United States Department of the Interior

FISH AND WILDLIFE SERVICE

Ecological Services
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Cheyenne, Wyoming 82009

In Reply Refer To:
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DEC 13 2010

Memorandum

To: State Director, Resources Policy and Management, Bureau of Land Management, State Office, Cheyenne, Wyoming

From: Field Supervisor, U.S. Fish and Wildlife Service, Wyoming Field Office, Cheyenne, Wyoming

Subject: Biological Opinion for the Impacts from the Wyoming Bureau of Land Management Resource Management Plans and their Effects to the Colorado Butterfly Plant (*Gaura neomexicana* ssp. *coloradensis*) and its Designated Critical Habitat

This biological opinion (BO) is in response to the U.S. Bureau of Land Management's (Bureau) request for formal consultation for the impacts from the Bureau's Wyoming Resource Management Plans (RMPs) to the Colorado Butterfly Plant (*Gaura neomexicana* ssp. *coloradensis*) and its Designated Critical Habitat that may occur on Bureau-administered lands in Wyoming. The U.S. Fish and Wildlife Service (Service) reviewed the biological assessment (BA) (BLM 2005) submitted by your office describing the effects of the Wyoming Resource Management plans and proposed Bureau-committed conservation measures on the Colorado butterfly plant and its designated critical habitat. Your September 16, 2005, request for formal consultation was received on September 19, 2005. On April 7, 2006, the Service received documentation from the Bureau changing their effects determination for the Livestock Grazing Program to designated Critical Habitat for both the Great Divide (BLM 1990) and Platte River RMPs (BLM 1985). In May 12, 2006, the Service provided the Bureau with a draft BO for review. During 2006, the Bureau was in the process of revising both the Great Divide (Rawlins Field Office) and the Platte River (Casper Field Office) RMPs and was focusing on section 7 consultation on those RMP revisions. Therefore, the Statewide Programmatic Colorado butterfly plant consultation was delayed and the Bureau did not provide comments and finalization notice to the Service for the May 12, 2006, draft BO.

The Great Divide RMP (1990) has now been replaced by the Rawlins RMP (BLM 2008). The Platte River RMP (1985) has now been replaced by the Casper RMP (BLM 2007). Section 7 consultation for the Colorado butterfly plant and its designated critical habitat was completed separately for both of those newly-revised RMPs during the revision process.

In order to complete a separate stand-alone statewide programmatic section 7 consultation for the Colorado butterfly plant and its designated critical habitat, the Bureau has recently reviewed both the newly revised Rawlins RMP (2008) and Casper RMP (2007) and on September 16, 2010, the Bureau submitted to the Service a minor change to their previous 2005 programmatic Colorado butterfly plant BA based on their review. The completion of a stand-alone statewide programmatic consultation will aid the Bureau in maintaining statewide consistency in its treatment of the Colorado butterfly plant across all of its Field Offices. In the Bureau's September 16, 2010, correspondence, the Bureau has requested finalization of the statewide programmatic consultation. Thus, the Service has prepared a new draft BO (contained herein) for review by the Bureau. This correspondence is provided in accordance with section 7(a)(2) of the Endangered Species Act of 1973 (Act), as amended (50 CFR §402.13 and §402.14).

This consultation now covers the Rawlins (2008) and Casper (2007) RMPs in Wyoming. The BO contained within this document addresses potential adverse effects to the Colorado butterfly plant and its designated critical habitat from the described Bureau activities of one planned program as well as the Bureau's commitment to the Conservation Measures listed in the Bureau's BA. The planned program with potentially likely adverse effects is the Livestock Grazing Management Program.

In addition, this correspondence addresses potential effects to the Colorado butterfly plant and its designated critical habitat from the described Bureau activities of 13 planned programs. For these programs, the Bureau has determined that the activities involved with them will have "no effect" or "are not likely to adversely affect" the Colorado butterfly plant and its designated critical habitat. These other programs according to the BA (with overlap depending on resource area) are (1) Cultural Resources/Historical landmarks, (2) Energy and Minerals Management, (3) Fire Management, (4) Forest Resources, (5) Lands and Realty Management, (6) Paleontological Resources, (7) Recreation Resources, (8) Sensitive Plants Management, (9) Soil/Water/Air Management, (10) Special Management Areas/Areas of Environmental Concern (ACECs), (11) Visual Resources Management, (12) Wild Horse Management, and (13) Wildlife and Fisheries Habitat Management. Additional detail for the description of these programs was taken from recent programmatic consultations, as necessary. This consultation is based on the project description, our review of your BA and analysis of effects (BLM 2005), and the Bureau-committed Conservation Measures (Appendix) as described in your BA.

Consultation History

The Service and the Bureau began statewide programmatic informal consultation on impacts of Bureau activities to the Colorado butterfly plant on October 23, 2001. On January 11, 2005, the Service designated critical habitat for the Colorado butterfly plant and the Bureau at that time began informally consulting with the Service over impacts to the designated critical habitat of the Colorado butterfly plant, as well. Greystone consultants provided electronic copies of a draft BA in October and December of 2004 and the Service discussed potential changes to those drafts with the Bureau. The Service received the Bureau's request for formal consultation on this proposed action on September 19, 2005. On September 26, 2005, the Service issued a memo to the Bureau notifying them that all materials necessary for the initiation of formal consultation had been received. A subsequent request by the Bureau to alter prioritizations for consultation delayed the completion of this BO. On April 7, 2006, the Service received documentation from the Bureau changing their effects determination to "likely to adversely affect" for the Livestock

Grazing Program's effects to designated Critical Habitat for both the Great Divide and Platte River RMPs.

At that time, the Bureau was in the process of revising both the Great Divide (Rawlins Field Office) and the Platte River (Casper Field Office) RMPs. The Bureau focused on section 7 consultation on those RMP revisions separately and did not provide comments and finalization notice to the Service for the May 12, 2006, draft programmatic Colorado butterfly plant BO. The Great Divide RMP has now been replaced by the Rawlins RMP. The Platte River RMP has now been replaced by the Casper RMP. Programmatic section 7 consultation for the Colorado butterfly plant and its designated critical habitat was completed separately for both of those newly-revised RMPs.

In order to complete statewide programmatic section 7 consultation, the Bureau has recently reviewed the newly revised Rawlins RMP and Casper RMP and on September 16, 2010, submitted to the Service a minor change to their previous 2005 programmatic BA based on their review. On September 16, 2010, the Bureau also requested finalization of the statewide programmatic consultation. Thus, the Service prepared a new statewide programmatic draft BO for review by the Bureau. On November 23, 2010, the Service received notification from the Bureau requesting finalization of the updated draft BO.

This correspondence has two parts--(1) informal consultation for "no effect" (NE) and "not likely to adversely effect" (NLAA) determinations for effects to the Colorado butterfly plant and its designated critical habitat in the Rawlins and Casper Resource Areas and (2) a biological opinion for potential adverse effects from grazing in the Rawlins and Casper Resource Areas. A complete administrative record of all documents and correspondence concerning this consultation are on file in the Wyoming Ecological Services Field Office in Cheyenne, Wyoming.

Informal Consultation

For the informal consultation portion of this correspondence, the Bureau has determined that programs under the Rawlins and Casper RMPs in Wyoming, coupled with the Bureau's commitment to the conservation measures listed in the Appendix will have "no effect" or are "not likely to adversely affect" the Colorado butterfly plant or its designated critical habitat. These 13 programs are (1) Cultural Resources/Historical landmarks, (2) Energy and Minerals Management, (3) Fire Management, (4) Forest Resources, (5) Lands and Realty Management, (6) Paleontological Resources, (7) Recreation Resources, (8) Sensitive Plants Management, (9) Soil/Water/Air Management, (10) Special Management Areas/ACECs, (11) Visual Resources Management, (12) Wild Horse Management, and (13) Wildlife Habitat Management. Some of the identified RMP programs contained overlapping activities and any activities which overlapped among two or more programs are described under the program to which they were most closely associated.

The Bureau's Colorado butterfly plant BA made "not likely to adversely affect (NLAA)" or "no effect (NE)" determinations for the effect of certain programs on the Colorado butterfly plant and its designated critical habitat in Bureau resource areas in Wyoming. These are displayed in Table 1 below.

Table 1. "Not likely to adversely affect" and "no effect" determinations made by the Bureau for Colorado Butterfly Plant and its Designated Critical Habitat.

Resource Management Plan (RMP) / Management Program	Determination for Colorado Butterfly Plant		Determination for Colorado Butterfly Plant Designated Critical Habitat	
	Rawlins RMP	Casper RMP	Rawlins RMP	Casper RMP
Cultural/historical landmarks	NLAA	NLAA	NE	NE
Energy & Minerals Management	NLAA	NLAA	NE	NLAA
Fire Management	NLAA	NLAA	NE	NE
Forest Management	NE	NE	NE	NE
Lands and Realty	NLAA	NLAA	NE	NE
Paleontology	NE	——	NE	NE
Recreation	NLAA	NLAA	NE	NE
Sens. Plants	NE	------	NE	NE
Soil/Water/Air	NE	NE	NE	NE
Special Management Areas - ACECs	NE	NE	NE	NE
Visual Resource Management	NE	------	NE	NE
Wild Horses	NE	------	NE	NE
Wildlife and Fish Management	NLAA	NLAA	NE	NE

The Service concurs with your determinations that activities associated with the programs listed in the preceding table will not be likely to adversely affect the Colorado butterfly plant or its designated critical habitat because (1) the activity will not occur in Colorado butterfly plant habitat, (2) the activity by its very nature will have no effect or will not be likely to adversely affect the Colorado butterfly plant or designated critical habitat, (3) Bureau-administered lands in these Bureau resource areas are not likely to contain occupied Colorado butterfly plant habitat, (4) no Colorado butterfly plants have been recorded on Bureau-administered lands within these resource areas in the past, and (5) the Bureau has committed to implementing conservation measures (see Appendix) to reduce the likelihood that any Bureau-authorized actions within the programs listed above would adversely affect the Colorado butterfly plant or its designated critical habitat if it were present on Bureau-administered lands in these resource areas.

A summary description of the programs and a summary of the rationale behind the above effects determinations follow. The following discussion is an overview of the Bureau's Resource Management Plan Activity Programs and Bureau-committed conservation measures for the Casper and Rawlins RMPs which are not likely to adversely affect or will not affect the Colorado butterfly plant or its designated critical habitat, now or in the foreseeable future. The names of the different programs are summarized here as in the BA (see Table A-1, BLM 2005) to accommodate similar activities under varying program names between the individual RMPs. Conservation Measures (Appendix) were identified in the Programmatic Colorado Butterfly Plant BA and the Bureau has committed to implement those conservation measures. For the purposes of this consultation, the Service has analyzed the effects to the Colorado butterfly plant and its designated critical habitat taking into account the Bureau's commitment to the implementation of the conservation measures. As per the Bureau's letter, commitment of the

Bureau to the conservation measures will be formalized through a maintenance action of all pertinent Wyoming RMPs following completion of this formal consultation.

Conservation measures (see Appendix) are designed to reduce the potential for adverse effects to occur as a result of Bureau-authorized activities. The Bureau has committed to ensuring that surveys are conducted in suitable habitat prior to implementation of activities that could result in disturbance. The Bureau's implementation of the conservation measures in the Appendix will reduce human and project disturbance to riparian areas for the protection of Colorado butterfly plants and their habitat. The Bureau's implementation of the conservation measures will also minimize the potential for inadvertent spraying of herbicides or introduction of noxious weeds into Colorado butterfly plant habitat. The Bureau's application and enforcement of buffer restrictions for spraying of insecticides near listed plants will help ensure that populations of necessary insect pollinators of listed plants will be maintained.

Cultural Resources.

Program Description. Under this program, the Bureau performs a variety of activities to preserve, protect, and restore cultural and historical resources. During inventory activities, the Bureau inventories, categorizes, and preserves cultural resources, conducts field activities, performs excavations, maps and collects surface materials, researches records, and photographs sites and cultural resources. Inventory data collection activities are used for documentation and development of mitigation plans prior to other resource program surface disturbing activities. Inventory activities may entail the use of hand tools, power tools, or heavy machinery. The Bureau's cultural management activities involve managing sites for scientific, public, and sociocultural use; developing interpretive sites; restricting certain land uses; closing certain areas to exploration; prohibiting some surface disturbing activities; preparing interpretive materials; and allowing the collection of certain invertebrate fossils. The Bureau also seeks listing of eligible sites on the National Register of Historic Places, installs protective fencing of trail segments, stabilizes deteriorating buildings, acquires access to sites when necessary, performs certain surface disturbing activities, pursues withdrawal of areas from exploration and development of locatable minerals, designates avoidance areas, pursues cooperative agreements, and identifies and interprets historic trails.

Roughly 95 percent of on-the-ground cultural program activity is site surveys in response to other program proposed activities. These surveys involve an archeologist walking across the ground in search of artifacts or other cultural features. The remaining program efforts (approximately 5 percent) on-the-ground can be categorized as data recovery. During the clearance of a site for another program activity, or during another program activity, important cultural resources may be discovered that are deemed worthy of further evaluation. When this occurs, a test or excavation (typically involving less than an acre) may be performed with hand tools, power tools, or heavy equipment that could involve intensive human activity at the site by field crews; placement of crew and evaluation facilities; intense, though usually localized, ground disturbance at the immediate site; and periodic use of primitive access roads and trails. Rarely, a site will have *in situ* interpretive value, and when this is the case, intensive development could occur which might include the construction of permanent access and service roads, power sources, facilities (including protective fencing), and relatively heavy, though usually localized, human use.

Anticipated Effects to Colorado butterfly plant. Activities associated with the Cultural Resources Program are not expected to adversely affect the Colorado butterfly plant and its

designated critical habitat in the Rawlins and Casper Resource Areas because the Bureau has agreed to implement the identified conservation measures and because there is a low likelihood that the plant occurs on Bureau-administered lands in these resource areas. There is no designated critical habitat for the Colorado butterfly plant on Bureau-administered lands. The conservation measures are designed to minimize the effects from Bureau-authorized activities to the Colorado butterfly plant and its habitat, reduce the possibility of noxious weed invasion or other non-native plant species introductions, reduce the impacts of herbicide use, and eliminate ground disturbance in Colorado butterfly plant occupied habitat.

Energy and Minerals Resource Management.
Program Description. The Bureau's Energy and Minerals Programs are divided into three categories. These categories are salable minerals, leasable minerals, and locatable minerals.

Salable Minerals. Salable minerals include common variety sand, gravel, stone, sandstone, shale, limestone, dolomite, granite rock, pumice, cinders, clay, and petrified wood. Salable minerals are disposed of under the Materials Act of 1947, as amended, and as such are discretionary actions. Historical use of these materials has been for building materials, road surfaces, and tools. Today, salable minerals are mainly used for maintaining roads, vehicle parking areas, and substrate materials and concrete aggregate, often associated with the oil and gas industry activities. The Wyoming Bureau's policy is to provide sand, gravel, and stone from federal mineral deposits as necessary to meet the need for federal, state, and local road construction and maintenance projects in the resource area.

Before issuing contracts or free use permits for salable minerals, the Bureau conducts appropriate environmental assessments. These include special studies or inventories of cultural values, threatened or endangered plant and wildlife species, or other resources. Stipulations or conditions may be included in the terms of the contract to ensure protection of the natural resource found there and reclamation of the land following project completion. Site reclamation is required following any surface disturbing mining activity for salable minerals. Reclamation of disturbed sites is important to be sure that the land can later be used productively for other purposes. Reclamation includes removing all surface debris, recontouring, reducing steep slopes, and planting vegetation. All reclamation proposals must conform to state agency requirements and must be approved by the Bureau.

Salable minerals are a resource over which the authorized officer has discretionary authority. The Bureau will prohibit the disposal (sale and removal) of salable minerals (including sand) within 0.25 miles of known Colorado butterfly plant populations (Appendix).

Sand and gravel may be removed from naturally occurring sites (excluding areas within 0.25 miles of Colorado butterfly plant populations) generally accessed by using relatively short, unpaved roads. Typically in these operations, the topsoil is removed from the site and stockpiled with earth moving equipment (e.g., bulldozers, front end loaders, or scrapers), the salable mineral material is then extracted from the ground with loaders or mechanized excavators or industrial shovels creating a pit, then the material is processed (i.e., crushed, screened, washed, etc.) at the site, and hauled away in dump trucks or wheeled semi-transports. Some operations may require the establishment of a quarry with rock cutting machinery and rock handling equipment such as hoists or cranes. Generally, construction of roads to a standard capable of bearing heavy, wide loads is required. Occasionally, water pumping equipment is required at the pit or quarry to keep the operations from becoming flooded, and once in a while transmission

lines are extended to the site to provide an electrical power source. It is common to have an office or operations shed located at the site.

Reclamation of disturbed sites is important so that the land can later be used productively for other purposes, and is a requirement following any surface disturbing activity. Reclamation includes removing all surface debris, trash, and wastes resulting from mining operations, recontouring the land surface with heavy machinery where necessary, reducing steep slopes of pits with heavy machinery such as bulldozers, scrapers, etc. where necessary, replacing topsoil with earth moving equipment, and reestablishing vegetation either by planting or seeding by hand or with farm implement equipment (tractors, discs, harrows, seeders, etc.). Reclamation of disturbed sites is often done as the operation moves ahead to new deposits.

Leasable Minerals. Leasable minerals include solid minerals such as coal, uranium and bentonite from acquired lands, and fluid minerals such as oil and gas. Fluid leasable minerals include oil, gas, and coalbed methane.

The Mineral Leasing Act of 1920 provides that all public lands are open to oil and gas leasing unless a specific order has been issued to close an area. The Wyoming Bureau has some of the most prolific oil-producing areas in the Rocky Mountains. Once acreage is nominated by the public to be included in an oil and gas lease sale, the acreage is sent to the appropriate Bureau field office via the parcel list to be reviewed and stipulated by the field office for protection of wildlife and other sensitive resources. These stipulations become part of the lease. Exploration, development, and reclamation are common phases of most leases. Mineral exploration involves opening areas to geophysical (seismic) exploration; permitting the exploration; allowing oil, gas, and mineral development; and leasing and developing oil, gas, and geothermal steam resources. Seismic exploration involves the use of shock waves to describe the mineral structure of the Earth's subsurface. This technology is used to locate reserves of oil and gas resources. Before seismic activity is completed, a Notice of Intent which gives the location and type of activity, and the results of an on-the-ground cultural inventory must be filed. The Bureau conducts an in-office study as well as environmental analysis to determine if any threatened or endangered species will be affected.

