

**DRAFT ECONOMIC ANALYSIS OF
CRITICAL HABITAT DESIGNATION
FOR THE COLORADO BUTTERFLY PLANT**

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September 17, 2004

TABLE OF CONTENTS

EXECUTIVE SUMMARY	ES-1
SECTION 1: FRAMEWORK OF THE ANALYSIS	1-1
1.1 Approach to Estimating Economic Effects.....	1-2
1.1.1 Efficiency Effects.....	1-2
1.1.2 Distributional and Regional Economic Effects.....	1-3
1.2 Scope of the Analysis	1-5
1.2.1 Sections of the Act Relevant to the Analysis.....	1-5
1.2.2 Other Relevant Protection Efforts.....	1-6
1.2.3 Additional Analytic Considerations.....	1-6
1.2.4 Benefits	1-6
1.3 Analytic Time Frame	1-7
1.4 Information Sources.....	1-7
SECTION 2: BACKGROUND	2-1
2.1 Species and Designation	2-1
2.1.1 Description of Species	2-1
2.1.2 Description of Designation	2-1
2.1.3 Overlap with other Endangered Species.....	2-5
2.2 Land Use Activities in the Proposed Critical Habitat Designation.....	2-5
SECTION 3: SOCIOECONOMIC PROFILE	3-1
3.1 Economic Profile	3-1
3.1.1 Population Patterns	3-1
3.1.2 Business Patterns	3-3
3.1.3 Employment by Industry	3-4
3.1.4 Income and Unemployment.....	3-8
3.2 Regionally Important Industries	3-8
3.2.1 Military	3-8
3.2.2 Development.....	3-9
3.2.3 Agriculture	3-10

SECTION 4: ECONOMIC IMPACTS	4-1
4.1 Pre-Designation Impacts Associated with Guara	4-2
4.2 Post-Designation Impacts	4-8
4.2.1 Conservation Agreements.....	4-8
4.2.2 Natural Gas Pipelines.....	4-17
4.2.3 Residential and Commercial Development	4-19
4.2.4 Road and Bridge Construction and Maintenance	4-22
4.2.5 Agriculture	4-23
4.2.6 Oil and Gas Drilling.....	4-24
4.3 Summary of Impacts	4-25
4.4 Small Business Impact Analysis.....	4-30
4.5 Potential Impacts to the Energy Industry.....	4-33
REFERENCES	R-1

EXECUTIVE SUMMARY

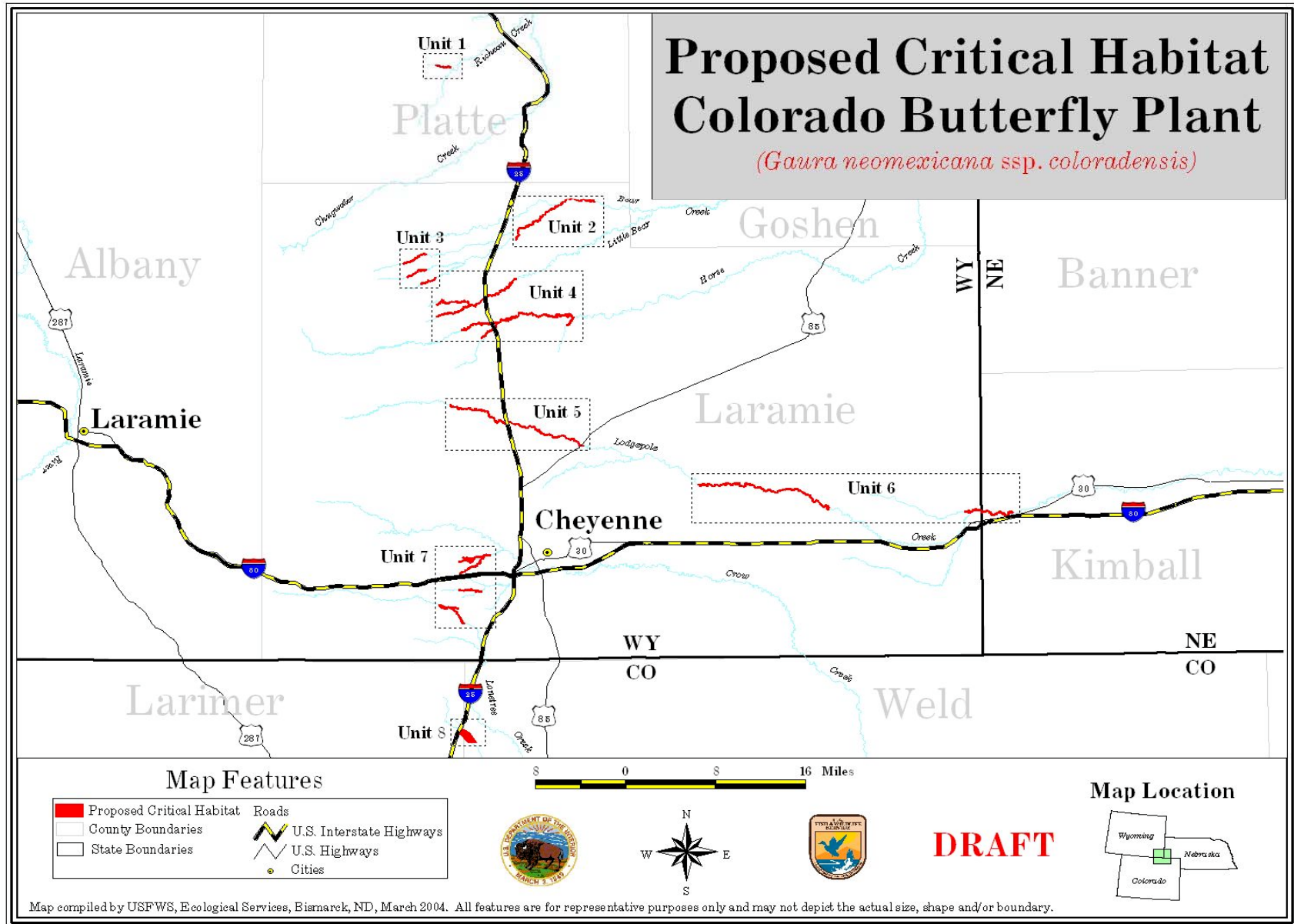
1. The purpose of this report is to assess the potential economic impacts associated with designation of critical habitat for the Colorado butterfly plant (*Gaura neomexicana ssp. coloradensis*). Section 4(b)(2) of the Endangered Species Act (Act) requires the Service to designate critical habitat on the basis of the best scientific data available, after 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 when the benefits of exclusion outweigh the benefits of including the areas within critical habitat, provided the exclusion will not result in extinction of the species.

2. The Colorado butterfly plant (*Gaura*) is a short-lived perennial herb adapted to early and mid-succession riparian habitat. The species is endemic to approximately 1,700 acres of habitat in Laramie and Platte counties, Wyoming, Kimball County, Nebraska, and Weld County, Colorado. As illustrated in Exhibit ES-1 the proposed critical habitat designation includes about 8,486 acres along approximately 113 stream miles within eight units. The upland extent of the proposed critical habitat boundary is 300 feet outward from the center of the stream. The entire designation occurs on non-Federal lands, with the majority occurring on private lands (approximately 80 percent, in terms of acres) managed primarily for agriculture and livestock. The remaining 20 percent is owned by the State of Wyoming (nine percent), the City of Fort Collins (eight percent), and the City of Cheyenne (three percent). The land owned by the City of Fort Collins is also under livestock production.

<i>SUMMARY OF ECONOMIC IMPACTS^a</i>	
Pre-designation costs (2000-2004):	\$260,000 to \$395,000
Post-designation costs (2005-2024):	up to \$286,700
Present value post-designation costs (7 percent):	up to \$232,600
Present value post-designation costs (3 percent)	up to \$257,200
Annualized post-designation costs (7 percent):	up to \$17,300

^a Impact estimates presented in this draft report are smaller in magnitude than the previous draft, primarily due to a change in the area assumed to be impacted per ranch.

3. Because the entire designation is non-Federal land and the primary land use within the proposed designation is cattle ranching and irrigated hay production, the activity that may be most affected by future conservation measures to protect *Gaura* and/or its habitat is ranching. However, agricultural activities on private lands that may adversely impact *Gaura* 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 Act do not apply to threatened plants, there are no requirements for private landowners to bear economic costs to protect *Gaura* from normal agriculture activities that may be damaging to the plant and/or its habitat.



4. There is an ongoing effort by the Service to work cooperatively with private landowners to establish conservation agreements to target specific threats to Gaura on a local scale. The Service believes that the conservation agreements will provide for the conservation needs of Gaura above and beyond what is achievable through the designation of critical habitat while meeting the needs of individual landowners. It is also 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.
5. The primary uncertainty in this economic analysis results from the unknown level of private landowner interest in the conservation agreement program. Because landowner participation in the conservation agreement program is voluntary, and thus uncertain, the impact of conservation measures for Gaura related to agriculture activities is presented as a range. The analysis assumes the upper bound for program participation is all individual landowners within the designation (i.e., 100 percent participation). Conversely, the lower bound on program participation is zero (i.e., no landowners participate in the program). These two scenarios form the upper and lower bounds of economic impact of Gaura conservation.

Results of the Analysis

6. This analysis captures both "pre-designation" (2000 through 2004) and "post-designation" (forecast from 2005 through 2024) economic impacts associated with species and habitat conservation efforts. Total estimated pre-designation costs are estimated to have ranged from \$260,000 to \$395,000. The vast majority of these historic costs, more than 96 percent, are administrative costs associated with the section 7 consultation process. Most of the past consultations were either general in nature (non-species and non-project specific), requests for comments and information from the Service, or findings by the Service of "no effect" or "not likely to adversely affect." Total present value post-designation costs are forecast to be as high as \$232,600, or upwards of \$22,000 annually.
7. Two natural gas pipeline projects, both in the vicinity of in Reach 3 of Unit 7 (Borie), account for approximately ten percent of total forecast costs (\$27,800). Agriculture-related conservation agreements account for the remaining costs (up to \$258,900). Forecast economic impacts to ranchers will be manifested primarily as administrative costs of the consultation process associated with the voluntary conservation agreement program. Specifically, approximately two-thirds of expected costs related to conservation agreements on rangeland are associated with the forecast administrative costs of establishing conservation agreements in 2004. Post-2004 project modification costs associated with the voluntary conservation agreements comprise the remaining one-third of conservation agreement-related costs.¹ Measures to protect the

¹ Twenty-percent of the proposed designation (1,707 acres) is owned by the City of Fort Collins (708 acres), the City of Cheyenne (254 acres), and the State of Wyoming (745). The City of Fort Collins leases its land to a local rancher. This analysis assumes that lands owned by the City of Cheyenne and the State of Wyoming are also leased for ranching, and that the rancher (lessee) bears the costs associated with establishing a conservation agreement.

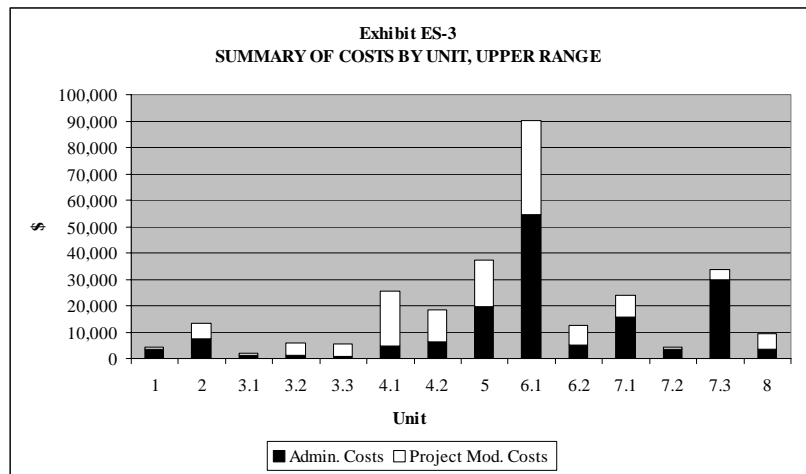
plant and/or its habitat may include the installation of additional fencing and annual costs for supplemental feed, fence repairs and maintenance and herbicide spraying.

8. The analysis expects that ranchers who install fencing to protect the Gaura will participate in a Partners for Fish and Wildlife (PFW) cost share program, and that PFW will pay the entire cost of the fence (materials and installation). Assuming full program participation, private entities are forecast to bear up to 59 percent of the total cost of Gaura conservation, the Service (including the PFW program) is anticipated to bear approximately 38 percent of forecast costs, and Federal agencies other than the Service less than three percent of total costs.

9. Exhibit ES-2 provides a detailed summary of the upper range of total costs associated with conservation activities for Gaura by unit and sub-unit over the next 20 years. Note that less than one consultation is projected for some units due to the fact that some landowners cover more than one unit, and each landowner is only expected to consult once. Exhibit ES-3 provides a graphical representation of the costs.

Exhibit ES-2			
SUMMARY OF COSTS BY UNIT			
Unit	Unit Name	Number of Informal Consultations	Total Costs, Upper Range
1	Tepee Ring Creek	1.0	\$4,300
2	Bear Creek East	2.1	13,300
3.1	Bear Creek West, Reach 1	0.3	1,900
3.2	Bear Creek West, Reach 2	0.3	5,900
3.3	Bear Creek West, Reach 3	0.2	5,400
4.1	Little Bear Creek/Horse Creek, Reach 1	1.3	25,600
4.2	Little Bear Creek/Horse Creek, Reach 2	1.8	18,400
5	Lodgepole Creek West	5.6	37,400
6.1	Lodgepole Creek East, Reach 1	15.6	90,300
6.2	Lodgepole Creek East, Reach 2	1.5	12,700
7.1	Borie, Reach 1	4.5	24,000
7.2	Borie, Reach 2	1.0	4,400
7.3	Borie, Reach 3	2.6	33,700
8	Meadow Springs Ranch (Colorado)	1.0	9,400
TOTAL		39.0	\$286,700

10. On a cost per unit basis the largest portion of forecast costs are expected to occur in Reach 1 of Unit 6, Lodgepole Creek East (32 percent). The next most costly units are Unit 5, Lodgepole Creek West (13 percent), and Reach 3 of Unit 7, Borie (12 percent). Together, these three units account for approximately 56 percent (\$161,400) of forecast costs. These higher costs result from a large area of concentrated subpopulations of Gaura within the unit; these three units contain almost 44 percent (approximately 1,029 acres) of the subpopulations proposed in the designation.



