

**DRAFT ENVIRONMENTAL ASSESSMENT  
PROPOSAL OF CRITICAL HABITAT  
FOR THE COLORADO BUTTERFLY PLANT  
(*Gaura neomexicana* ssp. *coloradensis*)**

**Prepared by  
U.S. Fish and Wildlife Service  
Ecological Services Field Office  
Cheyenne, Wyoming**

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## INTRODUCTION

Concurrent with the release of this environmental assessment, the U.S. Fish and Wildlife Service (Service) is releasing an economic analysis regarding the designation of critical habitat for the Colorado butterfly plant (*Gaura neomexicana* ssp. *coloradensis*). The Service encourages the reader to review both documents in their entirety.

### 1.0 PURPOSE OF THE PROPOSED ACTION

The purpose of the proposed action is to designate critical habitat for the Colorado butterfly plant (*Gaura neomexicana* ssp. *coloradensis*) by utilizing provisions of the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 et seq.) (ESA). The purpose of the ESA is to conserve the ecosystems upon which endangered and threatened species depend. Critical habitat designation identifies areas essential to the survival and recovery of the Colorado butterfly plant, and describes physical and biological features within critical habitat that require special management considerations to achieve conservation of the species.

The Service's position is that, outside the Tenth Circuit, the Service does not need to prepare environmental analyses as defined by the National Environmental Policy Act (NEPA) in connection with designating critical habitat under the ESA. A notice outlining the reasons for this determination was published in the Federal Register on October 25, 1983 (48 FR 49244). This assertion was upheld in the courts of the Ninth Circuit (*Douglas County v. Babbitt*, 48 F.3d 1495 (Ninth Cir. Ore. 1995), cert. denied 116 S. Ct. 698 (1996)). However, when the range of the species includes States within the Tenth Circuit, pursuant to the Tenth Circuit ruling in *Catron County Board of Commissioners v. U.S. Fish and Wildlife Service*, 75 F.3d 1429 (10th Cir. 1996), the Service will complete a NEPA analysis. The range of the Colorado butterfly plant includes States within the Tenth Circuit.

### 2.0 NEED FOR THE ACTION

The need for this action is to comply with section 4 of the ESA, which requires that critical habitat be designated for endangered and threatened species unless such designation is not prudent. On October 18, 2000, the Colorado butterfly plant was designated as threatened throughout its entire range under the ESA (65 FR 62302), but critical habitat was not designated at that time. On October 4, 2000, the Center for Biological Diversity and the Biodiversity Legal Foundation filed a complaint in the Federal District Court for the District of Colorado concerning the Service's failure to designate critical habitat for the Colorado butterfly plant (*Center for Biological Diversity, et al. v. Norton, et al.* (Civ. Action No. 00-D-1980)). On March 19, 2001, the Court approved a settlement agreement requiring us to submit a final critical habitat designation for the Colorado butterfly plant to the Federal Register on or before December 31, 2004. On August 6, 2004, the rule proposing critical habitat for the Colorado butterfly plant was published in the Federal Register (69 FR 47834).

Critical habitat is one of several provisions of the ESA that aid in protecting the habitat of listed species until populations have recovered and threats have been minimized so that the species can be removed from the list of threatened and endangered species. Critical habitat designation is intended to assist in achieving long-term protection and recovery of the Colorado butterfly plant and the ecosystem upon which it depends. Section 7(a)(2) of the ESA (16 U.S.C. 1336 (a)(2)) requires consultation for Federal actions that may effect critical habitat to avoid destruction or adverse modification of this habitat. Further explanation of critical habitat and its implementation is provided below.

## **2.1 Background**

Little is known about the historical distribution of the Colorado butterfly plant. Prior to 1984, no extensive documentation of the plant's range had been conducted. In 1979, 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 confirmation 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).

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 subpopulations. The spatial structuring of this subspecies is commonly referred to as a metapopulation. The metapopulation concept is rooted in the early recognition by both ecologists (Nicholson and Bailey 1935, Andrewartha and Birch 1954) and population geneticists (Wright 1931) who noted that species often exist as isolated patches of individuals, often due to the spatial segregation of suitable habitat, which may experience frequent extinction and recolonization. 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 (Hanski 1989; Olivieri et al. 1990; Hastings and Harrison 1994).

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 populations that go extinct. 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-fertilization. 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 (Lande 2002). 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.

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 F.E. Warren Air Force Base (WAFB) in Cheyenne, Wyoming, from 1984 to 2003. Floyd and Ranker (1998) studied three Colorado butterfly plant subpopulations at WAFB, Crow Creek, Diamond Creek, and Unnamed drainage, 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 revealed substantial spatial and temporal variation in rates of population growth. Population growth rate estimates for all three subpopulations combined were well above 1 for the 1992-1993 transition, and close to 1 for the 1993-1994 transition--values  $>1$  indicate that individuals are replacing themselves and the WAFB population as a whole is stable or growing. However, population growth rates varied among all plots and among individual subpopulations associated with each of the drainages, and there was a wide range in population growth rates for plots within one transition. 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 dynamics of populations (Floyd and Ranker 1998).

Using computer simulation, these subpopulations were projected forward 1,000 generations. This analysis predicted that the WAFB population as a whole (i.e., treating the three subpopulations as one) will persist over the long-term; however, local extinction will occur under certain conditions. Fine-scale environmental characteristics appeared to influence transition frequencies from one life-stage to the next. Even during a year of adequate rainfall, some plots yielded lower population growth rates, whereas other plots yielded high population growth even during a year of lower than average rainfall. Extended periods of below-average rainfall would likely result in localized extinction (Floyd and Ranker 1998).

Annual census of flowering plants at WAFB began in 1986, and continued from 1988 to 2003, within subpopulations located at Crow Creek, Diamond Creek, and Unnamed Drainage. Census summaries provided by Heidel (2004a) based on these data show that subpopulations within these three drainages are characterized by dramatic fluctuations in size. In 1986, the Crow Creek population numbered 2,095 flowering plants; in 2003 the population numbered 240 flowering plants, with a 17-year average of 1,373. Throughout this period, during which the total number of reproductively active individuals dropped almost 9-fold, annual fluctuations varied from 115 percent increases (1993 to 1994) to 70 percent declines (2002 to 2003). Similarly, dramatic fluctuations occurred at Diamond Creek, ranging from 35 percent increases (1996 to 1997) to 40 percent declines (2002 to 2003), and at Unnamed Drainage, which exhibited annual fluctuations from 58 percent decreases (1995 to 1996) to 238 percent increases (2002 to 2003).

Consequently, 17 years of census data, in conjunction with Floyd and Ranker's (1998) study, demonstrate that the Colorado butterfly plant subpopulations at Crow Creek, Diamond Creek, and Unnamed Drainage exhibit significant demographic uncertainty and instability. Populations found on private lands throughout Wyoming indicate similar demographic uncertainty. According to Wyoming Natural Diversity Database (WNDD) Element Occurrence records, for example, 1 population contained 1,447 individuals in 1986, increased to 3,952 in 1993, then declined to 1,950 when last surveyed in 1998. Another population contained 1,156 flowering plants in 1993, but only 187 when surveyed last in 1998, an 84 percent decline over 5 years. A

third population contained just 28 plants when surveyed in 1986, 543 in 1993, and 800 when last surveyed in 1998, exhibiting a 28-fold increase over a 13-year period, with an average annual increase of >200 percent.

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; Laursen and Heidel 2003; and Heidel 2004a), 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; Laursen and Heidel 2003; and Heidel 2004b). 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. Demographic uncertainty, or stochasticity, is variability in survival and reproduction of individuals due, at least in part, to chance or random events (Frankel et al. 1995).

Some researchers suggest that demographic uncertainty becomes an important hazard only for small populations (in the range of tens to hundreds of individuals). However, the actual number of individuals to reach an effective population size (i.e., number of breeding individuals) of several hundred will range from the upper 100s to the 1,000s (Shaffer 1987). This number increases further, by as much as an order of magnitude or more, as environmental uncertainty, natural catastrophes, and genetic uncertainty are accounted for in predictions of average persistence times for populations (Belovsky 1987; Goodman 1987; Shaffer 1987). While there is no managerial solution for threats due to stochastic factors, the magnitude of effect of these threats decreases as population size increases (Shaffer 1987; Frankel et al. 1995; Lande 2002). Maintaining the maximum number of individuals within each population, and maintaining the maximum number of populations within the Colorado butterfly plant metapopulation as a whole, may be the only means by which to maintain long-term species persistence.

Successful species conservation requires adequate genetic variability to enable species to respond to changing environmental circumstances. This concept is rooted in Fisher's (1929) recognition that the basis of an evolutionary response to a fluctuating environment is genetic variation maintained within a species. Of primary concern is inbreeding depression, the decrease in fitness associated with mating with close relatives. This phenomenon often is regarded as the primary selective force promoting outcrossing in plants (Lande and Schemske 1985; Charlesworth and Charlesworth 1987; Eckert and Barrett 1994; Latta and Ritland 1994) and is especially relevant to conservation of rare species because individuals in small populations tend to be more inbred than those from larger populations. Because these populations possess low genetic variation, in terms of allele richness and/or heterozygosity, they may experience low survivorship and reproduction.