Prior to oil and gas drilling activities, an application for permit to drill (APD) must be approved and a site-specific Environmental Assessment (EA) completed for each APD. Drilling operations are inspected regularly as are production facilities. All surface disturbing activities associated with leasable minerals management are subject to no surface occupancy (NSO) restrictions to protect threatened or endangered species habitat. The Bureau has agreed to apply a Condition of Approval (COA) on all APDs, or Control Surface Use (CSU) stipulation if applicable, within 0.25 miles of known habitat of the Colorado butterfly plant, prohibiting all surface-disturbance and OHV activities. Directional drilling may be utilized under the occupied habitat of the Colorado butterfly plant.

Ancillary development for oil and gas activities involves the construction of roads, pads, and other facilities; and the construction of new above ground powerlines. Stipulations involve implementing leases with no surface occupancy restrictions, seasonal restrictions, or with other standard surface protection restrictions; negotiating mitigated impacts between lessees and authorized officer; deciding mitigation measures and limitations, and reclamation. Reclamation involves correcting any disturbance made by the oil and gas operation. Reclamation activities

take place following the expiration of the lease. Reseeding, reshaping or road destruction are all activities involved with oil and gas reclamation.

Federal oil and gas program activities can be functionally divided into five categories: leasing, exploration (seismic and drilling), development, production (primary, secondary, and tertiary), and closeout/abandonment. Once acreage is nominated by the public to be included in an oil and gas lease sale, the acreage is reviewed and stipulated by the Bureau's Wyoming State Office for protection of wildlife and other sensitive resources, then notice these lease stipulations are sent to the respective field office for review. If these stipulations are appropriate, they ultimately become part of the issued lease.

Prior to conducting geophysical exploration activity, a Notice of Intent to Drill (NOI) which describes the location and type of project, the results of an on-the-ground cultural inventory must be filed with the Bureau's respective field office. The Bureau conducts an in-office study as well as environmental analysis, includes an initial determination as to whether any threatened or endangered species will be affected. If necessary, a field exam or survey for threatened or endangered species will be conducted. Most recent seismic activity in the area has been 3-D surveys, with vibroseis and shot hole surveys also allowed. Traditional geophysical exploration operations involve the stringing of vibration sensitive cable geophones in a line across the landscape for a distance of from one to several miles. The geophones are connected to an instrument truck or trailer equipped to gather and record seismic data. A geologic vibration source (e.g., subsurface explosions, ground surface explosions, heavy "thumper" trucks, etc.) is then activated, and the reflected vibrations from the earth's geologic structure are then recorded from the geophone lines. Any surface equipment/instruments and left over trash is then collected, and any surface disturbance (e.g., shot holes) is then reclaimed. Occasionally, geophysical data is collected aerially using instruments capable of measuring the earth's magnetic characteristics.

Prior to conducting site-specific drilling activities, a site specific EA is completed for each APD, or group of APDs. APDs are subject to site-specific conditions of approval which may be more restrictive than lease stipulations. Based on the environmental review, further timing and location restrictions may be added to protect local resources. Once an APD is approved, ground operations may begin. In traditional oil and gas operations, a minimum road capable of handling a well drill rig is constructed to the site, and a level 'pad' ranging in size from 1-5 acres is constructed for drill rig and ancillary facility (e.g., pipe racks, production pits, parking areas, etc.) setup. A drillhole is started (i.e., spudded) and drilling continues until the targeted geologic formation is reached. If a well is not capable of producing economic quantities of oil or gas, it is shut in and plugged and marked and the surface is reclaimed to its previous condition. If a well is a producing well, production facilities (e.g., pipelines and/or storage tanks, water treaters, pipeline compressor stations, powerlines, pumpjacks, fencing, etc.) will be constructed, and road upgrades may occur to accommodate tank trucks used to haul the oil to a terminal or local refinery. Discovery of a producing area may result in additional wells being drilled and a pipeline system established to transport the oil to a storage facility or terminal. If extensive reserves of oil are located field development may occur which would result in additional wells and transport systems with well spacing determined by the Wyoming Oil and Gas Commission. Drilling and production operations and facilities are inspected and maintained regularly, and varying amounts of human and vehicle activity is present with all the above actions.

When oil and gas wells are no longer capable of producing economic quantities of product, the field is closed out and abandoned. At each well location, all the "down-hole" and surface facilities are removed and the drillhole is plugged. The pad and production pits are reclaimed to existing standards, and a hole marker is placed at the well site. Unnecessary access roads are reclaimed (i.e., recontoured and revegetated). Various types of heavy equipment and vehicles are used for these activities. Finally, the site is inspected, bonds are released as appropriate, and the site is declared closed.

Locatable Minerals. Bentonite, uranium, and gypsum are the principle locatable minerals of Wyoming Bureau Resource Management Areas. Other locatable metallic minerals include silver, gold, platinum, cobalt, and other precious minerals. Actions associated with commercial locatable minerals include surface disturbance for mining, reclamation, and construction of access roads, buildings, and utility lines. Small scale mining may occur in the Bureau areas in Wyoming. All lands must be reclaimed after expiration of a mining lease.

Locatable minerals are those valuable mineral deposits which are not included under the authority of the mineral leasing acts, and do not include the common variety salable minerals such as sand, gravel, stone, cinders, pumice, clay, etc. Mining claims, either placer (surface or near surface alluvial or layered deposits), or lode (deeper underground layers, or veins), are staked (i.e., "located") for locatable minerals. All public lands are open to exploration for locatable minerals, except those withdrawn to protect other resource values and uses, or those lands with acquired federal mineral status. The Bureau has only limited management authority (i.e., discretion) over mining claim operations. Activities dealing with locatable mineral extraction are generally not subject to many of the special stipulations that are used in the salable and leasable mineral programs to protect sensitive resources from surface disturbance caused by mineral development. Mining claims are typically patented and fee titled, thereby leaving federal government ownership. Locatable metallic minerals (often referred to as 'hardrock') include silver, gold, platinum, cobalt, and other precious minerals. Bentonite (on lands other than "acquired lands"), uranium, and gypsum are locatable minerals.

Locatable mineral exploration and mining activities on Bureau-administered land are subject to the surface management regulations of the Secretary of the Interior in 43 CFR 3809, and for Wilderness Study Areas in 43 CFR 3802. These regulations require an operator to prevent unnecessary or undue degradation of the land. For activities other than casual use, they require the operator to submit either a notice, or a plan of operations and accompanying reclamation plan. Five acres or less of surface disturbance from exploration activities requires a notice to be filed with the Bureau. The notice must describe the proposed activities, the location on the ground, the start-up date, road access and construction, if any, and reclamation measures. Receipt and review of a notice is not a federal action and approval by the Bureau is not required.

A plan of operation must be submitted for exploration greater than 5 acres, or the production of minerals from any size of disturbance. If a plan of operations is required, it must include a description of the proposed activities, road access and construction, reclamation measures, time frames of non-operation, and a sketch or a map of the area to be disturbed, including all access routes. An EA or an Environmental Impact Statement (EIS) must be prepared by the Bureau or the claimant/operator prior to commencement of any surface-disturbing activities. A plan of operations must be approved by the Bureau, and operations at the plan level may not commence until the plan is approved. Operators must take such action as needed to minimize or prevent

adverse impacts to plants, fish, and wildlife, including threatened and endangered species and their habitat.

Actions associated with locatable minerals mining activities are as varied as the types of mining operations themselves. Typically, initial access roads are constructed to the mine site, and exploratory drilling with vehicle mounted machinery will take place, or exploratory pits will be excavated to define the resource boundaries. Most bentonite and uranium is recovered by open pit surface mining operations. Large earth-moving equipment may remove the topsoil and possibly some overburden materials, and place them aside during the actual mining operations. The mineral resource is then removed from the pit with heavy earth moving equipment such as scrapers, loaders, and industrial shovels, and hauled by mine roads to processing and/or load-out facilities, usually at or near the mine site. Various buildings are constructed at the mine site as well as permanent access roads and utility lines. Sometimes railroad lines are built to the mine site to transport the product to market. Following mineral recovery, the mine site is reclaimed and sold or transferred to other uses and purposes. Hardrock minerals are often recovered underground by shaft mining methods. The mining manifestations at the surface may be the presence of access roads or railroads, powerlines, administrative and equipment buildings, rock crushers and mineral processing facilities, and tailings piles at or near the mine. There may also be some mine water production pits and facilities present. Placer operations typically use large shovels or dredges to turn over in-stream and streamside alluvium for sluicing and screening to separate the gravels from the mineral materials. Some placer operations may use high-pressure hydraulic "cannons" to slurry the surface soils and materials into rock crushers, sluicing, and screening equipment for mineral separation.

Reclamation is a requirement following any surface-disturbing activity, even if the claim or site is declared abandoned and void by the Bureau. It is also required if the claimant relinquishes the claim or site to the federal government. The Bureau requires a reclamation bond or other financial security prior to the start of surface disturbing operations. Bureau expects the operator to reclaim the lands affected under their notice or approved plan of operations according to the measures stipulated by the authorized officer. All work must be reclaimed prior to bond release from the Wyoming Department of Environmental Quality (DEQ).

Anticipated Effects to Colorado butterfly plant. The Bureau's Energy and Minerals Resource Management Programs in Wyoming are not likely to adversely affect the Colorado butterfly plant or its designated critical habitat because the Bureau has agreed to implement the identified conservation measures and because there is a low likelihood that populations of Colorado butterfly plant exist on Bureau-administered lands in Wyoming. There is no designated critical habitat for the Colorado butterfly plant on Bureau-administered lands. The conservation measures are designed to minimize the effects from Bureau-authorized activities to the Colorado butterfly plant and its habitat, reduce the possibility of noxious weed invasion or other non-native plant species introduction, reduce the impacts of herbicide use, and eliminate ground disturbance in Colorado butterfly plant occupied habitat. There are also no subsurface mineral development activities currently occurring beneath privately owned surface lands within the designated critical habitat of the Colorado butterfly plant within the Rawlins or Casper Resource Areas.

Fire

Program Description. The three major categories of activities involved with the Bureau's Fire Management Program are prescribed fire, fire suppression, and fire rehabilitation.

Prescribed Fire. During prescribed burning activities, the Bureau evaluates areas on a case-by-case basis, writes fire plans, builds fire breaks, coordinates with all necessary parties and conducts prescribed burns. Prescribed fires are those fires intentionally set and controlled by the Bureau and their cooperators to enhance natural resources in the area. Prescribed fire is also used to dispose of slash and residue from timber sales. Thinning activities are sometimes used to reduce the fuel levels before a prescribed fire. Some prescribed fires are conducted to improve wildlife habitat and grazing potential as well. Prescribed fire is typically used to enhance natural resources in an area by disposing of slash and residue from timber sales and thinning activities, reducing combustible fuel levels, and by improving wildlife habitat and domestic livestock grazing potential

Prior to conducting a prescribed burn, fuel loads are identified and a burn plan is developed as to how the burn will be conducted and what safeguards must be in place to keep the fire under control. Vegetation thinning activities are sometimes used to reduce the fuel levels before a prescribed fire. Prescribed fire sites are usually accessed by road. The burn site is typically prepared prior to the actual prescribed fire by construction of firebreaks (often by black lining) and sometimes by windrowing or piling of the fuels to be burned within the firebreak. Fire engines are generally stationed on the site for emergency fire control if needed, and for mop-up operations. Qualified fire personnel conduct the actual prescribed fire under stringent guidelines of temperature conditions, humidity and wind speed and direction which minimizes the chances for the fire to escape. If all site conditions are favorable, and the weather forecast for the time of the burn is favorable, the fuels to be burned are ignited and burned in small increments until desired vegetation of the area is burned. Once the fire appears to have burned out, or is extinguished, the area is monitored to be certain that the fire is indeed completely extinguished and will not start up again or spread to areas not included in the burn plan. The burn area is generally allowed to revegetate naturally, unless conditions require re-seeding, in which case native plant species are seeded or planted. Monitoring continues to determine if the objectives of the project have been met.

Fire Suppression. The fire suppression objectives are to effectively protect life, property, and resource values from wildfire. Full fire suppression will be used on fires endangering human life or fires that come within 0.25 mile of state or private lands, structures and facilities, and oil and gas fields. Limited or modified fire suppression would occur in areas where fire could be allowed to function in its natural ecological role.

Because fire suppression activities are done on an emergency basis and require great expediancy, only minimal preplanning for fire suppression takes place. Similarly, section 7 consultation according to the Act often occurs "after the fact" due to the expediency necessary for wildfire suppression efforts. Recent trends in wildfire occurrence throughout the Wyoming Bureau lands are similar to trends throughout the west, with larger, catastrophic fires in recent years due to past fire suppression and the subsequent increase in fuels. Fire suppression activities can involve the use of off-road vehicles, hand tools and heavy equipment such as bulldozers. During the construction of a fire line to contain a wildfire, dozers may create a line down to bare soil

approximately 3 feet wide. Chemical fire suppression agents containing chemical dyes may also be used. These may affect the aquatic environment if they enter streams. Water may also be withdrawn from nearby sources such as streams, lakes, or public water supplies to suppress the fire.

Fire suppression activities depend on the severity of the fire, the size of the fire, and the resources determined to be in danger. Initial attack of a wildfire would consist of a ground crew (or smoke-jumper crew if the fire was in a remote location) dispatched to the site to evaluate the fire and what suppression requirements that they estimate are needed. Ground access to the site may be by vehicle or on foot using roads, trails, or across-country access. If the fire is small, the crew will immediately extinguish the fire using hand and power tools (e.g., pulaskis, shovels, chainsaws, etc.), and sometimes water from an engine pumper unit, or backpack pumps. If additional fire fighting resources are needed, more personnel and equipment are dispatched to the site. Additional work may include building fire lines by scraping a line down to mineral soil around the fire with hand tools. Hand built fire lines (hand lines) are typically about two feet wide and generally surround the fire perimeter. If the fire increases in size, or burns across the hand line, additional measures may be taken that could include (1) cutting trees, (2) constructing wider fire lines with mechanized equipment, (3) filling water pumper trucks from live waters and spraying the water onto burning vegetation, (4) water drops from helicopter buckets with water obtained at the nearest source accessible to helicopters, or (5) air tanker drops of chemical retardant which is a slurry consisting of water, chemical fertilizers and a binding agent such as clay. If additional personnel are required to fight the fire, a camp may be established in a safe location close enough to the fire to allow efficient movement of personnel and equipment. Camps may require areas large enough to accommodate personnel, cooking facilities, equipment areas, and storage of supplies needed to suppress the fire. Following containment and control of the fire, "mop-up" operations begin and continue until the fire is declared out (extinguished). Mop-up is a tactic to extinguish burning materials that could cause a fire to spread beyond the control lines. During mop-up operations, all hazardous snags near the fire line or within the fireline are felled, and all remaining burning embers are extinguished until cold.

Fire Rehabilitation. Emergency Stabilization and Rehabilitation techniques can begin before the fire is determined controlled and while fire suppression equipment is still in the fire area. Emergency Stabilization and Rehabilitation techniques could include, but are not limited to: grading, culvert installation, applying mulch, installing straw wattles, contour felling, seeding, fencing for livestock/wildlife management and monitoring and potentially treating weed invasions.

After the fire is extinguished, the area is surveyed for the need to revegetate or rehabilitate any resources damaged by the fire or suppression efforts. An Analysis of Burned Area Emergency Rehabilitation (BAER) is conducted on all fires, and implemented as necessary after considering the extent of the resource damage, the needs of the ecosystem, and public opinion. Rehabilitation involves efforts to repair or improve lands that need to be recovered to a management-approved condition from wildfire damage, or to repair or replace resources damaged by a wildfire. Such activities may include planting small trees and shrubs to reestablish burned habitat, reestablishing native tree species lost in a fire, reseeding grasses and forbs, mulching stream banks, controlling grazing, repairing damage to minor facilities (campgrounds, exhibits, fences, guzzlers, etc.), otherwise restoring habitat, treating invasive plants, maintaining roads/trails, restoring heritage sites, or replacing fences.

Anticipated Effects to Colorado butterfly plant. The Bureau's Fire Management Programs in Wyoming are expected to adversely affect the Colorado butterfly plant or its designated critical habitat because the Bureau has agreed to implement the identified conservation measures and because there is a low likelihood that Colorado butterfly plant occurs on Bureau-administered lands in Wyoming. There is no designated critical habitat for the Colorado butterfly plant on Bureau-administered lands. The conservation measures are designed to minimize the effects from Bureau-authorized activities to the Colorado butterfly plant and its habitat, reduce the possibility of noxious weed invasion or other non-native plant species introduction, reduce the impacts of herbicide use, and eliminate ground disturbance in Colorado butterfly plant occupied habitat.

Forest Resources.

Program Description. In the resource areas, the Bureau manages its forest resources to maintain and enhance the health, productivity, and the biological diversity of forest and woodland ecosystems, and provide a balance of natural resource benefits and uses, including opportunities for recreation uses, wildlife habitat, watershed values and commercial forest production. The Bureau's Forestry Program involves a variety of different activities, most of which involve timber harvesting. Other forestry activities involve managing the forest for other uses.

Timber Production. Forest stand inventories are conducted prior to any management activities, and regeneration surveys are performed following stand management activities. During the pre-harvest phase of timber production, the Bureau authorizes the cutting and removal of diseased trees, disease treatment of trees by spraying, and the spraying of grasses and shrubs. The Bureau allows forest stand improvement activities (initial thinning) of young trees (i.e., regeneration growth usually less than 15 feet in height) in forest stands. This activity may or may not require minimal road construction, and the trees are simply laid down with a chainsaw at a set spacing distance and left where they drop to decay. Pre-commercial harvest and removal of diseased trees and pre-commercial thinning of young trees is conducted to reduce the density of smaller trees, and thereby allowing the remaining trees to have better access to available nutrients, water, and light. These activities generally require creation of minimum to light road or two-track trail construction for access, and use of chainsaws and possibly some light yarding equipment for lay down and retrieval of trees.

During actual harvesting activities, the Bureau authorizes timber harvesting, permits clearcuts, ensures slash disposal, allows commercial thinning, logging, and skidder-type yarding as well as cable yarding. The Bureau permits the construction of roads and landings for use in timber harvesting operations. During commercial harvest activities, the Bureau allows removal of commercial size trees (i.e., saw logs), ensures slash piling or lop-and-scatter disposal of debris, allows commercial thinning of saw logs under some types of silvicultural treatment, and allows use of both skidder and cable yarding of harvested trees. Generally, light to medium roads are constructed to the harvest stand and yarding areas and load out landings are built in the sale area to facilitate the removal of logs. Trees are laid down with chain saws or harvester machines. Other commercial uses may include post and pole harvest and the removal of wildlings for transplanting purposes. Non-commercial harvest includes the collection and removal of dead and downed trees for firewood and cutting of Christmas trees in stands with good public access.