11. The annual cost of Gaura conservation to the typical agriculture operation forecast in this analysis is \$263. Considering this analysis assumes each operation implements all of the actions recommended to protect the species and its habitat, this analysis likely overstates the impacts to any one rancher. However, while the annual cost to the typical agriculture operation forecast in this analysis appears small, costs will vary by operation. In addition, farming and ranching operations in the region are suffering through a fourth year of drought, and their financial situation suggests the average operation is already only marginally profitable.

12. The impact estimates presented in this report are small in magnitude relative to other designations. This is driven by three factors. First, the number of acres of land expected to require special management to protect the Gaura is quite small (less than one-half acre per landowner). Second, the changes in land management required to protect the Gaura are modest (e.g., seasonal restrictions on grazing). Third, a portion of the costs is expected to be borne by Partners for Fish and Wildlife.

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13. The purpose of this analysis is to estimate the economic impact of actions taken to protect the Federally-listed Colorado butterfly plant (*Gaura neomexicana ssp. coloradensis*) (Gaura) and its habitat. It attempts to quantify the economic effects of the designation of critical habitat, as well as any protective measures taken as a result of the listing or other Federal, State, and local laws that aid habitat conservation in the areas proposed for designation. Costs are examined that (a) have been incurred since the date the species was listed and through the final designation of critical habitat (pre-designation costs), and (b) are forecast to occur after the designation is finalized, post-designation costs. This report was prepared by Industrial Economics, Incorporated, in cooperation with Dr. Larry Van Tassell from the University of Idaho,² for the U.S. Fish and Wildlife Service (Service).
14. This information is intended to assist the Secretary in determining whether the benefits of excluding particular areas from the designation outweigh the benefits of including those areas in the designation.³ In addition, this information allows the Service to address the requirements of Executive Orders 12866 and 13211, and the Regulatory Flexibility Act (RFA), as amended by the Small Business Regulatory Enforcement Fairness Act (SBREFA).⁴ This report also complies with direction from the U.S. 10th Circuit Court of Appeals that “co-extensive” effects should be included in the economic analysis to inform decision-makers regarding which areas to designate as critical habitat.⁵
15. This section provides the framework for this analysis. First, it describes the general analytic approach to estimating economic effects, including discussion of both efficiency and distributional effects. Next, it discusses the scope of the analysis, including

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³ Section 4 of the Endangered Species Act (16 U.S.C. §1533(b)(2)).

⁴ Executive Order 12866, “Regulatory Planning and Review,” September 30, 1993; Executive Order 13211, “Actions Concerning Regulations That Significantly Affect Energy Supply, Distribution, or Use,” May 18, 2001; Regulatory Flexibility Act (5 U.S.C. §601 *et seq*); and Small business Regulatory Enforcement Fairness Act of 1996 (Pub Law No. 104-121).

⁵ In 2001, the U.S. 10th Circuit Court of Appeals instructed the Service to conduct a full analysis of all of the economic impacts of proposed critical habitat designation, regardless of whether those impacts are attributable co-extensively to other causes (*New Mexico Cattle Growers Ass’n v. U.S.F.W.S.*, 248 F.3d 1277 (10th Cir. 2001)).

the link between existing and critical habitat-related protection efforts and economic impacts. Finally, it describes the information sources employed to conduct this analysis.

1.1 Approach to Estimating Economic Effects

16. This economic analysis considers both the economic efficiency and distributional effects that may result from species and habitat protection. Economic efficiency effects generally reflect “opportunity costs” associated with the commitment of resources required to accomplish species and habitat conservation. For example, if activities on private lands are limited as a result of the designation or the presence of the species, and thus the market value of the land is reduced, this reduction in value represents one measure of opportunity cost or change in economic efficiency. Similarly, the costs incurred by a Federal action agency to consult with the Service under section 7 represent opportunity costs of habitat conservation.
17. This analysis also addresses the distribution of impacts associated with the designation, including an assessment of any local or regional impacts of habitat conservation and the potential effects of conservation activities on small entities, the energy industry, or governments. This information may be used by decision-makers to assess whether the effects of the designation unduly burden a particular group or economic sector. For example, while habitat conservation activities may have a small impact relative to the national economy, individuals employed in a particular sector of the regional economy may experience a significant level of impact. The difference between economic efficiency effects and distributional effects, as well as their application in this analysis, are discussed in greater detail below.
18. Where data are available, the analysis attempts to capture the net economic impact imposed on regulated entities and the regional economy of Gaura conservation actions. That is, the economic impact of Gaura conservation to the land management agencies and regulated community taking into consideration any direct off-setting benefit they experience.

1.1.1 Efficiency Effects

19. At the guidance of the Office of Management and Budget (OMB) and in compliance with Executive Order 12866 “Regulatory Planning and Review,” Federal agencies measure changes in economic efficiency in order to discern the implications on a societal level of a regulatory action. For regulations specific to the conservation of Gaura, efficiency effects represent the opportunity cost of resources used, or benefits foregone, by society as a result of the regulations. Economists generally characterize opportunity costs in terms of changes in producer and consumer surplus in affected markets.⁶

⁶ For additional information on the definition of “surplus” and an explanation of consumer and producer surplus in the context of regulatory analysis, see Gramlich, Edward M., “A Guide to Benefit-Cost Analysis (2nd Ed.),” Prospect Heights, Illinois: Waveland Press, Inc., 1990; and U.S. Environmental Protection Agency EPA 240-R-00-003, “Guidelines for Preparing Economic Analyses,” September 2000.

20. In some instances, compliance costs may provide a reasonable approximation for the efficiency effects associated with a regulatory action. For example, a landowner or manager may enter into a consultation with the Service to ensure that a particular activity will not adversely modify critical habitat. The effort required for the consultation is an economic opportunity cost, because the landowner or manager's time and effort would have been spent in an alternative activity had his or her land not been designated critical habitat. In the case that compliance activity is not expected to significantly affect markets – that is, not result in a shift in the quantity of a good or service provided at a given price, or in the quantity of a good or service demanded given a change in price – the measurement of compliance costs provides a reasonable estimate of the change in economic efficiency.
21. Where habitat protection measures are expected to significantly impact a market, it may be necessary to estimate changes in producer and consumer surpluses. For example, a designation that precludes the development of large areas of land may shift the price and quantity of housing supplied in a region. In this case, changes in economic efficiency (i.e., social welfare) can be measured by considering changes in producer and consumer surplus in the real estate market.
22. This analysis begins by measuring costs associated with measures taken to protect species and habitat. As noted above, in some cases, compliance costs can provide a reasonable estimate of changes in economic efficiency. In the case of Gaura, compliance costs are in fact expected to represent a reasonable estimate of efficiency effects, and thus impacts on consumer and producer surpluses in affected markets are considered but not estimated.

1.1.2 Distributional and Regional Economic Effects

23. Measurements of changes in economic efficiency focus on the net impact of conservation activities, without consideration of how certain economic sectors or groups of people are affected. Thus, a discussion of efficiency effects alone may miss important distributional considerations. OMB encourages Federal agencies to consider distributional effects separately from efficiency effects.⁷ This analysis considers the potential for several types of distributional effects, including impacts on small entities; impacts on energy supply, distribution, and use; and regional economic impacts. It is important to note that these are fundamentally different measures of economic impact than efficiency effects, and thus cannot be added to or compared with estimates of changes in economic efficiency.

Impacts on Small Entities and Energy Supply, Distribution, and Use

24. This analysis considers how small entities, including small businesses, organizations, and governments, as defined by the RFA, may be affected by proposed critical habitat designation.⁸ In addition, in response to Executive Order 13211 “Actions

⁷ U.S. Office of Management and Budget, “Circular A-4,” September 17, 2003.

⁸ Regulatory Flexibility Act (5 U.S.C. §601 *et seq.*)

Concerning Regulations That Significantly Affect Energy Supply, Distribution, or Use,” this analysis considers the impacts of critical habitat on the energy industry and its customers.⁹ While small business impacts are discussed, significant impacts on the energy sector are not expected.

Regional Economic Effects

25. Regional economic impact analysis can provide an assessment of the potential localized effects of conservation measures. Specifically, regional economic impact analysis produces a quantitative estimate of the potential magnitude of the initial change in the regional economy resulting from a regulatory action. Regional economic impacts are commonly measured using input/output models. These models rely on multipliers that represent the relationship between a change in one sector of the economy (e.g., expenditures by recreationists) and the effect of that change on economic output, income, or employment in other local industries (e.g., suppliers of goods and services to recreationists). These economic data provide a quantitative estimate of the magnitude of shifts of jobs and revenues in the local economy.
26. The use of regional input/output models in an analysis of the impacts of species and habitat conservation efforts can overstate the long-term impacts of a regulatory change. Most importantly, these models provide a static view of the economy of a region. That is, they measure the initial impact of a regulatory change on an economy but do not consider long-term adjustments that the economy will make in response to this change. For example, these models provide estimates of the number of jobs lost as a result of a regulatory change, but do not consider re-employment of these individuals over time or other adaptive responses by affected businesses. In addition, the flow of goods and services across the regional boundaries defined in the model may change as a result of the regulation, compensating for a potential decrease in economic activity within the region.
27. Despite these and other limitations, in certain circumstances regional economic impact analysis may provide useful information about the scale and scope of localized impacts. It is important to remember that measures of regional economic effects generally reflect shifts in resource use rather than efficiency losses. Thus, these types of distributional effects are reported separately from efficiency effects (i.e., not summed). In addition, measures of regional economic impact cannot be compared with estimates of efficiency effects, but should be considered as distinct measures of impact.
28. A Regional economic analysis was not performed in this economic analysis. The extent to which regional economic impacts are realized depends largely on whether a significant number of projects are fundamentally altered. For example, impacts to the cattle industry depends on whether recommended project modifications substantially reduce output within economic sectors below that which would be seen in the absence of Gaura conservation. As explained in Section 4, almost all of the forecast impacts are to the ranching community, and the examination of potential grazing impacts indicated no

⁹ Executive Order 13211, “Actions Concerning Regulations That Significantly Affect Energy Supply, Distribution, or Use,” May 18, 2001.

reductions in grazing opportunity or livestock production. Therefore, this analysis assumes that regional economic impacts associated with ranching activities will be small in the context of the overall economy of the five counties surrounding the proposed critical habitat designation.

1.2 Scope of the Analysis

29. This analysis attempts to quantify the economic effects of the designation of critical habitat, *as well as the economic effects of the protective measures taken as a result of the listing of the Gaura or other Federal, State, and local laws that also aid habitat conservation in the areas proposed for designation.* Because habitat protection efforts affording protection to Gaura likely contribute to the efficacy of the proposed critical habitat designation efforts, the impacts of these actions may be considered relevant for understanding the full impact of proposed designation.

1.2.1 Sections of the Act Relevant to the Analysis

30. The analysis begins by looking at the costs incurred since the time that Gaura was first listed in October 2000 and through the time of the final designation of critical habitat. It focuses on activities that are influenced by the Service through sections 4, 7, 9, and 10 of the Act. It then looks at activities likely to occur post-designation, and quantifies the effects that sections 4, 7, 9, and 10 of the Act may have on those activities.
31. Section 4 of the Act focuses on the listing and recovery of endangered and threatened species, as well as the designation of critical habitat. According to section 4, the Secretary is required to list species as endangered or threatened “solely on the basis of the best available scientific and commercial data.”¹⁰ The protections afforded to threatened and endangered species and their habitat are described in sections 7, 9, and 10 of the Act, and economic impacts resulting from these protections are the focus of this analysis:
- Section 7 of the Act requires Federal agencies to consult with the Service to ensure that any action authorized, funded, or carried out will not likely jeopardize the continued existence of any endangered or threatened species or result in the destruction or adverse modification of the species' designated critical habitat. The administrative costs of these consultations, along with the costs of project modifications resulting from these consultations, represent compliance costs associated with the listing of the species and the designation of critical habitat.
 - Section 9 defines the actions that are prohibited by the Act. In particular, it prohibits the “take” of endangered wildlife, where “take” means to “harass, harm, pursue, or collect, or to attempt to engage in any such conduct.” The economic impacts associated with this section manifest

¹⁰ Section 4 of the Endangered Species Act (16 U.S.C. §1533(b)(1)(A)).

themselves in sections 7 and 10. However, the prohibition against "take" generally does not apply to plants.

- Under section 10(a)(1)(B) of the Act, an entity (i.e., a landowner or local government) may develop a Habitat Conservation Plan (HCP) for an endangered animal species in order to meet the conditions for issuance of an incidental take permit in connection with the development and management of a property.¹¹ To the extent that the project or development of an associated HCP may affect a listed plant species the Service must consult with the developer of the HCP on the potential impacts to the plant. The requirements posed by the HCP may have economic impacts associated with the goal of ensuring that the effects of incidental take are adequately minimized and mitigated. The designation of critical habitat does not require completion of an HCP; however, the designation may influence conservation measures provided under HCPs. Public and private lands covered by an operative HCP may be excluded from critical habitat designation; however, no HCPs are in place for Gaura. Federal agencies by agreement can be the lead agency on a multi-jurisdictional HCP.

1.2.2 Other Relevant Protection Efforts

32. The protection of listed species and habitat is not limited to the Act. Other Federal agencies, as well as State and local governments, may also seek to protect the natural resources under their jurisdiction. In addition, under certain circumstances, the designation of critical habitat may provide new information to a community about the sensitive ecological nature of a geographic region, potentially triggering additional economic impacts under other State or local laws. In cases where these costs may not have been triggered absent the designation of critical habitat, they are included in this economic analysis. However, no such costs were identified by this analysis.

1.2.3 Additional Analytic Considerations

33. Previous economic impact analyses prepared to support critical habitat decisions have considered other types of economic impacts related to the critical habitat designation, including time delay, regulatory uncertainty, and stigma impacts. This analysis considers these types of economic impacts and has determined that the proposed habitat designation for Gaura is unlikely to have economic impacts of this nature.

1.2.4 Benefits

34. The published economics literature has documented that real social welfare benefits can result from the conservation and recovery of endangered and threatened species. Such benefits have also been ascribed to preservation of open space and biodiversity, both of which can be associated with species conservation, but which are

¹¹ U.S. Fish and Wildlife Service, "Endangered Species and Habitat Conservation Planning." From: <http://endangered.fws.gov/hcp/>, as viewed on August 6, 2002.

not the purpose of critical habitat. Likewise, regional economies and communities can benefit from the preservation of healthy populations of endangered and threatened species, and the habitat on which these species depend.