The major threats that compromise attempts to maintain the long-term viability of rare plant species are--(1) the loss of genetic variation through stochastic forces (i.e., random genetic drift within small populations), and (2) the deleterious effects of inbreeding within small populations (Barrett and Kohn 1991). Two studies have examined the level of genetic variation in populations of the Colorado butterfly plant at WAFB. Floyd's (1995a) study surveyed the populations at Crow Creek, Diamond Creek, and Unnamed Drainage for 13 allozyme marker genes. Allelic frequency comparisons within and among subpopulations demonstrated significant population genetic structure.

Using Nei's (1978) genetic identity coefficient (I) and Rogers' (1972) genetic similarity coefficient (S), Floyd demonstrated that all three subpopulations were almost genetically identical. Additionally, all three populations as a whole contained approximately 12.5 percent polymorphic loci, with an average of 2.0 alleles per polymorphic locus. This percentage is extremely low, especially when compared with the average value of 34 percent polymorphism for most plant species (Hamrick et al. 1991), and compared with populations of a closely related species. Gottlieb and Pilz (1976), for example, found that populations of a rare congener, *Gaura demareei*, contained 27.8 percent polymorphic loci, and a closely related widespread species, *Gaura longiflora*, contained 33.3 percent for 18 allozymes assayed. Results of Floyd's (1995a) study demonstrate that, despite significant small-scale population genetic substructure, the Colorado butterfly plant populations at WAFB contain, on the whole, extremely low levels of genetic diversity.

A second study of Colorado butterfly plant population genetics at WAFB revealed similar results. Tuthill and Brown (2003), using Inter-simple sequence repeat variation, a Polymerase Chain Reaction based method of analyzing genetic variation, demonstrated 80 percent genetic similarity for all three subpopulations with individuals often more similar to members of other populations than within their own. Results further showed genetic divergence of Crow Creek, perhaps due to local selection, and that Unnamed Drainage contains some unique alleles that are not present in the other two populations. Thus, subpopulations within individual drainages exhibited concentrations of local genetic variability that may be very important for maintaining the long-term evolutionary potential of the Colorado butterfly plant.

While there have been no genetic studies conducted on other populations of the Colorado butterfly plant, there are several reasons why it is likely that other populations will exhibit similar characteristics of population genetic structure. Hamrick and others (1991) summarized a comprehensive review of 449 plant taxa representing 165 genera that were examined for allozyme diversity and eight species traits. Plant species with low levels of population genetic variation were typically dicots, short-lived perennials and annuals, endemic species in boreal or temperate origin, self pollinating, disperse seeds via explosive capsules, and early successional. The Colorado butterfly plant exhibits all of these traits with the exception of explosive seed dispersal. Similarly, the authors identified the following species associations with genetic variation distributed among, rather than within, populations - angiosperms; annuals; temperate and tropical; selfing species; gravity-dispersed seeds; and early- to mid-successional species. Again, the Colorado butterfly plant exhibits all of these traits with the exception of an annual life-history habit. Thus, the Colorado butterfly plant exhibits the suite of biological and

life-history traits of plant species generally associated with low levels of population genetic diversity (Floyd 1995a), and one would expect populations of the plant outside of WAFB to exhibit similar population genetic characteristics.

Of the known populations of the 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, 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).

Haying is a potential threat to the subspecies if conducted at certain times of the year. Delaying cutting until late in the growing season after the plants' fruit have hardened, or early season mowing prior to bolting, will minimize potential impacts (Mountain West Environmental Services 1985, Marriott 1987).

Construction of stock ponds and reservoirs can inundate habitat, rendering it unsuitable to the subspecies (Marriott 1987). Water diversions may remove moisture from occupied or potentially suitable habitat, rendering it less suitable or unsuitable for the plant (Marriott 1987, Fertig 1994). Management of water resources for domestic or commercial uses, in conjunction with conversions to agricultural land use, has channelized and isolated water resources and fragmented, realigned, and reduced riparian and moist lowland habitat that could otherwise provide suitable habitat to this subspecies (Compton and Hugie 1993).

Development of agricultural land for housing and commercial uses is a threat to the Colorado butterfly plant habitat (Fertig 1994). In nonagricultural, undeveloped areas, a substantial threat to populations is habitat degradation caused by plant community succession (Fertig 1994). Periodic disturbance is necessary to maintain the semi-open habitats preferred by this subspecies. Natural disturbances such as flooding, fire, and native ungulate grazing were sufficient in the past to create favorable habitat conditions. However, because the natural flooding regime within the subspecies' floodplain habitat has been altered by flood control structures and by irrigation and channelization practices, managed disturbance may be necessary to maintain suitable habitat (Fertig 1994, 1996). Unfortunately, many Federal programs focus on enhancing or protecting riparian areas by removing the types of disturbance needed by the plant, increasing vegetative cover and pushing habitat into later successional stages (e.g., riparian fencing and the Conservation Reserve Program that exclude livestock).

Livestock grazing can be a threat in some portions of habitat because of high grazing pressure caused when animals are not rotated among pastures or from concentrated use during summer flowering (Fertig 1994). However, light to moderate grazing is generally beneficial by reducing vegetative cover and allowing for seedling establishment (Fertig 1994). Timing of grazing also is important, plants can survive and even thrive in habitats that are winter-grazed or managed on a short term rotation cycle (Mountain West Environmental Services 1985, Fertig 1994).

The most serious threat to this subspecies on agricultural lands is the indiscriminate application of herbicides used for the control of several noxious weeds commonly found throughout its range (Mountain West Environmental Services 1985, Marriott 1987, Fertig 1994). The plant appears



to be highly susceptible to commonly used herbicides when applied non-selectively. 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

## **2.2 Endangered Species Act**

### **2.2.1 Critical Habitat**

Critical habitat is defined in section 3(5)(A) of the ESA as--(i) the specific areas within the geographical area occupied by a species, at the time it is listed in accordance with the ESA, on which are found those physical or biological features (I) essential to the conservation of the species and (II) that may require special management considerations or protection; and (ii) specific areas outside the geographical area occupied by a species at the time it is listed, upon a determination that such areas are essential for the conservation of the species. The term “conservation” as defined in section 3(3) of the Endangered Species Act, means “to use and the use of all methods and procedures which are necessary to bring an endangered species or threatened species to the point at which the measures provided pursuant to this Endangered Species Act are no longer necessary” (i.e., the species is recovered and removed from the list of endangered and threatened species).

Section 4(b)(2) of the ESA requires that the Service base critical habitat designation on the best scientific and commercial data available, taking into consideration the economic impact, and any other relevant impact, of specifying any particular area as critical habitat. The Service may exclude areas from critical habitat designation if the Service determines that the benefits of exclusion outweigh the benefits of including the areas as critical habitat, provided the exclusion will not result in the extinction of the species. Within the geographic area occupied by the species, the Service will designate only areas currently known to be “essential to the conservation of the species.” Critical habitat should already have the features and habitat characteristics that are necessary to sustain the species. The Service will not speculate about what areas might be found to be essential if better information were available, or what areas may become essential over time. If information available at the time of designation does not show an area provides essential support for a species at any phase of its life cycle, then the area should not be included in the critical habitat designation. Within the geographic area occupied by the species, the Service will not designate areas that do not now have the primary constituent elements, as defined at 50 CFR 424.12(b), that provide essential life cycle needs of the species.

Section 318 of Fiscal Year 2004 National Defense Authorization Act (Pub. L. 108-136) amended section 4 of the ESA. This provision prohibits us from designating as critical habitat any lands or other geographical areas owned or controlled by the Department of Defense, or designated for its use, that are subject to an Integrated Natural Resources Management Plan (INRMP) prepared under section 101 of the Sikes Act (16 U.S.C. 670a), if the Service determines in writing that such plan provides a benefit to the species for which critical habitat is proposed for designation.

The Service identified habitat essential for the conservation of the Colorado butterfly plant in Laramie and Platte Counties in Wyoming; Kimball County in Nebraska; and Weld County in Colorado. The Service has examined the INRMP for the WAFB to determine coverage for the Colorado butterfly plant. 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 this species. Some objectives for achieving those goals include--continue to participate in, and encourage development of, Cooperative Agreements and Memorandum of Understanding activities with Federal, State, and local government and support agencies; promote and support the scientific study and investigation of federally listed species management, conservation, and recovery; restrict public access in existing and potential habitat areas; and increase public education of Federally listed species through management actions, the WAFB Watchable Wildlife Program, and a Prairie Ecosystem Education Center (WAFB 2001). Based on the beneficial measures for the Colorado butterfly plant contained in the INRMP for WAFB, the Service has not included this area in the proposed designation of critical habitat for Colorado butterfly plant pursuant section 4(a)(3) of the ESA. The Service will continue to work cooperatively with the Department of the 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. The non-inclusion of WAFB demonstrates the important contributions that approved INRMPs have to the conservation of the species. As with HCP exclusions, a related benefit of excluding Department of Defense lands with approved INRMPs is to encourage continued development of partnerships with other stakeholders, including States, local governments, conservation organizations, and private landowners to develop adequate management plans that conserve and protect Colorado butterfly plant habitat. The Service found the INRMP provides benefits for the Colorado butterfly plant.