During restoration efforts following timber harvest activities, the Bureau conducts rehabilitation surveys and ensures site regeneration and stand replacement, fencing of regenerated areas, and re-contouring of landings, as needed.

Other Forest-related Activities. During forest management for other activities, the Bureau assesses effects of grazing, manages forests for recreation, livestock grazing, and wildlife habitat and prescribed burning. Additional forest management activities include acquiring easements, pursuing legal access sites, authorizing road development, and installing drain culverts and water bars.

Anticipated Effects to Colorado butterfly plant. The habitat for the Colorado butterfly plant does not occur in forested areas, so it is unlikely that this subspecies would be found near any timber harvest or other forest-related management activity. For these reasons, the Forest Resources Program is expected to have no effect on the Colorado butterfly plant or its designated critical habitat.

Lands and Realty.

Program Description. The Lands and Realty Program authorizes and responds to requests for land use authorizations, sales, exchanges, access acquisitions, and other activities.

Rights-of-Way (ROWs). Rights-of-way authorizations allow the use, or passage over, of public lands to get to, from, or through a location, or to allow the construction of a facility such as a utility line. Rights-of-way granted by the Bureau may include access roads, pipelines, communication sites, irrigation ditches, and electrical distribution lines associated with oil and gas wells and production facilities.

Rights-of-way may be temporary (such as haul roads used while timber sales are in progress), or extended (such as for a public highway or electric transmission line). When roads are authorized on public land, the ROW is written to include stipulations so that the road design must follow accepted Bureau road engineering standards. The Bureau road engineering standards are designed to provide for the safety of users of the roadway as well as to avoid environmental degradation.

All public lands, except some withdrawals and ACECs, are available for rights-of-way authorizations. Most rights-of-way are granted for access roads, pipelines, and electrical distribution lines associated with oil and gas wells and production facilities. If the right-of-way is no longer needed, constructed facilities are removed and any reclamation needed such as contouring or reseeding is done before the right-of-way is relinquished.

Temporary Use Permits (TUPs). All public lands, except some withdrawals and ACECs, are available for issuance of temporary use permits (TUPs). TUPs can be issued for activities that usually have a short and definite time period of use, such as for a training area for military use. When the temporary use of the area is complete, the site is evaluated, and if needed, reclamation work is done prior to the temporary use permit being closed. TUPs can be issued for a wide variety of uses. In the past, TUPs have been issued for staging areas for U.S. Army National Guard training exercises, and for "rendezvous" sites for primitive weapons club gatherings that included camping areas, commons areas, event locations and temporary sanitation sites. Impacts from activities such as these are minor and short term, with any disturbance returned to its natural condition at the end of the authorization.

Sales/Exchanges. Land tenure adjustments include land sales, exchanges, and rarely, purchases. Land sales and exchanges take place to facilitate management or acquire lands with special

attributes that would enhance the operation of one or more of the programs that the Bureau carries out, or as a response to a request from a private landowner or company. All land tenure adjustments must be determined to be in the public interest before they can be authorized. In some cases, land tenure adjustment could result in increased access, and thus increased human activity in areas that previously may not have had a high level of human use. Lands exchanged out of public ownership may be developed by the landowner to meet his needs, or at some point in the future, be sold again to another party and developed or used according to their needs. Lands disposed from federal ownership could ultimately go to any use; lands acquired to federal ownership (i.e., Bureau administration) would be managed as any other lands for the purposes for which they were acquired.

Access Acquisition Efforts. Access acquisition needs (typically for roads) are most commonly identified for public access for recreational use. This may be for hunting, sightseeing, rockhounding or general exploring. Acquisition of access to public lands has been identified in locations that would provide the public with an opportunity to utilize resources that have previously been unavailable because the public lands had no public access. An increase in access could result in an increase in human activity in an area that previously had little activity, development of roads, trails, parking areas and other facilities to enhance the public's use of the area. These construction activities could lead to the use of heavy equipment and machinery, as well as surface disturbance at the site.

Other Lands and Realty-related Activities. Other activities under this program include processing stock driveway withdrawals and locatable mineral entry withdrawals; establishing protective withdrawals; and developing stipulations. The Bureau also pursues cooperative agreements; develops recreation site facilities; considers offsite mitigation; minimizes access in wildlife habitat; fences revegetation sites; blocks linear rights-of-way to vehicle use; and leases acres for landfills. Withdrawals are used to preserve sensitive environmental values, protect major federal investments in facilities, support national security, and provide for public health and safety. They segregate a portion of public lands and suspend certain operations of the public land laws, such as desert land entries or mining claims. Land withdrawals can be used to transfer jurisdiction to other federal land-managing agencies.

Anticipated Effects to Colorado butterfly plant. Activities associated with the Lands and Realty Program are expected to adversely affect the Colorado butterfly plant or its designated critical habitat in all Wyoming Bureau resource areas because the Bureau has agreed to implement the identified conservation measures and because there is a low likelihood that populations of Colorado butterfly exist on Bureau-administered lands in Wyoming. There is no designated critical habitat for the Colorado butterfly plant on Bureau-administered lands. The conservation measures are designed to minimize the effects from Bureau-authorized activities to the Colorado butterfly plant and its habitat, reduce the possibility of noxious weed invasion or other non-native plant species introduction, reduce the impacts of herbicide use, and eliminate ground disturbance in Colorado butterfly plant occupied habitat.

Paleontological Resources.

Program Description. The objective of the paleontological resources program is to manage paleontological resources that are part of the Bureau-administered public land surface estate for their informational, educational, scientific, public, and recreational uses.

Using the land for scientific purposes such as paleontological exploration is authorized through a permit system. Fossils are part of the surface estate, such that whoever owns the surface consequently owns the fossils. A paleontological collecting permit is required before collecting any fossil vertebrates, significant fossil invertebrates, and plants on Bureau-administered public lands.

Potential effects on paleontological resources on Bureau-administered public lands are considered in site-specific environmental analyses before authorizing surface-disturbing activities. Site-specific inventories are required where significant fossil resources are known or are anticipated to occur. Hobby collection of invertebrate fossils and petrified wood are allowed except in specified areas. The closing of Bureau-administered public lands or restricting uses to protect paleontological resources are evaluated case-by-case.

Anticipated Effects to Colorado butterfly plant. Activities associated with the paleontological resources program are expected to adversely affect the Colorado butterfly plant or its designated critical habitat in all Wyoming Bureau resource areas because the Bureau has agreed to implement the identified conservation measures and because there is a low likelihood that Colorado butterfly plant populations occur on Bureau-administered lands in Wyoming. There is no designated critical habitat for the Colorado butterfly plant on Bureau-administered lands. The conservation measures are designed to minimize the effects from Bureau-authorized activities to the Colorado butterfly plant and its habitat, reduce the possibility of noxious weed invasion or other non-native plant species introduction, reduce the impacts of herbicide use, and eliminate ground disturbance in the species occupied habitat.

Recreation Resources.

Program Description. Recreation management activities include allowing recreational access and use by the public, developing recreational areas and campsites, imposing restrictions, acquiring recreational access, and assessing effects of recreational use to the environment. Recreational activities allowed by the Bureau include hiking, hunting, mountain biking, dog walking, wildlife viewing, cross-country skiing, boating, and fishing, horseback riding, and camping. Large recreational events may include organized group hikes or horse endurance rides. Recreational land and access acquisition activities involve maintaining public access, pursuing rights-of-way, providing continued access, and pursuing land acquisition. Recreational site development includes maintaining or developing recreational sites and facilities, developing campgrounds, providing fishing and floating opportunities, maintaining developed and undeveloped recreational sites, adding developments as opportunities arise, adding interpretive markers, and constructing roads and interpretive sites. Development and enforcement of stipulations/protective measures includes enforcing recreation-oriented regulations, patrolling high-use areas and contacting users in the field. The Bureau places boundary signs, identifies hazards on rivers, restricts recreational uses; with some exceptions, limits motorized vehicles to existing trails, designates road use and recreation areas, requires facilities to blend with the natural environment, and conducts field inventories. There is the potential for recreational activities to occur year-round in Wyoming Bureau resource areas.

The types of recreational use found in the resource area can be categorized as (1) concentrated/developed, (2) dispersed, (3) water based, and (4) off highway vehicle (OHV) use. According to the RMPs, development of additional recreational and camping sites will be pursued in the resource area, as needed. Prior to the development of any recreational use area such as a trail or campsite area, a site specific EA will be done to identify any conflicts or

protective stipulations that may be required. Camping areas will be in the "primitive-but-managed" category, providing only trash receptacles and fire rings. These will be established in areas historically used by campers (typically near streams or in wooded areas) to control access and litter and provide a safe area for campfires. Little or no road construction would occur, and what little did take place would be only to minimum engineering standards. Some light equipment and vehicles would be used during construction and maintenance activities.

Many recreational uses are authorized on public lands that do not require a permit or notice of use (referred to as independent, non-commercial, or casual recreational use), including hiking, sightseeing, rockhounding, photography and nature study. The Bureau has little or no "control" or authorization discretion over these casual use activities.

Activities associated with dispersed recreation are basically just the nature of the activity itself (e.g., walking across the land, shooting of firearms or primitive weapons, use of optical equipment, use of hand held and portable collecting tools, mechanized travel on existing roads and trails, etc.). Placement of signs to manage recreation may occur, but would have minimal surface disturbing impacts. No significant surface disturbance of the land is expected with these activities. Although there are no designated recreational waterways for canoeing, kayaking, floating, or boating, these activities do also occur in the resource areas. Other activities commonly associated with water based recreation include fishing from streambanks or lakesides, accessing streams and lakes by vehicle, launching watercraft, and boating in stream channels or lakes. There is generally very little surface disturbance occurring with these activities, although in some instances short access roads could be constructed, or boat launch site might be constructed on streambanks or lakesides. The primary environmentally impacting activities associated with these activities is the noise and commotion associated with human movement and exertions.

Recreational OHV use (including over-the-snow vehicles) on public lands is that use taking place off of the paved highways and thoroughfares. OHV use does not refer to other forms of mechanized transportation (e.g., bicycles, carts and wagons, etc.). On public lands, ORV use falls into three regulatory categories: (1) lands closed to OHVs; (2) OHV use limited to existing roads and trails; and (3) lands open to all OHV use. Most of the Bureau-administered public lands area are designated in the category of "limited to existing roads and trails" for OHVs, with the exception of necessary tasks (such actions as project inspection and maintenance, retrieval of game during hunting seasons, fire fighting activities, and other emergency uses).

Anticipated Effects to Colorado butterfly plant. Activities associated with the recreation program are not expected to adversely affect the Colorado butterfly plant or its designated critical habitat in all Wyoming Bureau resource areas because the Bureau has agreed to implement the identified conservation measures and because there is a low likelihood that Colorado butterfly plants exist on Bureau-administered lands in Wyoming. There is no designated critical habitat for the Colorado butterfly plant on Bureau-administered lands. The conservation measures are designed to minimize the effects from Bureau-authorized activities to the Colorado butterfly plant and its habitat, reduce the possibility of noxious weed invasion or other non-native plant species introduction, reduce the impacts of herbicide use, and eliminate ground disturbance in Colorado butterfly plant occupied habitat.

Sensitive Plants Management.

Program Description. The objective for sensitive plants management is to maintain and enhance known populations of sensitive plant species within Bureau-administered public lands. As habitats or sites for any future listed species are identified within Bureau resource areas, the Bureau is committed to developing protective measures for these in cooperation with the Service (BLM 2005).

The known populations of sensitive plant species will be protected from disturbance by maintaining or establishing fencing around the populations, and by intensively managing surface disturbance in adjacent areas that could affect the populations. Any proposed surface disturbance will be examined on a case-by-case basis to determine potential adverse effects and appropriate mitigation to minimize those effects. Developments, uses, and facilities will be managed temporally and spatially to avoid damage to the sensitive plant species.

Anticipated Effects to Colorado butterfly plant. Activities associated with the sensitive plants management program are not expected to adversely affect the Colorado butterfly plant or its designated critical habitat in all Wyoming Bureau resource areas because the Bureau has agreed to implement the identified conservation measures and because there is a low likelihood that populations of Colorado butterfly plant exist on Bureau-administered lands in Wyoming. There is no designated critical habitat for the Colorado butterfly plant on Bureau-administered lands. The conservation measures are designed to minimize the effects from Bureau-authorized activities to the Colorado butterfly plant and its habitat, reduce the possibility of noxious weed invasion or other non-native plant species introduction, reduce the impacts of herbicide use, and eliminate ground disturbance in Colorado butterfly plant occupied habitat.

Soil/Water/Air Management

Soil Activities Description. The Bureau performs a variety of activities designed to preserve and protect soil resources. Through the Bureau's soil-related activities, the Bureau evaluates proposed projects, applies soil management practices, applies seasonal closures, and completes ground water studies. Some of these field activities involve the use of heavy machinery and hand tools. Field activities can involve developing riparian exclosures or constructing stream crossings. Other activities can involve imposing restrictions on activities such as mineral exploration and development, pipelines, powerlines, roads, recreation sites, fences, and wells.

Activities associated with soil mapping/sampling may include surveying, core drilling, use of pick-up truck mounted soil augers and core samplers (1.5 to 2 inches in diameter) and back-hoes (usually around 12 to 24 inches in width and pits may be up to 6 feet deep) for digging soil characterization pits and trenches, using hand held shovels to dig holes or pits, and associated human and vehicle disturbances. These trenches are backfilled and revegetated/reseeded when surveys are complete. Disturbances are usually very small and the vegetation quickly regenerates there. Surface soil erosion studies may also be conducted. These soil resource related activities in the Bureau resource areas are mainly in support of other programs. Soil mapping and identification requires the digging of trenches to identify and measure soil horizons below the surface.

Other activities associated with soil resources may include reclamation of abandoned mine lands and open shafts, removal of waste rock in floodplains or streams, or cleanup of tailings. These reclamation programs are covered under the hazardous materials section of this document.

Water Activities Description. Through water resource management activities the Bureau seeks to maintain or improve surface and groundwater quality consistent with existing and anticipated uses and applicable state and federal water quality standards, provide for the availability of water to facilitate authorized uses, and to minimize harmful consequences of erosion and surface runoff. Water resources are also to be protected or enhanced through site-specific guidelines. The Bureau develops pollution prevention plans, ensures rights to water-related projects are filed, delineates no chemical use buffer zones, designs activities to promote reduction of channel erosion, and restores damaged wetlands or riparian areas. The Bureau also provides technical expertise on other activities such as livestock ponds, stream monitoring, waterfowl monitoring activities, reestablishes floodplains, and provides impact analyses of oil and gas development or any surface disturbance projects.

Air Quality Activities Description. Through air management activities, the Bureau monitors efforts in cooperation with the U.S. Forest Service (FS), Wyoming DEQ and the U.S. Environmental Protection Agency (EPA), and evaluating and regulating surface development. Monitoring for air quality components (i.e., carbon monoxide, nitrogen dioxide, sulfur dioxide, ozone, particulate matter, visibility, atmospheric deposition, etc.) is conducted from various facilities around the state.

Air quality actions within the resource area consist of installation and maintenance of monitoring equipment. Air quality monitoring station sites generally occupy less than one acre, are often fenced off from other activities, with an unimproved, two–track, access trail to the site near a county road or other legal, physical access. Creation of a monitoring station typically takes less than two days of construction, and a site may be in continuous operation for many years. Air monitoring stations generally consist of metering equipment contained in a barrel shaped container propped off of the ground on various forms of frame, or small, covered weather station sheds or platforms. In some cases, there may be short towers (approximately 30 feet or less in height) with cup anemometers and other instruments attached, and solar collectors for power. Air monitoring stations are maintained on-site on a weekly or near weekly basis, with each routine maintenance session usually taking less than two hours to perform. Actual operation of the monitoring equipment is practically unnoticeable. The majority of these facilities occur on private or state lands.

Anticipated Effects to Colorado butterfly plant. Activities associated with the soil/water/air management resources program are not expected to adversely affect the Colorado butterfly plant or its designated critical habitat in all Wyoming Bureau resource areas because the Bureau has agreed to implement the identified conservation measures and because there is a low likelihood that populations of Colorado butterfly plant exist on Bureau-administered lands in Wyoming. There is no designated critical habitat for the Colorado butterfly plant on Bureau-administered lands. The conservation measures are designed to minimize the effects from Bureau-authorized activities, reduce the possibility of noxious weed invasion or other non-native plant species introduction, reduce the impacts of herbicide use, and eliminate ground disturbance in Colorado butterfly plant occupied habitat.

Special Areas/Areas of Critical Environmental Concern (ACECs)

Program Description. Under this program, the Bureau designates Areas of Critical Environmental Concern (ACECs) and manages and protects important historic, cultural, scenic, wildlife, and other natural resources. Designated ACECs require intensive management of all

surface-disturbing activities. Plans of operations must be approved for all exploration and mining operations in areas designated as ACECs.

Under the ACEC/special areas programs, the Bureau closes areas where accelerated erosion is occurring, applies restrictions on ground-disturbing activities, and implements restrictions on logging and heavy equipment use. Recreational trails may be built and guided tours may be provided as well as pursuing land exchanges. ACEC activities help ensure protection of petroglyphs, artifacts, and cultural deposits from weathering and vandalism. Another activity under this program includes the evaluation of noxious weed and grasshopper control measures.

Anticipated Effects to Colorado butterfly plant. Activities associated with the Special Areas/Areas of Critical Environmental Concern (ACECs) program are expected to adversely affect the Colorado butterfly plant or its designated critical habitat in all Wyoming Bureau resource areas because the Bureau has agreed to implement the identified conservation measures and because there are is a low likelihood that populations of Colorado butterfly plant exist on Bureau-administered lands in Wyoming. There is no designated critical habitat for the Colorado butterfly plant on Bureau-administered lands. The conservation measures are designed to minimize the effects from Bureau-authorized activities to the Colorado butterfly plant and its habitat, reduce the possibility of noxious weed invasion or other non-native plant species introduction, reduce the impacts of herbicide use, and eliminate ground disturbance in Colorado butterfly plant occupied habitat.

Visual Resources.

Program Description. The objective of visual resources management is to maintain or improve scenic values and visual quality, and establish visual resources management priorities in conjunction with other resource values. Visual resources are managed in accordance with objectives for visual resources management classes that have been assigned to each Bureau Resource Area. Visual resource classification inventories have been developed for some, but not all, of the areas in Wyoming. To improve visual resources, the Bureau designs facilities to blend in with the surroundings, reclaims watershed projects and water wells, regulates discharge of produced water, and restricts activities that might degrade visual resources.

No activity or occupancy is allowed within 200 feet of the edge of state and federal highways. Facilities or structures such as power lines, oil wells, and storage tanks are required to be screened, painted, and designed to blend with the surrounding landscape, except where safety indicates otherwise. Any facilities or structures proposed in or near wilderness study areas will be designed so as not to impair wilderness suitability.