35. In Executive Order 12866, OMB directs Federal agencies to provide an assessment of costs and benefits of a proposed regulatory actions.¹² However, in its guidance for implementing Executive Order 12866, OMB acknowledges that often, it may not be feasible to monetize, or even quantify, the benefits of environmental regulations. Where benefits cannot be quantified, OMB directs agencies to describe the benefits of a proposed regulation qualitatively. *Given the limitations associated with estimating the benefits of proposed critical habitat designation for Gaura, the Service believes that the benefits of proposed critical habitat designation are best expressed in biological terms that can be weighed against the expected cost impacts of the rulemaking. This discussion can be found in the preamble to the final rulemaking.*

1.3 Analytic Time Frame

36. The analysis examines activities taking place both within and adjacent to the proposed designation. Estimates of post-designation impacts are based on activities that are “reasonably foreseeable,” including, but not limited to, activities that are currently authorized, permitted, or funded, or for which proposed plans are currently available to the public. The analysis estimates economic impacts to activities from 2004 (anticipated year of species’ final listing) to 2024, (twenty years from the present).

1.4 Information Sources

37. The following organizations were consulted in the preparation of this report:

- U.S. Fish and Wildlife Service (Service)
- Partners for Fish and Wildlife (PFW)
- Federal Energy and Regulatory Commission (FERC)
- Natural Resource Conservation Service (NRCS)
- U.S. Army Corps of Engineers (USACE)
- Colorado Department of Transportation (CDOT)
- Nebraska Department of Roads (NDOR)
- Wyoming Department of Transportation (WYDOT)
- Federal Highway Administration (FHWA)
- Wyoming Governor’s office
- Wyoming Association of Conservation Districts
- Laramie County Planning Department
- Laramie County Conservation District
- Wyoming Department of Environmental Quality
- Cheyenne Metropolitan Planning Organization
- City of Cheyenne Development Office

¹² Executive Order 12866, “Regulatory Planning and Review,” September 30, 1993.

- Platte County Planning Department
- Weld County Planning Department
- Larimer County Planning Department
- Larimer County Parks and Open Lands
- Kimball County
- City of Fort Collins
- BioResources, Inc.
- El Paso Company
- Natural Resource Group, Inc.
- Entrega Pipeline Company
- Cheyenne Plains Gas Pipeline Company
- Colorado Oil and Gas Conservation Commission
- Wyoming Oil and Gas Conservation Commission
- Petroleum Association of Wyoming
- Four ranchers in Laramie County that own land within the proposed critical habitat designation area
- One rancher in Laramie County that does not own land within the proposed designation area
- Wyoming Stockgrowers Association
- Wyoming Farm Bureau
- Wyoming Woolgrowers
- Wyoming Department of Agriculture
- Laramie County Cooperative Extension
- University of Wyoming

38. The Service has proposed to designate critical habitat for the proposed Federally listed Colorado butterfly plant (*Gaura neomexicana ssp. coloradensis*). Gaura is a short-lived perennial herb adapted to early and mid-succession riparian habitat. The species is endemic to approximately 1,700 acres (ac) of habitat in Laramie and Platte counties, Wyoming, western Kimball County, Nebraska, and Weld County, Colorado. This section provides background on the geography, ecology, and human-uses of the proposed critical habitat designation. It details the current state of the proposed lands, including a description of management activities, land ownership, and ecology of the area.

2.1 **Species and Designation**¹³

2.1.1 **Description of Species**

39. Gaura is a short-lived perennial herb with one to several reddish, pubescent stems from 50-80 centimeters tall. Lower leaves are lance-shaped with smooth or wavy-toothed margins. The inflorescence, located above the leaves, consists of numerous branches that continue to grow throughout the flowering season. Only a few flowers are open at any one time, located below the rounded buds and above the maturing fruits on each flowering branch. Individual flowers are 1-1.5 cm long with four reddish sepals and four white petals that turn pink or red with age. Flowers have a slightly irregular symmetry due to the downward curve of the eight stamens. The hard, nut-like fruits are 4-angled and sessile. Non-flowering plants consist of a prostrate rosette of oblong, mostly glabrous, entire or toothed leaves 4-18 cm long.

2.1.2 **Description of Designation**

40. The proposed critical habitat designation includes approximately 8,486 ac along approximately 113 stream miles within eight units (see Exhibit 2-1). The upland extent of proposed critical habitat boundary is defined as 300 feet from the center of the stream. Of the known Gaura populations, the vast majority occur on private lands managed primarily

¹³ Draft Proposed Designation of Critical Habitat for the Colorado Butterfly Plant (*Gaura neomexicana ssp. coloradensis*).

for agriculture and livestock. The estimated land ownership within the proposed critical habitat boundaries is approximately 6,779 ac of private land, 962 ac of city (City of Cheyenne and the City of Fort Collins) land, and 745 ac of land owned by the State of Wyoming. Exhibit 2-2 provides a map of the designation area.¹⁴

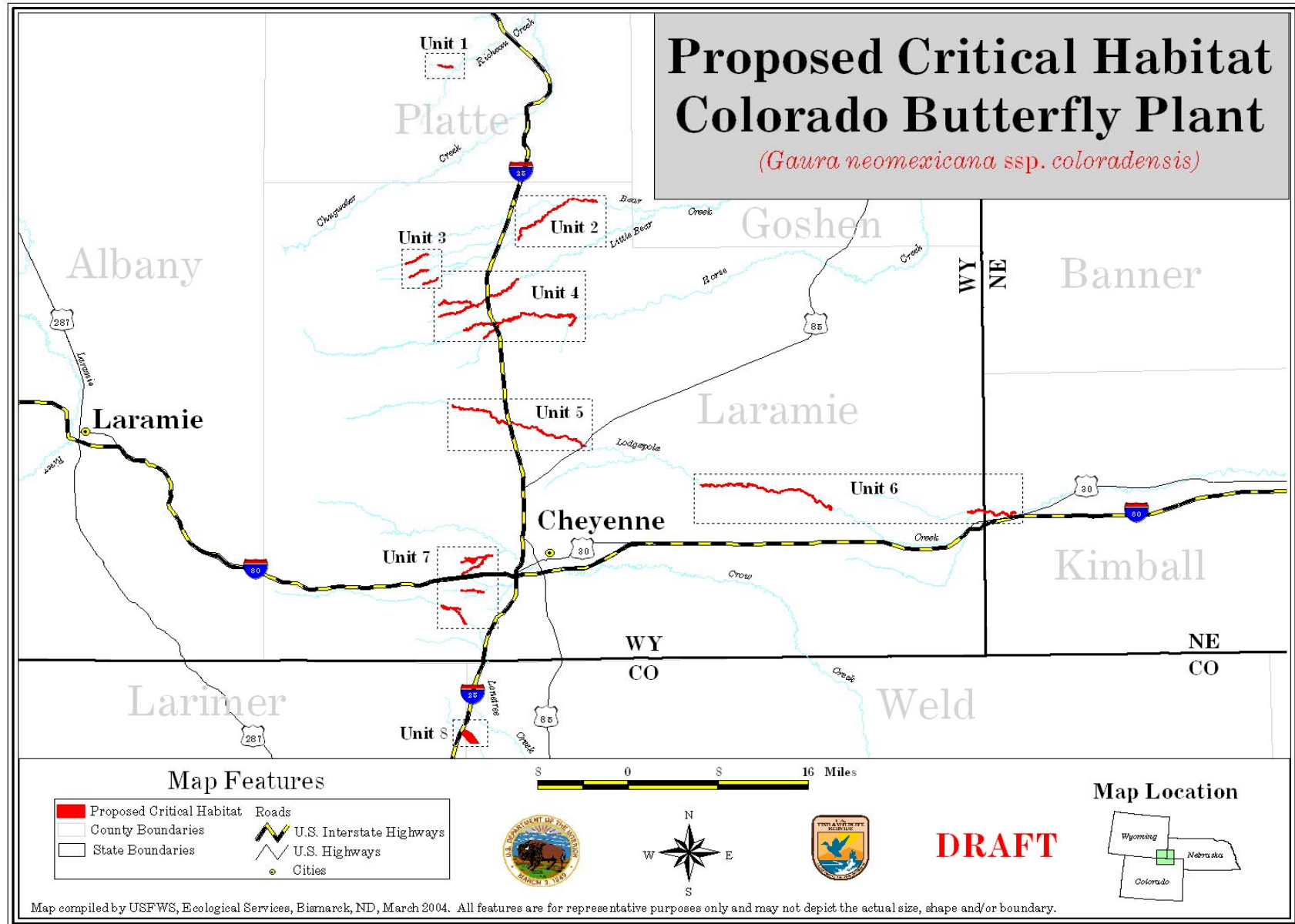
EXHIBIT 2-1				
PROPOSED CRITICAL HABITAT UNITS				
Unit No.	Unit Name	Acres	Length (miles)	Percent of Habitat Containing Concentrated Subpopulations
1	Tepee Ring Creek	106.9	1.5	13%
2	Bear Creek East	800.7	11.2	13%
3.1	Bear Creek West, Reach 1	125.6	1.8	11%
3.2	Bear Creek West, Reach 2	174.2	2.6	49%
3.2	Bear Creek West, Reach 3	200.1	2.9	42%
4.1	Little Bear Creek/Horse Creek, Reach 1	1,402.9	15.6	27%
4.2	Little Bear Creek/Horse Creek, Reach 2	1,077.0	20.5	20%
5	Lodgepole Creek West	1,066.8	15.0	30%
6.1	Lodgepole Creek East, Reach 1	1,188.6	16.9	54%
6.2	Lodgepole Creek East, Reach 2	494.2	7.9	27%
7.1	Borie, Reach 1	616.3	9.4	24%
7.2	Borie, Reach 2	174.2	2.5	10%
7.3	Borie, Reach 3	350.8	5.4	19%
8	Meadow Springs Ranch (Colorado)	707.5	n/a	15%
	TOTAL	8,486	113	27%

41. Not all of the areas within the extant boundaries of the proposed designation provide the primary constituent elements necessary for this species. Existing features and structures within proposed critical habitat, such as buildings, roads, parking lots, 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 proposed for critical habitat.¹⁵ Therefore, Federal actions with effects limited to the areas that do not contain the primary constituent elements would not be subject to section 7 consultation. Within the proposed critical habitat boundaries, only lands containing some or all of the primary constituent elements are proposed as critical habitat.

¹⁴ See the Draft Proposed Designation of Critical Habitat for the Colorado Butterfly Plant (*Gaura neomexicana ssp. coloradensis*) for a more detailed description of the units and more detailed maps of the units.

¹⁵ See the Draft Proposed Designation of Critical Habitat for the Colorado Butterfly Plant (*Gaura neomexicana ssp. coloradensis*) for a description of the primary constituent elements.

42. Non-Federal public and private lands covered by an operative HCP may be excluded from critical habitat designation, however, no HCPs are in place for Gaura. Furthermore, none of the habitat supporting populations located on F.E. Warren Air Force Base (WAFB) will be designated as critical habitat. WAFB has an approved Integrated Natural Resources Management Plan (INRMP) that addresses conservation needs of Gaura. Additionally, the INRMP incorporates the needs of this species in conjunction with those of Preble's meadow jumping mouse (*Zapus hudsonius preblei*) (Preble's) on the Base.



2.1.3 Overlap with other Endangered Species

43. There are known populations of Preble's in the vicinity of Gaura populations, but none of the proposed critical habitat designation for Gaura overlaps with the designated critical habitat for Preble's. However, non-designated Preble's habitat does overlap the proposed Gaura designation. Both species generally occupy similar riparian habitat, but different zones within the riparian habitat. Preble's typically requires dense riparian vegetation consisting of grasses, forbs, and shrubs,¹⁶ while Gaura requires open riparian habitat, devoid of dense or overgrown vegetation. In the absence of occasional disturbance, Gaura's habitat can become choked out by dense vegetative growth.¹⁷
44. The Service has conducted past consultations on Gaura in combination with numerous species, as indicated in Exhibit 2-3. Generally, if a consultation is triggered for any listed species, the consultation process will also take into account all other listed species known or thought to occupy areas on or near the project lands. As such, listing or critical habitat-related protections for other threatened or endangered species may benefit Gaura as well (i.e., provide baseline protection). However, due to the difficulty in apportioning the costs of consultations between various species as well as awareness that a consultation for Gaura would need to be conducted absent consultations for or involving other species, this analysis does not attempt to apportion the consultations and related costs reported by Action agencies between Gaura and other listed species, and assumes that all future section 7 consultations within the extant boundaries of the proposed critical habitat are fully attributable to the presence of the Gaura and its habitat. At the same time, it should be recognized that these multi-species consultations likely would have occurred if the Gaura was not listed. These costs, therefore, are cumulatively not additive.

2.2 Land Use Activities in the Proposed Critical Habitat Designation

45. The Service has identified the following activities that may occur within the proposed critical habitat designation as potentially affecting the conservation status of the species or habitat: commercial and private development, road construction and maintenance, utility and pipeline development, domestic livestock grazing, hay production, nonnative vegetation and insect control.

¹⁶ Federal Register, "Endangered and Threatened Wildlife and Plants: Designation of Critical Habitat for the Preble's Meadow Jumping Mouse (*Zapus hudsonius preblei*)," Vol. 68, No. 120, page 37278.

¹⁷ Draft Proposed Designation of Critical Habitat for the Colorado Butterfly Plant (*Gaura neomexicana* ssp. *coloradensis*).

EXHIBIT 2-3

**OTHER LISTED SPECIES INCLUDED IN PAST CONSULTATIONS
ON GAURA**

Species	Status
Bald eagle (<i>Haliaeetus leucocephalus</i>)	Threatened
Whooping Crane (<i>Grus americana</i>)	Experimental Population, Non-Essential
Black-footed ferret (<i>Mustela nigripes</i>)	Endangered
Mountain plover (<i>Charadrius montanus</i>) ¹	Proposed, Threatened
Ute Ladies-tresses (<i>Spiranthes diluvialis</i>)	Threatened
Swift fox (<i>Vulpes velox</i>) ²	Candidate
Peregrine falcon (<i>Falco peregrinus</i>)	Endangered
¹ The mountain plover was withdrawn on September 9, 2004 (68 FR 53083).	
² The swift fox was removed from candidate status on January 8, 2001 (66 FR 1295).	