Habitat is often dynamic, and species may move from one area to another over time. Furthermore, the Service recognizes designation of critical habitat may not include all habitat eventually determined as necessary to recover the species. For these reasons, areas outside the critical habitat designation will continue to be subject to conservation actions that may be implemented under section 7(a)(1) and the regulatory protections afforded by section 7(a)(2) jeopardy standard and the section 9 take prohibition, as determined on the basis of the best available information at the time of the action. The Service specifically anticipates that federally-funded or assisted projects affecting listed species outside their designated critical habitat areas may still result in jeopardy findings in some cases. Similarly, critical habitat designations made on the basis of the best available information at the time of designation will not control the direction and substance of future recovery plans, habitat conservation plans, or other species conservation planning efforts if new information available to these planning efforts calls for a different outcome.

In accordance with section 3(5)(A)(i) of the ESA and regulations at 50 CFR 424.12 in determining which areas to propose as critical habitat, the Service is required to base 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 the conservation of the species, and that may require special management considerations or protection. These 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.

### **2.2.2 Section 7 Consultation**

Section 7(a)(2) of the ESA requires every Federal agency, in consultation with and with the assistance of the Secretary, to insure that any action it authorizes, funds, or carries out is not likely to jeopardize the continued existence of a listed species or result in the destruction or adverse modification of designated critical habitat. In fulfilling these requirements, each agency is to use the best scientific and commercial data available. This section of the ESA sets out the consultation process, which is further implemented by regulation (50 CFR 402).

Generally, the Federal agency is to review its actions at the earliest possible time to determine whether any action may affect listed species or critical habitat. If the action may affect a listed species or critical habitat, consultation with the Service is needed. It should be noted that section 7 requirements are not restricted to designated critical habitat, but apply to any Federal action that may affect a listed species.

### **2.2.3 Technical Assistance**

Although it is not defined in the regulations, technical assistance includes those parts of the consultation process when the Service provides information to agencies, applicants, and/or consultants, but specifically stops short of concurrence on “may effect” determinations. The term is used to differentiate “informal” consultation (where a concurrence with an agency, applicant, or consultant on “may effect” is provided) and the provision of information. This differentiation is primarily made for record-keeping purposes.

A telephoned or written inquiry about the presence or absence of listed and/or proposed species in a project area usually initiates informal consultation and frequently generates technical assistance. Service biologists may respond in different ways:

1. If species are not likely to be present, the consultation requirement is met and the Service may advise the agency, applicant or consultant.
2. If historical records or habitat similarities suggest the species may be in the area, then some survey work may be recommended to make a more precise determination.
3. If the species is definitely in the project area, but the Service determines it will not be adversely affected, the Service may notify the agency of that finding.

Technical assistance from the Service may take a variety of forms. It can include information on candidate species as well as names of contacts having information on State listed species. The Service may provide correspondence to State agencies or other Service offices to alert them to a project.

As a part of technical assistance, the Service may recommend:

1. The action agency conduct additional studies on the species' distribution in the area affected by the action, or
2. The action agency monitor impacts of the action on aspects of the species' life cycle. Monitoring may be recommended when incidental take is not anticipated but might possibly occur, thus triggering the need for project changes or formal consultation.

#### **2.2.4 Critical Habitat for Threatened Plants**

The Act and its implementing regulations provide protections for listed species by prohibiting actions that undermine efforts to protect the species. For example, under Section 9(a)(1) of the Act (16 U.S.C. 1538(a)(1)), a person is prohibited from importing, exporting, taking, and transporting an animal listed as threatened or endangered. A "take" of a listed species can occur through the alteration of designated critical habitat. *Babbitt v. Sweet Home Chapter of Communities for a Great Oregon*, 5151 U.S. 687 (1995).

Section 9(a)(2) of the Act (16 U.S.C. 1538(a)(2)), however, generally does not prohibit the taking of a plant listed as threatened or endangered unless such action occurs on property under Federal jurisdiction or is done in knowing violation of a State law or regulation or in the course of violating a State criminal trespass law. As a result, when a listed plant species is located on private property, the landowner is not prohibited from activities that destroy the listed plant or its habitat. In effect, the listing of a plant, whether threatened or endangered, has little effect on the actions of private persons acting on their own land.

The Service recognizes that most of the occupied habitat of the Colorado butterfly plant exists on private property and, consequently, the designation of critical habitat on those private lands would not affect the ability of the landowners to modify the habitat or otherwise "take" the plant. As a consequence, the Service is working with some of these landowners to develop voluntary conservation agreements to provide specific protections to some populations of the Colorado butterfly plant. This effort is reflected in Alternatives C and D, discussed *infra*.

### **3.0 DESCRIPTION OF ALTERNATIVES**

The Service considered three alternatives, including the No Action Alternative. The Action Alternatives are to designate critical habitat as agreed to in the court-approved settlement. The Action Alternatives vary by acreage of habitat included in the critical habitat proposal.

#### **3.1 Alternative A: No Action Alternative**

Pursuant to NEPA and its implementing regulations (40 CFR 1502.14), the Service is required to consider the No Action Alternative. The No Action Alternative would basically maintain the status quo. The Colorado butterfly plant would remain listed as a threatened species, but with no additional protection through designation of critical habitat. This alternative serves to delineate the existing environment and conditions that result from the listing of the species, without

designation of critical habitat. Since the listing of the species as threatened, the Colorado butterfly plant has been protected under section 7 of the ESA by prohibiting Federal agencies from implementing actions that would jeopardize the continued existence of the species. This protection under the ESA is considered the baseline against which the Service evaluates the action alternatives described below. In addition, the No Action Alternative would ignore the legal requirement to designate critical habitat, where prudent, and would be non-responsive to the court-mediated settlement to designate critical habitat by December 31, 2004.

### **3.2 Action Alternatives**

Each Action Alternative includes designation of critical habitat in areas believed to contain the physical and biological features upon which the Colorado butterfly plant depends. The ESA refers to these essential habitat features as “primary constituent elements.”

Based on the Service’s knowledge to date, the primary constituent elements for the Colorado butterfly plant consist of, but are not limited to:

- (1) Subirrigated, alluvial soils on level or low-gradient floodplains and drainage bottoms at elevations of 5,000 to 6,400 feet (1,524 to 1,951 meters).
- (2) Mesic habitat 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) habitat that is open and without dense or overgrown vegetation (including hayed fields, 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).
- (4) Hydrological conditions characteristic of habitat conditions within the range of the Colorado butterfly plant, namely, creation and maintenance of stream channels, floodplains, and floodplain benches that facilitate patterns of plant communities favorable to the Colorado butterfly plant.

#### **3.2.1 Alternative B: Designation of Critical Habitat as Identified in the Proposed Rule Without Conservation Agreements**

This Alternative would designate critical habitat as described in the Proposed Rule published in the Federal Register on August 6, 2004. The proposed critical habitat area constitutes the Service’s best assessment at this time of the area essential for the conservation of the Colorado butterfly plant.

Critical habitat is being proposed on approximately 8,486 acres (ac) (3,434 hectares (ha)) along approximately 113 stream miles (182 kilometers) on city, State, and private lands within Platte and Laramie Counties in Wyoming, Kimball County in Nebraska, and Weld County in Colorado (Appendix 1). The Service has proposed eight units as critical habitat for the Colorado butterfly plant. The critical habitat areas described below constitute the Service’s best assessment at this

time of the areas essential for the conservation of the Colorado butterfly plant that may require special management. The eight proposed units are--(1) Tepee Ring Creek in Wyoming; (2) Bear Creek East in Wyoming; (3) Bear Creek West in Wyoming; (4) Little Bear Creek/Horse Creek in Wyoming; (5) Lodgepole Creek West in Wyoming; (6) Lodgepole Creek East in Wyoming and Nebraska; (7) Borie in Wyoming; and (8) Meadow Springs Ranch in Colorado.

