, III, IV) that are used as (1) inventory tools to characterize the visual quality of the landscape; (2) management tools that outline visual protection standards to spatially restrict surface disturbing activities; (3) guidelines for rehabilitation of existing facilities and/or projects.

Class I areas are those areas where the existing character of the landscape is to be preserved, and where the only landscape changes allowed are those caused by natural or ecological processes. Surface disturbing activities are prohibited and very limited management actions are allowed. Any allowed artificial changes to the landscape are to be low and should not attract attention.

Management actions in Class II areas are restricted to maintain the existing characteristic of the landscape. Management activities may be seen but not attract attention to the casual observer and any changes that are allowed must repeat the basic elements of form, line, color and texture found in the predominant natural features of the landscape. If a project proposal cannot be mitigated to retain the character of the landscape, proposal modifications will be required.

In Class III areas basic changes (form, line, color or texture) are allowed. However, accepted changes must remain subordinate to the visual strength of the existing landscape character.

Management activities may dominate the view in Class IV areas and can be the major focus to the casual observer. Changes to the landscape are allowed, but must be subordinate to the original composition and character of the landscape.

Effects Analysis

Actions associated with VRM are not likely to impact blowout penstemon or its habitat. The exclusion of some activities and structures from designated viewsheds may have a positive effect by limiting

disturbance of potential habitats for blowout penstemon. Potentially, a request for movement of a structure or project from a higher to lower VRM classification area could place a project near occupied or potential blowout penstemon habitat, however impacts to blowout penstemon by such moves would be precluded by conservation measures and ACEC management actions that restrict ground disturbing activities within occupied habitat.

Determinations

For FOs that address visual resources under other management programs, the determinations listed below will apply to those activities under whichever management program includes visual resource management actions.

Rawlins RMP

Implementation of VRM, as presented in the Rawlins RMP (BLM 2008a), may affect, but is **not likely to adversely affect** blowout penstemon, due to **beneficial effects**. This determination is based on conservation measures that restrict ground disturbing activities within occupied habitat and the potential for management actions associated with VRM to preserve or minimize disturbance in occupied or potential habitat for the species.

Casper RMP

Implementing VRM actions as presented in the Casper RMP (BLM 2007), may affect, but is **not likely to adversely affect** blowout penstemon, due to **beneficial effects**. This determination is based on the potential of these management actions to preserve or minimize disturbance in habitats suitable for blowout penstemon and conservation measures restricting ground disturbing activities within occupied habitat should the plant be found within the planning area in the future.

Lander RMP

Implementation of VRM actions, as presented in the Lander RMP (BLM 2011) may affect, but is **not likely to adversely affect** blowout penstemon, due to **beneficial effects**. This determination is based on the potential of these management actions to preserve or minimize disturbance in habitats suitable for blowout penstemon and conservation measures restricting ground disturbing activities within occupied habitat should the plant be found within the planning area in the future.

Green River RMP

Implementation of VRM actions, as presented in the Green River RMP (BLM 1997a) may affect, but are **not likely to adversely affect** blowout penstemon, due to **beneficial effects**. This determination is based on the potential of these management actions to preserve or minimize disturbance in habitats suitable for blowout penstemon and conservation measures restricting ground disturbing activities within occupied habitat should the plant be found within the planning area in the future.

Water and Soil Resources

Management Actions

BLM-administered public lands are to be managed to protect and conserve the quality of water and soil resources. Objectives of water resource management are (1) to maintain or improve surface and groundwater quality consistent with existing and anticipated uses and applicable state and Federal water quality standards (2) to provide for availability of water to facilitate authorized uses and (3) to minimize harmful consequences of erosion and surface runoff from BLM-administered land. Activities authorized under water resources management may include implementing watershed plans, identifying heavy

sediment loads, monitoring and treating soil erosion, evaluating and restricting surface development activities, and monitoring water quality.