Anticipated Effects to Colorado butterfly plant. Activities associated with the Visual Resources program are not expected to adversely affect the Colorado butterfly plant or its designated critical habitat in all Wyoming Bureau resource areas because the Bureau has agreed to implement the identified conservation measures and because there is a low likelihood that populations of Colorado butterfly plant exist on Bureau-administered lands in Wyoming. There is no designated critical habitat for the Colorado butterfly plant on Bureau-administered lands. The conservation measures are designed to minimize the effects from Bureau-authorized activities to the Colorado butterfly plant and its habitat, reduce the possibility of noxious weed invasion or other non-native plant species introduction, reduce the impacts of herbicide use, and eliminate ground disturbance in Colorado butterfly plant occupied habitat.

Wild Horse Management.

Program Description. The management objective of wild horse management is to maintain viable herds that will preserve the free-roaming nature of wild horses in a thriving ecological balance and to provide opportunity for the public to view them. Wild horse and burro populations have more than tripled since passage of the Wild and Free Roaming Horse and Burro Act in 1971, and horse numbers on Bureau lands in the West were estimated at more than 60,000 as compared to 17,000 in the late 1960's.

Through its Wild Horse Program, the Bureau authorizes herding, corralling, transporting, monitoring, and otherwise rounding up wild horses. Herds are monitored by airplane census and counted each year. Helicopters may also be used to round up wild horses. Through planning processes, the Bureau decides how many wild horses to allow on a certain area. This is termed the Approximate Management Level and the Bureau can adjust horse numbers as needed. Issues taken into consideration include carrying capacity, trends in utilization, and public input. The Bureau's wild horse management specialists coordinate with wildlife biologists and archaeologists to ensure that wild horse management will not cause adverse impacts to biological or cultural resources. Excess wild horses are distributed throughout the country by an adoption process or may be placed in wild horse sanctuaries.

Anticipated Effects to Colorado butterfly plant. As there are no wild horse herds in areas of Colorado butterfly plant occupied or potential habitat in Wyoming, this program is expected to have no effect on Colorado butterfly plant populations or designated critical habitat in the State.

Wildlife Habitat Management.

Program Description. Through wildlife habitat management, the Bureau in Wyoming seeks to maintain biological diversity of plant and animal species and supports the Wyoming Game and Fish Department strategic plan population objective levels. To accomplish this, the Bureau maintains and improves forage productions and quality of rangelands, fisheries, and wildlife habitat; and provides habitat for threatened, endangered, and special status animal and plant species on Bureau-administered public land surface in compliance with approved recovery plans.

Approximately 90 percent of wildlife program activities are in support of other resource programs such as fuels reductions, density of timber stands in deer and elk winter habitats, oil and gas exploration, timber harvest, or prescribed fires. Wildlife and fisheries management program activities may include: surveying, monitoring, habitat improvement activities, developing habitat management plans, creating cooperative management areas, developing stipulations and protective measures, acquiring land and easements, conducting inventories, and performing livestock or forestry related activities. The Bureau develops stipulations and protective measures including the authorization of withdrawals from some areas from mineral entry, limiting access of 4-wheel drive vehicles, snowmobiles, horseback riders, and pedestrians, prohibiting surface development, and imposing road closures. Livestock-related wildlife management activities include the development of water sources; construction and maintenance of fences; the management of other resource activities to conserve forage and protect habitat; the improvement of forage production and quality of rangelands; and the improvement of range with mechanical treatment. Forestry-related wildlife management activities include the management of timber and the promotion of cutting, thinning, planting, and seeding. Other wildlife management activities include monitoring habitat, using prescribed burning; developing islands; managing accesses; authorizing agricultural entry and disposal; using surface protection mitigation; constructing artificial structures; using heavy equipment and hand tools; documenting

resource damage; improving aquatic and riparian habitat; developing cooperative agreements to facilitate species transplants; chemically controlling pests, and exotic fish removal.

Anticipated Effects to Colorado butterfly plant. Activities associated with the Wildlife Habitat Management Program are not expected to adversely affect the Colorado butterfly plant or its designated critical habitat in the Rawlins and Casper Resource Areas because the Bureau has agreed to implement the identified conservation measures and because there is a low likelihood that populations of Colorado butterfly plant exist on Bureau-administered lands in Wyoming. There is no designated critical habitat for the Colorado butterfly plant on Bureau-administered lands. The conservation measures are designed to minimize the effects from Bureau-authorized activities to the Colorado butterfly plant and its habitat, reduce the possibility of noxious weed invasion or other non-native plant species introduction, reduce the impacts of herbicide use, and eliminate ground disturbance in Colorado butterfly plant occupied habitat.

PROGRAMMATIC BIOLOGICAL OPINION

FOR THE

WYOMING BUREAU OF LAND MANAGEMENT'S

RESOURCE MANAGEMENT PLANS

AND THEIR EFFECTS TO THE

COLORADO BUTTERFLY PLANT
(*Gaura neomexicana* ssp. *coloradensis*)

AND ITS DESIGNATED CRITICAL HABITAT

U.S. Fish and Wildlife Service
Wyoming Ecological Services Office
Cheyenne, Wyoming

December 2010

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PROGRAMMATIC BIOLOGICAL OPINION

DESCRIPTION OF THE PROPOSED ACTION

The proposed action examined in this consultation is the continuation of management according to the existing Rawlins and Casper Wyoming Resource Management Plans (RMP) as well as the U.S. Bureau of Land Management's (Bureau's) commitment to conservation measures listed in the Biological Assessment (BLM 2005) and supplemental comment received September 16, 2010. These are identified in the Appendix. The RMPs are used by the Bureau to guide and control future actions and set standards upon which future decisions on site-specific activities are based. The RMPs only establish general management policy on a broad scale. They are not used to make decisions that commit resources on a small scale such as on specific parcels of land. The RMPs also identify desired outcomes, also known as "desired future conditions". These outcomes are expressed in the RMPs as goals, standards, objectives, and allowable uses and actions needed to achieve desired outcomes. These are often referred to as RMP decisions or resource allocations. It is upon these RMP decisions or resource allocations and Bureau-committed conservation measures that the effects determinations in this Biological Opinion are based.

Until revised, the Wyoming RMPs have been and will continue to be used by the Bureau, in conjunction with the conservation strategy listed in the BA, to guide and control future actions and set standards upon which future decisions on site-specific activities will be based. This consultation only addresses the potential effects of the Wyoming RMPs as of the date of this BO.

As per section 7 of the Endangered Species Act of 1973 (Act), as amended (50 CFR §402.13 and §402.14), the Bureau will conduct site-specific consultation with the Service prior to authorization of any actions authorized under the Wyoming RMPs which "may affect" the Colorado butterfly plant (*Gaura neomexicana* ssp. *coloradensis*). These future consultations will provide a means for site-specific analysis and documentation of impacts to the Colorado butterfly plant.

The RMPs incorporate current laws and regulations and public land resource management initiatives to guide long-range land management decisions for public lands and resources in all counties in Wyoming. The RMPs do not include land management decisions where land surfaces and minerals are both privately owned, or owned by the State of Wyoming, or local governments, or those lands that are managed by other federal agencies.

A description of activities of the Wyoming RMPs that may affect, and are likely to adversely affect, the Colorado butterfly plant is contained in the Statewide Programmatic Colorado butterfly plant BA (BLM 2005) and is described below.

Description of Activities Described under the Statewide Programmatic Colorado butterfly plant BA that may affect and are likely to adversely affect the Colorado butterfly plant and its Designated Critical Habitat

The following discussion describes the Wyoming Bureau's Livestock Grazing program which may have potential adverse effects to the Colorado butterfly plant and critical habitat. A conservation strategy was included in the Bureau's BA (BLM 2005) to address potential adverse effects. The Bureau has committed to implementing the conservation measures listed in that conservation strategy as part of their proposed action (see Appendix), therefore, the Service has evaluated the implementation of these conservation measures as part of the proposed action. The conservation measures are designed to minimize the effects from livestock grazing, reduce the possibility of noxious weed invasion or other non-native plant species introduction, reduce the impacts of herbicide use, and eliminate ground disturbance in Colorado butterfly plant occupied habitat.

Table 2. Colorado Butterfly Plant "likely to adversely affect" determinations made by the Bureau.

Resource Management Plan (RMP) / Management Program	Determination for Colorado Butterfly Plant		Determination for Colorado Butterfly Plant Designated Critical Habitat	
	Rawlins RMP	Casper RMP	Rawlins RMP	Casper RMP
Livestock Grazing	LAA	LAA	LAA	LAA

Livestock Grazing Management.
The livestock management objective for the Rawlins and Casper Resource Areas is to maintain or improve forage production and range condition and to provide a sustainable resource base for livestock grazing on public lands while improving wildlife habitat and watershed conditions. Grazing is authorized on most of the Bureau-administered lands in the Rawlins Resource Area. Categories under this program include (1) livestock management activities, (2) range management, (3) fencing, (4) predator/pest management, (5) water management, (6) detrimental impacts management, and (7) lease management.

Livestock Management. Most livestock operators use off-highway vehicles (OHVs) (pick-up trucks, 4-wheelers, motorcycles), ride horseback, or walk to access their allotments. "Herding" (moving) livestock by walking, horseback riding, and the use of dogs to distribute livestock on allotments or trailing (move them from one location to another - on or off of allotments), and the use of domestic sheep bed grounds (a temporary site to bed down flock(s) of sheep) and associated sheep herder camps are commonly employed methods of livestock operations. Another method that livestock producers can use to change the distribution of livestock is to provide salt or mineral supplements in specified areas.

A typical grazing parcel on Bureau-administered land may be permitted on a yearlong use basis with the amount of allowable forage identified as Animal Unit Months of use (AUM's). The livestock operator may, with concurrence from the Bureau, change the use pattern from year to year to compliment healthy rangelands, depending on the available forage, condition of the pasture and weather conditions, or to achieve pre-determined management goals. Livestock grazing patterns are found in Table 2. Permits are normally issued for a 10-year period. If Bureau personnel identify a need for specific management or a change in the current pattern of use it can be stipulated on the permit when it is re-authorized. Cattle are the predominant class of livestock grazed on Bureau-administered lands in the Rawlins and Casper Resource Areas, however, sheep, horses and bison may also be authorized.

Table 2. Livestock Grazing Patterns (BLM 2004)

Pattern of Use	Description
Yearlong	When livestock are retained in a pasture throughout the plant growing season or the pasture or allotment is grazed in the same manner continuously throughout the year, each year.
Seasonal	Livestock are grazed in various seasons, i.e.; spring/summer/fall, spring/fall, winter, spring, summer, fall, or any combination, but not the entire year.
Rested	Stipulates that a pasture is not grazed at all in a given year, not even the mature forage is grazed. Usually the rested pasture is managed in conjunction with a rotational grazing system.
Rotational	Involves a multi-pasture system, where livestock are moved from one pasture to another on a scheduled basis. A sub-set of this system is to graze a pasture for short duration with a large number of livestock then rest the pasture (short-duration pattern, high intensity).
Deferred	Specifies that a pasture is not grazed until seed maturity is assured or a comparable growth stage has been reached and that grazing occurs after seed maturity.

Range Management. Range management activities include using prescribed fire, vegetation manipulation projects, changing composition of existing vegetation, using herbicides, using mechanical or biological vegetative treatments to improve forage production, using heavy equipment, and herbicide treatment of sagebrush. Rangeland restoration activities might also include aerial seeding, seeding by disking or drilling (using a tractor or other heavy equipment), fertilizing, or plowing.

Fencing. In some cases, cross-fencing (subdividing an allotment, pasture, or ranch with fence) is used to accomplish management needs or when a parcel is leased by more than one lessee. Temporary fencing, including electric fencing may be authorized to accomplish management goals. Fencing might be used to reduce grazing intensity or distribute grazing livestock away from important resources (streams, springs, riparian areas, wetlands, cottonwood galleries, etc.). When fencing is proposed, either permanent or temporary, fences are built to the Bureau's standards. These standards are required to reduce the amount of restriction or hazards to wildlife. Fence construction and maintenance would likely require access to the site, possible removal of vegetation or uneven surface materials (rocks, trees, sand, etc.), stringing wire,

digging postholes, building fence braces, building rock jacks, cutting or removing on or off site building materials (fence posts, rails, gathering rocks, etc.), weed management (spraying, cutting, pulling, etc.), or if the project is large enough, the possibility of camps for workers. The use of corrals for confinement of livestock for various purposes (sheep shearing, overnight holding of livestock, etc.) requires construction and maintenance activities including, hauling building materials, heavy equipment use, access to the corral site, etc. Fencing activities include fence construction and repair, design and implementation of grazing systems, and building livestock exclosures for important riparian habitat.

Predator/pest management. Predator/pest management includes controlling predators or pests of livestock operations. Activities may include mormon cricket or grasshopper control using insecticides, or the control of prairie dogs or coyotes on allotments using various lethal and non-lethal means.

Water Management. Water management activities include the development of reservoirs, springs, pipelines, and wells, and providing access to these developments. Permittees may undertake water improvement projects such as stock water ponds, pits, or reservoirs; pipeline and trough systems; spring developments; storage tanks and troughs; wells; or temporary tanks and water hauling. These off-stream water improvements better distribute the use and intensity of use by livestock away from streams, rivers or wetlands and help protect important riparian areas and could require the use of hand tools, mechanical or heavy equipment, hauling/transporting of materials (gravel, dirt, tanks, etc.), and clearing of vegetation.

Detrimental Impacts Management. Managing detrimental impacts includes documenting, treating, and preventing resource damage. Potential detrimental impacts include the degradation of stream banks, the introduction of noxious weeds, soil erosion, and reduced cottonwood tree recruitment. The Bureau has committed to meeting the range management standards in the *Standards for Healthy Rangelands and Guidelines for Livestock Grazing Management for Public Lands* (Appendix B of BLM 2003) while managing their lands for livestock grazing. In extreme situations such as extended drought, permits may be placed in a reduced use or non-use status until conditions improve. Bureau-administered surface lands in the Wyoming Bureau's resource areas are managed to achieve the four fundamentals of rangeland health outlined in grazing regulations (43 CFR 4180.1) which are (1) watersheds must function properly; (2) water, nutrients and energy must cycling properly; (3) water quality must meet state standards; and (4) habitat for special status species must be protected. Monitoring of riparian/wetland areas by interdisciplinary teams using the Proper Functioning Condition methodology is how the Bureau determines whether a given watershed is functioning properly. This would entail the use of a team of interdisciplinary personnel (generally 2-5 personnel) to assess the condition of the riparian/wetland habitat within a given allotment.

Grazing Lease Management. Grazing lease management activities include conducting monitoring studies, performing project work to enhance and improve riparian zones, designating stock trails, managing leases, developing management plans and agreements, and canceling, or changing livestock driveways. Activities under this program include converting to new types of livestock; authorizing livestock grazing, and adjusting season of use, distribution, kind, class, and number of livestock. Grazing allotments are grouped into one of three categories:

M (maintain), C (custodial), and I (improve). Recommendations are provided in each category for the intensity of grazing management, including multiple-use resource management objectives, needs for range improvement and monitoring, and actions needed to improve and maintain rangeland condition and productivity.

STATUS OF THE SPECIES

Species Description

The Colorado butterfly plant (*Gaura neomexicana* ssp. *coloradensis*) is a semelparous, perennial herb. It has one or a few reddish, hairy stems that are 2-3 feet tall. The lower leaves are lance-shaped with smooth or wavy-toothed margins and average 2-6 inches long, while those on the stem are smaller and reduced in number. Flowers are arranged in a branched, elongate pattern above the leaves. Only a few flowers are open at any one time and these are located below the rounded buds and above the mature fruits. Individual flowers are 0.25-0.5 inches long with four reddish sepals (modified leaves surrounding the flower) and four white petals that turn pink or red with age. The hard, nutlike fruits are 4-angled and have no stalk. Non-flowering plants consist of a stemless, basal rosette of oblong, hairless leaves 1-7 inches long (Marriott 1987, Fertig 1994, Fertig et al. 1994).

Life History

The Colorado butterfly plant (*Gaura neomexicana* ssp. *coloradensis*) occurs on sub-irrigated, alluvial (stream deposited) soils on level or slightly sloping floodplains and drainage. Colonies are often found in low depressions or along bends in wide, active, meandering stream channels a short distance upslope of the actual channel. The plant requires early-to mid-succession riparian habitat. It commonly occurs in communities dominated by redtop (*Agrostis stolonifera*) and Kentucky bluegrass (*Poa pratensis)* on wetter sites, and wild licorice (*Glycyrrhiza lepidota)*, Flodman's thistle (*Cirsium flodmanii*), curlytop gumweed (*Grindelia squarrosa)*, and smooth scouring rush (*Equisetum laevigatum*) on drier sites. Both these habitat types are usually intermediate in moisture between wet, streamside communities dominated by sedges (*Carex* spp.), rushes (*Juncus* spp.), and cattails (*Typha* spp.), and dry, upland shortgrass prairie. Typical Colorado butterfly plant habitat is open, without dense or overgrown vegetation. Coyote willow (*Salix exigua*) and Canada thistle (*Cirsium arvense*) may become dominant in Colorado butterfly plant habitats that are not periodically flooded or otherwise disturbed.

The Colorado butterfly plant is an early successional plant (although probably not a pioneer) adapted to use stream channel sites that are periodically disturbed. Historically, flooding was probably the main cause of disturbances in the plant's habitat, although wildfire and grazing by native herbivores also may have been important. Although flowering and fruiting stems may undergo increased mortality because of these events, vegetative rosettes appear to be little affected (Mountain West Environmental Services 1985). The survival of vegetative rosettes appears to be related to available soil moisture. Heidel (2004, 2005), for example, found a significant correlation between census number and summer precipitation two years prior in populations at the U.S. Department of Defense F. E. Warren Air Force Base (WAFB). Because

the long-term viability of this plant relies on successful flowering and fruiting, as well as the difficulty in identifying small rosettes, only the flowering plants typically are counted to estimate population size and trends. The establishment and survival of seedlings appears to be enhanced at sites where tall and dense vegetation has been removed by some form of disturbance. In the absence of occasional disturbance, the plant's habitat can become choked out by dense growth of willows (*Salix* spp.), grasses (including red top (*Agrostis stolinifera*)), baltic rush (*Juncus balticus*), and exotic plants (such as Canada thistle (*Cirsium arvense*) and leafy spurge (*Euphorbia esula*)), which prevents new seedlings from becoming established and replacing plants that have died (Floyd 1995a).