In the Service's delineation of the critical habitat units, the Service selected areas to provide for the conservation of the Colorado butterfly plant in all areas where it is known to occur, except WAFB. All units are essential because, as previously discussed, Colorado butterfly plant populations exhibit significant demographic uncertainty, contain very low genetic variation, and have very little opportunity to colonize new geographic areas with which to balance local extinction events. The Service believes the proposed designation is of sufficient size to maintain ecological processes and to minimize secondary impacts resulting from human activities and land management practices occurring in adjacent areas. The Service mapped the units with a degree of precision commensurate with the available information, the size of the unit, and time allotted to complete this proposal. The Service anticipates that the boundaries of the units may be refined based on additional information received during the comment period and after surveys are completed in the summer of 2004.

### **3.2.2 Alternative C. Designation of Critical Habitat as Identified in the Proposed Rule With Conservation Agreements (Preferred Alternative)**

The Service is working with, and will continue to work with, the Wyoming Stockgrowers Association, the Wyoming Association of Conservation Districts, the Wyoming Department of Agriculture, the Natural Resources Conservation Service (NRCS) in Wyoming and Nebraska, the City of Cheyenne in Wyoming, and the City of Fort Collins in Colorado, to develop conservation agreements with willing landowners to provide for the conservation of the Colorado butterfly plant. These agreements will include specific on-the-ground actions to alleviate specific threats including--allowing the Service access to private land to conduct annual monitoring of Colorado butterfly plant populations to evaluate success of management actions under the agreement; establishing an adaptive management approach to evaluate success of management actions under the agreement; and facilitating the collection of data needed for future recovery of the species. Through cooperation and communication between landowners and the Service, such agreements will provide for the conservation needs of the Colorado butterfly plant above and beyond what would be achievable through the designation of critical habitat on private lands while meeting the needs of individual landowners. Working cooperatively with private landowners to protect habitat for the Colorado butterfly plant through conservation agreements is the Service's preferred approach to protecting the species on private lands. The Service will pursue such agreements to the fullest extent practicable prior to finalizing critical habitat. If, prior to finalizing the designation of critical habitat, the Service determines that the benefits of excluding an area subject to one of these agreements outweigh the benefits of including it, the Service will exclude such from the designation. Currently, one such agreement is in progress.

Alternative C would designate critical habitat as described in the Proposed Rule published on August 6, 2004 (69 FR 47834), in addition to using voluntary conservation agreements to provide protection to the Colorado butterfly plant and its habitat. Critical habitat under this

alternative would be the same as in Alternative B: approximately 8,486 ac (3,434 ha) along approximately 113 stream miles (182 kilometers) on city, State, and private lands within Platte and Laramie Counties in Wyoming, Kimball County in Nebraska, and Weld County in Colorado.

Some examples of the types of activities that may be included in conservation agreements include: management of timing and rotation of livestock grazing activities to reduce impacts to habitat occupied by *G. n. ssp. coloradensis*; riparian fencing to reduce impacts to occupied habitat; modification of timing of the cutting of hay to allow for maturation and hardening of fruits on *G. n. ssp. coloradensis* plants; manage use of herbicides used to control weeds; mowing areas early in the growing season to open occupied habitat to *G. n. ssp. coloradensis* and reduce competition with weedy species; and modifying any future water development projects, such as livestock impoundment construction, to ensure the maintenance of hydrological regime of occupied habitat.

### **3.2.3 Alternative D. Designation of Critical Habitat Including Extension Into Unoccupied Habitat with Conservation Agreements**

Alternative D would designate critical habitat in an area that not only includes the area described above as the Proposed Alternative and in the Proposed Rule published on August 6, 2004, in the Federal Register (69 FR 47834), but also includes additional unoccupied habitat (approximately 97 stream miles encompassing 6,608 acres) extending west and east of the proposed critical habitat. Alternative D would include all known locations where the species currently occurs, surrounding habitat to maintain the ecological processes that allow the population and the primary constituent elements to persist, and a larger area of unoccupied habitat downstream to facilitate dispersal.

This area of critical habitat would include approximately 15,094 ac (6,108 ha) along approximately 210 stream miles (338 kilometers) primarily on private lands within Platte and Laramie Counties in Wyoming. A map of the area is found in Appendix 2. Within this area, all known populations of the Colorado butterfly plant occur in subpopulations found in low depressions or along bends in wide, active, meandering stream channels just a short distance upslope of the active channel. To allow for the possibility of greater dispersal distances downstream, this alternative includes an additional 6,608 acres located downstream of the known populations and currently unoccupied by the Colorado butterfly plant.

## **4.0 AFFECTED ENVIRONMENT**

The Action Alternatives are located in the same general vicinity and are primarily under private ownership. Alternatives B and C include approximately 8,486 acres and Alternative D includes approximately 15,094 acres. Unless otherwise noted, the following information has been taken from the Draft Economic Analysis of Critical Habitat Designation for the Colorado Butterfly Plant (Industrial Economics, Incorporated, July 31, 2004) which analyzed the economic effects of the Proposed Alternative (Alternative B) and is available in Appendix 3. The Service hereby incorporates that analysis by reference. Further details of information provided below, as well as complete citations and bibliography, also may be found in the Draft Economic Analysis.

#### **4.1 Physical Environment**

The Colorado butterfly plant typically occurs on subirrigated, alluvial (stream deposited) soils on level or low gradient floodplains and drainage bottoms at elevations of 1,524 to 1,951 meters (5,000 to 6,400 feet). Subpopulations are often found in low depressions or along bends in wide, active, meandering stream channels just a short distance upslope of the active channel. The plant occurs on soils derived from conglomerates, sandstones and tuffaceous mudstones and siltstones of the Tertiary White River, Arikaree, and Oglalla formations (Fertig 2000). Average annual precipitation within its range is 33-41 (13-16 inches) primarily in the form of rainfall (Fertig 2000).

#### **4.2 Fish, Wildlife, and Plants**

The Colorado butterfly plant requires early- to mid-succession riparian habitat experiencing periodic disturbance. It commonly occurs in communities including *Agrostis stolonifera* (redtop) and *Poa pratensis* (Kentucky bluegrass) on wetter sites, or *Glycyrrhiza lepidota* (wild licorice), *Cirsium flodmanii* (Flodmans' s thistle), *Grindelia squarrosa* (curlytop gumweed), and *Equisetum laevigatum* (smooth scouring rush) on drier sites (Fertig 1994). Both of 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. *Salix exigua* (coyote willow) and *Cirsium arvense* (Canada thistle) may become locally dominant in areas that are not periodically flooded or otherwise disturbed, resulting in decline of the species.

There are no verified occurrences of other federally-listed species present on the proposed critical habitat. Wildlife potentially found in the vicinity of the proposed critical habitat include most species commonly found in the arid shortgrass prairie ecosystem typical of southeast Wyoming. Whitetail and mule deer frequent the moist valley bottoms, and pronghorn antelope are found in shortgrass uplands. The area also is frequented by red-tail and ferruginous hawks, as well as coyotes and red foxes.

#### **4.3 Human Environment**

The proposed critical habitat designation spans the City of Cheyenne, Wyoming, and rural areas within Wyoming, Colorado and Nebraska. Most of the proposed designation (approximately 7,299 ac, or 84 percent) is located in Laramie County, Wyoming. Laramie County, located in southeastern Wyoming, has an estimated population of 84,100 persons as of July 1, 2003. The population of Laramie County has increased by about 2,500 persons, or 3 percent since the 2000 Census. This growth rate is larger than the 1.5 percent Statewide population increase between 2000 and 2003. Most of Laramie County's growth has been in and around Cheyenne. Approximately 65 percent of the county population resides in Cheyenne. In 2002, the population of Cheyenne was 53,658.

The remainder of Laramie County is largely rural, with the small communities of Albin (population 120), Burns (population 290), and Pine Bluffs (population 1,160) interspersed among



numerous farms and ranches. Furthermore, except for Kimball County, Nebraska, each of the counties' populations has increased between 1990 and 2003. All of the counties surrounding the proposed critical habitat designation are forecast to experience population growth.

The predominant economic activity in rural areas of Laramie County is agricultural production. The most prevalent types of agricultural production involve irrigated hay production in support of livestock operations and dryland winter wheat production. Laramie County contains 755 farms and ranches with 1.75 million acres of land in agricultural production, for an average size of 2,324 acres per operation.

Agricultural operations in Laramie County range from dryland farms raising winter wheat in eastern areas of the county, to large livestock operations in the central and northern portions of the county. In 2003, Laramie County had 58,000 acres of irrigated hay in production, of which 36,000 acres were irrigated. The irrigated hay operations typically depend upon surface water diversions from the Horse Creek and Chugwater Creek drainages.

Livestock inventories in Laramie County include approximately 70,000 cattle and calves and 8,000 breeding sheep in 2004. Severe drought in the area has decreased the number of cattle and calves from 90,000 in 2001. Livestock sales accounted for 73 percent of gross farm and ranch sales, with the remaining 27 percent coming from sales of crops.

The profitability of high plains ranching operations depends upon many factors including cattle prices, management practices, water availability, and a host of variables relating to operating costs. Returns to ranching activities in southeast Wyoming have been further reduced in recent years due to an ongoing drought that has reduced water supplies and feed production and has forced many ranchers to reduce the size of their herds.