Monitoring of streams and rivers for water quality tend to be short-term in nature (a few hours or less) and completed with small, hand held kits on site. Access for these activities would be primarily by vehicle and monitoring would be done by personnel walking into and along streams and rivers. Permanent instream flow monitoring and continuous water quality analysis gauging stations are small structures and would result in some disturbance to streams or rivers during construction and occasional maintenance activities. Planting of riparian plant species to reduce erosion and sediment movement along watercourses is generally done using hand held tools or smaller equipment like motorized augers, backhoes, tree spades, etc. There are numerous other activities related to water resources management; however, these activities are also anticipated to be infrequent and small in scale.

Soil resources are affected by all surface disturbing activities. To protect soil resources site-specific impact minimization measures and techniques are generally applied to surface disturbing actions. These mitigation measures are designed to conserve topsoil, minimize erosion, reestablish vegetation in disturbed areas and maintain soil productivity. Some restrictions aimed at protecting soil resources are programmatically constraining, such as limiting surface activities when soils are wet, or in areas with steep slopes.

Management actions associated with soil resources may include the identification, interpretation, inventory or evaluation of existing soil resources and conditions, restoring disturbed areas to pre-disturbance conditions, managing actions to maintain or improve soil chemical, physical and biotic properties, controlling the extent of surface disturbance in the planning area by establishing acreage limits for total surface disturbance, and periodically monitoring, evaluating, and adapting management actions.

Effects Analysis

Water resources are highly unlikely to be present in blowout penstemon occupied or potential habitat. It is therefore unlikely that water resource management actions will have any impacts to the plant or its habitat. Additionally, there are conservation measures in place that would restrict ground disturbing activities from occurring in areas occupied by blowout penstemon should management actions associated with water resources be proposed in these areas.

Soil resource management actions that increase vegetative cover to reduce soil erosion could result in the loss of potential habitat for blowout penstemon, as it does not persist in areas with vegetative cover greater than 40%. However, it is not likely that revegetation projects will be sited in sand dune areas, as these areas are naturally erodible, which would create difficulties for plant establishment. Further, areas with known populations are not to be considered for revegetation projects per a conservation measure that prohibits such projects within 0.25 miles of occupied habitat. Other activities associated with soil resource management actions, such as soil mapping and identification, could impact potential habitat if cores are drilled or truck mounted augers are used to obtain samples. These activities however would be precluded from occurring in occupied blowout penstemon habitat by a conservation measure that prohibits ground disturbing activities within 0.25 miles of known populations of the species.

Determinations

For FOs that address water and soil resources under other management programs, the determinations listed below will apply to those activities under whichever management program includes water and soil resources management actions.

Rawlins RMP

Implementation of water and soil resources management actions, as prescribed in the Rawlins RMP (BLM 2008a), may affect, but is **not likely to adversely affect** blowout penstemon, due to **insignificant effects**. This determination is based conservation measures the prohibit ground disturbing activities in occupied habitat and the low potential for water and soil management actions to occur in habitat preferred by the plant.

Casper RMP

Implementation of water and soil resources management actions, as prescribed in the Casper RMP (BLM 2007), may affect, but is **not likely to adversely affect** blowout penstemon, due to **discountable effects**. This determination is based on the absence of blowout penstemon in the planning area and the limited potential for management actions to occur in potential blowout penstemon habitat.

Lander RMP

Implementation of water and soil resources management actions, as prescribed in the Lander RMP (BLM 2011), may affect, but is **not likely to adversely affect** blowout penstemon, due to **discountable effects**. This determination is based on the absence of blowout penstemon in the planning area and the limited potential for management actions to occur in potential blowout penstemon habitat.

Green River RMP

Implementation of water and soil resources management actions, as prescribed in the Green River RMP (BLM 1997a), may affect, but is **not likely to adversely affect** blowout penstemon, due to **discountable effects**. This determination is based on the absence of blowout penstemon in the planning area and the limited potential for management actions to occur in potential blowout penstemon habitat.