Population Dynamics

The Colorado butterfly plant is distributed throughout its occupied range into patchy groups of subpopulations, some of which are isolated with little or no possibility of interbreeding with other local populations. The spatial structuring of this subspecies is commonly referred to as a metapopulation. Local populations exist on a patch of suitable habitat, and although each has its own, relatively independent population dynamics, the long-term persistence and stability of the metapopulation arise from a balance of population extinctions and colonization to unoccupied patches through dispersal events (USFWS 2004b).

Balancing local population extinction with new colonization events is problematic for the Colorado butterfly plant since naturally occurring disturbance associated with creation of suitable habitat for colonization, such as seasonal floods, has been largely curtailed by water development and flood control. Consequently, what once may have been a dynamic, but stable, metapopulation, may now be characterized by a series of local populations with a very low probability of colonizing new patches, and little opportunity to replace extirpated populations. Biological characteristics that may serve to reduce these negative consequences at least in the short-term for the Colorado butterfly plant include seed banks, delay of stage transition from rosette to flowering adults under poor habitat conditions, and self-compatibility. However, the regional persistence of a metapopulation has been shown to be possible only when the rate of colonization exceeds the local rate of extinction. Consequently, the removal of opportunities for future colonization events poses a significant threat to long-term metapopulation persistence and species viability. This highlights the importance of maintaining viability of as many local populations as possible through conservation (USFWS 2004b).

Most of what is known about the Colorado butterfly plant and its conservation is based on surveys and research conducted on populations located on the WAFB in Cheyenne, Wyoming, from 1984 to 2003. Floyd and Ranker (1998) studied three Colorado butterfly plant subpopulations at WAFB from 1992 to 1994. The purpose of their study was to examine population growth, demographic variability, demographic stage transition dynamics and the probability of population extinction. Results suggested that each of the three subpopulations was not stable but exhibited significant demographic variability both spatially and temporally, and population growth values were not useful parameters to describe long-term population dynamics (Floyd and Ranker 1998, USFWS 2004b).

Annual census of flowering plants at WAFB began in 1986, and continued from 1988 to 2004, within subpopulations located at Crow Creek, Diamond Creek, and Unnamed Drainage. Census summaries provided by Heidel (2004) based on these data show that subpopulations within these three drainages are characterized by dramatic fluctuations in size (USFWS 2004b).

Most populations of the Colorado butterfly plant for which census or demographic data have been collected exhibit substantial demographic uncertainty. Some of the observed temporal variation in subpopulations at WAFB has been correlated with unpredictable environmental factors such as temperature and precipitation (Floyd and Ranker 1998, Heidel 2004), and spatial variation may be attributable, in part, to fine-scale microhabitat differences in light availability or competition with other herbaceous vegetation or noxious weeds (Munk et al. 2002, Heidel 2004). Similar factors may be correlated with some of the observed demographic variability in less-well-studied populations throughout the subspecies' range. However, even for the well-studied subpopulations at WAFB, no clear cause-and-effect relationships have been found to explain the observed fluctuations in population numbers, and studies have not accounted for the majority of the observed demographic uncertainty (USFWS 2004b).

Status and Distribution

On October 18, 2000, the Colorado butterfly plant was designated as threatened throughout its entire range under the Act (65 FR 62302; USFWS 2000), and on January 11, 2005, critical habitat was designated along 51 stream miles within Platte and Laramie Counties in Wyoming (70 FR 1940; USFWS 2005). It is a short-lived, perennial herb endemic to moist soils in mesic or wet meadows of floodplain areas in southeastern Wyoming, north-central Colorado, and extreme western Nebraska. This early to mid-seral stage species occurs primarily in habitats created and maintained by streams active within their floodplains with vegetation that is relatively open and not overly dense or overgrown.

Little is known about the historical distribution of the Colorado butterfly plant. Prior to 1984, no extensive documentation of the plants' range had been conducted. The plant was known from several historical (and presumably extirpated) locations in southeastern Wyoming and in northern Colorado, as well as from three extant populations in Laramie County in Wyoming and Weld County in Colorado. The total known population size was estimated in the low hundreds (Dorn 1979). Intensive range-wide surveys from 1984 to 1986 resulted in the discovery or relocation of more than 20 populations in Wyoming, Colorado, and Nebraska, containing approximately 20,000 flowering individuals (Marriott 1987). Additional surveys since 1992 have resulted in the discovery of additional populations in Wyoming and Colorado (Fertig 1994; Floyd 1995b). However, other historically known populations in Wyoming and Colorado have not been relocated in recent years and may no longer be extant (Fertig 1994).

Extensive surveys were conducted during 1998 to document the status of previously known populations at 14 sites in Wyoming and Colorado (Fertig 1998). All 14 sites supported populations of the Colorado butterfly plant. Repeated survey information led Fertig (1998) to conclude that 10 of these populations were either relatively stable or increasing over the long-term. Fertig (1998) estimated the entire population of this taxon to contain between 47,000 and 50,000 reproductive plants. Twelve previously known populations were not surveyed. Three of

these populations were surveyed from 1989 until 1992 and were found to contain a limited number of plants. However, four populations in Colorado and five in Wyoming have not been relocated since 1986 and may be extirpated.

Surveys were conducted by the Service in 2004 during which approximately 80 percent of all habitat occupied by the Colorado butterfly plant was surveyed. Of 77 known locations at least 0.2 miles apart previously identified by Wyoming Natural Diversity Database (WYNDD), 59 locations along 94 stream miles were surveyed. A total of 17,891 reproductively mature plants were counted throughout the survey area. While 23 of the previously known 59 locations contained no plants, 23 new locations 0.2 miles apart with adult plants were identified. All plants located during the survey were within Laramie County in Wyoming and Weld County in Colorado. Neither plants, nor suitable habitat, were found in Nebraska likely because of habitat deterioration associated with five years of continuous drought.

These 2004 survey results on both private and state land, as well as updated surveys conducted by the Service in 2005, suggest that the Colorado butterfly plant occurs only in southeast Wyoming and northern Colorado, and is likely extirpated from Nebraska. Populations of the Colorado butterfly plant occur in two locations in Colorado, both currently owned by the City of Fort Collins: the Meadow Springs Ranch in northern Weld County where the plant has been known historically; and the Soapstone Prairie Natural Area in northern Larimer County where a new population was discovered in 2005.

Three additional populations, comprised of a total of 7,322 reproductively mature plants according to recent surveys, occur on F.E. Warren Air Force Base (Heidel 2005). Survey results suggest that two of these populations appear relatively stable or increasing, while one appears to be declining (Heidel 2005). Annual monitoring of these three populations by Wyoming Natural Diversity Database has continued for the past 18 years and is ongoing.

Threats

Of the known populations of Colorado butterfly plant, the vast majority occur on private lands managed primarily for agriculture and livestock. Haying and mowing at certain times of the year, water development, overgrazing, land conversion for cultivation, competition with exotic plants, non-selective use of herbicides, and loss of habitat to urban development are the main threats to these populations (Mountain West Environmental Services 1985, Marriott 1987, Fertig 1994). Because of the small, isolated nature of populations and few numbers present in many of them, the subspecies is much more susceptible to random events such as fires, insect or disease outbreaks, or other unpredictable events that could easily eliminate local populations. In nonagricultural, undeveloped areas, a significant threat to Colorado butterfly plant populations may result from natural succession of the plant community.

One major threat on agricultural lands may be the application of broadleaf herbicides for control of Canada thistle, leafy spurge, and other non-native plants (Marriot 1987). Although competition from weedy species may have negative impacts on Colorado butterfly plant populations, observations have indicated that the Colorado butterfly plant is highly susceptible to commonly used herbicides (especially if no special precautions are taken during application).

Alternative (and presumably more Colorado butterfly plant-friendly) methods of weed control involving the release of bio-control insects, mowing, and new chemical application techniques, are currently being investigated (Fertig 1998).

While excessive grazing can lead to changes in essential habitat conditions (e.g., increases in soil temperature resulting in loss of moisture, decreases in plant cover, and increases in non-native species), managing for appropriate levels of grazing provides an important management tool with which to maintain open habitat needed by the Colorado butterfly plant. Grazing by cattle may be a threat at some sites, especially if animals are not periodically rotated or if use is concentrated in small areas during the summer flowering period. The habitat of the Colorado butterfly plant is often heavily used by livestock which tend to concentrate near water sources. In an instance of two adjacent pastures, Marriott (1987) observed that the more heavily grazed pasture supported far fewer individuals. Studies have shown that the Colorado butterfly plant may persist and thrive in habitats that are winter grazed or managed on a short-term rotation cycle (Fertig 1994, Mountain West Environmental Services 1985). Although reproductive individual Colorado butterfly plants may be grazed (the plant is quite palatable to a wide range of herbivores), the establishment and survival of seedlings and rosettes may be enhanced by the reduction of competing vegetative cover (Fertig 1994, 1996). Due to their low stature, rosettes do not appear to be regularly grazed (Mountain West Environmental Services 1985). Grazing by horses also occurs in many privately owned Colorado butterfly plant sites, but does not appear to negatively impact Colorado butterfly plant populations under normal stocking rates (Fertig 1998).

Fertig (1998) observed that mowing an area for hay production is rarely a threat to Colorado butterfly plant populations unless cutting is done before fruits are able to mature. Once fruits have ripened they are protected by a hard, woody fruit wall that is not readily damaged by machinery. Mowing in mid-summer may actually stimulate extra flower and fruit production through increased branching and the release of apical dominance in cut stems. Colorado butterfly plants may also benefit from decreased competition and enhanced moisture availability in mowed environments. Late summer and fall mowing may also facilitate seed dispersal, provided that fruits have already ripened (Fertig 1998, Jennings et al. 1997).

The three largest private land populations of Colorado butterfly plant observed in 1998 were all found in areas that had been mowed in mid summer or late fall (Fertig 1998). Furthermore, Munk (1999) observed that Colorado butterfly plant regeneration may be increased with removal of heavy grass cover. Munk (1999) also observed increased branching of floral stems when the terminal bud was removed and apical dominance released with grazing of Colorado butterfly plant by pronghorn antelope. Although bolted plants (those plants where the flowering stalk has emerged and is actively growing) are frequently grazed by cattle (Munk 1999), rosettes receive little defoliation by grazing cattle, most likely due to the fact that rosettes "hug" the ground and cattle are not able to reach them.

Construction of stock ponds and reservoirs, conversion of rangeland to crop cultivation, and the loss of habitat to residential and urban development are also important threats in agricultural areas. The cities of Cheyenne, Wyoming and Fort Collins, Colorado contain areas of formerly suitable Colorado butterfly plant habitat that have been lost to urbanization. The protection or

continued agricultural management of suitable private land habitat may also be critical to the long-term survival of the Colorado butterfly plant (Fertig 1998).

In non-agricultural settings, the greatest threat to the Colorado butterfly plant may be the changes in habitat suitability resulting from natural succession. Without periodic disturbance events, the semi-open habitats, preferred by this subspecies may become choked by tall and dense growth of willows, gramminoids, and exotic weeds (Fertig 1994). Natural disturbance events such as flooding, fire, and ungulate grazing, may have been sufficient in the past to create favorable conditions. In the absence of such events today, managed disturbance may be necessary to maintain and create areas of habitat (Fertig 1994, 1996, 1998).

Because of the small, isolated nature of populations and few numbers present in many of them, the subspecies is much more susceptible to random events such as fires, insect or disease outbreaks, or other unpredictable events that could easily eliminate local populations (USFWS 2004b). High recreational use by campers, motorists, and fishermen is a threat to populations on state park lands in Nebraska.

Alterations of stream hydrology could also threaten Colorado butterfly plant. The plant is supported by moist soil throughout the growing season, and by wet habitats that are dominated by grass/forb/sedge communities. During the past 150 years, and continuing today, water development, diversions, stream channel alterations for flood control or other purposes (including oil and gas development and mining), and changes in hydrograph have altered hydrology, floodplain geomorphology, and vegetation composition and trends. While in some streams and reaches this may have provided improved conditions for the plant, in many cases it has resulted in the loss of suitable habitat and likely fragmentation or loss of the plant within watersheds (USFWS 2004b).

Critical Habitat

Critical habitat is defined in section 3(5)(A) of the Act as (i) the specific areas within the geographic area occupied by a species, at the time it is listed in accordance with the Act, on which are found those physical or biological features (I) essential to conserve the species and (II) that may require special management considerations or protection; and (ii) specific areas outside the geographic area occupied by a species at the time it is listed, upon determination that such areas are essential to conserve the species. "Conservation" means the use of all methods and procedures that are necessary to bring an endangered or threatened species to the point at which listing under the Act is no longer necessary. In accordance with sections 3(5)(C) of the Act, not all areas that can be occupied by a species will be designated critical habitat. Within the geographic area occupied by the species we designate only areas currently known to be essential.

This biological opinion does not rely on the regulatory definition of "destruction or adverse modification" of critical habitat at 50 CFR 402.02. Instead, we have relied upon the statute and the August 6, 2004, Ninth Circuit Court of Appeals decision in *Gifford Pinchot Task Force v. U.S. Fish and Wildlife Service* (No. 03-35279) to complete the following analysis with respect to critical habitat.

In accordance with section 3(5)(A)(i) of the Act and regulations at 50 CFR 424.12, in determining which areas to designate as critical habitat the Service based critical habitat determinations on the best scientific and commercial data available and to consider physical and biological features (primary constituent elements) that are essential to conservation of the species, and that may require special management considerations and protection. These physical and biological features include, but are not limited to: (1) space for individual and population growth, and for normal behavior; (2) food, water, air, light, minerals, or other nutritional or physiological requirements; (3) cover or shelter; (4) sites for breeding, reproduction, rearing, (or development) of offspring; and (5) habitats protected from disturbance or that are representative of the historic geographical and ecological distributions of a species.

Critical habitat receives protection under section 7 of the Act through prohibition against destruction or adverse modification of critical habitat with regard to actions carried out, funded, or authorized by a federal agency. Aside from the added protection that may be provided under section 7, the Act does not provide other forms of added protection to lands designated as critical habitat. Because consultation under section 7 of the Act does not apply to activities on private land or non-federal lands that do not involve a federal nexus, critical habitat designation does not result in any regulatory requirements for these actions.

Colorado Butterfly Plant Critical Habitat Designation

Critical habitat for the Colorado butterfly plant has been designated in Laramie and Platte counties, Wyoming (70 FR 1940; USFWS 2005). In total, approximately 3,538 acres along 51 stream miles fall within the boundaries of the critical habitat designation. Management considerations for the Colorado butterfly plant include: maintaining surface and subsurface water flows that provide the essential hydrological regime that supports the species; appropriate restraints on application of herbicides used to control noxious weeds; preventing habitat degradation caused by plant community succession; and preventing harmful habitat fragmentation from residential and urban development that detrimentally affects plant-pollinator interactions, leads to a decline in species reproduction, and increases susceptibility to non-native plant species.

In accordance with section 3(5)(A)(i) of the Act and regulations at 50 CFR 424.12, in determining which areas to designate as critical habitat, we are required to base critical habitat determinations on the best scientific and commercial data available and to consider those primary constituent elements (PCEs) that are essential to the conservation of the species, and that may require special management considerations and protection. These include, but are not limited to, space for individual and population growth and for normal behavior; food, water, air, light, minerals, or other nutritional or physiological requirements; cover or shelter; sites for breeding, reproduction, and rearing (or development) of offspring; and habitats that are protected from disturbance or are representative of the historic geographical and ecological distributions of a species.

The primary constituent elements (PCEs) for the Colorado butterfly plant critical habitat include those habitat components essential for the biological needs of rosette growth and development, flower production, pollination, seed set and fruit production, and genetic exchange. The PCEs

for the Colorado butterfly plant are: (1) subirrigated, alluvial soils on level or low-gradient floodplains and drainage bottoms at elevations of 5,000 to 6,400 ft; (2) a mesic moisture regime, intermediate in moisture between wet, streamside communities dominated by sedges, rushes, and cattails, and dry upland shortgrass prairie; (3) early- to mid-succession riparian (streambank or riverbank) plant communities that are open and without dense or overgrown vegetation (including hayed fields that are disced every 5-10 year at a depth of 8-12 inches, grazed pasture, other agricultural lands that are not plowed or disced regularly, areas that have been restored after past aggregate extraction, areas supporting recreation trails, and urban/wildland interfaces); and (4) hydrological and geological conditions that maintain stream channels, floodplains, floodplain benches, and wet meadows that support patterns of plant communities associated with the Colorado butterfly plant.

Existing features and structures within the boundaries of the mapped units, such as buildings, roads, parking lots, other paved areas, landscaped areas, regularly plowed or disced agricultural areas, and other features not containing any of the PCEs are not designated as critical habitat.

Special Management Considerations or Protections for Colorado Butterfly Plant Critical Habitat

When designating critical habitat for the Colorado butterfly plant, the Service assessed the areas where the PCEs were found and which may require special management considerations or protections. For the Colorado butterfly plant, special management considerations include maintaining existing management regimes that produce surface or subsurface water flows that provide the essential hydrological regime that supports the species; appropriate application of herbicides used to control noxious weeds; and preventing harmful habitat fragmentation from residential and urban development that detrimentally affects plant-pollinator interactions, local hydrologic patterns and moisture regimes, leads to a decline in species reproduction, and increases susceptibility to overgrowth by non-native plant species. While excessive grazing can lead to changes in essential habitat conditions (e.g., increases in soil temperature resulting in loss of moisture, decreases in plant cover, and increases in non-native species), managing for appropriate levels of grazing provides an important management tool with which to maintain open habitat needed by the Colorado butterfly plant.

The Service designated a total of seven units as critical habitat for Colorado butterfly plants. The critical habitat areas described below constitute the Service's best assessment at the time of designation of the areas essential for the conservation of the Colorado butterfly plant. All units are located in Wyoming. The units are (1) Tepee Ring Creek; (2) Bear Creek East; (3) Bear Creek West; (4) Little Bear Creek/Horse Creek; (5) Lodgepole Creek West; (6) Lodgepole Creek East; and (7) Borie.

Existing features and structures within the boundaries of the mapped units, such as buildings, roads, parking lots, other paved areas, lawns, other urban and suburban landscaped areas, regularly plowed or disced agricultural areas, and other features not containing any of the primary constituent elements are not considered critical habitat.