#### **4.4 Tribal lands**

No critical habitat is proposed on tribal lands.

### **5.0 ENVIRONMENTAL CONSEQUENCES**

This section reviews the expected environmental consequences of designating critical habitat for the Colorado butterfly plant under the Action Alternatives and the environmental consequences of the No Action Alternative. Typically, determining the impacts of a proposed action involves evaluating the "without the action" baseline versus the "with the action" scenario. The impact of a proposed action equals the difference, or the increment, between the two scenarios.

For the most part, individuals, organizations, States, local and Tribal governments, and other non-Federal entities are only affected by the designation of critical habitat for a plant if their actions occur on Federal lands, require a Federal permit, license, or other authorization, or involve Federal funding.

Potential environmental consequences that may result from implementation of the No Action and the Action Alternatives are discussed below. All impacts are expected to be indirect, as the

decision to designate critical habitat does not in itself directly result in any alteration of the environment.

Regardless of which alternative is chosen, in accordance with section 7(a)(2) of the ESA, Federal agencies are required to review actions they authorize, fund, or carry out to determine the effects of proposed actions on federally-listed species. If the Federal agency determines that its action may adversely affect a listed species, it must enter into formal consultation with the Service. This consultation results in a biological opinion issued by the Service as to whether the proposed action is likely to jeopardize the continued existence of the species, which is prohibited under the ESA.

## **5.1 Physical Environment**

None of the alternatives will result in a negative effect to the physical environment. The No Action Alternative A would likely result in no effect to the physical environment. Since the Colorado butterfly plant was listed in 2000, the Service is aware of no significant project modifications that have been made as a result of section 7 consultation on the Colorado butterfly plant. Taking no action and not designating critical habitat, while not a legal alternative, would likely continue this trend.

In terms of the Action Alternative B, the purpose of a designating critical habitat is to provide protection to the federally-listed species and its habitat. Since 90 percent of the proposed designation occurs on private lands, and there is typically not a Federal nexus for farm and ranch activities occurring on occupied habitat, no changes to the physical environment on which the Colorado butterfly plant is found would result from the proposed critical habitat designation alone. Therefore, the Service anticipates negligible effects to the physical environment from Alternative B.

If conservation agreements are in place in addition to critical habitat, as identified for Alternatives C and D, there would likely be beneficial effects to the Colorado butterfly plant and its habitat. As described above, conservation agreements may involve building small enclosures around subpopulations of the plant, and controlling the use of herbicides to within 50 to 100 feet of a known subpopulation. The enclosures would be constructed of four-strand barbed wire fence with wooden and steel posts. While negative effects to the physical area would be negligible, beneficial effects may be significant--i.e., improved habitat for the Colorado butterfly plant by eliminating livestock grazing during the reproductive stage in its cycle; and limiting the lethal impacts of herbicides to the plant. Because conservation agreements do not involve any major farm/ranch management changes or modifications--that is, all activities associated with conservation agreements are located within the small fraction of the occupied habitat in which concentrated subpopulations of the plant are found--other effects are considered negligible.

## **5.2 Fish, Wildlife, and Plants**

### **5.2.1 Colorado Butterfly Plant**

The No Action Alternative A would have negligible impacts on the Colorado butterfly plant because the protections resulting from its listing in 2000 and the associated requirements of section 7 of the ESA are already in place and duplicate protections associated with critical habitat designation. Since the Colorado butterfly plant was listed, the Service has conducted three formal consultations involving this species. All of these projects were implemented with little change from the originally proposed actions. The Service also conducted 142 informal consultations involving many species list requests; concurrence with not likely to adversely affect based on project description, site location, and survey results; the Service making recommendations regarding use of herbicides; and the Service making recommendations on avoiding potential impacts to the plant by pipeline rights-of-way (e.g., boring pipelines beneath wetland and/or riparian areas).

Action Alternative B would have minimal additional impacts beyond those already considered in section 7 consultation since the 2000 listing--as identified in the paragraph above. Beneficial effects to the Colorado butterfly plant that may accrue from designation of critical habitat would be the requirement under section 7 of the ESA that Federal agencies review their actions to assess their effects on critical habitat. Designation of critical habitat also may provide some benefits to the Colorado butterfly plant by alerting Federal agencies to situations when section 7 consultation is required. Another potential benefit is that critical habitat may help to focus Federal, State, and private conservation and management efforts by identifying the areas of most importance to a species. Critical habitat also allows for long-term planning for species conservation.

The beneficial effects of Alternatives C and D of protecting extant populations of the Colorado butterfly plant through conservation agreements, by partnering with private landowners on whose property populations occur, are likely substantially greater than for Alternatives A or B. Greater protection results from conservation agreements because these agreements address the specific types of actions (e.g., indiscriminate application of herbicides; overgrazing; timing of hay cutting) undertaken by private landowners that may adversely impact the plant or its habitat and that would not involve a Federal nexus subject to consultation under section 7(a)(2) of the ESA.

### **5.2.2 Other Fish, Wildlife and Plant Species**

The No Action Alternative A would have negligible impacts on fish, wildlife or plants beyond those protections already in place as a result of listing of the Colorado butterfly plant in 2000 and associated requirements of section 7 of the ESA. As stated above, since the Colorado butterfly plant was listed in 2000, the Service is aware of no significant project modifications that have been made as a result of section 7 consultation on the Colorado butterfly plant. It is possible that Service recommendations regarding the use of herbicides and avoiding impacts to suitable habitat for the Colorado butterfly plant (e.g., boring pipelines beneath wetlands) would benefit other wetland and/or riparian associated species such as waterfowl and shorebirds. Taking no action and not designating critical habitat, while not a legal alternative, would likely continue this trend.

Action Alternative B would have minimal additional impacts beyond those already considered in section 7 consultation since the 2000 listing—as identified in the preceding paragraph. Fish, wildlife, and plants may indirectly benefit as a result of protections provided through conservation of the Colorado butterfly plant and the associated requirements of section 7(a)(2) of the ESA; for example, waterfowl and shorebirds that use wetland and/or riparian habitat. However, since approximately 90 percent of the proposed designation occurs on private lands, and since actions typical of farm and ranch operations of landowners impacted by this designation involve no Federal nexus, the Service does not anticipate significant additional benefits to other species.

Action Alternatives C and D, which include implementing individual conservation agreements, would likely have some beneficial effects to other fish, wildlife and plants. Greater protection results from conservation agreements because these agreements address the specific types of actions (e.g., indiscriminate application of herbicides; overgrazing; timing of hay cutting) undertaken by private landowners that may adversely impact other plants, animals or their habitats, but would not involve a Federal nexus subject to consultation under section 7(a)(2) of the ESA. Therefore, improving habitat conditions for the Colorado butterfly plant through conservation agreements would likely provide some benefit to all riparian associated plants and animals. Waterfowl and shorebirds may benefit the most from such agreements, for example. Because there are no verified occurrences of other federally-listed species present on the proposed critical habitat, the Service anticipates that there will be no effect to other federally-listed species from any of the alternatives.

### **5.3 Human Environment**

As discussed above, individuals, organizations, States, local governments, and other non-Federal entities, generally, are only affected by the designation of critical habitat only if their actions occur on Federal lands, require a Federal permit, license, or authorization, or involve Federal funding. Since 2000, Federal agencies have been required to consider the effects of their actions on the Colorado butterfly plant and consult with the Service as appropriate. Under Alternative A, B, or C, while a similar process is required for critical habitat, analysis of effects to critical habitat is not expected to cause large increases in the number or complexity of consultations. Under Alternative D, the inclusion of additional, unoccupied lands, may lead to additional consultation. The Service will not speculate as to the number, but the difference would be negligible.

#### **5.3.1 Agriculture**

The agricultural operations that are most likely to be affected by the Colorado butterfly plant designation are high plains cattle ranches that depend heavily upon stream-flow and early season precipitation to produce the grass that supports livestock during the entire year. Most ranchers use flood irrigation during the spring to irrigate hay meadows that are harvested in mid-summer to produce feed for cattle during the winter months. These hay meadows are typically located along riparian areas of creeks. While the hay fields are under irrigation, cattle are typically moved to higher elevation grazing lands. Since there is little Federal land along Horse Creek and

Chugwater Creek, these higher-elevation grazing lands are usually private, although some State lands and a few BLM grazing allotments are involved. Cattle are returned to the hay meadows in late summer or early fall after the hay crop is harvested and graze on re-growth in the hay meadows before being fed harvested feed during the winter months. Cattle are typically fed until after calving is completed in spring, and the yearly process begins again.