Wild Horses

Management Actions

The objectives of wild horse management on public lands are to protect, maintain and control a viable herd of wild horses by providing adequate habitat, resources, and appropriate management levels (AMLs) within designated horse management areas (HMAs). There are approximately 3,000 wild horses managed within 16 HMAs on public lands in Wyoming. The AMLs for each HMA is set to ensure a thriving natural ecological balance will be maintained between horse populations and the rangeland ecosystem.

Herding, corralling, transporting, monitoring, and conducting round-ups are all actions related to the wild horse resource management program. Herds are typically monitored from airplanes and helicopters, while possibly employing OHVs and domestic horses during wild horse round-ups. Intensive localized ground disturbance can result in areas where permanent or temporary corrals and capture facilities are constructed, as horse hoof action can cause soil compaction and extreme vegetation disturbance. Wild horses and the areas managed for their protection are similar to other wildlife species, with the exception that when wild horse populations exceed AMLs, excess horses are removed.

Effects Analysis

HMAs and herds are found in the Rawlins, Lander and Rock Springs FOs, while the Casper FO has no designated HMAs or herds. Actions associated with wild horse management are expected to be limited to occasional herding, corralling, and transporting of horses. These actions are not expected to impact blowout penstemon plants or habitats, since they are not likely to occur in unstable and shifting dune

areas. Further, it is unlikely that wild horse corral and round-up structures would be constructed in dune areas. Such structures would be prohibited in occupied habitat per conservation measures.

Blowout penstemon is palatable to wild horses. However, the only known populations reside in the north central region of the Rawlins FO and are not located near any of the HMAs. It is therefore unlikely that occasional grazing or trampling of plants by wild horses will occur. In areas with potential blowout penstemon habitat in the Rock Springs and Lander FOs, the roaming nature of wild horse herds could introduce or increase the spread of noxious or invasive weeds, degrading potential blowout penstemon habitat, yet this has not been documented as a mechanism for weed dispersal in dune areas.

Determinations

For FOs that address wild horse resources under other management programs, the determinations listed below will apply to those activities under whichever management program includes wild horse management actions.

Rawlins RMP

Implementation of wild horse management, as presented in the Rawlins RMP (BLM 2008a), will have **no effect** on the blowout penstemon. This determination is based on the absence of wild horse HMAs within or near blowout penstemon habitat and the low likelihood that habitat would be impacted by actions associated with management of wild horses.

Casper RMP

There are no wild horse management areas or herds located in the Casper RMPPA. For this reason, there are no specific management actions outlined in the Casper RMP (BLM 2007).

Lander RMP

Implementation of wild horse management, as presented in the Lander RMP (BLM 2011), may affect, but is **not likely to adversely affect** blowout penstemon, due to **discountable effects**. This determination is based on the absence of blowout penstemon within the Lander RMPPA and the low likelihood that potential blowout penstemon habitat would be impacted by actions associated with management of wild horses.

Green River RMP

Implementation of wild horse management, as presented in the Green River RMP (BLM 1997a), may affect, but is **not likely to adversely affect** blowout penstemon, due to **discountable effects**. This determination is based on the absence of blowout penstemon within the Green River RMPPA and the low likelihood that potential blowout penstemon habitat would be impacted by actions associated with management of wild horses.

Table 2: Summary of Determinations

Resource Management Program	Resource Management Plan	Rawlins	Casper	Lander	Green River
Air Quality		NLAA-I	NE	NE	NE
Cultural Resources		NLAA-I	NLAA-D	NLAA-D	NLAA-D
Fire and Fuels Management		NLAA-I	NLAA-D	NLAA-D	NLAA-D
Fish and Wildlife Resources		NLAA-I	NLAA-D	NLAA-D	NLAA-D
Forest Resources		NE	NE	NE	NE
Lands and Realty		NLAA-I & D	NE	NLAA-D	NE
Livestock Grazing		LAA	NLAA-D	NLAA-D	NLAA-D
Minerals (locatable, leasable, salable)		NLAA-I	NLAA-D	NLAA-D	NLAA-D
OHVs and Travel Management Areas		NLAA-D	NLAA-D	NLAA-D	NLAA-D
Paleontological Resources		NE	NLAA-D	NLAA-D	NE
Recreation Resources		NLAA-I	NLAA-D	NLAA-D	NLAA-D
Special Designations and Management Areas		NLAA-B	NLAA-B	NLAA-B	NLAA-B
Transportation and Access Management		NLAA-I	NLAA-D	NLAA-D	NLAA-D
Vegetative Resources		NLAA-I	NLAA-D	NLAA-D	NLAA-D
Visual Resource Management		NLAA-B	NLAA-B	NLAA-B	NLAA-B
Water and Soil Resources		NLAA-I	NLAA-D	NLAA-D	NLAA-D
Wild Horses		NE		NLAA-D	NLAA-D