46. This section summarizes key economic and demographic information for the counties likely to be impacted by the proposed critical habitat designation for Gaura. County level data are presented to provide context for the discussion of economic impacts and to illuminate trends that may influence these impacts. Because approximately 85 percent of the acreage proposed for designation is located in Laramie County, Wyoming, the description focuses more on socioeconomic conditions in Laramie County that may be affected. A small area (Unit 1) has been proposed for designation in southern Platte County, Wyoming, but agricultural activities and other socioeconomic conditions in that area closely resemble those in nearby Laramie County. Relatively small amounts of acreage also have been proposed for designation in extreme western Nebraska (part of Unit 6) and extreme northern Colorado (Unit 8), but socioeconomic conditions in those areas closely resemble those of Laramie County.
47. To provide context and comparison for the economic analysis, this section first provides demographic information for the broader study area, Laramie and Platt counties in Wyoming, Weld County in Colorado, and Kimball County in Nebraska. This section also provides information for the City of Cheyenne, Wyoming, which is the largest populated area in the vicinity of the proposed critical habitat designation. Cheyenne, the County Seat of Laramie County, is the regional trade center for all areas proposed for critical habitat designation for the Gaura. The analysis also presents demographic information for Larimer County, Colorado, as Unit 8 abuts the Larimer/Weld county line and the landowner (the City of Fort Collins) is located in Larimer County. This section then details economic activities taking place within and surrounding the proposed critical habitat designation.

3.1 Economic Profile

3.1.1 Population Patterns

48. The proposed critical habitat designation spans urban Wyoming (i.e., the City of Cheyenne) and rural areas within Wyoming, Colorado and Nebraska. Exhibit 3-1 presents the population size, change in population from 1990 to 2003, and forecasted population growth for the geographic area of concern.

49. 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, or about 17 percent of the total Wyoming population of 501,200 persons as of that date.¹⁸ The population of Laramie County has increased by about 2,500 persons, or three 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 reside in Cheyenne. In 2002, the population of Cheyenne was 53,658, an increase of 1.1 percent (589 individuals) since 2000.¹⁹
50. The remainder of Laramie County is largely rural, with the small communities of Albin (pop. 120), Burns (pop. 290), and Pine Bluffs (pop. 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. As Exhibit 3-1 illustrates, all of the counties surrounding the proposed critical habitat designation are forecast to experience population growth.

¹⁸ Population and income estimates are by the Wyoming Department of Administration, Economic Analysis Division. From: <http://eadiv.state.wy.us/pop.htm>, as viewed on June 30, 2004.

¹⁹ U.S. Census Bureau, "Incorporated Place Population Estimates and Population Change, Sorted within County: April 1, 2000 to July 1, 2002." From: <http://eire.census.gov/popest/data/cities/subtab12.php>, as viewed on June 30, 2004.

EXHIBIT 3-1

SOCIOECONOMIC PROFILE OF COUNTIES CONTAINING CRITICAL HABITAT FOR THE COLORADO BUTTERFLY PLANT

State	County	Population 2003 ^a	Percent of State Population	Percent Change 1990-2003 ^b	Population Forecast ^c	Forecast Year	Annual Growth Rate
Wyoming	State	501,242	100%	10.5%	513,930	2010	0.38%
	Laramie	84,083	16.8%	15.0%	86,630	2010	0.42%
	Platte	8,628	1.7%	5.9%	9,150	2010	0.84%
Colorado	State	4,550,688	100%	38.1%	7,156,422	2030	1.69%
	Larimer	266,610	5.9%	43.2%	441,904	2030	1.89%
	Weld	211,272	4.6%	60.3%	473,275	2030	3.03%
Nebraska	State	1,739,291	100%	10.2%	2,085,210	2020	1.07%
	Kimball	3,853	0.2%	-6.2%	4,017	2020	0.25%

Source:

^a U.S. Census Bureau, "Annual Estimates of the Population for Counties: April 1, 2000 to July 1, 2003." From: <http://eire.census.gov/popest/data/counties/CO-EST2003-01.php>, as viewed on June 30, 2004.

^b U.S. Census Bureau, "Time Series of State Intercensal Population Estimates by County, April 1, 1990 to April 1, 2000." From: <http://eire.census.gov/popest/data/counties/tables/CO-EST2001-12.php>, as viewed on June 30, 2004.

^c Wyoming Department of Administration and Information, Economic Analysis Division, "Wyoming Population Estimates and Forecasts for Counties, Cities, and Towns: 1991 to 2010." Available at <http://eadiv.state.wy.us/pop/Wyc&sc10.pdf>

Colorado Division of Local Government, Demography Office, "Draft Population Forecasts by County, 2000-2030." From: <http://dola.colorado.gov/demog/PopulationTotals.cfm>, as viewed on June 30, 2004.

University of Nebraska-Lincoln, College of Business Administration, Bureau of Business Research, Population Projections, "Kimball County by Age Group." From: <http://www.bbr.unl.edu/PopProjections/PopProj.html>, as viewed on June 30, 2004.

3.1.2 Business Patterns

51. The U.S. Census Bureau provides information on annual payrolls and the number of businesses within county industries. In 2001, the principal industries within the geographic area of concern, in terms of annual payroll, included manufacturing, construction, health care and social assistance, and retail trade. Annual payroll within these industries totaled approximately \$3 billion, representing 56 percent of the total county payroll.

52. Within Laramie County, Wyoming, the principal industries included health care and social assistance, retail trade, manufacturing, construction, and finance and insurance. Annual payroll within these industries totaled approximately \$425 million, representing 62 percent of the total county payroll. Except for construction, these industries are unlikely to be impacted by the proposed designation. Exhibit 3-2 below highlights annual payroll for various industries by county and in total.

3.1.3 Employment by Industry

53. Exhibit 3-3 provides data on the number of industries located in the geographic area of concern, and Exhibit 3-4 summarizes the employment by industry. The reported number of establishments represents the total number of physical locations at which business activities are conducted with one or more paid employee in the year 2001. These figures provide a measure of the average density of commercial and industrial establishments in the region. More than 15,000 business establishments operate and employ more than 330,000 individuals in the counties. As reported in Exhibit 3-2, these businesses had a collective annual payroll of almost \$5.5 billion.
54. Within the counties encompassing the proposed designation, the largest employment sectors are government and government enterprises, retail trade, manufacturing, construction, health care and social assistance, and accommodation and food services. These industries employ more than 200,000 individuals, representing 61 percent total county employment. The largest single employer is the government and government enterprises sector, employing 55,000 individuals, or almost 17 percent of county employment.
55. Employment within the government and government enterprises sector represented almost 30 percent of the job base in Laramie County (almost 16,000 jobs). Employment within the retail trade sector constituted approximately 14 percent of all jobs in the county, while accommodation and food services, health care and social assistance, and construction each accounted for about 6 to 7 percent of employment. In Cheyenne, one out of every three employees works for the government.²⁰ F.E. Warren Air Force Base, with about 4,200 military and civilian employees, the Federal government, with more than 3,000 non-military employees, and the state government, also with more than 3,000 employees, account for the large volume of government employment.²¹

²⁰ Francis E. Warren Air Force Base, "Community/Wyomingites." From: <http://www.militarynewcomers.com/FEWARREN03/Resources/Community.html>, as viewed on June 30, 2004.

²¹ Greater Cheyenne Chamber of Commerce, "Community Information." From: <http://www.cheyennechamber.org/website/community/index.asp>, as viewed on June 30, 2004.

EXHIBIT 3-2

ECONOMIC ACTIVITY BY COUNTY: ANNUAL PAYROLL (2001)

Industry	Laramie County, Wyoming		Platte County, Wyoming		Kimball County, Nebraska		Larimer County, Colorado		Weld County, Colorado		Total	
	\$1,000s	%	\$1,000s	%	\$1,000s	%	\$1,000s	%	\$1,000s	%	\$1,000s	%
Forestry, fishing, hunting, and agriculture support	0	0.0%	0	0.0%	0	0.0%	1,297	0.0%	1,875	0.1%	3,172	0.1%
Mining	9,123	1.3%	0	0.0%	3,200	11.7%	8,173	0.3%	36,376	2.0%	56,872	1.0%
Utilities	7,259	1.1%	0	0.0%	0	0.0%	14,030	0.5%	16,209	0.9%	37,498	0.7%
Construction	58,529	8.6%	1,986	3.7%	447	1.6%	335,611	11.7%	327,866	18.4%	724,439	13.4%
Manufacturing	59,937	8.8%	2,326	4.4%	0	0.0%	599,669	20.8%	340,096	19.1%	1,002,028	18.5%
Wholesale trade	31,377	4.6%	1,430	2.7%	1,848	6.8%	115,758	4.0%	103,175	5.8%	253,588	4.7%
Retail trade	106,653	15.6%	6,054	11.4%	3,680	13.5%	341,344	11.9%	177,914	10.0%	635,645	11.7%
Transportation & warehousing	25,871	3.8%	1,566	2.9%	317	1.2%	46,274	1.6%	44,169	2.5%	118,197	2.2%
Information	37,973	5.6%	0	0.0%	0	0.0%	133,149	4.6%	22,109	1.2%	193,231	3.6%
Finance & insurance	53,529	7.8%	2,296	4.3%	1,481	5.4%	119,701	4.2%	175,734	9.9%	352,741	6.5%
Real estate & rental & leasing	8,024	1.2%	243	0.5%	0	0.0%	48,450	1.7%	17,158	1.0%	73,875	1.4%
Professional, scientific & technical services	38,054	5.6%	888	1.7%	410	1.5%	269,164	9.4%	65,730	3.7%	374,246	6.9%
Management of companies & enterprises	8,805	1.3%	0	0.0%	0	0.0%	13,230	0.5%	85,645	4.8%	107,680	2.0%
Admin, support, waste mgt, remediation services	16,528	2.4%	8,111	15.2%	0	0.0%	167,415	5.8%	82,685	4.6%	274,739	5.1%
Educational services	2,950	0.4%	0	0.0%	2,471	9.0%	19,557	0.7%	8,571	0.5%	33,549	0.6%
Health care and social assistance	146,463	21.4%	2,873	5.4%	2,602	9.5%	337,327	11.7%	183,083	10.3%	672,348	12.4%
Arts, entertainment & recreation	3,087	0.5%	1,139	2.1%	451	1.7%	17,702	0.6%	6,402	0.4%	28,781	0.5%
Accommodation & food services	40,855	6.0%	0	0.0%	0	0.0%	147,531	5.1%	45,833	2.6%	234,219	4.3%
Other services	27,097	4.0%	0	0.0%	0	0.0%	82,771	2.9%	39,429	2.2%	149,297	2.8%
Auxiliaries	0	0.0%	0	0.0%	0	0.0%	57,021	2.0%	1,641	0.1%	58,662	1.1%
Unclassified establishments	734	0.1%	0	0.0%	0	0.0%	3,165	0.1%	1,838	0.1%	5,737	0.1%
Total	683,239	100.0%	53,241	100.0%	27,311	100.0%	2,878,339	100.0%	1,783,538	100.0%	5,425,668	100.0%

Source: U.S Census Bureau, "CenStats Databases, County Business Patterns Data (NAICS) 2001." From: <http://censtats.census.gov>, as viewed on June 30, 2004.

EXHIBIT 3-3

ECONOMIC ACTIVITY BY COUNTY: NUMBER OF ESTABLISHMENTS (2001)

Industry	Laramie County, Wyoming		Platte County, Wyoming		Kimball County, Nebraska		Larimer County, Colorado		Weld County, Colorado		Total	
	Number	%	Number	%	Number	%	Number	%	Number	%	Number	%
Forestry, fishing, hunting, and agriculture support	4	0.2%	3	1.1%	1	0.7%	21	0.3%	20	0.5%	49	0.3%
Mining	18	0.8%	3	1.1%	19	12.7%	30	0.4%	55	1.3%	125	0.8%
Utilities	8	0.3%	4	1.4%	1	0.7%	13	0.2%	17	0.4%	43	0.3%
Construction	273	11.6%	28	9.8%	7	4.7%	1,169	14.3%	736	17.2%	2,213	14.5%
Manufacturing	54	2.3%	14	4.9%	6	4.0%	395	4.8%	240	5.6%	709	4.7%
Wholesale trade	87	3.7%	8	2.8%	7	4.7%	323	4.0%	235	5.5%	660	4.3%
Retail trade	360	15.3%	43	15.1%	32	21.3%	1,243	15.2%	563	13.2%	2,241	14.7%
Transportation & warehousing	87	3.7%	9	3.2%	6	4.0%	159	1.9%	224	5.2%	485	3.2%
Information	60	2.6%	7	2.5%	4	2.7%	149	1.8%	57	1.3%	277	1.8%
Finance & insurance	156	6.6%	12	4.2%	8	5.3%	435	5.3%	230	5.4%	841	5.5%
Real estate & rental & leasing	107	4.6%	11	3.9%	1	0.7%	431	5.3%	175	4.1%	725	4.8%
Professional, scientific & technical services	249	10.6%	21	7.4%	10	6.7%	953	11.7%	346	8.1%	1,579	10.4%
Management of companies & enterprises	10	0.4%	10	3.5%	1	0.7%	22	0.3%	25	0.6%	68	0.4%
Admin, support, waste mgt, remediation services	119	5.1%	19	6.7%	5	3.3%	457	5.6%	222	5.2%	822	5.4%
Educational services	25	1.1%	4	1.4%	11	7.3%	88	1.1%	32	0.7%	160	1.1%
Health care and social assistance	225	9.6%	39	13.7%	13	8.7%	704	8.6%	297	6.9%	1,278	8.4%
Arts, entertainment & recreation	27	1.1%	37	13.0%	16	10.7%	124	1.5%	50	1.2%	254	1.7%
Accommodation & food services	176	7.5%	1	0.4%	2	1.3%	654	8.0%	310	7.2%	1,143	7.5%
Other services	269	11.4%	12	4.2%	0	0.0%	681	8.3%	387	9.0%	1,349	8.9%
Auxiliaries	2	0.1%	0	0.0%	0	0.0%	15	0.2%	6	0.1%	23	0.2%
Unclassified establishments	34	1.4%	0	0.0%	0	0.0%	94	1.2%	54	1.3%	182	1.2%
Total	2,350	100.0%	285	100.0%	150	100.0%	8,160	100.0%	4,281	100.0%	15,226	100.0%

Source: U.S Census Bureau, "CenStats Databases, County Business Patterns Data (NAICS) 2001." From: <http://censtats.census.gov>, as viewed on June 30, 2004.