When designating critical habitat, the Service chose areas that had the greatest potential in aiding in the recovery of the species. Therefore, these areas currently have adequate primary constituent elements and have minimal threats to them at this time. Section 4(b)(8) of the Act, requires the Service to identify activities that may adversely modify critical habitat. Federal actions that, when carried out, funded or authorized by a federal agency, may destroy or adversely modify critical habitat for Colorado butterfly plant include but are not limited to: (1) any activity that results in development or alteration of the landscape within a unit, including clearing; activities associated with construction for urban and industrial development, roads, bridges, pipelines, or bank stabilization; agricultural activities such as plowing, discing, haying, or intensive grazing; off-road vehicle activity; and mining or drilling of wells; (2) any activity that results in changes in the hydrology of the unit, including construction, operation, and maintenance of levees, dams, berms, and channels; activities associated with flow control (e.g., releases, diversions, and related operations); irrigation; sediment, sand, or gravel removal; and other activities resulting in the draining or inundation of the unit; (3) any sale, exchange, or lease of federal land that is likely to result in the habitat in a unit being destroyed or appreciably degraded; (4) any activity that detrimentally alters natural processes in a unit including the changes to inputs of water, sediments and nutrients, or that significantly and detrimentally alters water quantity in the unit; and (5) any activity that could lead to the introduction, expansion, or increased density of exotic plant or animal species that are detrimental to the Colorado butterfly plant and its habitat.

ENVIRONMENTAL BASELINE

Regulations implementing the Act (50 CFR 402.02) define the environmental baseline as the past and present impacts of all federal, state, or private actions and other human activities in the action area, the anticipated impacts of all proposed state or federal projects in the action area that have already undergone formal or early section 7 consultation, and the impact of state or private actions which are contemporaneous with the consultation process.

The action area is defined at 50 CFR 402 to mean "all areas to be affected directly or indirectly by the federal action and not merely the immediate area involved in the action". For the purposes of this consultation, the Service defines the action area to include all floodplain areas in the Rawlins and Casper Resource Areas, where the habitat conditions are suitable and support Colorado butterfly plant populations, and that could potentially be impacted by decisions made in the Rawlins and Casper RMPs. These areas are located in Laramie County (the easternmost portion of the Rawlins Resource Area) and Platte County, Wyoming (the southwesternmost portion of the Casper Resource Area). The land holdings of the Bureau in these areas are mostly scattered, isolated parcels surrounded by private lands. Many of the parcels do not have legal public access and must be accessed by crossing the surrounding private

property. Often these Bureau-administered parcels are not fenced from the surrounding private property and livestock are permitted to travel freely across the property boundaries (F. Blomquist and J. Carroll, Personal Communication).

The primary past and present impacts to Colorado butterfly plant in the action area may have included indiscriminate spraying of broadleaf herbicides and the disturbance of riparian areas that contain native grasses due to agricultural conversions, water diversions, channelization, and urban development (USFWS 2000) or vegetative succession in the absence of periodic disturbances which makes habitat unsuitable for seedling establishment (Fertig 2001). Modification of Colorado butterfly plant habitat suitability may be due to irrigation developments and other human-caused changes to stream hydrology. Human-caused changes to stream hydrology have taken the form of channelization of streams, construction and use of irrigation canals, water impoundment (pond) construction, increased water discharges to surface waters, and water removal from surface flows. These activities are widespread across the Rawlins and Casper Resource Areas and many historical projects exist there that have changed stream hydrology.

Invasive plant species do occupy much of the Rawlins and Casper Resource Areas and herbicide use to control these invasive species has been undertaken by private citizens or performed by County Weed and Pest Districts.

Livestock grazing and hay production is the predominant land use in Colorado butterfly plant habitat within its distributional range. Grazing, haying and mowing activities are normally undertaken by private land owners as part of their agricultural operations. These activities may be beneficial to Colorado butterfly plants through the maintenance of habitat or they may be detrimental in that these activities if not timed properly may reduce the reproductive success of individual Colorado butterfly plants.

Numerous other existing actions including electricity transmission lines, mining operations, and telecommunication towers are present in the action area. These have been considered as part of the environmental baseline for this action.

The U.S. Department of Defense has developed an Integrated Natural Resources Management Plan (INRMP) prepared under section 101 of the Sikes Act (16 U.S.C. 670a), for protection and conservation of the Colorado butterfly plant on the F.E. Warren Air Force Base near Cheyenne, Wyoming. The INRMP identifies management issues related to conservation and enhancement of the Colorado butterfly plant and identifies goals and objectives that involve the protection of populations and habitat for the Colorado butterfly plant. Some objectives for achieving those goals include: continuing to participate in, and encouraging development of, Cooperative Agreements and Memorandum of Understanding activities with federal, state, and local government and support agencies; promoting and supporting the scientific study and investigation of federally listed species management, conservation, and recovery; restricting public access in existing and potential habitat areas; and increasing public education of federally listed species through management actions, the WAFB Watchable Wildlife Program, and a Prairie Ecosystem Education Center. The Service will continue to work cooperatively with the

Department of Defense, U.S. Air Force to assist the WAFB in implementing and refining the programmatic recommendations contained in this plan that provide benefits to the Colorado butterfly plant.

An additional 11 other properties within the range of the Colorado butterfly plant have Wildlife Extension Agreements (WEAs) in place to provide for the conservation of the Colorado butterfly plant. Nine of the WEAs are with private landowners in Wyoming. Two WEAs are with city municipalities including the City of Cheyenne, Wyoming and the City of Fort Collins, Colorado (USFWS 2005).

The goals of the above WEAs for the properties are similar in nature and include the following elements:

1. Monitoring Colorado butterfly plant populations and habitat conditions. Data collected during monitoring will include the number of flowering adult plants and habitat condition. Habitat condition in areas managed primarily for livestock grazing will be evaluated according to the Natural Resources Conservation Service (NRCS) rangeland condition assessment methodology. Data will provide information regarding the effects of land management activities on Colorado butterfly plant habitat and population growth;

2. For those areas managed primarily for hay production, coordinating hay cutting activity with needs of Colorado butterfly plant seed production. The landowner agrees to inform the Service prior to the intended first cutting and allow the Service or its designee the opportunity to conduct Colorado butterfly plant surveys. The landowner agrees to allow the Service or its designee at least one additional opportunity to conduct Colorado butterfly plant surveys after the initial cutting, and prior to any additional cuttings. If three or more years of data collection reveals that the conservation needs of the Colorado butterfly plant could substantially benefit from changes in hay production activities, the landowner agrees to work with the Service to modify these activities to the extent feasible;

3. Controlled application herbicides to no closer than 100 feet of a known subpopulation of the Colorado butterfly plant. Some areas included in WEAs that are occupied by the Colorado butterfly plant also are occupied by invasive plant species in need of control, such as Canada thistle and leafy spurge. While herbicide application may be required to control the spread of these invasive species, the landowner agrees to the application of herbicides no closer than 100 feet of a known subpopulation of the Colorado butterfly plant; and

4. Managing livestock grazing activities in conjunction with conservation needs of Colorado butterfly plant. It is assumed that the Colorado butterfly plant requires habitat in average, or above average, range condition according to the criteria identified above. However, if it is found that some other grazing intensity or timing of grazing is beneficial to the Colorado butterfly plant--resulting in above or below average range

condition as defined by the NRCS criteria above--then that identified range condition will become the new target for that location to the extent practicable.

Currently approved WEAs are designed to address specific threats to provide for the conservation of the Colorado butterfly plant and to implement conservation actions on the ground. Ninety percent of this Colorado butterfly plants' occurrence is on private land, and, as a federally threatened plant, there are no prohibitions against take under the Act.

One formal section 7 consultation with potential adverse effects identified for the Colorado butterfly plant is the consultation for a burning project on the FE Warren Air Force Base which identified 0.01 acres of temporary disturbance (ES-6-WY-01-F010, WY4648). Another formal section 7 consultation is the consultation for the Medicine Bow Lateral Loop (ES-6-WY-01-F003, WY4352) which documented potential temporary disturbance of six Colorado butterfly plant sites.

Status of the Colorado Butterfly Plant Within the Action Area

At least 34 populations of the Colorado butterfly plant are known to occur within Wyoming, based on surveys conducted by the Service in 2004 and 2005. None of the known occurrences are located on Bureau-administered surface land or land where the Bureau has subsurface leasing rights (BLM 2005). All of these occurrences are located in riparian habitats associated with the North Platte River drainage.

The two largest populations of Colorado butterfly plant within Wyoming occur on the WAFB. The Air Force has entered into cooperative agreements with the Service and The Nature Conservancy to develop management plans and monitor populations on the WAFB (Fertig 2000). The WAFB has designated habitat along Crow and Diamond Creeks as the Colorado Butterfly Plant Research Natural Area (Marriott and Jones 1988). Current management on the WAFB includes restrictions on application of herbicides and on mowing near stream areas, and introduction of biocontrol insects.

The populations found partly or entirely on state school trust lands and on private lands are managed primarily for production of hay or livestock pasture (Fertig 2000). None of the private lands are formally protected through conservation easements or comparable designations although WEAs for protection of the Colorado butterfly plant have been developed between many of the private landowners and the Service. Currently, ten such agreements are in place in Laramie County, Wyoming, providing protection to approximately 2,200 acres of riparian habitat along 37 miles of stream.

No Colorado Butterfly Plant populations are known to occur on Bureau-administered lands in any of the Wyoming resource areas including the Rawlins and Casper River Resource Areas. However, it is possible that undiscovered populations do exist on Bureau-administered lands in the Bureau's resource areas. The majority of Bureau-administered lands in the range of the Colorado butterfly plans are confined to the uplands with very little wetland habitat existing there. The most suitable areas of habitat for the Colorado butterfly plant are found either in private ownership or as state trust lands.

Analysis of Proposed Management Actions and Effects

The proposed action includes management actions or prescriptions described in the Rawlins RMP (BLM 2008) and the Casper RMP (BLM 2007). Both of these plans are recently-approved revisions. The Rawlins RMP represents a selection of management actions that attempt to resolve planning issues and provide for sustained multiple use of public lands and resources. The following sections describe the management actions in the Rawlins RMP and the Casper RMP that may affect the Colorado butterfly plant. Both the Rawlins RMP and Casper RMP provide a complete description of each management prescription.

Factors Affecting the Colorado Butterfly Plant Within the Action Area

Factors that could affect this plant in the action area include irrigation developments and other human-caused changes to stream hydrology, introduction of invasive species, herbicide use, urban development (USFWS 2000), vegetative succession in the absence of periodic disturbances which makes habitat unsuitable for seedling establishment (Fertig 2001), forage production, or stochastic events.

Changes to stream hydrology. Human-caused changes to stream hydrology may take the form of channelization of streams, construction and use of irrigation canals, water impoundment (pond) construction, increased water discharges to surface waters, and water removal from surface flows. These activities are widespread across the Rawlins and Casper Resource Areas and many historical projects exist that have changed stream hydrology. Invasive plant species do occupy much of the resource areas and herbicide use to control these invasive species may be undertaken by private citizens or performed by County Weed and Pest Districts. Depending on the time of the year in which it occurs, grazing may be either detrimental or beneficial to Colorado butterfly plant populations. If it occurs during the flowering stage, grazing may reduce the plant's reproductive capacity through removal of the flowers of individual Colorado butterfly plants. However, if timed to occur prior to or subsequent to the plant's flowering stage, grazing may also be beneficial by reducing the density of competing vegetation thereby helping to maintain the plant's habitat.

Construction of stock ponds and reservoirs has inundated some Colorado butterfly plant habitat and made it unsuitable for the subspecies. The development of irrigation canals to move water to croplands may remove moisture from occupied or potentially suitable habitat leaving it in a drier, unsuitable condition. Additionally, the management of water resources for domestic and commercial uses, coupled with encroaching agricultural land use, has had a tendency to channelize and isolate water resources and fragment, realign, and reduce riparian and moist lowland habitat that could otherwise serve as potential Colorado butterfly plant habitat (USFWS 2000).

Introduction of invasive species/herbicide use. One serious threat on agricultural lands is non-selective use of broadleaf herbicides for the control of *Cirsium arvense* (Canada thistle), *Euphorbia esula* (leafy spurge), and other exotic plants (Marriott 1987). The noxious weed problem in the range of the Colorado butterfly plant is particularly evident on WAFB. Although competition from these subspecies may have serious negative implications for populations of

Colorado butterfly plant, the plant appears to be highly susceptible to commonly used herbicides when they are applied non-selectively. Additionally, herbicide use along road crossings in and adjacent to Colorado butterfly plant populations also has been noted. Biological control agents have been used at WAFB, but have not yet been fully effective in controlling Canada thistle or leafy spurge. Introduced gall-forming flies have slowly become established on the WAFB and have reduced the vigor, height, and reproductive ability of small patches of Canada thistle. The first evidence of successful establishment of flea beetles, a biocontrol agent for leafy spurge, was observed on the WAFB in 1997 (Fertig 1998).

Urban development. Residential and urban development around the cities of Cheyenne and Fort Collins has converted areas of formerly suitable Colorado butterfly plant habitat (USFWS 2000).

Vegetative succession in the absence of periodic disturbances. In non-agricultural, undeveloped areas, a significant threat to Colorado butterfly plant populations is habitat degradation resulting from succession of the plant community. Without periodic disturbance events, the semi-open habitats preferred by this subspecies can become choked by tall and dense growth of willows, grasses, and exotic weeds (Fertig 1994). Natural disturbances, such as flooding, fire, and native ungulate grazing, were sufficient in the past to create favorable habitat conditions for the plant. However, the natural flooding regime within the subspecies' floodplain habitat has been altered by construction of flood control structures and by irrigation and channelization practices. In the absence of such natural disturbances today, managed disturbance may be necessary to maintain and create areas of suitable habitat (Fertig 1994, 1996). However, many federal programs, such as those administered by the USDA Natural Resources Conservation Service, focus on enhancing or protecting riparian areas by removing the types of disturbance the plant needs, increasing vegetative cover, and pushing the habitat into later successional stages.

Forage production. Livestock grazing and hay production is the predominant land use in Colorado butterfly plant habitat within the Rawlins and Casper Resource Areas. Grazing activities on Bureau-administered lands are authorized by the Bureau through a permitting process. Grazing, haying and mowing activities are normally undertaken by private land owners as part of their agricultural operations. These activities may be beneficial to Colorado butterfly plants through the maintenance of habitat or they may be detrimental in that these activities if not timed properly may reduce the reproductive success of individual Colorado butterfly plants. On some sites, including WAFB, habitat degradation resulting from plant succession and noxious weed competition is the main threat to the long-term survival of populations (USFWS 2000).

Conversion of moist, native grasslands to commercial croplands has been evident through portions of the action area. Since much of the agricultural lands are irrigated hay fields, mowing of Colorado butterfly plant habitat for hay production has been suggested as a potential threat if conducted at an inappropriate time of year. Although this threat can be significant if cutting occurs before the plant's fruits have ripened, if cutting is delayed until late in the growing season when a hard fruit wall is developed, the seeds are not damaged by cutting and may actually be dispersed in the process. Likewise, early season mowing (before the flower stalks have bolted) may provide some advantages to the plant by reducing the cover of competing vegetation (Fertig 1994).

There are no known diseases affecting Colorado butterfly plant populations, although the subspecies is occasionally affected by insect galls. Colorado butterfly plant is highly palatable to a variety of insect and mammalian herbivores [e.g., cattle, horses, and pronghorn (*Antilocapra americana*)]. Livestock grazing can be a threat at some sites if grazing pressures are high due to animals not being rotated among pastures or concentrated use during the summer flowering period. Additionally, plants are occasionally uprooted or trampled by livestock and wildlife grazing in the vicinity. In at least one location where a population of Colorado butterfly plants was divided by a fence, the heavily-grazed side of the fence had few or no Colorado butterfly plants. However, in a similar situation, the more heavily-grazed side of the fence had numerous rosettes, but the side with no grazing had dense willow cover and no Colorado butterfly plants. In addition to the intensity of grazing, the timing of grazing is key to Colorado butterfly plant survival. Based on surveys conducted by the Service in 2004 and 2005, observations have shown that the plant can persist and thrive in habitats that are winter-grazed or managed on a short-term rotation cycle. Light to medium grazing can provide additional benefits by reducing the competing vegetative cover and allowing Colorado butterfly plant seedlings to become established (USFWS 2000).

Stochastic Events. Because of the small, isolated nature of the populations and the few individuals present in many of them, the Colorado butterfly plant also is more susceptible to random events, such as fires, insect or disease outbreaks, or other events that can easily cause the extirpation of small populations. Although the plant evolved with and even depended upon the disturbance associated with various types of events, they may now pose a threat to the Colorado butterfly plant. Individual plants may not survive such events, and because of low numbers and the now highly restricted range of the subspecies, events such as fires and floods pose a threat.

Colorado Butterfly Plant Critical Habitat Environmental Baseline

For the purposes of this consultation, the Service defines the action area to include critical habitat for the Colorado butterfly plant as defined by the Service on which the Bureau may have some discretionary authority over management actions. For critical habitat designation, the Service delineated critical habitat as 360 feet outward from the stream edge of 1st and 2nd order streams. For 3rd and 4th order streams, the Service delineated critical habitat as 393 feet outward from the stream edge. For 5th order streams and above, the Service delineated critical habitat as 458 feet outward from the stream edge.

Status of the Colorado Butterfly Plant Critical Habitat within the Action Area

Seven units were designated as critical habitat for the Colorado butterfly plant, however, only two of these occur within the action area. The units which occur within the action area are the Lodgepole Creek West Unit and the Teepee Ring Creek Unit. There is no critical habitat for the Colorado butterfly plant designated on Bureau-administered lands within the Rawlins and Casper Resource Areas.

However, Bureau-authorized grazing permits have been identified as potentially affecting designated critical habitat of the Colorado butterfly plant because the Bureau has small, isolated, often unfenced parcels administered under Section 15 of the Taylor Grazing Act in the portion of

the resource areas which contain Colorado butterfly plant critical habitat. The livestock grazing associated with these parcels is authorized by the Bureau and the grazing preference placed on the grazing permit may extend to the management of livestock grazing on Colorado butterfly plant occupied habitat on private ranch land surrounding the Bureau-owned parcels. Therefore, a federal nexus may be established between the grazing on the surrounding private lands and the grazing on the "Section 15 grazing parcels". The stipulations placed by the Bureau on the Bureau's "Section 15 parcels" could affect the grazing management occurring on the surrounding private lands, some of which contain portions of Colorado butterfly plant critical habitat (J. Carroll, F. Blomquist; Personal Communication). The livestock which the Bureau authorizes on unfenced Section 15 grazing parcels do not stay on these parcels but cross onto private lands and graze portions of those private lands which may contain occupied Colorado butterfly plant habitat as well as designated critical habitat. The grazing by those "Bureau-authorized" livestock would not occur, "but for" the authorizing of the livestock by the Bureau. Therefore, interrelated/interdependent effects occur on the private land as a result of actions authorized on Bureau-administered lands.