* LAA = likely to adversely affect; NE = no effect; NLAA = not likely to adversely affect; B = beneficial effects; D = discountable effects; I = insignificant effects;

Cumulative effects

Cumulative effects include future state, tribal, local, or private actions reasonably certain to occur in FO RMPPAs. Blowout penstemon is found on both federal and state managed lands in Wyoming. There have been minimal surveys conducted to document the presence or absence of the species on privately owned lands, but based on expert BLM, USFWS and WYNDD opinion and aerial photointerpretation of potential habitat, it is reasonable to assume that blowout penstemon populations exist on private lands in the state.

Habitat loss, fragmentation, and degradation are reasonably certain to occur on non-federal lands as there are no state level protections designated for blowout penstemon in Wyoming. Impacts to habitat will likely result from ground disturbing activities that remove or stabilize dune systems or exacerbate the spread of noxious and invasive weeds into dune areas. These impacts are likely to be attributed to human activities such as urbanization, oil and gas developments, or the lack of prescribed fires. Additionally, the surge of interest in wind energy development on non-federal lands is likely to impact blowout penstemon habitat. Construction and maintenance of access roads, facilities, and turbine pads will result in the direct loss and fragmentation of habitat, and downwind impacts from operant wind developments could alter sand erosion patterns and soil-water evaporation rates.

There is also potential for direct harm, such as tissue damage or uprooting of plants, to occur on non-federal lands. OHV use and livestock grazing and management are likely to occur in areas with occupied or potential habitat. The intensity of direct harm caused by such activities could be severe on non-federal lands since there are no protections afforded to the species, such as restrictive buffers, to minimize impacts from activities that could result in repeated and intense damage to the plants.

4.0 CONSERVATION STRATEGIES

Implementation of the following conservation strategies is intended to minimize adverse impacts that are likely to result from the management programs and actions authorized under the Rawlins, Casper, Lander and Green River RMPs. In addition to the existing conservation measures common to all RMPs (items 1 and 2), the BLM is committed and bound to implement conservation measures 3 through 16. In the event new populations of blowout penstemon are discovered, conservation measures 3 through 16 would apply until such time that further investigation and consultation with the USFWS necessitate examination of these measures for adequacy. The BLM will also consider on a case-by-case basis implementing best management practices (BMPs) to further protect blowout penstemon and its habitat (items 17 through 34).