EXHIBIT 3-4

ECONOMIC ACTIVITY BY COUNTY: FULL-TIME AND PART-TIME EMPLOYMENT (2001)

Industry	Laramie County, Wyoming		Platte County, Wyoming		Kimball County, Nebraska		Larimer County, Colorado		Weld County, Colorado		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Farm employment	920	1.7%	636	11.3%	363	12.8%	2,101	1.2%	6,041	6.1%	10,061	3.0%
Forestry, fishing, related activities, and other	(D)		(D)		(D)		490	0.3%	1,386	1.4%	1,876	0.6%
Mining	183	0.3%	(D)		185	6.5%	631	0.4%	1,693	1.7%	2,692	0.8%
Utilities	114	0.2%	(D)		0	0.0%	228	0.1%	225	0.2%	567	0.2%
Construction	3,203	5.9%	353	6.3%	94	3.3%	14,966	8.8%	9,048	9.1%	27,664	8.3%
Manufacturing	1,742	3.2%	134	2.4%	339	11.9%	18,180	10.7%	11,721	11.8%	32,116	9.7%
Wholesale trade	943	1.7%	(D)		76	2.7%	3,613	2.1%	3,802	3.8%	8,434	2.5%
Retail trade	7,004	13.0%	597	10.6%	372	13.1%	20,433	12.0%	10,445	10.5%	38,851	11.7%
Transportation and warehousing	2,394	4.4%	369	6.6%	80	2.8%	3,068	1.8%	2,948	3.0%	8,859	2.7%
Information	(D)		44	0.8%	(D)		3,460	2.0%	1,196	1.2%	4,700	1.4%
Finance and insurance	2,244	4.2%	172	3.1%	(D)		5,811	3.4%	4,391	4.4%	12,618	3.8%
Real estate and rental and leasing	1,963	3.6%	196	3.5%	(D)		7,287	4.3%	3,139	3.2%	12,585	3.8%
Professional and technical services	2,370	4.4%	200	3.6%	103	3.6%	12,618	7.4%	3,830	3.9%	19,121	5.8%
Management of companies and enterprises	394	0.7%	(D)		(D)		236	0.1%	724	0.7%	1,354	0.4%
Administrative and waste services	2,473	4.6%	(D)		(D)		9,822	5.8%	5,147	5.2%	17,442	5.3%
Educational services	303	0.6%	(D)		(D)		1,966	1.2%	588	0.6%	2,857	0.9%
Health care and social assistance	3,344	6.2%	(D)		66	2.3%	13,606	8.0%	8,240	8.3%	25,256	7.6%
Arts, entertainment, and recreation	858	1.6%	99	1.8%	18	0.6%	3,650	2.1%	1,358	1.4%	5,983	1.8%
Accommodation and food services	3,817	7.1%	481	8.5%	203	7.1%	13,659	8.0%	5,555	5.6%	23,715	7.1%
Other services, except public administration	2,624	4.9%	238	4.2%	147	5.2%	8,730	5.1%	5,102	5.1%	16,841	5.1%
Government and government enterprises	15,733	29.1%	890	15.8%	425	14.9%	25,613	15.1%	12,799	12.9%	55,461	16.7%
Total	53,982	100.0%	5,627	100.0%	2,844	100.0%	170,168	100.0%	99,378	100.0%	332,003	100.0%

Note: (D) Not included in county data to avoid disclosure of confidential information. The estimates for these items are included in the totals.

Source: U.S. Department of Commerce, Bureau of Economic Analysis. "Regional Economic Accounts, Local Area Personal Income, Total full-time and part-time employment by industry." From: <http://www.bea.doc.gov/bea/regional/reis/>, as viewed on June 30, 2004.

3.1.4 Income and Unemployment

56. Exhibit 3-5 summarizes per capita personal income (PCPI), poverty rates, and unemployment rates, for the geographic region of concern. Each of the counties' per capita personal income is below their respective state's PCPI for 2002. Looking specifically at Laramie County, it has a PCPI of \$30,949, slightly lower than Wyoming's average PCPI of \$31,021. Furthermore, Laramie County's poverty rate is 9.1 percent, lower than the statewide average, and its unemployment rate is 4.1 percent, also lower than the statewide average. The City of Cheyenne's unemployment rate is 1.9 percent.²²

EXHIBIT 3-5				
SOCIOECONOMIC PROFILE OF COUNTIES CONTAINING CRITICAL HABITAT FOR THE COLORADO BUTTERFLY PLANT				
State	County	Per Capita Personal Income 2002^a	Poverty Rate 1999^b	Unemployment Rate 2003^c
Wyoming	State	\$31,021	11.4%	4.4%
	Laramie	30,949	9.1	4.1%
	Platte	27,055	11.7%	4.9%
Colorado	State	33,723	9.3%	6.0%
	Larimer	31,420	9.2%	5.7%
	Weld	24,495	12.5%	6.7%
Nebraska	State	29,182	9.7%	4.0%
	Kimball	22,821	11.1%	2.2%

Source:
^a U.S. Department of Commerce, Bureau of Economic Analysis. "Regional Economic Accounts, Local Area BEARFACTS." From: <http://www.bea.gov/bea/regional/bearfacts/countybf.cfm>, as viewed on June 30, 2004.
^b U.S. Census Bureau, "State and County Quick Facts." From <http://quickfacts.census.gov/qfd/>, as viewed on June 30, 2004.
^c U.S. Department of Labor, Bureau of Labor Statistics, "Labor Force Data by County, 2003 Annual Averages." From: <ftp://ftp.bls.gov/pub/special.requests/la/laucounty.txt>; and "Unemployment Rates for States, 2003." From: <http://www.bls.gov/lau/lastrk03.htm>, as viewed on June 30, 2004.

3.2 Regionally Important Industries

3.2.1 Military

57. Warren Air Force Base, which lies entirely within Laramie County, is the county's largest employer and contributes significantly to the local economy. However, habitat supporting populations of Gaura located on the Base is not being considered for

²² Wyoming Department of Employment, Wyoming Labor Market Information. Research & Planning, Local Area Unemployment Statistics, "2003 Wyoming Benchmark Labor Force Estimates." From: <http://doe.state.wy.us/lmi/LAUS/03bmk.htm>, as viewed on June 30, 2004.

designation as the Base has an approved INRMP that addresses conservation needs of the species.

3.2.3 Development

58. From 1990 to 2000, the housing stock in the City of Cheyenne increased from 21,856 to 22,282.²³ This increase of 426 housing units represents approximately 1.9 percent growth in residential development over that ten year period. During this same period of time, the housing stock in Laramie County increased from 30,507 to 31,927. This is an increase of 1,420 housing units, or 4.7 percent, over the decade.

59. Recent trends indicates that new residential home construction is occurring at a rate of several hundred units per year, each in the City of Cheyenne and in the surrounding unincorporated area in Laramie County. From 1990 to 2000, the size of the city increased from 19.64 square-miles to 21.3 square-miles. This increase of 1.7 square-miles represents approximately 8 percent growth within the incorporated city limits over the ten-year period. Since 2000, the city has annexed another 1,085 ac, or 1.6 square-miles.²⁴

EXHIBIT 3-6					
NEW BUILDING AND SEPTIC PERMITS FOR THE CITY OF CHEYENNE AND LARAMIE COUNTY					
Activity	1999	2000	2001	2002	2003
New Residential Building Permits, City, of Cheyenne	204	143	210	279	604
New Commercial Construction Permits, City of Cheyenne	20	31	50	51	30
City of Cheyenne Annexation (acres)	640	6	49	943	94
Rural Septic Permits Issued, Laramie County	338	262	297	298	323
Note: New residential permits is defined as new net housing units, including new residences, townhouses, condominiums, multi-plexes, and apartment units. Source: Center for Economic and Business Data, "Economic Indicators for Greater Cheyenne, Annual Trends Addition," Tables 3.0, 3.1, and 4.9. From: http://www.lccc.wy.edu/cebd/Default.htm , as viewed on June 30, 2004.					

²³ Center for Economic and Business Data, "Economic Indicators for Greater Cheyenne, Annual Trends Addition," Table 4.8. From: <http://www.lccc.wy.edu/cebd/Default.htm>, as viewed on June 30, 2004. Reported housing stock represents year-round occupied housing units, including owner-occupied housing units plus renter-occupied housing units plus vacant housing units. This includes single family, multi-family and mobile and trailer homes.

²⁴ Center for Economic and Business Data, "Economic Indicators for Greater Cheyenne, Annual Trends Addition," Table 3.0. From: <http://www.lccc.wy.edu/cebd/Default.htm>, as viewed on June 30, 2004.

3.2.4 Agriculture

60. 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.²⁵
61. 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 hay in production, of which 36,000 acres were irrigated.²⁶ The irrigated hay operations typically depend upon surface water diversions from the Horse Creek and Chugwater Creek drainages.
62. 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 2001.²⁷
63. Gross farm and ranch sales in the county totaled \$65.5 million in 2002, down from \$96.7 million in 1997.²⁸ Livestock sales accounted for 73 percent of that total, with the remaining 27 percent coming from sales of crops. Net cash farm income of operations for the county was estimated to be \$2.6 million in 2002, just over one-tenth of a county high of \$23.9 million in 1997.²⁹
64. The agricultural operations that are most likely to be affected by the Gaura 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

²⁵ U.S. Department of Agriculture, National Agricultural Statistical Service, "2002 Census of Agriculture," Wyoming State and County Data, Volume 1 Geographic Area Series, Part 50, Chapter 2, Table 1: County Summary Highlights: 2002. Available at <http://www.nass.usda.gov/census/census02/volume1/WYVolume104.pdf>

²⁶ U.S. Department of Agriculture, "Agricultural Statistics Data Base, Quick Stats, Crops County Data." From: <http://www.nass.usda.gov:81/ipedb/>, as viewed on June 30, 2004.

²⁷ U.S. Department of Agriculture, "Agricultural Statistics Data Base, Quick Stats, Livestock County Data." From: <http://www.nass.usda.gov:81/ipedb/>, as viewed on June 30, 2004.

²⁸ U.S. Department of Agriculture, National Agricultural Statistical Service, "2002 Census of Agriculture," Wyoming State and County Data, Volume 1 Geographic Area Series, Part 50, Chapter 2, Table 2. Market Value of Agricultural Products Sold Including Direct and Organic: 2002 and 1997. Available at <http://www.nass.usda.gov/census/census02/volume1/WYVolume104.pdf>

²⁹ U.S. Department of Agriculture, National Agricultural Statistical Service, "2002 Census of Agriculture," Wyoming State and County Data, Volume 1 Geographic Area Series, Part 50, Chapter 2, Table 4. Net Cash Farm Income of the Operations and Operators: 2002. Available at <http://www.nass.usda.gov/census/census02/volume1/WYVolume104.pdf>

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 hay until after calving is completed in spring, and the yearly process begins again.

65. 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. A University of Wyoming study showed that in 1992, a typical 400-cow operation would net \$151.83 per cow annually on a cash basis, for a total annual cash income of \$60,732.³⁰ After deducting non-cash costs for depreciation and family management and labor, however, net profit dropped to \$2.80 per cow or a total of \$1,120 on an annual basis. Those returns are relatively low given that the average value of ranch assets required to produce those returns was estimated to be \$1.8 million in 1992 dollars.
66. A 1996 USDA Economic Research Service survey of cow-calf operations in the U.S. found the value of production for producers in the western U.S. was \$291.28 per bred cow.³¹ After subtracting \$232.64 per cow in operating costs and \$98.70 in ownership costs, a loss of \$40.06 per bred cow ensued.
67. 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. The average net farm income in Laramie County per operator was \$3,059 in 2002, with 56 percent of the farm operators reporting a net average loss of \$23,393.³²

³⁰ Moline, B.R., R.R. Fletcher, D.T. Taylor, G. Fink, F. Henderson, L. Bourret. "Livestock Production, 1992," University of Wyoming College of Agriculture Publication B-993, February 1994. Available at <http://www.uwyo.edu/CES/PUBS/B-993.htm>

³¹ Short, S.D. "Characteristics and Production Costs of U.S. Cow-Calf Operations, 2001," U.S. Department of Agriculture, Economic Research Service, ERS Statistical Bulletin No. 974-3, November 2001. Available at <http://www.ers.usda.gov/catalog/OneProductAtATime.asp?ARC=c&PDT=2&PID=1255>.

³² U.S. Department of Agriculture, National Agricultural Statistical Service, "2002 Census of Agriculture," Wyoming State and County Data, Volume 1 Geographic Area Series, Part 50, Chapter 2, Table 4. Net Cash Farm Income of the Operations and Operators: 2002. Available at <http://www.nass.usda.gov/census/census02/volume1/WYVolume104.pdf>

68. This section considers the economic impacts of actions taken to protect Gaura and its habitat. It quantifies the economic effects of the proposed critical habitat designation, as well as protective measures taken as a result of the species' listing or other Federal, State, and local laws that aid habitat conservation in the areas proposed for designation. First, it provides a discussion of *pre-designation impacts*, as the impacts associated with species and habitat conservation efforts in place from the time of the listing to final designation of critical habitat, which has not yet occurred for Gaura. Impacts associated with these management efforts may be on-going until the time of final designation. Second, this section provides estimates of *post-designation impacts*, potential future impacts associated with the proposed critical habitat designation and other species and habitat conservation management efforts related to Gaura.
69. Economic impacts associated with Gaura conservation are related to the conservation strategy for the plant, utilities construction and maintenance, residential and commercial development, oil and gas drilling, livestock grazing, hay production, and road and bridge maintenance.
70. The impacts associated with past and potential future species and habitat management efforts are manifested in economic efficiency effects (i.e., social welfare) as outlined below.
- Administrative Costs: Costs associated with engaging in section 7 consultation, including time spent attending meetings, preparing letters and biological assessments, and in the case of formal consultations, the development of a Biological Opinion (BO) by the Service are quantified as administrative costs. Section 7 consultation can require substantial administrative effort on the part of all participants. These impacts are measured as the cost of labor required to fulfill these managerial duties. Estimates of per-effort costs associated with informal and formal consultations are presented in Exhibit 4-1. Costs of the biological assessment (BA) are typically borne by the Action agency. Unless otherwise stated, this table is used to develop total administrative costs for consultations associated with activities within the proposed critical habitat designation for Gaura.
 - Project Modification Costs: Species and habitat management efforts that involve project consultation activity are likely to result in project

modifications to comply with the goals of the management efforts. Costs of implementing these modifications are associated with changes in labor or material requirements that may occur at one point in time and/or be on-going.

EXHIBIT 4-1				
ESTIMATED ADMINISTRATIVE COSTS OF CONSULTATION AND TECHNICAL ASSISTANCE EFFORTS FOR GAURA (PER EFFORT)^a				
Consultation Type	Service	Action Agency	Third Party	Biological Assessment
Technical Assistance	\$260 - \$680	N/A	\$600 - \$1,500	N/A
Informal Consultation	\$1,000 - \$3,100	\$1,300 - \$3,900	\$1,200 - \$2,900	\$0 - \$4,000
Formal Consultation	\$3,100 - \$6,100	\$3,900 - \$6,500	\$2,900 - \$4,100	\$4,000 - \$5,600

^a Low and high estimates primarily reflect variations in staff wages and time involvement by staff.
Sources: IEc analysis based on data from the Federal Government General Schedule Rates, Office of Personnel Management, 2002, a review of consultation records from several Service field offices across the country. Confirmed by local action Agencies.