The grazing allotments identified to have Section 15 grazing parcels and also to contain designated critical habitat for the Colorado butterfly plant are the (1) Lodgepole Creek West Grazing Allotment in the Rawlins Resource Area and the (2) Braunschweig Allotment in the Casper Resource Area. The corresponding critical habitat units for these grazing allotments are the Lodgepole Creek West and the Teepee Ring Creek designated critical habitat units, respectively. The Lodgepole Creek West Grazing Allotment has 480 acres of Bureau-administered surface. The total Animal Unit Months (AUMs) for the allotment equals 120 AUMs. Cattle are currently authorized to graze on the Lodgepole Creek West Grazing Allotment from July 1st through September 30th each year. The Braunschweig Allotment has 5,662 acres of Bureau-administered surface. The total AUMs for the Braunschweig allotment equals 988 AUMs. Cattle (n = 794) are currently authorized to graze on the Braunschweig Allotment from May 16 to November 15 each year. Horses (n = 27) are currently authorized to graze on the Braunschweig Allotment from July 1 to November 30 each year.

The following is a brief description of the designated critical habitat unit which makes up the action area and the reasons why the Primary Constituent Elements (PCEs) essential for the conservation of the Colorado butterfly plant may be in need of special management or protection.

Lodgepole Creek West

The Lodgepole Creek West unit consists of 902 acres along 12.7 miles of Lodgepole Creek in Laramie County, Wyoming (USFWS 2005). This unit is primarily under private ownership, but includes some Wyoming state lands. Subpopulations of the Colorado butterfly plant have been found along Lodgepole Creek from T16N 68W Section 24 on the western edge of this unit, extending 12 miles of stream east to T15N R66W Section 3. Surveys conducted during 2004 revealed several subpopulations of Colorado butterfly plant present throughout T16N R67W Sections 19 and 20. Access was denied for the Service's 2004 surveys throughout the remainder of the unit. The Service finalized a WEA with the landowner of Sections 19 and 20 to provide assistance in managing the Colorado butterfly plant. Sections 19, 20, and 24 were then removed from this unit.

Habitat throughout the designated critical habitat stream reach is primarily identified as "palustrine emergent seasonally flooded wetland" intermixed with "palustrine emergent temporarily flooded wetland". This unit has supported a large number of small, and a few large, subpopulations over the years in a variety of habitat types and land management practices. The number of subpopulations within the variety of habitat may represent a number of locally selected genotypes existing under conditions not found elsewhere, providing an important contribution to the long-term conservation of the species. This unit may require special management for appropriate levels of grazing needed to maintain open habitat in some areas, and management for reduced levels of grazing in others; special management to maintain surface or subsurface water flows; and the application of herbicides used to control noxious weeds.

Tepee Ring Creek Unit

The Tepee Ring Creek Unit located in Platte County, Wyoming consists of 107 acres along 1.5 stream miles of Tepee Ring Creek in Platte County, Wyoming, and is under private ownership. One subpopulation of Colorado butterfly plant has been found along Tepee Ring Creek in the lower SE corner of T21N R68W Section 2. Habitat occupied by the Colorado butterfly plant is moist meadow along the stream. Habitat along this stream reach throughout this unit is primarily identified as PEMA (palustrine emergent temporarily flooded) wetland intermixed with PEMC (palustrine emergent seasonally flooded) wetland, according to National Wetlands Inventory terminology. Habitat containing primary constituent elements extends throughout this entire reach, and it is likely that the Colorado butterfly plant occurs in Section 1 downstream of the subpopulation in Section 2. This unit is essential to the conservation of the species because it represents the northernmost extent of the subspecies' known range of occurrence, separated by approximately 25 miles from the closest population, and likely contains unique genetic variability not found in other populations.

Factors Affecting the Colorado Butterfly Plant Critical Habitat within the Action Area

Federal actions that, when carried out, funded or authorized by a federal agency, may destroy or adversely modify critical habitat for Colorado butterfly plant include, but are not limited to: (1) any activity that results in development or alteration of the landscape within a unit, including land clearing; activities associated with construction for urban and industrial development, roads, bridges, pipelines, or bank stabilization; agricultural activities such as plowing, disking, haying, or intensive grazing; off-road vehicle activity; and mining or drilling of wells; (2) any activity that results in changes in the hydrology of the unit, including construction, operation, and maintenance of levees, dams, berms, and channels; activities associated with flow control (e.g., releases, diversions, and related operations); irrigation; sediment, sand, or gravel removal; and other activities resulting in the draining or inundation of a unit; (3) any sale, exchange, or lease of federal land that is likely to result in the habitat in a unit being destroyed or appreciably degraded; (4) any activity that detrimentally alters natural processes in a unit including the changes to inputs of water, sediment and nutrients, or that significantly and detrimentally alters water quantity in the unit; and (5) any activity that could lead to the introduction, expansion, or increased density of exotic plant or animal species that are detrimental to the Colorado butterfly

plant and to its habitat. Federal actions not affecting listed species or critical habitat and actions on non-federal lands that are not federally funded or permitted do not require section 7 consultation.

EFFECTS OF THE ACTION

Management under the Bureau's Rawlins and Casper RMPs for the Bureau-administered lands (Proposed Action) includes activities under numerous topics/resource types which may affect Colorado butterfly plants and their designated critical habitat. However, only the activities under the Livestock Grazing Management Program were identified as having potentially likely adverse effects to Colorado butterfly plants and their critical habitat. The potential effects of activities under Livestock Grazing Management on Colorado butterfly plants and their critical habitat are described here.

Direct and Indirect Effects

Direct effects are effects that result directly or immediately from the proposed action on the species. For example, actions that would immediately remove or destroy habitat or displace the species from its habitat or an area would be considered direct effects. Indirect effects are effects that are caused by, or result from, the proposed action and occur later in time after the proposed action is completed. Potential effects could result from livestock grazing and the resultant soil compaction or streamside degradation that could potentially occur. Livestock grazing could result in the temporary or permanent loss of the constituent elements necessary for recovery of the species.

The Proposed Action is the Bureau's management according to the Rawlins and Casper RMPs for the Bureau-administered lands for 10 to 15 years. Since (1) there is such a lengthy time period for the life of the proposed action, (2) direct effects could occur under the proposed action for up to 10 to15 years, and (3) the indirect effects resulting from the proposed action may be combined with direct effects or be sufficiently difficult to distinguish from direct effects, the two types of effects are not differentiated here but instead are discussed jointly in the following discussion.

Effects on Colorado Butterfly Plant

The Wyoming Bureau's Statewide Programmatic Colorado Butterfly Plant BA describes activities in the Livestock Grazing program that may affect and are likely to adversely affect the Colorado butterfly plant over the life of the Rawlins and Casper RMPs. These effects are (1) the trampling, consumption, or destruction of individual Colorado butterfly plants by livestock grazing and (2) any manipulation of the timing or intensity or cessation of grazing of the habitat of this plant. The potential effects of these activities on the Colorado butterfly plant are described here.

Potential effects could result from direct damage to individual Colorado butterfly plants from grazing, trampling of the flowering parts of the plant or from grazing of the flowering parts of

the surrounding vegetation. Loss of habitat could also occur if the Bureau did not permit livestock grazing activities and Colorado butterfly plant habitat was not maintained in suitable condition.

Analysis for Effects of the Action on Colorado Butterfly Plant

Analysis for the Effects of Livestock Grazing. Livestock grazing may be beneficial, neutral, and/or detrimental to the Colorado butterfly plant depending on the timing or intensity of grazing (Fertig 2001, Munk et al. 2002). Grazing by livestock may be a threat at some sites, especially if an area is overgrazed, i.e. the animals are not periodically rotated or if use is concentrated in small areas during the summer flowering period. Potential adverse effects to Colorado butterfly plants could result from removal or damage of the flowering or vegetative parts of the plant from grazing or trampling. Trampling or direct removal of Colorado butterfly plants may occur as livestock graze grasses, forbs, and other vegetation.

Factors such as grazing, which tend to decrease the overstory canopy of grasses and forbs and reduce litter build-up, may have beneficial effects and contribute to long-term Colorado butterfly plant persistence (Fertig 1994, 1996; Munk 1999). Reproductive flowering stalk portions of individual Colorado butterfly plants are grazed (the plant is quite palatable to a wide range of herbivores). However rosettes, due to their low stature and relatively closeness to the earth, do not appear to be regularly grazed by livestock in non-overgrazed situations (Fertig 2000, Mountain West Environmental Services 1985).

Livestock can also introduce noxious weeds from one area into another by passing viable seed through their digestive systems (DiTomaso 2000). Disturbance, such as that caused by trampling or compaction of the soil or overgrazing of vegetation appears to be important early in noxious weed invasion because disturbances such as these create vacant niches that invading noxious weeds can occupy (Masters and Sheley 2001). However, the Colorado butterfly plant also depends on disturbance for establishment of populations (Dorn 1980, Fertig 1994, 2000). Colorado butterfly plants could also potentially be introduced into new areas by their seeds passing through the digestive tracts of grazing herbivores. However, to date, no studies have been conducted to this.

The influence that noxious weeds may have on Colorado butterfly plant abundance has not been thoroughly documented. However, Munk et al. 2002 documented that experimental removal of the noxious weed Canada thistle (*Cirsium arvense*), in the absence of herbivory by livestock, did not increase Colorado butterfly abundance. However in that study, experimental mechanical removal of grasses, other forbs, and litter did significantly increase Colorado butterfly plant rosette density (Munk et al. 2002). Furthermore, observations made by the Service during Colorado butterfly plant surveys in 2004 and 2005 indicate that noxious weeds may play a less significant role in influencing Colorado butterfly plant populations in locations that are regularly grazed by livestock compared with ungrazed habitat.

In areas which are not regularly grazed, mowed, or otherwise disturbed, Heidel (2005) found that two noxious weed species, Canada thistle and leafy spurge (*Euphorbia esula*), and one native woody species, coyote willow (*Salix exigua*) appeared to be increasing. Canada thistle, leafy

spurge, and coyote willow numbers were increasing while Colorado butterfly plant numbers were decreasing (Heidel 2005). This may indicate that competitive effects do exist between these species with Colorado butterfly plants at a selective disadvantage in these types of non-disturbed competitive situations.

Fruit dissemination of the Colorado butterfly plant is poorly understood, although flooding and transport by muddy animals may be important dispersal mechanisms (Fertig 2000). Long distance dispersal (possibly by muddy waterfowl), may occur frequently enough to account for the relatively homogenous structure across widely spaced populations (Fertig 2000). It is also plausible that grazing herbivores (including livestock) could also incidentally ingest Colorado butterfly plant seeds and introduce the seeds to unoccupied areas and actually improve the reproductive fitness of any given plant. No other documentation has been found in the literature relative to the topic of livestock acting as a potential seed disperser of Colorado butterfly plants.

The Bureau intends to continue grazing activities and survey (see Hazlett 1999) for the Colorado butterfly plant and if populations are discovered, grazing activities will be managed to maintain Colorado butterfly plant populations (BLM 2005). The Bureau in the Rawlins and Casper Resource Areas has committed to conservation measures to protect Colorado butterfly plants (see the Appendix for a complete list). The use of these conservation measures will reduce or eliminate the effects by ensuring that (1) surveys are conducted prior to surface disturbing construction activities and, if necessary, modify the action to protect the habitat or the species, (2) excessive surface disturbances do not take place in occupied habitat, (3) invasive plant species infestations are controlled in a manner conducive to the survival of Colorado butterfly plants, (4) the hydrologic regime of the plant's habitat is maintained and studied, and (5) grazing activities are conducted in a manner that will maintain the habitat of the Colorado butterfly plant while minimizing any removal of the plant's flowering parts (BLM 2005).

Summary for Effects of the Action on CBP

Colorado butterfly plant populations in Wyoming are typically found in areas where livestock grazing, mowing, or haying has maintained the habitat in areas where competing vegetation has been removed. However, activities authorized in the livestock grazing program may damage individual plants. The degree to which the plants can sustain damage and not be "adversely affected" is currently unknown but it is suspected that the activities authorized in the livestock grazing program may affect individual Colorado butterfly plant's reproductive success.

The Bureau has made a "may affect, likely to adversely affect determination" for the potential effect that Bureau-authorized livestock grazing activities may have on Colorado butterfly plant that may exist on Bureau-administered surface acreage in the Bureau's Wyoming resource areas based on the potential for browsing or trampling, or mowing of the flowering parts of individual Colorado butterfly plants. However, current livestock grazing practices have not proven detrimental to populations of this plant and may provide beneficial effects to Colorado butterfly plant populations, if they exist within the Wyoming Bureau's resource areas (BLM 2005) and are managed properly.

It is anticipated that livestock grazing actions as described in the Rawlins and Casper RMPs could result in negative impacts to the Colorado butterfly plant from injury or destruction of individual plants. Livestock Grazing Management according to the aforementioned RMPs and the Bureau-committed conservation measures (Appendix) could lead to harm, destruction, or reduced fitness of individual Colorado butterfly plants by trampling, crushing, or grazing of the flowering parts and less frequently, the basal rosettes. However, beneficial effects of grazing, if conducted during appropriate times, are also known to maintain the habitat for the Colorado butterfly plant.

Effects on Colorado Butterfly Plant Critical Habitat

Only Bureau-authorized activities under the Rawlins and Casper River RMP Livestock Grazing Management Program were identified as having potential adverse effects to Colorado butterfly plant critical habitat. The potential effects of activities under Livestock Grazing Management on Colorado butterfly plant critical habitat are described here. Potential effects could result from livestock grazing and the resultant soil compaction or streamside degradation that could potentially occur. Livestock grazing could result in the temporary or permanent loss of the primary constituent elements necessary for recovery of the plant.

Analysis for Effects of the Action on Colorado butterfly plant Critical Habitat

Analysis for effects of Livestock Grazing on Critical Habitat. Habitat alterations resulting from agricultural use (grazing) may be beneficial, neutral, and/or detrimental to Colorado butterfly plant critical habitat depending on the intensity, duration, and timing of occurrence (Fertig 2000). The Colorado butterfly plant's habitat requires disturbance to reset vegetative succession. Also, the Colorado butterfly plant's habitat benefits if the surrounding competing species are removed. Such removal can occur either by flooding, mowing, spraying of herbicides, haying, or grazing. Excessive livestock use could conceivably cause soil compaction thereby limiting water permeability of the soil. Excessive livestock use could also cause complete and continual removal of all palatable vegetation thereby rendering the habitat unsuitable to persistence of Colorado butterfly plants. Livestock use could also introduce noxious weeds to Colorado butterfly plant critical habitat. This could lead to a decrease in habitat suitability as introduced noxious weeds could alter the vegetative characteristics composing the critical habitat of the Colorado butterfly plant.

The livestock which the Bureau authorizes on unfenced Section 15 grazing parcels do not stay on these parcels but cross onto private lands and graze portions of those private lands some of which contain Colorado butterfly plant designated critical habitat. The grazing by those "Bureau-authorized" livestock would not occur, "but for" the authorizing of the livestock by the Bureau. Therefore, interrelated/interdependent effects occur to Colorado butterfly plant designated critical habitat on the private land as a result of actions authorized on Bureau-administered lands.

The Bureau intends to continue authorizing grazing activities on Section 15 grazing parcels, continue to survey for Colorado butterfly plant and, if necessary, modify proposed actions to protect the habitat and/or the species. If populations are discovered, grazing activities will be managed to maintain Colorado butterfly plant populations (BLM 2005). The Bureau in the

Rawlins and Casper Resource Areas has committed to implementing conservation measures to protect Colorado butterfly plants (see Appendix I for a complete list) on the lands which they administer. The use of these conservation measures will reduce or eliminate the effects to critical habitat by (1) reducing the likelihood that surface disturbing construction projects will take place in critical habitat, (2) minimizing the potential for invasive plant species infestations in critical habitat, (3) ensuring that grazing activities are conducted in a manner that will maintain the critical habitat of the species (BLM 2005). To the extent of the Bureau's authority, they will encourage the incorporation and implementation of these conservation measures in Section 15 allotment management plans which extend onto private lands containing designated critical habitat for the Colorado butterfly plant.

Summary for Effects of the Action on Colorado Butterfly Plant Critical Habitat

Colorado butterfly plant populations in Wyoming are typically found in areas where livestock grazing, haying, or mowing has maintained the habitat by reducing competing vegetation. However, activities authorized in the Rawlins and Casper RMPs Livestock Grazing Program may damage areas of critical habitat located on private or state lands in grazing allotments. The degree to which the permitted grazing would adversely affect critical habitat of the Colorado butterfly plant is currently unknown, but it is suspected that the activities authorized in the livestock grazing program may affect a small portion of some designated critical habitat of the Colorado butterfly plant.

The Bureau has made a "may affect, likely to adversely affect determination" for the potential effect that Bureau-authorized livestock grazing activities may have on Colorado butterfly plant critical habitat. Some livestock grazing effects on designated critical habitat of the Colorado butterfly plant on private lands would not occur "but for" the issuance and authorization of grazing permits by the Bureau on the unfenced Section 15 parcels which they administer.

The extent of these impacts are expected to be managed by the Bureau, to the extent possible, in the future as they are identified. As the Bureau at times has limited access to private lands where the grazing activities which they permit are located, it will be a challenge for the Bureau to measure the extent of these impacts to the designated critical habitat of the Colorado butterfly plants and to establish the extent of their discretionary authority in these situations.

It is anticipated that activities associated with livestock grazing as described in the Rawlins and Casper RMPs for the Bureau-administered lands if they were undertaken could adversely affect the Colorado butterfly plant critical habitat. In particular, the Bureau's permitting of grazing activities on the Section 15 grazing parcels and the preference of the allotment which could extend to the surrounding private land and designated critical habitat of the Colorado butterfly plant could result in soil compaction, complete vegetative removal, excess soil disturbance through trampling causing erosion of the riparian area, or introduction of noxious weeds. Thus, the designated critical habitat of the Colorado butterfly plant may have adversely affected primary constituent elements. The primary constituent elements which may be adversely affected are (1) the sub-irrigated alluvial soils, (2) the mesic moisture regime, (3) the early to mid-succession riparian plant communities, and (4) the hydrologic and geologic conditions that appropriately maintain the stream channel.

CUMULATIVE EFFECTS

Cumulative effects include the effects of future state, tribal, local, or private actions that are reasonably certain to occur in the action area considered in this biological opinion. Future federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to section 7 of the Act.

Impacts to Colorado butterfly plants could result from livestock operations on private lands in both Laramie and Platte Counties, Wyoming. These impacts could be beneficial (maintaining habitat through grazing or haying), or detrimental (limiting individual plant reproductive fitness by removal of fruiting parts through trampling or ingestion). The nature of the impacts from livestock operations is likely to be fairly similar but additive across land ownerships (BLM 2005).