Existing Protections Common to all Field Offices

1. The *Wyoming BLM Mitigation Guidelines for Surface Disturbing and Disruptive Activities* are designed to protect resources such as soils, vegetation, wildlife habitat and other valuable resources. The purpose of the guidelines "...are (1) to reserve, for BLM, the right to modify the operations of all surface and other human presence disturbance activities as part of the statutory requirements for environmental protection, and (2) to inform a potential lessee, permittee, or operator of the requirements that must be met when using BLM-administered public lands. These guidelines have been written in a format that will allow for (1) their direct use as stipulations, and (2) the addition of specific or specialized mitigation following the submission of a detailed plan of development or other project proposal, and an environmental analysis..." (BLM 2008a). For BLM-related projects within suitable blowout penstemon habitat, the BLM will require surveys to be conducted in accordance with BLM and USFWS protocols. In the absence of survey, species presence will be assumed and applicable conservation measures will be implemented, including potentially the modification of operational plans, protection requirements related to seasonal use or occupancy restriction, facility design, etc. These guidelines are included in all Wyoming FO RMPs.
2. The *Standards for Healthy Rangelands and Guidelines for Livestock Grazing Management for the Public Lands Administered by the State of Wyoming* were developed and are applied to achieve the four fundamentals of rangeland health including (1) watersheds are functioning properly; (2) water, nutrients, and energy are cycling properly; (3) water quality meets State standards; and (4) habitat for special status species is protected. These standards and guidelines maintain focus on both the health of the land and its natural and human dependent communities through adaptive and sustainable on-the-ground management of the public rangelands. The standards are meant to reflect minimal acceptable conditions for public rangelands and apply to all resource uses on public lands at a landscape level. If a standard is not being met then guidelines, which guide grazing management practices at the allotment or watershed level, will be altered to ensure that BLM management of public rangeland resources are on track to meet standards within a reasonable timeframe. Standards and guidelines specific to the protection of special status species are listed below:

Standard 1 – "Within the potential of the ecological site (soil type, landform, climate, and geology), soils are stable and allow for water infiltration to provide for optimal plant growth and minimal surface runoff."

Standard 3 – “Upland vegetation on each ecological site consists of plant communities appropriate to the site which are resilient, diverse, and able to recover from natural and human disturbance.”

Standard 4 – “Rangelands are capable of sustaining viable populations and a diversity of native plant and animal species appropriate to the habitat. Habitats that support or could support threatened, endangered, species of special concern, or sensitive species will be maintained or enhanced.”

Guideline VII – “Grazing management practices will incorporate the kinds and amounts of use that will restore, maintain, or enhance habitats to assist in the recovery of Federal threatened and endangered species or the conservation of federally-listed species of concern and other State-designated special status species. Grazing management practices will maintain existing habitat or facilitate vegetation change toward desired habitats. Grazing management will consider threatened and endangered species and their habitats.”

Conservation Measures

All conservation measures must be adhered to unless further consultation and coordination has occurred with USFWS and an agreement has been reached

3. Place mineral supplements, or new water sources (permanent or temporary), for livestock, wild horses, or wildlife at least 1.0 mile from known blowout penstemon populations. Do not place supplemental feed for livestock, wildlife, or wild horses within 1.0 mile of known blowout penstemon populations. Straw or other feed must be certified weed-free. These restrictions are intended to keep free-ranging livestock away from blowout penstemon populations and subsequent grazing on the blowout penstemon plants. Surveys for blowout penstemon will be conducted in potential blowout penstemon habitat prior to the authorization of range improvement projects.
4. The Bureau will not alter livestock grazing permits/leases in any allotment with pastures containing blowout penstemon populations, without coordinating adjustments with the USFWS.

Conservation measures 3 and 4 will be added to grazing permit/lease renewals or Allotment Management Plans in allotments with known blowout penstemon populations. All Allotment Management Plans are a required conformance measure within their respective grazing permit/lease.

5. Introduction of biological controls for noxious and invasive plant species will be prohibited in known and potential blowout penstemon habitat until the impact of the control agent has been fully evaluated and determined not to adversely affect the plant population. The Bureau will monitor biological control vectors.
6. Herbicide treatment (aerial, vehicle and ground) will be prohibited within 0.5 miles of occupied blowout penstemon habitats (see Standard Operating Procedures (SOPs) from National Vegetation Treatment EIS ROD appendix B) as is consistent with conservation measures detailed in the National Programmatic Vegetation Treatment EIS (BLM 2007a, 2007b). For insecticide treatments, no aerial application of malathion or carbaryl will occur within 3.0 miles of occupied habitats; only carbaryl bran bait or diflubenzuron combined with Reduced Agent Area Treatment

(RAATs) methodology would be used within the 3-mile buffer; and no application of carbaryl bran bait would be applied within 0.25 mile buffer of occupied blowout penstemon habitats.