71. The remainder of this section details these economic impacts. The first section discusses pre-designation impacts associated with species and habitat management efforts, including all management efforts that have occurred since the time of the listing of Gaura, in October 2000, and are expected to continue to occur through the time period when final designation is established in December 2004. The second section discusses post-designation impacts forecast from 2004 through 2024, and the third section summarizes these findings. The fourth section provides a screening level analysis of the potential effects of proposed critical habitat designation on small entities (i.e., small businesses, small organizations, and small government jurisdictions) to satisfy the requirements of the Regulatory Flexibility Act as amended by the Small Business Regulatory Enforcement Fairness Act (SBREFA) of 1996.³³ Finally, pursuant to Executive Order No. 13211, the fifth section reports the potential impacts the proposed critical habitat designation is likely to have on the energy industry.

4.1 Pre-Designation Impacts Associated with Gaura

72. Since Gaura was listed, three formal consultations have been conducted on the species: (1) investigation of burning and mowing on WAFB; (2) the Medicine Bow lateral loop natural gas pipeline project; and (3) remedial actions at former landfills at WAFB. The Service has also conducted 143 technical assistance/informal consultation efforts in Wyoming, Colorado and Nebraska since listing.

³³ Regulatory Flexibility Act (5 U.S.C. §601 *et. seq.*)

73. Pre-designation impacts associated with Gaura conservation are summarized in Exhibit 4-2. The range of total estimated pre-designation costs, including costs incurred between the time of listing in October 2000 through the final critical habitat designation for the Gaura in December 2004, is approximately \$260,000 to \$395,000. The vast majority of these costs, more than 94 percent, are administrative costs associated with the consultation process.³⁴ As stated in 2.1.3, a number of the consultations described in Exhibit 4-2 covered several listed species. Because it is difficult to apportion these costs among the several species, the full costs of the consultations are disclosed as a pre-designation cost associated with the Gaura. Most of these costs would have been incurred, however, even if the Gaura was not listed. The cost range does not include the historic costs related to WAFB projects as the Gaura habitat located on WAFB is not being proposed as critical habitat and is outside the scope of the analysis. However, information on the historic consultations at WAFB is provided in Exhibit 4-2 for background.
74. The only non-WAFB historic formal consultation involved the Colorado Interstate Gas Company (CIG) and the Medicine Bow Lateral. In 1999, the company began construction on a pipeline from Douglas, Wyoming to the Cheyenne Hub in Weld County, Colorado, covering approximately 149 miles with 24-inch pipe. Gaura was found along the proposed pipeline route at Little Bear Creek (Unit 2), and just outside the pipeline right-of-way at Lodgepole Creek (Unit 5) and South Fork Bear Creek (Unit 2).³⁵ At the time of construction across Little Bear Creek, the right-of-way was realigned to avoid plants. The approximate cost of rerouting the pipeline project to avoid Gaura was \$20,000.³⁶

³⁴ The cost of technical assistance and formal consultation efforts were quantified using the low and high range for each category as defined in Exhibit 4-1. Informal consultations were quantified using the low range of costs as the Service indicated biological assessments were not necessary for any of the historic informal consultations given the “not likely to adversely affect” and “no effect” determinations. The low range is also appropriate considering most of the informal consultations are either general (non-species and non-project specific) in nature, requests for comments and information from the Service, or notifications of available information. Personal communication with Service Biologist, Cheyenne Field Office, July 1, 2004.

The vast majority of these historic costs, more than 96 percent, are administrative costs associated with the consultation process. Most of the past consultations were either general in nature (non-species and non-project specific), requests for comments and information from the Service, or findings by the Service of “no effect” or “not likely to adversely affect.”

³⁵ Long, Michael M., Filed Supervisor, Wyoming Field Office, U.S. Fish and Wildlife Service, to Paul Friedman, Federal Energy Regulatory Commission, May 25, 2001, transmitting the Fish and Wildlife Service's biological opinion for Medicine Bow Lateral Loop Natural Gasline project.

³⁶ Personal communication with Kendrick Moholt of BioResources, Inc., June 3, 2004. These costs include biological surveys, drafting, increased pipe length and miscellaneous labor.

EXHIBIT 4-2

SUMMARY OF COSTS OF PREVIOUS CONSULTATIONS

WYOMING

Agency	Consultation Summary	Administrative Costs	Project Modification Costs	Total Costs
Various	37 Technical Assistance efforts – responding to species list requests.	\$31,820 – \$80,660	N/A	\$31,820 – \$80,660
FERC	<p>One formal Consultation regarding the construction and operation of approximately 154 miles of natural gas pipeline. Gaura conservation/mitigation measures include:</p> <ul style="list-style-type: none"> • Reroute, where possible to avoid individual plants. • Removal, salvage, and replanting of plants which can not be avoided. • Protect plants and habitat through the use of protective mats. • Allow a one-time pass through for equipment at all locations. • Complete construction within 36 hours at all Colorado butterfly plant locations. 	\$13,900 – \$22,300	\$0 – \$20,800	\$13,900 – \$43,100
USEPA	<p>Six informal consultations exchanging information on the use of herbicides and fungicides on dry edible beans and sugar beets to control problem weed species and pests. These efforts are not project specific. Service recommendations if the spraying activity occurs in Gaura habitat:</p> <ul style="list-style-type: none"> • Establishment of a buffer zone between the treated fields and the riparian areas. • Ground application when wind speed is greater than 10 mph. • Avoid application prior to or immediately following a precipitation event. 	\$21,000	N/A	\$21,000
USACE	<p>Four informal consultations on proposed construction of fiber optic cable lines from Denver to Cheyenne (Sprint), from Salt Lake City to Denver (Enron), from Laramie to WY/CO border and from WY/UT border to Patrick Draw Oil field and Walcott to the WY/CO border. Service recommends surveys prior to work in Gaura habitat if Gaura is present, or to abrogate the need for surveys:</p> <ul style="list-style-type: none"> • Bore under all wetlands that have suitable habitat for Gaura. • All drilling and operations should start and end in upland habitats, well away from any wetland and/or soil habitats • Avoid any crossing of wetlands with vehicles and/or heavy equipment. 	\$14,000	N/A	\$14,000

EXHIBIT 4-2

SUMMARY OF COSTS OF PREVIOUS CONSULTATIONS

WYOMING

Agency	Consultation Summary	Administrative Costs	Project Modification Costs	Total Costs
	Three informal consultations on the construction of an extension of the Sherard Raw Water Delivery Pipeline along Middle Crow Creek, road crossings on Horse Creek, and Prestridge No. 2 Reservoir. Based on USACE and Service survey results and/or the information provided, the Service determined the projects would have no effect or were not likely to adversely affect Gaura.	\$10,500	N/A	\$10,500
WY DEQ, Land and Water Quality Divisions	Nine informal consultations: one on review of draft vegetation rules for coal mines in WY, one on review of a public notice to reclassify Sand Creek from Class 3B to Class 4B water (both not Gaura specific), and seven resulting from WYDEQ notifying the service about annual reports it received from aggregate, quarry, and gravel permittees.	\$31,500	N/A	\$31,500
BLM	Seven informal consultations on the spraying of herbicides, the WY wild horse pilot project, and the Enron and Williams Communications projects. The Service concluded the projects were not likely to adversely affect Gaura.	\$24,500	N/A	\$24,500
Laramie County	Two informal consultations: one providing comments on a preliminary draft of conservation measures for an HCP (conservation measures are for Preble's and mountain plover) and another providing comments based on review of public information on the Shellback Ranch and Country Walk subdivisions.	\$7,000	N/A	\$7,000
Laramie County and Cheyenne Housing & Community Development Office	Two informal consultations on the Allison Draw and Meals on Wheels of Cheyenne, Inc., projects. The Service found the projects were not likely to adversely affect Gaura.	\$7,000	N/A	\$7,000
Various Consultants	Four informal consultations responding to species and information requests and/or preliminary scoping or biological screening comments for natural gas pipeline (two), fiber optic cable (one), or communication tower (one) projects.	\$14,000	N/A	\$14,000
Service (BLM)	One informal consultation providing scoping comments and species information for a Notice of Intent to prepare a PEIS for wind energy development on western lands administered by the BLM (not Gaura specific).	\$3,500	N/A	\$3,500
Service (USDA)	One informal consultation providing comments on USDA program for biocontrol of Saltcedar (<i>Tamarix</i> spp.) in 14 western states (not Gaura specific).	\$3,500	N/A	\$3,500

EXHIBIT 4-2

SUMMARY OF COSTS OF PREVIOUS CONSULTATIONS

WYOMING

Agency	Consultation Summary	Administrative Costs	Project Modification Costs	Total Costs
KN Energy, Inc. (FERC)	One informal consultation modifying a Memorandum of Understanding into an annual concurrence letter for pipeline projects not likely to adversely affect threatened and endangered species (not Gaura specific).	\$3,500	N/A	\$3,500
City of Cheyenne	One informal consultation for a proposed flood control project on Crow Creek. Service visited the site, provided species information and recommended that a survey be conducted because a population of Gaura was documented in the area (WAFB).	\$3,500	N/A	\$3,500
WYDOT	One informal consultation providing species and other general information for use during project planning for reconstruction of a 10-miles of Interstate 25.	\$3,500	N/A	\$3,500
Wyoming Regulatory Office	One informal consultation on pipeline from the Frontier Refinery to the Kaneb Terminal. The Service found the project was not likely to adversely affect Gaura.	\$3,500	N/A	\$3,500
Office of Surface Mining	One informal consultation on the review of WY Coal Rules and Regulations. Recommended updating the list of threatened and endangered species in regulation to include Gaura as threatened.	\$3,500	N/A	\$3,500
WAFB	One formal consultation on remedial actions at three former landfills at WAFB. There are no conservation/mitigation measures for Gaura as there will be no effect to the plant since it is not present at or downstream of the action area.	N/A	N/A	N/A
	One formal consultation on a project to investigate the effects of burning and mowing on Gaura and Preble's on WAFB. There are no conservation/mitigation measures for Gaura as the population is not likely to be significantly affected by the loss of any plants in the treatment plots.	N/A	N/A	N/A
	One informal consultation for scoping comments and species information for a proposed network of trails	N/A	N/A	N/A
	Two informal consultations on a proposed research project to enhance recruitment of Gaura and a proposed elevated boardwalk trail where the Service determined the project may adversely affect Gaura and recommend initiation of formal consultation.	N/A	N/A	N/A
	Two informal consultations on the use of 15-acres of base land for Cheyenne Frontier Days and the use of injection wells to treat contaminated groundwater where the Service did not agree with determination and either requested surveys or a field visit.	N/A	N/A	N/A

EXHIBIT 4-2

SUMMARY OF COSTS OF PREVIOUS CONSULTATIONS

WYOMING

Agency	Consultation Summary	Administrative Costs	Project Modification Costs	Total Costs
	Four informal consultations on rebuilding visitor center, installing a chain link fence to enclose the base, constructing overflow parking, and drilling of extraction and monitoring wells. Service found the projects either did not occur on suitable Gaura habitat or that the projects were not likely to adversely affect Gaura.	N/A	N/A	N/A
	Three informal consultations on building construction and remodeling and creation of outdoor recreation facilities. The service concluded no effect because Gaura was not present in vicinity of the project.	N/A	N/A	N/A
COLORADO				
	Seventeen Technical Assistance efforts – responding to species requests.	\$14,620 – \$37,060	N/A	\$14,620 – \$37,060
	Fifteen Technical Assistance efforts – concurrence letters based on no habitat presence on surveys that were done	\$12,900 – \$32,700	N/A	\$12,900 – \$32,700
	Twelve Technical Assistance efforts – concurrence letters stating “not likely to adversely effect” based on a description of the project.	\$10,320 – \$26,160	N/A	\$10,320 – \$26,160
	Five informal consultations with/recommendations <ul style="list-style-type: none"> • Conduct a survey • Reintroduction of plant into area • Test species for host specificity for bio-control method. • Not enough information to evaluate. 	\$17,500	N/A	\$17,500
NEBRASKA				
	One informal consultations on a road construction project	\$3,500	N/A	\$3,500
	TOTAL COST	\$258,560 – \$373,880	\$ 0 – \$20,800	\$258,560 – \$394,680

4.2 Post-Designation Impacts

75. This section forecasts costs that may occur after the designation is finalized in December 2004 through 2024. It discusses future management actions involving species and habitat protection, including a discussion of the types of economic impacts associated with each component of these management actions.
76. This analysis focuses on the following activities identified as the most likely to be affected by critical habitat designation for Gaura: conservation strategy for private landowners (conservation agreements), natural gas pipelines, residential and commercial development, road and bridge construction and maintenance, agriculture, and oil and gas drilling.

4.2.1 Conservation Agreements

77. The primary land use within the proposed designation is cattle ranching and irrigated hay production in support of livestock operations. Agricultural activities on private lands that may adversely impact Gaura 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 bear economic costs to protect Gaura from normal agriculture activities that may be damaging to the plant and/or its habitat. Therefore, there is an ongoing effort by the Service to work cooperatively with private landowners to establish conservation agreements to target specific threats to Gaura on a local scale.
78. The Service believes that the conservation agreements will provide for the conservation needs of Gaura above and beyond what is achievable through the designation of critical habitat while meeting the needs of individual landowners. It is also 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. Therefore, the economic analysis quantifies the costs associated with the conservation measures as costs motivated by the proposed designation of critical habitat. Because the conservation strategy is centered on activities associated with the primary land use, farming and ranching, the costs associated with the conservation measures are incorporated into the quantification of impacts of critical habitat designation related to agriculture activities.
79. This analysis assumes that conservation agreements are motivated by the potential exclusion from critical habitat and that all are processed prior to the finalization of the designation in December 2004. While the administrative and project modification costs related to the conservation agreements are technically pre-designation impacts, because more than 75 percent of the forecast project modification costs resulting from the conservation agreements occur after December 2004, this analysis considers the costs of the conservation measures a post-designation impact.