The No Action Alternative A and Alternative B would have no impacts on land management practices including grazing, spraying herbicides, hay cutting, or stockwater development beyond those already resulting from the 2000 listing of the Colorado butterfly plant and the associated requirements of section 7 of the ESA. To date, there have been no section 7 consultations addressing impacts to the Colorado butterfly plant from agricultural activities. Agricultural activities on private lands that may adversely impact the Colorado butterfly plant and/or its habitat (e.g., application of herbicides, grazing, timing of hay cutting) do not typically involve a Federal nexus. Taking no action and not designating critical habitat, as in Alternative A, while not a legal alternative, would likely continue this trend.

Action Alternative B would have minimal additional impacts beyond those already considered in section 7 consultation since the 2000 listing. The objectives of designating critical habitat are to protect features essential to the conservation of the species for which the habitat is designated. Approximately 90 percent of the proposed designation occurs on private lands, and since actions typical of farm and ranch operations of landowners impacted by this designation involve no Federal nexus, the Service anticipates negligible effects to the human environment.

Action Alternatives C and D include designating critical habitat and implementing conservation agreements. Agricultural activities on private lands that may adversely impact the Colorado butterfly plant and/or its habitat (e.g., application of herbicides, grazing, timing of hay cutting) do not typically involve a Federal nexus. Further, since the section 9 take provisions of the ESA do not apply to threatened plants, there are no requirements for private landowners to protect the Colorado butterfly plant from normal agriculture activities that may be damaging to the plant and/or its habitat. The main Federal nexus for agriculture activities on private land is the NRCS. While the NRCS is unable to forecast long-term participation in conservation programs in the future, the agency states that future consultations with the Service for the Colorado butterfly plant are unlikely. In the coming year, NRCS estimates that there will be less than five stock pond and reservoir projects in the southeastern portion of the Wyoming (Laramie and Platte County), and that consultation with the Service for the Colorado butterfly plant is not likely for these projects. To date, the NRCS has not consulted on any activities impacting the Colorado butterfly plant or its habitat.

The Service believes that the conservation agreements will provide for the conservation needs of the Colorado butterfly plant above and beyond what is achievable through the designation of critical habitat while meeting the needs of individual landowners. It also is the Service's intention to exclude from the designation of critical habitat any lands included in these conservation agreements prior to finalization of critical habitat.

As previously stated, Alternatives C and D also include conservation agreements. Changes in farm income due to participation in conservation agreements potentially could result from

increased costs (e.g., fencing off concentrated subpopulations of the Colorado butterfly plant) as well as from decreases in forage production (e.g., restrictions on haying during certain times of the year). For Alternative C, based on the assumptions identified in the economic analysis in Appendix 3, the potential annualized cost associated with conservation agreements for a typical agriculture operation at \$263. Alternative D contains acreage equal to 1.78 times the acreage included in Alternative C. Therefore, the costs associated with Alternative C can be multiplied by 1.78 to estimate the costs of Alternative D. However, in some cases, the cost of consultation is the same for both Action Alternatives.

## **5.3.2 Development**

### **5.3.2.1 Natural Gas Pipelines**

The No Action Alternative A would have no impacts on natural gas pipelines beyond those already resulting from the 2000 listing of the Colorado butterfly plant and the associated requirements of section 7 of the ESA. If a pipeline right-of-way crosses suitable habitat for the Colorado butterfly plant, surveys may be necessary. If presence of the plant is assumed, or confirmed by survey results, then the Service will likely recommend boring beneath the suitable habitat or keep heavy equipment operation within suitable habitat to a minimum.

The Action Alternative B would have minimal additional impacts beyond those considered in section 7 consultation since the 2000 listing—identified in the paragraph above. Natural gas pipeline projects can impact the Colorado butterfly plant by altering the landscape within a unit. The Federal Energy Regulatory Commission (FERC) has indicated two major pipeline projects may pass in the vicinity of the proposed critical habitat designation over the next 10 years.

As discussed in the Economic Analysis in Appendix 3, Entrega Gas Pipeline, Inc. is planning to construct a 327-mile interstate gas pipeline that will extend from Rio Blanco County, Colorado, to Wamsutter, Wyoming, continuing on to the Cheyenne Hub in Weld County, Colorado. It does not appear that the proposed Entrega Gas Pipeline project will cross the known plant populations. Total nominal costs of Colorado butterfly plant impact minimization efforts are expected to range from \$3,500 to \$13,900. The Cheyenne Plains Pipeline Company is planning the construction of approximately 380 miles of 30-inch pipeline from the Cheyenne Hub (located near the Colorado/Wyoming border) southeast across Colorado and Kansas to the town of Greensburg, Kansas. Total costs of Colorado butterfly plant impact minimization efforts are expected to range from \$3,500 to \$13,900 for the Cheyenne Plains Pipeline Project.

### **5.3.2.2 Residential and Commercial Development**

The No Action Alternative would have no impacts on residential and commercial development beyond those already resulting from the 2000 listing of the Colorado butterfly plant and the associated requirements of section 7 of the ESA. To the Service's knowledge, there has been no need to consult in the past on residential or commercial development due to impacts to the Colorado butterfly plant.

The Action Alternatives B, C, and D would likely have negligible impacts beyond those already considered in section 7 consultation since the 2000 listing. Future residential development within the proposed critical habitat could impact the survival of the species. The development of houses and residential-related infrastructure (i.e. water supply, sewage treatment) within known population area could cause direct take of the species or eliminate suitable habitat. However, what Federal nexus would trigger the need for section 7 consultation is unclear, and the Service believes it is unlikely that there would, generally, be such a nexus and consequent need to consult. Even without critical habitat designation, consultation on residential and commercial development would be taking place because of the presence of the Colorado butterfly plant.

### **5.3.2.3 Road and Bridge Construction and Maintenance**

The No Action Alternative would have no impacts on road and bridge construction and maintenance beyond those already resulting from the 2000 listing of the Colorado butterfly plant and the associated requirements of section 7 of the ESA. The Service is not aware of any previous consultations that have addressed significant impacts to the Colorado butterfly plant or its habitat as a result of road and/or bridge construction and maintenance. The main Federal nexus for road and bridge construction and maintenance is Federal funding from the Federal Highway Administration (FHWA). No consultations with FHWA have been conducted on the Colorado butterfly plant to date.

Additionally, as stated in the economic analysis (page 4-23), none of the projects planned in the next 2 years is anticipated by FHWA to impact drainages or Colorado butterfly plant habitat; and FHWA does not foresee the need for future consultations due to impacts to the plant as a result of the proposed critical habitat designation. Therefore, it is unlikely that Action Alternatives B and C would have any substantial impacts beyond those already considered in section 7 consultation since the 2000 listing. Since Alternative D includes extensions of lands included in Alternative C to include more proposed critical habitat on private lands, and FHWA does not foresee any significant impacts to lands in these areas, the Service believes any additional impacts to the Colorado butterfly plant or its habitat would be negligible for this Alternative.

### **5.3.2.4 Oil and Gas Drilling**

The No Action Alternative A would have no impacts on oil and gas drilling beyond those already resulting from the 2000 listing of the Colorado butterfly plant and the associated requirements of section 7 of the ESA. To date, there have been no section 7 consultations addressing impacts to the Colorado butterfly plant from oil and gas drilling.

The Action Alternatives B, C, and D, would have negligible impacts beyond those already considered in section 7 consultation since the 2000 listing. There is minimal oil and gas drilling in Laramie County, Wyoming, where the majority of the critical habitat is proposed, and all of the additional proposed critical habitat occurs for Alternative D. Since listing, only 11 Applications for Permits to Drill (APD) have been issued for oil and gas well drilling in Laramie County, four in 2004, one in 2003, three in 2002, and three in 2001. For comparison, 7,404 APDs were issued Statewide in 2000, 10,514 in 2001, and 6,473 in 2002. The Wyoming Oil and Gas Conservation Commission and the Petroleum Association of Wyoming have

indicated that the level of oil and gas drilling in Laramie County is likely to remain low, and that impacts to the Colorado butterfly plant habitat are not anticipated in the County.

#### **5.4 Archeological and Cultural Resources**

Because designation of critical habitat involves no ground-disturbing activities or changes in management, designation of critical habitat is expected to have no impacts on known archaeological and cultural resources under any of the alternatives.

#### **5.5 Environmental Justice**

Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, 59 FR 7629 (1994), directs Federal agencies to incorporate environmental justice in their decision making processes. Federal agencies are directed to identify and address, as appropriate, any disproportionately high and adverse environmental effects of their programs, policies, and activities on minority or low-income populations. This assessment has not identified any adverse or beneficial effects unique to minority or low-income populations in the affected areas for any of the alternatives.

#### **5.6 Cumulative Impact**

According to Council on Environmental Quality NEPA regulations (40 CFR 1508.7), cumulative impact is the impact on the environment that results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions.

The Service has attempted to determine cumulative impacts by combining the impacts of the Action alternatives with other past, present, and reasonably foreseeable future actions conducted by the Service and others within the critical habitat. Actions contributing to the cumulative impacts in the vicinity of the proposed critical habitat appear limited, but include natural events (such as drought) and activities related to conservation agreement implementation.