- a. Where pests (weeds, insects, fungal) have the potential to degrade area ecological health and threaten blowout penstemon population growth, survival, or reproductive success, through coordination with the USFWS ground applications of pesticides may be individually allowed within occupied habitats.
 - b. The BLM will work with the Animal and Plant Health Inspection Service (APHIS), the USFWS, and county weed and pest agencies to select pesticides and methods of application that will most effectively manage the infestation and least affect the blowout penstemon.
7. Only through coordination with the USFWS will revegetation projects be authorized within 0.25 miles of occupied blowout penstemon habitat and only native species will be used.
 8. Limit the use of off-highway vehicles (OHVs) to existing roads and trails within 1.0 mile of known blowout penstemon populations, with the exception of authorized necessary tasks under separate program authorizations. No OHV competitive events will be allowed within 1.0 mile of known blowout penstemon populations. Roads near blowout penstemon plants that are not required for routine operations and/or maintenance of existing/developed projects, or lead to abandoned projects, will be reclaimed as directed by the BLM and in coordination with the USFWS.

The BLM will limit the use of OHVs to existing roads and trails within 1.0 mile of known blowout penstemon populations, the only exceptions to this measure are for the performance of authorized necessary tasks specifically related to firefighting, hazardous material cleanup, existing ROW maintenance and inspection, and fence maintenance associated with livestock and grazing management activities.

9. The BLM will prohibit BLM-authorized surface disturbing activities on Federal oil and gas leases and/or BLM-managed surface estate with 0.25 mile of known blowout penstemon populations.
10. The disposal (sale and removal) of salable minerals, which includes sand, is a discretionary Bureau action and is prohibited within a 0.25 mile buffer area of known blowout penstemon populations.
11. Prior to any land tenure adjustments in known blowout penstemon habitat, the BLM will conduct surveys to assess habitat boundaries and those areas with occupied habitat will remain in Federal ownership. Further, the BLM will engage in opportunities for land acquisition to conserve ESA listed plant species through purchase, donation, land exchange, conservation easement or other means to prevent habitat loss (BLM 2008c). Only through coordination with the USFWS are BLM-administered public lands that contain occupied habitat for blowout penstemon to be exchanged or sold (BLM 2008c).
12. All new proposed ROW project locations (power lines, pipelines, roads, etc.) will be prohibited within 0.25 miles from any known occupied blowout penstemon habitat to minimize disturbances. If the avoidance of adverse effects is not possible, the BLM will re-initiate consultation with the USFWS.

- a. Wind energy developments will not be authorized within 1.0 mile of occupied blowout penstemon habitat to minimize potential impacts associated with wind turbines. If projects are proposed within 1.0 mile of occupied habitat the BLM will re-initiate consultation with the USFWS.
13. Proposed projects not addressed in other conservation measures will be prohibited within 0.25 miles from any known blowout penstemon populations to minimize surface disturbance and adverse effects within occupied habitat. If the avoidance of adverse effects is not possible, the BLM will re-initiate consultation with the USFWS.
14. The BLM will conduct ongoing surveys to inventory and monitor existing blowout penstemon populations. Photointerpretation of aerial maps combined with on-the-ground surveys will be conducted in those FOs identified as having potential habitat. These actions will assist in determining the range of blowout penstemon in Wyoming and aid the USFWS in compiling species distribution lists.
15. A database of all surveyed, inventoried and/or monitored blowout penstemon sites will be maintained by the BLM in conjunction with WYNDD.
16. BLM will provide educational materials to authorized permittees in blowout penstemon habitat, including, but not limited to, ROW and livestock permittees (regarding practices for minimizing potential for impacts related to fence and ROW maintenance). BLM efforts (i.e., phone calls, or other direct communication) will be taken to ensure all authorized permittees (e.g., grazing permittees and/or ROW permittees) have received the educational materials and to ensure there are no questions regarding the importance of avoiding impacts to blowout penstemon habitats or individual plants.