4.2.1.1 Modeling of Costs

80. The agricultural impacts of critical habitat designations for Gaura will likely be reflected primarily by changes in farm and ranch income. Changes in farm income potentially could result from increased costs (e.g., hand-application of herbicides) as well as from decreases in forage production (e.g., restrictions on haying during certain times of the year). Specifically, this economic analysis measures the potential costs associated with a typical agriculture operation entering into a conservation agreement to protect the plant and its habitat. Information concerning potential cost increases and production decreases were obtained through interviews with ranching industry representatives, other agricultural experts, and a small sample of individual ranchers.
81. The typical agriculture operation is defined as an average individual operator, adjusting for the number of operations that own more than one parcel of land within the boundaries of the proposed designation. The designation encompasses approximately 53 parcels of land (assuming one parcel within Tepee Ring Creek, Unit 1), and 37 individuals (or entities) own these parcels (assuming one operation in Tepee Ring Creek, Unit 1). This count of operations defines the number of agriculture operations potentially impacted by the proposed designation.
82. The characteristics of the “typical agriculture operation” are based on data on the size of the designation, the area of concentrated subpopulations of the plant on a landowner's property and the existing land use. Given the total area encompassed by the designation (8,486 acres) and the average percent of the designation occupied by concentrated subpopulations of the plant (27 percent), the typical agriculture operation is assumed to own 229 acres of habitat and 62 acres of habitat containing concentrated subpopulations of the plant. However, while the proposed designation contains all the primary constituent elements necessary for this species, and smaller numbers of plants may occur throughout the designation, the special management provisions of the conservation agreements will focus on the core of the concentrated subpopulations (“core subpopulations”).
83. The Service estimates the average size of a core subpopulation for which special management would be considered in a conservation agreement is 50 feet by 50 feet, or 250 square feet. In addition, the Service expects the average landowner will have four of these core subpopulations on their property within the proposed designation, or 1,000 square feet.³⁷ To allow for uncertainty, this analysis assumes that each landowner will have 0.5 acres of core subpopulations on their property within the proposed designation for which special management actions should be taken, or 21,780 square feet. Based on existing land use, approximately 60 percent of the habitat occupied by core subpopulations is assumed to be under hay production (0.3 acres) and the remaining 40 percent is assumed to be used solely as pasture for grazing (0.2 acres). The typical ranching operation also is assumed to spray herbicides on 10 acres of Gaura habitat.

³⁷ The first Gaura conservation agreement is in process. While the landowner has approximately 40 acres of Gaura riparian habitat, the special management provisions of the conservation agreement includes fencing only 2,016 square feet (36-foot by 56-foot area, or 184 linear feet) around the core subpopulation.

84. The average estimated cost of the conservation agreement's protective measures to the typical agriculture operation is then multiplied by the number of landowners forecast to enter into conservation agreements to determine the potential cost of critical habitat to agriculture activities. Because landowner participation in the conservation agreement program is uncertain, the impact of critical habitat designation related to agriculture activities is presented as a range. Given the entire designation is not federally owned, the upper bound for program participation is the number of individual landowners within the designation. By using the number of individual landowners to define the upper bound, the analysis assumes that those individuals owning multiple parcels within the designation only consult once on all lands owned within the boundary of the designation. Conversely, the lower bound on program participation is zero, considering rancher participation in the program is voluntary.

4.2.1.2 Future Costs

85. There are four major threats to Gaura from agricultural activities: (1) indiscriminant use of herbicides, (2) livestock grazing, (3) haying operations, and (4) building new impoundments that flood the habitat. The following section describes the threat of each activity to Gaura, the project modifications the Service would likely recommend,³⁸ and additional cost impacts of these project modifications to the typical agriculture operation.

Indiscriminant Use of Herbicides

86. The most serious threat to Gaura on agriculture land is the indiscriminant application of herbicides to control noxious weeds. The two major noxious weeds infesting Gaura habitat are leafy spurge (*Euphorbia esula*) and Canada thistle (*Cirsium arvense*). These weeds are so pervasive in certain areas that aerial spraying is often used to apply the chemicals. However, the Gaura is highly susceptible to commonly used herbicides when the chemicals are applied non-selectively.
87. The Service would likely recommend no spraying within 50 feet of a Gaura population. If spraying occurs on a side hill or an embankment above a plant population, a 100-foot buffer zone is suggested to prevent drift downhill. These recommendations would necessitate hand spraying around areas where Gaura is found. Aerial spraying for most farm applications costs between \$4.50 and \$9.00 per acre, and custom ground spray

³⁸ For the purpose of modeling the costs of the conservation agreements, this analysis applies these general assumptions to all landowners within the designation. The Service does not necessarily suggest these recommendations in all cases, to all landowners, or to the same extent as described in this model, and there are no such general recommendations published by the Service. The Service may make such recommendations within a conservation agreement on a landowner specific basis to accommodate the needs of Gaura as well as the landowner. However, because the land management for each farm/ranch varies, and because each landowner has unique needs and constraints within which to work, the Service recommendations are made on a case by case basis only. Service recommendations were obtained from an interview with a Service Biologist from Cheyenne Field Office on June 17, 2004, and from comments received from the Service on July 21, 2004.

application costs approximately \$35 per hour.³⁹ Assuming it takes 0.5 hours per acre to spray around a Gaura population ground spraying costs approximately \$17.50 per acre. This increases the cost of herbicide application by \$8.50 to \$13.00 per acre, or approximately \$10.75 per acre.

88. This model assumes the typical agriculture operation will conform to the suggested buffer zones to prevent drift and protect the 0.5 acre core subpopulation. This model also assumes, given the potential threat herbicides pose to the plant, that the typical agriculture operation will hand spray areas of proposed designation outside of the core subpopulation and its surrounding bufferzone. The model assumes the proposed designation is treated with herbicides at the same proportion as the farmland treated within the county during the 2002 and 1997 crop seasons. According to the 2002 Census of Agriculture, 1,754,794 acres were farmed in Laramie County in 2002, and 1,760,647 acres in 1997,⁴⁰ and herbicides were used to control weeds, grass, or brush on 3.5 percent of the farmland in 2002 (63,072 acres) and five percent of the farmland in 1997 (87,188 acres).⁴¹ Based on this assumption, 305 to 428 acres of the proposed designation (8,486 acres) will be sprayed with herbicides annually. The typical agriculture operation will therefore spray herbicides on eight to 11 acres per annum, or approximately 10 acres on average.
89. Changing from aerial application to ground application increases the annual cost of herbicide application to the typical agriculture operator by approximately \$105 (9.8 acres multiplied by \$10.75 per acre).

Livestock Grazing

90. Moderate to light grazing of Gaura habitat by livestock is beneficial to the plant's survival as it opens the habitat and decreases competition. Grazing is only dangerous to the plant if it occurs during flowering and seed setting in July and August.
91. The Service would likely recommend light grazing before late May in areas occupied by core subpopulations of the plant. The area would not be grazed again until after August, at which time it could be heavily grazed by livestock. While timing restrictions exclude grazing activities during the summer, grazing activities around Gaura could work into a rancher's existing pasture rotation schedule. The timing restrictions, therefore, are not expected to decrease the carrying capacity of the typical agriculture operation. However, some ranchers may be required to cross-fence grazing areas or

³⁹ Hewlett, J.P., J. Brown and C.E. Olson, "Custom rates for Wyoming farm and ranch operations: 2000-2002," University of Wyoming Cooperative Extension Service, B-1142, March 2004. Available at <http://agecon.uwyo.edu/FarmMgt/PUBS/B1142.pdf>

⁴⁰ U.S. Department of Agriculture, National Agricultural Statistical Service, "2002 Census of Agriculture," Wyoming State and County Data, Volume 1 Geographic Area Series, Part 50, Chapter 2, Table 1: County Summary Highlights: 2002. Available at <http://www.nass.usda.gov/census/census02/volume1/WYVolume104.pdf>

⁴¹ U.S. Department of Agriculture, National Agricultural Statistical Service, "2002 Census of Agriculture," Wyoming State and County Data, Volume 1 Geographic Area Series, Part 50, Chapter 2, Table 39. Fertilizers and Chemicals Applied: 2002 and 1997. Available at <http://www.nass.usda.gov/census/census02/volume1/WYVolume104.pdf>

enclose the area occupied by the core subpopulations to accommodate these grazing restrictions. If the core subpopulations are enclosed, the enclosure can be made available for grazing after the plant has set seed.

92. Custom fencing on smooth to rolling terrain typically costs approximately \$7,000 per mile or \$1.32 per linear foot.⁴² Assuming the typical farming operation fences the 0.2 acres of livestock pasture occupied by core subpopulations, the enclosure would cost approximately \$494.⁴³ However, the cost of fencing would be borne by PFW. PFW engage in cost sharing on a case-by-case basis and have provided assistance to at least one rancher that has entered into a conservation agreement with the Service to protect Gaura.⁴⁴ The organization typically provides the fencing materials, and considers this a 50 percent cost share. The rancher provides the other 50 percent of the fencing cost in labor. However, PFW has indicated it will pay for 100 percent of the costs (including materials and installation) considering the small size of the fencing projects associated with Gaura protection.⁴⁵ Assuming the typical agriculture operation participates in the PFW cost-share program, the rancher is expected to bear no capital costs for fencing; that is, all of the costs will be borne by PFW. The analysis also forecasts an hour of labor (\$32 per hour) for annual fence repair and maintenance for the barbed wire fence surrounding the core subpopulation.⁴⁶ The fence repair and maintenance costs will be borne by the rancher.
93. Additional forage could be leased during the grazing restriction period, if needed, for approximately \$13.50 per animal unit month (AUM).⁴⁷ Costs for transporting the livestock to the leased pasture would cost approximately \$3.68 per loaded mile for a tractor-trailer with a capacity of around 50,000 lbs.⁴⁸ However, as previously mentioned, the analysis assumes grazing restrictions on livestock pasture occupied by core

⁴² Hewlett, J.P., J. Brown and C.E. Olson, "Custom rates for Wyoming farm and ranch operations: 2000-2002," University of Wyoming Cooperative Extension Service, B-1142, March 2004. Available at <http://agecon.uwyo.edu/FarmMgt/PUBS/B1142.pdf>

⁴³ The 0.2 acres occupied by core subpopulations is equivalent to 8,765 ft², or a square with the dimensions 94 feet by 94 feet. The cost to place a fence around the four sides of the square is 94 feet multiplied by four sides multiplied by \$1.35 per foot, or \$494.

⁴⁴ Interview with Partners for Fish and Wildlife personnel, June 25, 2004.

⁴⁵ Comments on the Draft Economic Analysis of proposed critical habitat for the Colorado butterfly plant received from the Service on July 21, 2004.

⁴⁶ Hewlett, J.P., J. Brown and C.E. Olson, "Custom rates for Wyoming farm and ranch operations: 2000-2002," University of Wyoming Cooperative Extension Service, B-1142, March 2004. Available at <http://agecon.uwyo.edu/FarmMgt/PUBS/B1142.pdf>

⁴⁷ Wyoming Agricultural Statistical Service, "Wyoming Agricultural Statistics 2003," Value of Farmland and Buildings, Cropland and Pasture, Cash Rent for Pasture: Wyoming 1993-2002. Available at <http://www.nass.usda.gov/wy/bulletin/bultntoc.htm>

⁴⁸ Hewlett, J.P., J. Brown and C.E. Olson, "Custom rates for Wyoming farm and ranch operations: 2000-2002," University of Wyoming Cooperative Extension Service, B-1142, March 2004. Available at <http://agecon.uwyo.edu/FarmMgt/PUBS/B1142.pdf>

subpopulations will fit within the existing pasture rotation schedule of the typical agriculture operation.

Haying Operations

94. Flood irrigated native grass hay is the most common harvested forage grown in areas where Gaura is most likely to be found. Harvesting typically begins during the first part of July and continues throughout the month. Because there is usually insufficient water in the creeks to irrigate the hay meadows after the July harvest, only one cutting is obtained each summer. Cattle graze the regrowth in the meadows during the fall, and the harvested forage is fed to the herd during the winter months. Like grazing, hay mowing is only injurious to the plant if it occurs during flowering and seed setting in July and August.
95. The Service would likely recommend that haying operations in areas occupied by core subpopulations not occur until September so that the plant is not disturbed until seeds are set. However, delaying hay activities by six to eight weeks greatly impacts the quality of harvested hay. Studies in western Nebraska show that delaying the optimal harvesting date for grass hay by 60 days decreases total forage yield (harvested plus regrowth) by five to ten percent. The delay in harvest also decreases the nutritional value of the hay, lowering the crude protein (CP) from around 7.5 percent to six percent, and the total digestible nutrients (TDN) from approximately 49 percent to 42 percent.⁴⁹ Using beef cattle feed concentrate (32 percent CP and 82 percent TDN) to compensate for the lost forage and nutritional value would cost the typical agriculture operation approximately \$40 per acre (at an average five-year cost for concentrate in Wyoming of \$287 per ton).⁵⁰

⁴⁹ Reece, P.E., J.T. Nichols, J.E. Brummer, R.K. Engel, and K.M. Eskridge. "Harvest date and fertilizer effects on native and interseeded wetland meadows." *Journal of Range Management*. 47(1994):178-183.

⁵⁰ Assuming a beef cow is supplemented with 20 pounds of hay per day, it would be deficit 1.4 pounds of TDN (20 lbs. * (0.49 – 0.42)) and 0.30 pounds of CP (20 lbs. * (0.075 – 0.06)). To replace the lost TDN and CP would require 1.70 pounds of beef cattle concentrate (1.4 lbs. deficit TDN / 0.82 percent TDN) and 0.94 pounds of beef cattle concentrate (0.30 lbs. deficit CP / 0.32 percent CP), respectively. Therefore, TDN is the limiting factor. At a price of \$0.1435 per pound (\$287 per ton), the cost of 1.70 pounds of beef cattle concentrate to replace the lost forage quality in a 20 pound feeding of hay is \$0.25. The source of the five year average annual beef cattle concentrate price is: Wyoming Agricultural Statistical Service, "Wyoming Agricultural Statistics 2003," Average Prices Paid by Farmers and Ranchers: Selected Inputs, Mountain Region 1, April 1, 1999-2003. Available at <http://www.nass.usda.gov/wy/bulletin/bultntoc.htm>

Given an average annual hay yield of 1.7 tons per acre in Laramie County, approximately \$40 of beef cattle concentrate would be required to compensate for the reduced forage quality resulting from delayed harvest on one acre (1.7 tons of hay per acre * 2,000 lbs. per ton = 3,400 lbs. hay production / 20 lbs. of hay per day * \$0.25 supplement feed cost per day). The daily feeding of 1.7 pounds of beef cattle concentrate per cow would also compensate for the five to ten percent reduction in total forage yield resulting from the delayed harvest. The source of the 10-year average annual "Other Hay" crop yield in Laramie County is: U.S. Department of Agriculture, "Agricultural Statistics Data Base, Crop County Data." From: <http://www.nass.usda.gov:81/ipedb/>, as viewed on June 30, 2004

96. Purchasing beef cattle concentrate to compensate for lost forage and nutritional value increases the typical agriculture operator's annual operating costs by approximately \$12 (0.2 acres multiplied by \$40 per acre).