Ranching activities continue to be affected by ongoing drought conditions throughout parts of central Wyoming. In 2004, portions of Wyoming received rain alleviating some of the immediate effects of drought (forage drought), although the relief was short-lived and benefited only the cool season forage plants. The hydrologic drought is more severe and continues to affect agricultural operations. In general, drought has resulted in many operators selling off large portions of their livestock. Potential cumulative effects are unlikely to have any noticeable effect on local services, the availability of housing, or the local or regional economy under any of the alternatives.



**Table 1. SUMMARY OF MAXIMUM POTENTIAL ENVIRONMENTAL CONSEQUENCES BY ALTERNATIVE**

<b>IMPACTS</b>	<b>Alternative A No Action</b>	<b>Alternative B Designate CH</b>	<b>Alternative C CH &amp; Cons. Agreements</b>	<b>Alternative D Extended CH &amp; Cons. Agreements</b>
Colorado butterfly plant	Existing sec.7 consultation	Negligible beneficial impacts beyond those associated with the 2000 listing	Some beneficial impacts due to conservation agreements; negligible for critical hbt.	Some beneficial impacts due to conservation agreements; negligible for critical hbt.
Other Fish, Wildlife, and Plants	No Effect	Negligible beneficial impacts beyond those associated with the 2000 listing	Some beneficial impacts due to conservation agreements; negligible for critical hbt.	Some beneficial impacts due to conservation agreements; negligible for critical hbt.
Natural Gas Pipelines	Existing sec.7 consultation	Same as Alternative A	Same as Alternative A	Same as Alternative A
Residential and Community Devel.	No Effect	Same as Alternative A	Same as Alternative A	Same as Alternative A
Road & Bridge Construction & Maint.	No Effect	Same as Alternative A	Same as Alternative A	Same as Alternative A
Agriculture	No Effect	Same as Alternative A	Same as Alternative A	Same as Alternative A
Oil & Gas Drilling	Existing sec.7 consultation	Same as Alternative A	Same as Alternative A	Same as Alternative A
Archaeological and Cultural	No Effect	Same as Alternative A	Same as Alternative A	Same as Alternative A
Environmental Justice	No Effect	Same as Alternative A	Same as Alternative A	Same as Alternative A
Economic Impact	Existing sec.7 consultation	Same as Alternative A	\$14,000-\$234,308	\$24,920-\$417,068

## **6.0 COUNCIL ON ENVIRONMENTAL QUALITY ANALYSIS OF SIGNIFICANCE**

Under the Council on Environmental Quality (CEQ) 40 CFR Part 1508.27, the determination of “significantly” requires consideration of both context and intensity.

### **6.1 Context**

Based upon information present in the Draft Economic Analysis and responses from agencies and the public, any effects, although long-term, will not be national, only regional and mostly local in context. When considered in the context of the value of the economic activity that is predicted to occur over the next 10 years in the region, the total economic costs associated with the total co-extensive section 7 implementation and third party costs for the Colorado butterfly plant appear relatively low.

Additionally, only a portion of the section 7 costs is attributable to critical habitat designation. Even without critical habitat designation, section 7 consultation would be taking place because of the presence of the Colorado butterfly plant. The component of the consultation addressing critical habitat (and associated costs) is only a part of the entire consultation.

### **6.2 Intensity**

Intensity is defined by CEQ as referring to the severity of impact. The following 10 points identified by CEQ were considered in evaluating intensity:

1. **Environmentally Beneficial Actions.** Critical habitat identifies geographic areas that are essential for the conservation of a threatened or endangered species and which may require special management considerations or protection. The designation of critical habitat does not affect land ownership or establish a refuge, wilderness, reserve, preserve, or other conservation area. It does not allow government or public access to private lands. Federal agencies must consult with the Service on activities they undertake, fund, or permit that may affect critical habitat. However, the ESA provides little protection to listed plants located on private property, such as the case for the Colorado butterfly plant. Even so, Federal agencies must consult when their actions may affect the species whether located on private or Federal lands, regardless of whether critical habitat has been designated.
2. **Public Health And Safety.** The Service could identify no areas where the designation of critical habitat would have any discernable impact to public health or safety.

3. **Unique Characteristics of the Geographic Area.** Although the area proposed as critical habitat may be in proximity to historic and cultural sites, parklands, farmland, wetlands, scenic rivers and ecologically critical areas, no adverse impacts will occur to these areas since designation of critical habitat involves no ground-disturbing activities or changes in management.
4. **Controversy.** The scientific identification and understanding of the Colorado butterfly plant is not in dispute. There is a perception by some segments of the public that critical habitat designation will severely limit property rights; however, critical habitat designation has no effect on private actions on private land that do not involve Federal approval or action. As discussed above, Federal agencies must consult with the Service on activities they undertake, fund, or permit that may affect critical habitat. The designation of critical habitat does not affect land ownership or establish a refuge, wilderness, reserve, preserve, or other conservation area. It does not allow government or public access to private lands. Public understanding of critical habitat has improved since initial discussions were began with the potentially affected landowners during May, 2004, as a result of ongoing outreach efforts (e.g., extensive discussions with the Wyoming Stockgrowers Association to facilitate a better understanding of what constitutes a Federal nexus and how a critical habitat designation or conservation agreement may affect private landowners). The Service believes the “controversy” over critical habitat is not the type of controversy that leads to a finding of significance under CEQ guidelines
5. **Uncertain, Unique, or Unknown Risks.** The Service has designated critical habitat for other species in the recent past and is aware of no associated risks not disclosed in this Environmental Assessment. Therefore, the Service anticipates minimal effects to the human environment and is certain this action does not involve any unique or unknown risks.
6. **Precedent-Setting Aspects.** This designation of critical habitat is not expected to set any precedents for future actions with significant effects or represent a decision in principle about a future consideration because the effects of designating critical habitat for the Colorado butterfly plant are no different than the pre-designation circumstance.
7. **Cumulative Effects.** See discussion on page 25, section 5.6.
8. **Cultural Resource Effects.** The Service has not located any properties in the National Register of Historic Places or other cultural sites that would be affected by the designation of critical habitat for this plant.
9. **Endangered Species Effects.** For further discussion see pages 19-20. In general, there will be little or no impact to threatened or endangered species.

**10. Violation of Environmental Protection Laws.** This designation of critical habitat will not violate any Federal, State, or local laws or requirements imposed for the protection of the environment.

## **7.0 CONTACTS AND COORDINATION WITH OTHERS**

All of the private landowners that may be impacted by the proposed critical habitat designation for the Colorado butterfly plant have been notified. The following is a list of individuals, organizations, and public agencies contacted concerning development of this Draft Environmental Assessment and the Proposed Rule to designate critical habitat for the Colorado butterfly plant or to whom copies of this Draft Environmental Assessment were sent. Each of these individuals also will be notified of publication of the final rule:

### **DEPARTMENT OF THE INTERIOR**

U.S. Fish and Wildlife Service

Fish and Wildlife Management Assistance Office, Lander, Wyoming

### **DEPARTMENT OF TRANSPORTATION**

Federal Highway Administration

### **FEDERAL CONGRESSIONAL DELEGATION**

Office of Senator Craig Thomas

Office of Senator Mike Enzi

Office of Representative Barbara Cubin

### **STATE AGENCIES**

Colorado Division of Wildlife

Nebraska Game and Parks Commission

Wyoming Game and Fish Department

Wyoming Department of Agriculture

Wyoming Department of Environmental Quality

Wyoming Board of State Lands Commissioners

Wyoming Department of Transportation

Wyoming Division of State Parks and Historic Sites

Wyoming Department of Commerce

Wyoming State Lands and Farm Loans Office

Wyoming State Lands and Investments Office, State Forestry

Wyoming State Clearinghouse

Wyoming Office of Federal Land Policy

Wyoming Game and Fish Commission

Wyoming Natural Diversity Database

Wyoming Cooperative Fishery and Wildlife Research Unit

Wyoming Oil and Gas Conservation Commission

Wyoming Livestock Board

## GOVERNORS

Wyoming: Dave Freudenthal

Nebraska: Mike Johanns

Colorado: Bill Owens

## STATE LEGISLATIVE MEMBERS

### Senators:

Wyoming: Jim Anderson, Jana Ginter, John Hanes, April Brimmer Kunz, Curt Meier, E. Jayne Mockler, Kathryn Sessions

Nebraska: Philip Erdman

Colorado: Ken Arnold, David T. Owen

### Representatives:

Wyoming: Deborah Alden, Rodney “Pete” Anderson, Floyd A. Esquibel, James C. Hageman, Becket Hinckley, Pete Illoway, Wayne H. Johnson, Larry Meuli,