Best Management Practices

17. When project proposals are received, BLM will initiate coordination with the USFWS at the earliest possible date so that both agencies can advise on project design. This should minimize the need to redesign projects at a later date to include blowout penstemon conservation measures, determined as appropriate by the USFWS.
18. Preserve the Rawlins FO blowout penstemon ACEC to ensure the continued existence of the species in Wyoming by restricting management actions within ACEC boundaries. As new populations are discovered or the species migrates with its preferred habitat, re-evaluate the ACEC boundaries. BLM FOs should coordinate efforts to maintain ACEC protection around occupied blowout penstemon habitat, should habitat eventually cross FO borders.
19. The BLM will participate in the development of a conservation agreement, assessment and strategy, and a species specific recovery plan for blowout penstemon in coordination with the USFWS and other agencies as appropriate. Once a recovery plan and conservation agreement are finalized for blowout penstemon in Wyoming, populations and habitat of the species on BLM-administered lands will be monitored to determine if conservation/recovery objectives are being met.
20. Limit the use of off-highway vehicles (OHVs) to existing roads and trails within 1.0 mile of *potential* blowout penstemon habitat, with the exception of authorized necessary tasks. No OHV competitive events will be allowed within 1.0 mile of potential blowout penstemon populations.

21. Coordinate with the USFWS, the National Resource Conservation Service (NRCS), State of Wyoming and private landowners to work proactively to ensure adequate protection for blowout penstemon and its habitat when new activities are proposed.
22. In the event that a new population of blowout penstemon is found, the USFWS Wyoming Field Office (307-772-2374) will be notified within one week of discovery.
23. Initiate land tenure adjustments to acquire lands with populations of blowout penstemon or potential habitat to ensure a higher level of protection under the ESA on Federal lands for blowout penstemon.
24. Prior to any land tenure adjustments in potential blowout penstemon habitat, the BLM will survey to assess for the presence or suitability for colonization of the species. While it is difficult to assess whether blowout penstemon will potentially colonize a specific site, the BLM should try to retain in Federal ownership lands that serve as potential habitat as they “are part of a broader, logical public land ownership management unit” (BLM 2008c). Potential blowout penstemon habitat is important for reintroduction and recovery efforts for the species.
25. Form a steering committee to develop and prioritize management practices and assist BLM and USFWS with research projects.
26. Monitor and analyze vegetation treatments (prescribed fire, mechanical, chemical, etc.) in known or potential blowout penstemon habitat for impacts to the species.
27. Monitor blowout penstemon sites for invasion by noxious and invasive plant species.
28. Establish monitoring, biological, ecological, and life history studies as funding and staffing allow, such as, monitoring current populations each year for trends, studies regarding identification of pollinators, genetics, life history, effects of pesticides and herbicides, seed viability and germination, and studies monitoring the success of reintroduction efforts. The Rawlins FO, in conjunction with various university collaborators, is conducting pollination, genetic and seed bank studies.
29. Collect and bank blowout penstemon seeds at local, regional, national, and international arboreta, seed banks, and botanical gardens as insurance against catastrophic events, for use in biological studies, and for possible introduction/reintroduction into potential habitat.
30. Train law enforcement personnel on protections for the plant and its habitat, its status, and current threats to its existence.
31. Educate resource specialists, rangers, and fire crews about blowout penstemon and its habitat to help with project design for the general area and for fire suppression actions occurring in potential habitat for the plant. Provide ongoing education on habitat characteristics and identification of the plant. A flyer summarizing the plant’s description, life history and habitat was distributed in 2008 to BLM specialist staff and is made available to the public in BLM FOs and online.
32. The BLM will consider potential reintroduction sites in coordination with the USFWS to maintain the integrity of these sites for the survival of the blowout penstemon. The objective would be to reintroduce populations of blowout penstemon into areas of historic occurrence.

33. Utilizing the USFWS 5-year Review: Summary and Evaluation document develop propagation techniques and use them to introduce or repopulate blowout penstemon populations in the event population reestablishment becomes necessary.

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