Mowing and haying manipulates vegetative composition on private and state lands. This could be beneficial to Colorado butterfly plant critical habitat. However, these activities could also be detrimental if done at a time of year when species which compete with Colorado butterfly plant (grasses, noxious weeds, etc.) would benefit. Late season or early season mowing (after the Colorado butterfly plant's fruit have ripened) may be one of the best management tools available for maintaining the habitat of this species. In many current management situations, the timing of mowing is related to growth conditions of the hay crop and weather patterns rather than the biological needs of Colorado butterfly plant. Mowing has little impact on the leaves of the rosettes and probably does not result in population declines (Fertig 2000).

Other potential effects from non-federal actions in the planning area could include increases in urbanization (although this is not thought to be a significant impact in the planning area at this time), and increased oil, gas, or mineral extraction on private lands. In particular, if coalbed methane development on private lands in the area occurred in occupied Colorado butterfly plant habitat, it could alter riparian stream channel functions. Dewatering of aquifers in preparation for methane extraction and the combined discharge of such waters into surface streams could cause significant changes to stream hydrology and chemical properties thereby potentially impacting any extant Colorado butterfly plant populations or designated critical habitat occurring in those drainages.

At the broad scale of this programmatic consultation, interrelated or interdependent effects that may result from the implementation of the Bureau's RMPs in Wyoming can not effectively be identified specifically. It is anticipated that with individual project implementation under the umbrella of this programmatic consultation, some interrelated or interdependent effects may manifest from future projects. These may take the form of activities on private or state lands adjacent to or near the Bureau-administered lands which would not take place were it not for implementation of a Bureau-authorized activity. Examples of actions with interrelated or independent effects may include Bureau's issuance of rights-of-way, oil and gas leasing, fire management activities, land exchanges, livestock grazing authorization, stock water development, fence construction, etc. The possible extent of these types of interrelated and interdependent effects to Colorado butterfly plant critical habitat is unknown at this time and are subject to future section 7 consultation under the Act.

CONCLUSION

After reviewing the current status of the Colorado butterfly plant; the environmental baseline for the action area; the effects of the Resource Management Plans; the Bureau-committed conservation measures; and the cumulative effects, it is the Service biological opinion that the direct and indirect effects of the implementation of the Bureau's Rawlins and Casper RMPs with commitment to conservation measures, as proposed, are not likely to jeopardize the continued existence of the Colorado butterfly plant or adversely modify its critical habitat.

The Service has reached the "no jeopardy"/"no adverse modification" conclusion by considering the following.

1. It appears that this subspecies is more widespread and numerous than was previously known. When this taxon was originally designated as a candidate for listing, it was known from only three small populations. Surveys in 1984-1986, 1992-1993, and 2004-2005 resulted in the discovery or relocation of 34 populations, many of which are reasonably large. More importantly, studies have indicated that this species may be less threatened by certain agricultural practices than originally suspected. In particular, populations may continue to thrive in winter-grazed or rotationally grazed pastures and can persist in hayed meadows, especially if haying is delayed until after the plants fruiting period (Mariott 1987; Fertig 1994, 1996).

2. The Bureau has no known populations of this subspecies or its designated critical habitat under its direct management as no known populations or designated critical habitat exist on Bureau-administered surface lands or Bureau-administered subsurface.

3. The Bureau is not proposing to implement any significant changes to the management of any Colorado butterfly plant potential habitat that may cause detrimental impacts to any populations.

4. The Bureau is committed to implementing protective measures (see Appendix I) to minimize potential impacts to Colorado butterfly plant and its designated critical habitat if these plants or critical habitat are located on lands over which the Bureau has some discretionary authority through the approval of allotment management plans for "section 15 parcels".

5. Finally, although individuals can be adversely impacted by livestock grazing activities (trampling, ingestion, etc.) and livestock may cause some degree of soil disturbance or compaction, the populations seems to withstand some grazing pressure and may actually rely on these activities for maintenance of their habitat.

The Service believes that any adverse effects, resulting from the Rawlins and Casper Resource Management Plans, are tied to the use of livestock grazing on section 15 grazing parcels which may result in harm, or death of Colorado butterfly plants or adversely affect some portions of their designated critical habitat. Any actions implemented under the RMP that may adversely

affect Colorado butterfly plant or its critical habitat would require separate formal section 7 consultation at the project level.

INCIDENTAL TAKE

Sections 7(b)(4) and 7(o)(2) of the Act generally do not apply to listed plant species. However, limited protection of listed plants from take is provided to the extent that the Act prohibits the removal and reduction to possession of federally listed plants.

CONSERVATION RECOMMENDATIONS

Section 7(a)(1) of Act directs federal agencies to utilize their authorities to further the purposes of the Act by carrying out conservation programs for the benefit of endangered and threatened species. Conservation recommendations (CR) are discretionary agency activities to minimize or avoid adverse effects of a proposed action on listed species or critical habitat, to help implement recovery plans, or to develop information. The recommendations provided here relate only to the proposed action and do not necessarily represent complete fulfillment of the agency's section 7 responsibility for these species.

CR1. The Service recommends that the Bureau follow all best management practices as identified in the Bureau's Statewide Programmatic Colorado Butterfly Plant Biological Assessment (BLM 2005).

RE-INITIATION NOTICE

This concludes formal consultation of the actions outlined in the request. As provided in 50 Section 402.16, re-initiation of formal consultation is required where discretionary federal agency involvement or control over the action has been maintained (or is authorized by law) and if: (1) the amount or extent of incidental take is exceeded; (2) new information reveals effects of the agency action that may affect listed species or critical habitat in a manner or to an extent not considered in this opinion; (3) the agency action is subsequently modified in a manner that causes an effect to the listed species or critical habitat that was not considered in this opinion; or (4) a new species is listed or critical habitat designated that may be affected by the action. In instances where the amount or extent of incidental take is exceeded, any operations causing take must cease pending re-initiation.

Thank you for your assistance in the conservation of this threatened species. In future communications regarding this Biological Opinion, please refer to consultation number WY10F0442b. If we may be of further assistance, please contact Alex Schubert of my staff at (307) 772-2374, ext. 238.

cc: BLM, Endangered Species Coordinator, State Office, Cheyenne, WY (T. Abbott)
DOI Solicitor, Lakewood, CO (M. Zallen)
FWS, Endangered Species, Lakewood, CO (B. Fehey)
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WGFD, Non-Game Coordinator, Lander, WY (B. Oakleaf)

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APPENDIX – CONSERVATION STRATEGY TAKEN FROM STATEWIDE PROGRAMMATIC BIOLOGICAL ASSESSMENT: COLORADO BUTTERFLY PLANT (*Gaura neomexicana* ssp. *coloradensis*)

These conservation measures are taken from the Biological Assessment (BA)(BLM 2005) for the Colorado Butterfly Plant and supplemental correspondence received September 16, 2010. Implementation of the following conservation strategy is intended to minimize or eliminate adverse impacts that are likely to result from implementation of the management actions provided in the Bureau of Land Management's (Bureau or BLM) Resource Management Plans (RMPs). In addition to the existing conservation measures in the RMPs, the Bureau has committed to implement conservation measures 1 through 12. The Bureau will also consider implementing best management practices 1 through 21 to further protect the Colorado butterfly plant and its habitat. In the event new populations are discovered, these measures would apply to the individual plants, and should include a 0.5-mile disturbance buffer around the new site until further investigation and consultation results in more appropriate management buffers.

Existing Protections in both the Rawlins and Casper RMPs

1. The *Wyoming BLM Standard Mitigation Guidelines for Surface Disturbing Activities* requires any lessee or permittee to conduct inventories or studies in accordance with Bureau and U.S. Fish and Wildlife Service guidelines to verify the presence or absence of threatened or endangered species before any activities can begin on site. In the event the presence of one or more of these species is verified, the operation plans of a proposed action will be modified to include the protection of the species and its habitat, as necessary. Possible protective measures may include seasonal or activity limitations, or other surface management and occupancy constraints (BLM 1990).

2. Standards for Healthy Rangelands and Guidelines for Livestock Grazing Management for the Public Lands Administered by the Bureau of Land Management in the State of Wyoming, specifically:

    A. 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.

    B. 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.

    C. 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 species, endangered species, species of special concern, or sensitive species will be maintained or enhanced.

Conservation Measures Committed to by BLM

These Conservation Measures are binding measures that the Bureau shall implement in order to facilitate conservation of the Colorado butterfly plant. However, because it is impossible to provide measures that will address all possible actions, in all locations across the range of the Colorado butterfly plant, it is imperative that project-specific analysis and design be completed for all actions that have the potential to affect the Colorado butterfly plant. Circumstances unique to individual projects or actions and their locations may still result in adverse effects to this plant. In these cases, additional or modified Conservation Measures may be necessary to avoid or minimize adverse effects or further consultation with the U.S. Fish and Wildlife Service will be required. The order in which the Conservation Measures appear below does not imply their relative priority.

1. The Bureau will add the following two conservation measures to grazing permit renewals in allotments with known Colorado butterfly plant populations.

    A. Place mineral supplements, or new water sources (permanent or temporary), for livestock, wild horses, or wildlife at least 1.0 mile from known Colorado butterfly plant populations. Do not place supplemental feed for livestock, wildlife, or wild horses within 1.0 mile of known Colorado butterfly plant populations. Straw or other feed must be certified weed-free. These restrictions are intended to keep free-ranging livestock away from Colorado butterfly plant populations and subsequent grazing on the Colorado butterfly plants. Surveys for the Colorado butterfly plant will be conducted in potential Colorado butterfly plant habitat prior to livestock operations projects.

    B. The Bureau will not increase permitted livestock stocking levels in any allotment with pastures containing known Colorado butterfly plant populations without consulting with the U.S. Fish and Wildlife Service. It is unknown to what extent overall impacts due to livestock grazing have on the Colorado butterfly plant, whether it is detrimental due to actual grazing and trampling of plants or beneficial due to livestock removal of adjacent competing vegetation.

2. Biological control of noxious plant species will be prohibited within 1.0 mile from known Colorado butterfly plant 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.

3. Except in cases of extreme ecological health (insect or weed outbreaks/infestations), herbicide treatment of noxious plants/weeds will be prohibited within 0.25 miles of known Colorado butterfly plant populations and insecticide/pesticide treatments will be prohibited within 1.0 mile of known Colorado butterfly plant populations to protect pollinators.

Where insect or weed outbreaks have the potential to degrade area ecological health inside the buffers listed above, at the discretion of the Bureau's authorized officer and with concurrence by the Service, the following will apply: where needed, and only on a case-by-case basis, pesticide use within 1.0 mile of known Colorado butterfly plant populations will be applied by hand and herbicides applied by hand within 0.25 miles of Colorado butterfly plant populations, with care taken not to spray Colorado butterfly plants.

Aerial application of herbicides will be carefully planned to prevent drift in areas near known Colorado butterfly plant populations (outside of the 0.25 mile buffer). The Bureau work with the Animal and Plant Health Inspection Service, the U.S. Fish and Wildlife Service, and County Weed and Pest Agencies to select pesticides and methods of application that will most effectively manage the infestation and least affect the Colorado butterfly plant.

4. If revegetation projects are conducted within 0.25 miles of known Colorado butterfly plant habitat, only native species will be selected. This conservation measure will keep non-native species from competing with the Colorado butterfly plant.

5. Limit the use of off road vehicles (OHVs) to designated roads and trails within 1.0 mile of known Colorado butterfly plant populations, with no exceptions for the "performance of necessary tasks" other than fire fighting and hazardous material cleanup allowed using vehicles off of highways. No OHV competitive events will be allowed within 1.0 mile of known Colorado butterfly plant populations. Roads that have the potential to impact Colorado butterfly plants and are not required for routine operations or maintenance of developed projects, or lead to abandoned projects will be reclaimed as directed by the Bureau.

6. Apply a condition of approval (COA) on all applications for permit to drill (APDs) oil and gas wells for sites within 0.25 miles of any known Colorado butterfly plant populations. This condition will prohibit all authorized surface disturbance and OHV travel from sites containing Colorado butterfly plant populations. Operations outside of the 0.25 mile buffer of the Colorado butterfly plant population, such as "directional drilling" to reach oil or gas resources underneath the Colorado butterfly plant habitat would be acceptable.

7. For known Colorado butterfly plant populations, the Bureau will place a Controlled Surface Use (CSU) stipulation prohibiting all surface disturbances on new oil and gas leases, buffering the area within 0.25 miles of known Colorado butterfly plant populations. For existing oil and gas leases with known Colorado butterfly plant populations (these would be for newly discovered populations not currently documented), the Bureau will require the COA in conservation measure 13 above including the same 0.25 mile buffer area around those known Colorado butterfly plant populations.

8. The disposal (sale and removal) of salable minerals, is a discretionary Bureau action and is prohibited within a 0.25 mile buffer area of known Colorado butterfly plant populations.

9. To prevent loss of habitat for the Colorado butterfly plant, the Bureau "shall retain in Federal ownership all habitats essential for the survival and recovery of any listed species, including habitat that was used historically, that has retained its potential to sustain listed species, and is deemed to be essential to their survival" (BLM 2001). Prior to any land tenure adjustments in *known* Colorado butterfly plant habitat, the Bureau will survey to assess the habitat boundary and retain that area in federal ownership. Bureau-administered public lands that contain identified habitat for the Colorado butterfly plant will not be exchanged or sold, unless it benefits the species.

10. All proposed rights-of-way projects (powerlines, pipelines, roads, etc.) will be designed and locations selected at least 0.25 miles from any known Colorado butterfly plant habitat to minimize disturbances. If the avoidance of adverse affects is not possible, the Bureau will re-initiate consultation with the U.S. Fish and Wildlife Service.

11. All proposed projects will be designed and locations selected to minimize disturbances to known Colorado butterfly plant populations, and if the avoidance of adverse effects is not possible, the Bureau will re-initiate consultation with the U.S. Fish and Wildlife Service. Projects will not be authorized closer than 0.25 miles from any known Colorado butterfly plant populations without concurrence of the U.S. Fish and Wildlife Service and the Bureau authorized officer. No activities will be authorized within 0.25 miles of any known Colorado butterfly plant populations during the essential growing season time period (from April 15 to September 15, the growing, flowering and fruiting stages) to reduce impacts to this species.

12. Projects that may alter natural hydrology or water quality, change the vegetation of the riparian ecosystem, or cause direct ground disturbance, will be evaluated and redesigned, as needed, to ensure that adverse effects to individuals and populations of the Colorado butterfly plant do not occur."

Best Management Practices

The following best management practices, if implemented, would minimize adverse effects caused by implementation of the management actions provided in the two applicable RMPs

1. When project proposals are received, the Bureau will initiate coordination with the U.S. Fish and Wildlife Service 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 Colorado butterfly plant conservation measures, determined as appropriate by the U.S. Fish and Wildlife Service.

2. The Bureau will participate in the development of both, a conservation agreement, assessment strategy and a species specific recovery plan for the Colorado butterfly plant

in coordination with the U.S. Fish and Wildlife Service and other agencies as appropriate. Habitat of the Colorado butterfly plant on Bureau-administered lands will be monitored to determine if recovery/conservation objectives are being met.

3. Coordinate with the U.S. Fish and Wildlife Service, the National Resource Conservation Service, and private landowners to ensure adequate protection for the Colorado butterfly plant and its habitat when new activities are proposed, and to work proactively to enhance the survival of the plant.

4. In the event that a new population of Colorado butterfly plant is found, the U.S. Fish and Wildlife Service Wyoming Field Office (307-772-2374) will be notified within one week of discovery.

5. Initiate land tenure adjustments to acquire lands with potential Colorado butterfly plant habitat to ensure a higher level of protection under the Endangered Species Act of 1973 (Act), as amended (50 CFR §402) on federal lands for the Colorado butterfly plant.

6. To prevent loss of habitat for the Colorado butterfly plant, the Bureau "shall retain in federal ownership all habitats essential for the survival and recovery of any listed species, including habitat that was used historically, that has retained its potential to sustain listed species, and is deemed to be essential to their survival" (BLM 2001). Prior to any land tenure adjustments in *potential* Colorado butterfly plant habitat, the Bureau will survey to assess the potential for the existence of the Colorado butterfly plant. While it is difficult to assess whether the Colorado butterfly plant was historically present on such sites, the Bureau should try and retain in federal ownership all habitats essential for the survival and recovery of the Colorado butterfly plant, including habitat that was used historically, that has retained its potential to sustain this listed species, and is deemed to be essential to their survival. Potential Colorado butterfly plant habitat may be used for reintroduction efforts and is important for the recovery and enhancement of the species.

7. Maintain and restore the dynamics of stream systems, including the movement of streams within their floodplains, which are vital for the life cycle of this plant. Flow timing, flow quantity, and water table characteristics should be evaluated to ensure that the riparian system is maintained where these plants occur.

8. Maintain and restore the natural species composition and structural diversity of plant communities in riparian zones and wetlands.

9. For the protection of the Colorado butterfly plant and its potential habitat, surface-disturbing activities should be avoided in the following areas: (a) identified 100-year flood plains; (b) areas within 500 feet from perennial waters, springs, wells, and wetlands, and; (c) areas within 100 feet from the inner gorge of ephemeral channels.

10. Recreational foot trails that may be located adjacent to Colorado butterfly plant habitat should be constructed to reduce impacts to this species.

11. Form a steering committee to develop and prioritize management practices and assist the Bureau and U.S. Fish and Wildlife Service with research projects.

12. Conduct inventories for the Colorado butterfly plant in areas with potential habitat in the Rawlins and Casper Resource Areas.

13. Maintain a database of all searched, inventoried, or monitored Colorado butterfly plant sites.

14. Analyze vegetation treatments (mowing, prescribed fire, mechanical treatments, etc.) in known or potential Colorado butterfly plant habitat for impacts to the species.

15. Monitor Colorado butterfly plant sites for invasion by noxious and invasive plant species.

16. 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 regarding monitoring the success of reintroduction efforts.

17. Collect and bank Colorado butterfly plant 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.

18. Train law enforcement personnel on protections for the plant and its habitat, its status, and current threats to its existence.

19. Educate resource specialists, rangers, and fire crews about the Colorado butterfly plant and its habitat to help with project design for the general area and for fire suppression actions occurring in potential habitat for the Colorado butterfly plant and on the habitat characteristics and plant identification for the plant, so that if they encounter a Colorado butterfly plant occurring in riparian habitat, they can report it to their office threatened and endangered species specialist.

20. The Bureau should work towards developing reintroduction sites in coordination with the U.S. Fish and Wildlife Service to maintain the integrity of these sites for the survival of the Colorado butterfly plant. The objective would be to reintroduce populations of the Colorado butterfly plant into areas of historic occurrence and introduce new populations in suitable habitat within the plant's historic range.

21. Develop propagation techniques and use them to reintroduce/introduce the Colorado butterfly plant and to repopulate known populations in the event population recovery becomes necessary.