Layton Morgan, Ed Prosser, Wayne Reese, Tony Ross

Colorado: Tambor Williams

## COUNTY COMMISSIONERS

County Commissioner Laramie and Platte Counties in Wyoming; Weld County in Colorado; and Kimball County in Nebraska

## LOCAL GOVERNMENTS AND PRIVATE GROUPS

City of Fort Collins, Colorado

Colorado Natural Heritage Program

Nebraska Natural Heritage Program

City of Cheyenne, Wyoming

Biodiversity Conservation Alliance

Wyoming Association of Conservation Districts

Wyoming Audubon Society

Wyoming Farm Bureau

Wyoming Stock Growers Association

Wyoming Outdoor Council

Wyoming Wildlife Federation

Wyoming Wool Growers Association

Wyoming Natural Diversity Database

## 8.0 LIST OF CONTRIBUTORS

Tyler Abbott, Fish and Wildlife Biologist  
4000 Airport Parkway  
Cheyenne, Wyoming 82001  
307-772-2374, extension 32

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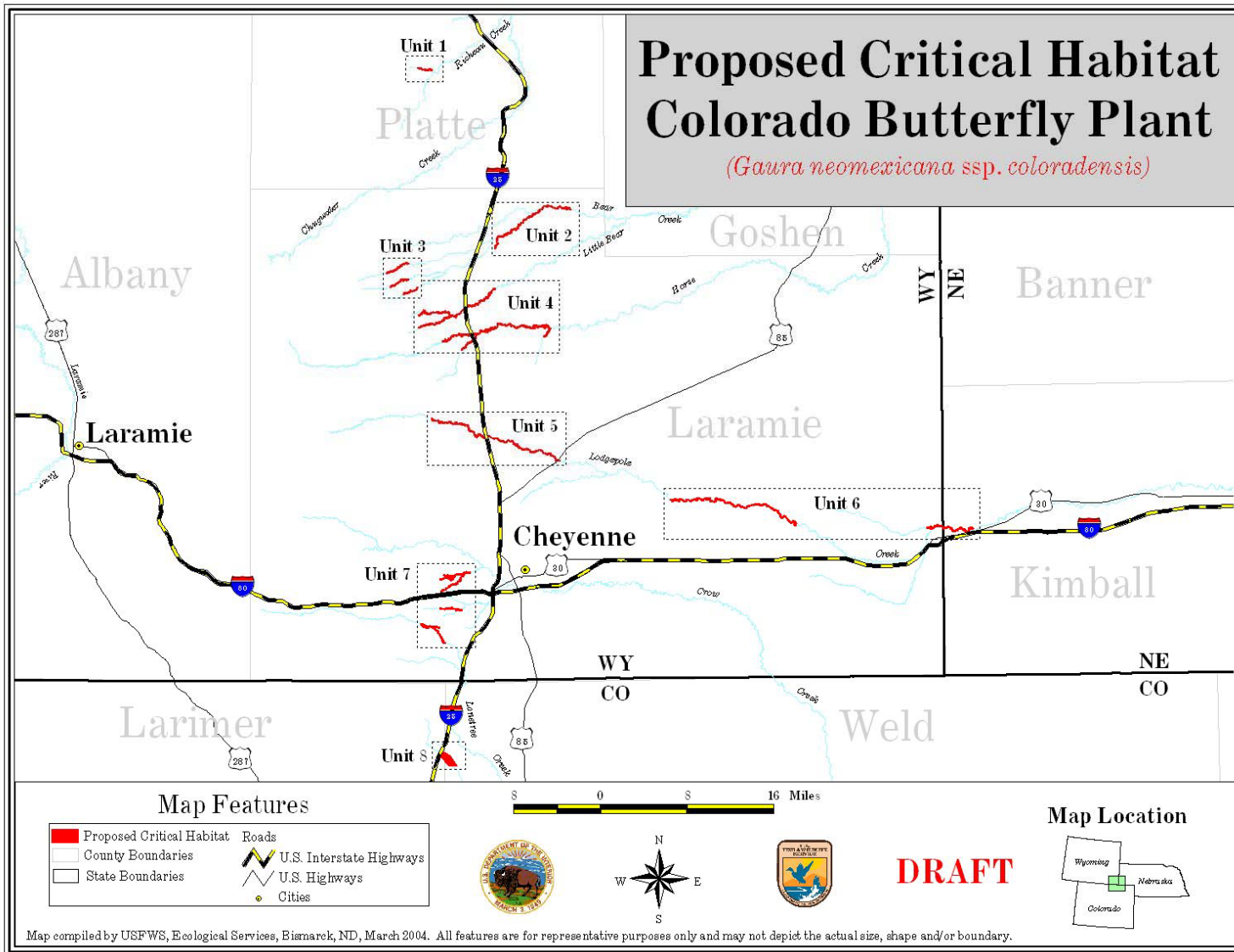
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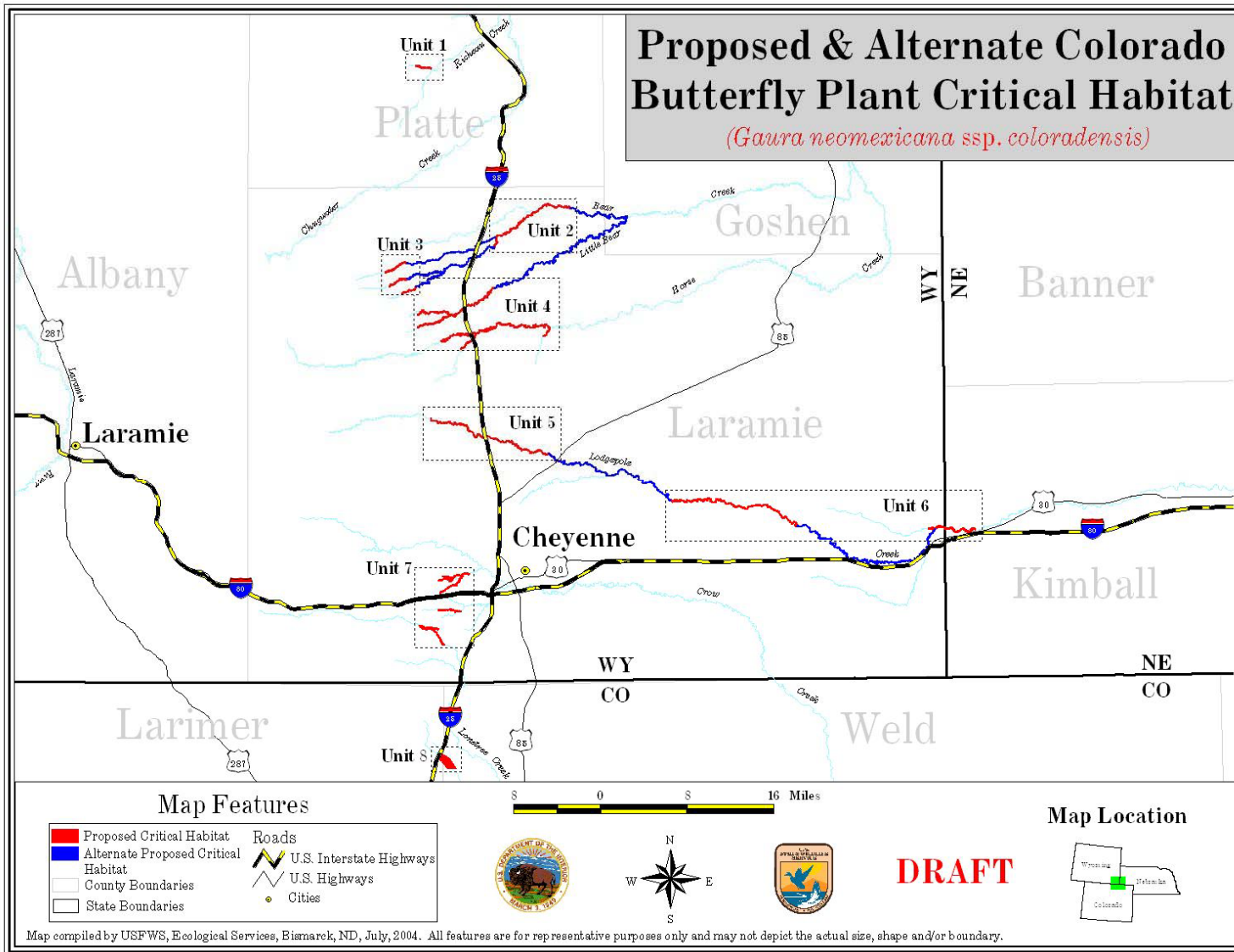


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**APPENDIX 1**  
**Map of Alternative C**  
**Area Proposed as Critical Habitat for Colorado Butterfly Plant**



**APPENDIX 2**  
**Map of Alternative D**  
**Critical Habitat Including Extension Into Unoccupied Habitat**



**APPENDIX 3**

**Draft Economic Analysis of Critical Habitat Designation for the Colorado Butterfly Plant**