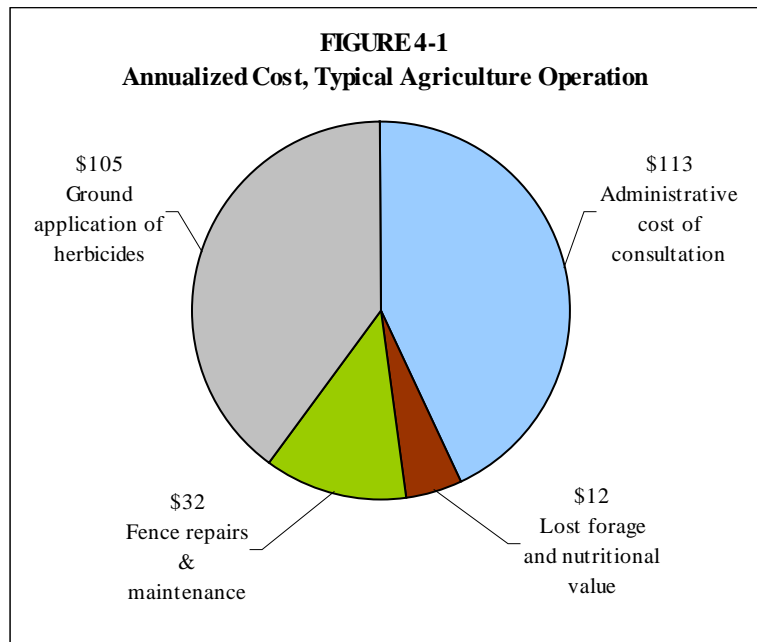
Building New Impoundments

97. The Service recommends against the development of additional water impoundments that would flood Gaura habitat. This analysis assumes that irrigation and watering structures for agricultural activities are in place and that no new development will likely occur.

4.2.1.3 Economic Impacts: Typical Ranching Operation

98. Assuming a 20-year planning horizon and a seven-percent discount rate, the present value of the economic impact to a typical agriculture operation of entering into a conservation agreement is approximately \$2,787, or \$263 annualized (see Figure 4-1).

99. As part of the conservation agreement process, each individual landowner will enter into a low-level informal consultation with the Service. Technically, while no Federal nexus exists for the conservation agreement program, the model assumes the Service will conduct an intra-agency consultation because of the funding the PFW (i.e. the Service) provides for fencing. The Service Field Office in Cheyenne indicates the landowner will not be required to perform a Biological Assessment and that the administrative costs allocated to the Service and PFW for consultation efforts (\$1,000 and \$1,300, respectively) is sufficient to cover all expenses, including contracting plant surveys.⁵¹ The typical agriculture operation will spend approximately \$1,200 of their time in consultation with the Service in the development of the conservation agreement during 2004, or \$113 annualized for the 20-year period of this analysis.



100. Using the cost information previously described, the economic impact per agriculture operation to protect the plant and its habitat are listed in Exhibit 4-3. These include capitalized costs associated with the section 7 consultation process undertaken during 2004 (year 1) and annual costs to purchasing beef cattle concentrate,

⁵¹ Personal communication, Service Biologist, Cheyenne Field Office, June 28, 2004.

for fence repairs and maintenance, and additional costs associated with ground application of herbicides. The present value of all over a 20-year period is \$2,787 for the typical agriculture operation, or \$263 annualized.

EXHIBIT 4-3					
PRESENT VALUE OF ESTIMATED COSTS ASSOCIATED WITH CONSERVATION AGREEMENTS TO THE TYPICAL AGRICULTURE OPERATION					
(20-Years at a Seven Percent Discount Rate)					
Activity	Acres Impacted	Capitalized Cost	Annual Cost	Present Value of Capitalized and Annual Costs	Annualized Value of Capital and Annual Costs
Administrative cost of consultation		\$1,200		\$1,200	\$113
Hay production	0.3		\$12	\$132	\$12
Livestock grazing	0.2		\$32	\$339	\$32
Herbicide spraying	9.8		\$105	\$1,116	\$105
TOTAL				\$2,787	\$263

4.2.1.4 Economic Impacts: By Third Party, Service and Action Agency

101. As illustrated in Exhibit 4-4, the present value of costs to protect the plant and its habitat through voluntary conservation agreements with the Service over the 20-year period of this analysis is estimated at \$207,000 (approximately \$130,000 in administrative costs and \$77,000 in project modifications). This represents the upper bound of costs assuming all landowners participate in the conservation agreement program with the Service. The lower bound, assuming no ranchers participate in the program because it is voluntary, is zero.

- The upper bound cost to agriculture operations is approximately \$103,000 (\$44,000 in administrative consultation costs and \$59,000 in project modification costs).
- The Service is expected to incur only administrative costs for its efforts in the consultation process. At a cost of \$1,000 per consultation, the forecast upper bound cost to the Service is approximately \$37,000.
- PFW (also the Service) is expected to incur administrative costs for its role in the consultation process (\$1,300 per consultation) and project modification costs related to its share (100 percent) of the fencing costs to enclose livestock pastures. The total estimated upper bound cost to PFW is approximately \$66,000 (\$48,000 in administrative costs and \$18,000 in project modification costs).

EXHIBIT 4-4

**PRESENT VALUE OF AGRICULTURE COSTS
(20-Years at a Seven Percent Discount Rate)**

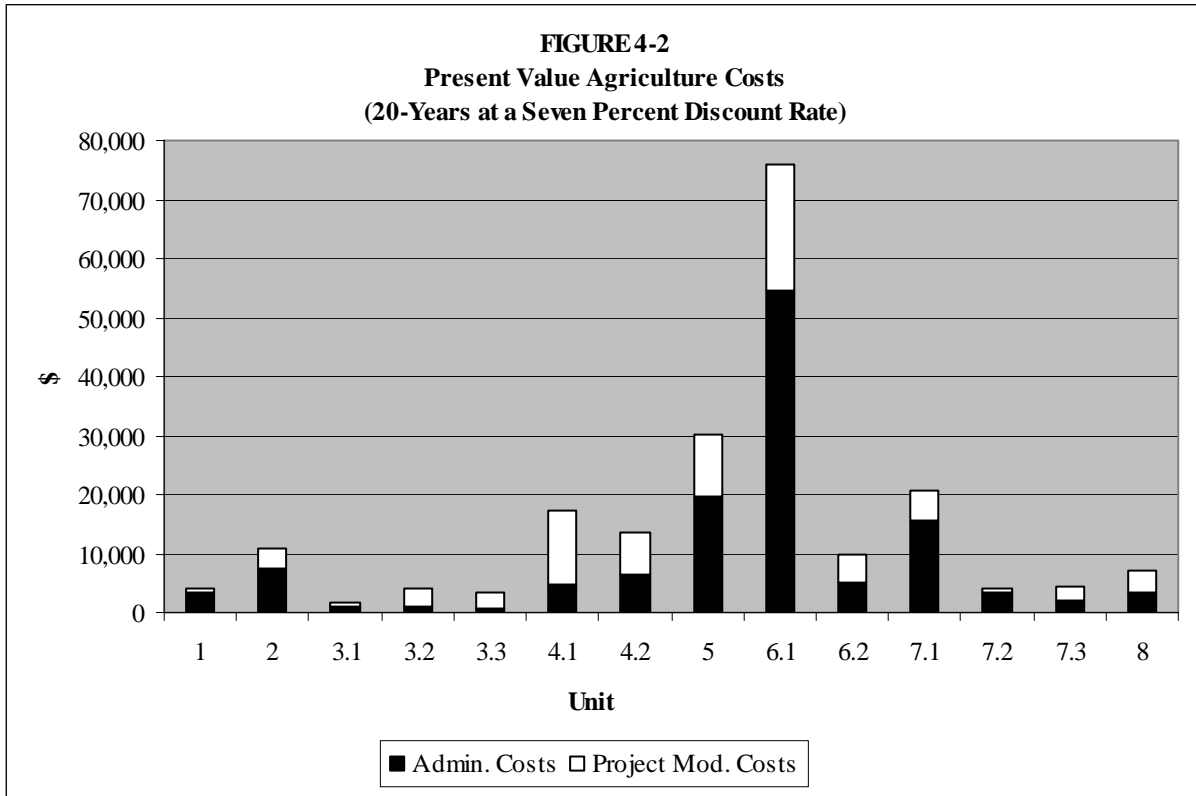
Unit or Reach	Service Admin. Costs	PFW Admin. Costs	PFW Project Mod. Costs	Total PFW Costs	Third Party Admin. Costs	Third Party Project Mod. Costs	Total Third Party Costs	Admin. Costs	Project Mod. Costs	Total Costs
1	1,000	1,300	109	1,409	1,200	350	1,550	3,500	459	3,959
2	2,125	2,763	817	3,580	2,550	2,624	5,174	7,438	3,442	10,879
3.1	325	423	109	531	390	348	738	1,138	457	1,594
3.2	325	423	671	1,093	390	2,153	2,543	1,138	2,823	3,961
3.3	200	260	660	920	240	2,119	2,359	700	2,779	3,479
4.1	1,325	1,723	2,975	4,697	1,590	9,550	11,140	4,638	12,525	17,163
4.2	1,825	2,373	1,692	4,064	2,190	5,431	7,621	6,388	7,123	13,511
5	5,625	7,313	2,514	9,826	6,750	8,070	14,820	19,688	10,583	30,271
6.1	15,625	20,313	5,041	25,353	18,750	16,183	34,933	54,688	21,224	75,911
6.2	1,500	1,950	1,048	2,998	1,800	3,364	5,164	5,250	4,412	9,662
7.1	4,500	5,850	1,162	7,012	5,400	3,729	9,129	15,750	4,891	20,641
7.2	1,000	1,300	137	1,437	1,200	439	1,639	3,500	576	4,076
7.3	625	813	523	1,336	750	1,680	2,430	2,188	2,204	4,391
8	1,000	1,300	834	2,134	1,200	2,676	3,876	3,500	3,509	7,009
TOTAL	37,000	48,100	18,290	66,390	44,400	58,718	103,118	129,500	77,008	206,508

4.2.1.5 Economic Impacts: By Unit

102. Based on the proportion of habitat occupied by concentrated subpopulations within each unit or reach (sub-unit), the present value of costs associated with the proposed critical habitat designation can be allocated based on the average forecast cost per acre of concentrated subpopulation. The administrative costs associated with consultation, on the other hand, are allocated based on the number of individual consultations that occur within each unit. This allocation assumes that those individuals owning multiple parcels within the designation only consult once on all lands owned within the boundary of the designation. For example, the administrative cost of consultation associated with a landowner that owns a parcel in Unit 7, Reach 1, and another in Unit 7, Reach 2, would be allocated equally between the two reaches. The unit costs are detailed in Exhibit 4-4 above, and presented graphically in Figure 4-2 below.

103. On a cost per unit basis the largest portion of forecast agriculture-related costs are expected to occur in Reach 1 of Unit 6, Lodgepole Creek East (37 percent). The next most costly units are Unit 5, Lodgepole Creek West (15 percent), and Reach 1 of Unit 7, Borie (10 percent). Together, these three units account for more than 60 percent (approximately \$127,000) of forecast costs. These costs are driven primarily by the acres of habitat occupied by concentrated subpopulations within the units. The three units also contain almost 50 percent (approximately 1,110 acres) of the area of concentrated

subpopulations within the proposed critical habitat designation. The three largest units, in terms of area of concentrated subpopulations, account for almost 60 percent of the area occupied by concentrated subpopulations (1,341 acres) and 60 percent of forecast agriculture-related costs (approximately \$123,000). These units are Reach 1 of Unit 6 (Lodgepole Creek East), Reach 1 of Unit 4 (Little Bear Creek/Horse Creek) and Unit 5 (Lodgepole Creek west).



4.2.2 Natural Gas Pipelines

104. Natural gas pipeline projects can impact Gaura by altering the landscape within a unit. Habitat can be damaged during the clearing of the right-of-way, soil removal and stockpiling, and during clean-up and restoration efforts.⁵² Additionally, wetland crossings associated with pipeline projects can specifically impact Gaura habitat.⁵³ 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.⁵⁴

⁵² Long, Michael M., Filed Supervisor, Wyoming Field Office, U.S. Fish and Wildlife Service, to Paul Friedman, Federal Energy Regulatory Commission, May 25, 2001, transmitting the Fish and Wildlife Service's biological opinion for Medicine Bow Lateral Loop Natural Gasline project.

⁵³ Federal Energy Regulatory Commission, "Wetland and Waterbody Construction and Mitigation Procedures," January 17, 2003. Available at <http://www.ferc.gov/industries/gas/enviro/wetland.pdf>

⁵⁴ Personal communication with Paul Friedman, Federal Energy Regulatory Commission, May 26, 2004.

105. 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. The project is only in the design stage - specific routes and other details have not yet been finalized - and a formal application was recently filed with FERC.⁵⁵ It is anticipated that construction will begin on this project in late 2004.
106. It does not appear that the proposed Entrega Gas Pipeline project will cross the known plant populations. However, the proposed route will cross in the vicinity of unoccupied Gaura habitat, and surveys are being conducted to determine the presence of Gaura in the project area. Natural Resource Group, Inc., on behalf of Entrega Gas Pipeline Inc., has been in consultation with the Service regarding surveys for and conservation of threatened and endangered species potentially occurring along the proposed project route. The Service recently approved Entrega's Survey Plan, which identifies the survey protocol to be used to determine the presence or absence of each threatened and endangered species requiring surveys in the proposed project area. Since the proposed route of the project does not cross occupied Gaura habitat (Reaches 2 and 3 of Unit 7 are north of the pipeline route), this analysis assumes that the project may result in an informal consultation with the Service, and assesses costs accordingly.⁵⁶ Therefore, total nominal costs of Gaura mitigation efforts are expected to range from \$3,500 to \$13,900.⁵⁷
107. Secondly, 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.⁵⁸ The Cheyenne Plains line starts in Colorado at a location 5 miles east of Interstate 25, and approximately 5 miles south of the Wyoming State line, several miles south of Reach 3 of Unit 7 of the proposed critical habitat designation. Field studies have been conducted over the past two seasons along its alignment and found no Gaura present. An additional study will be conducted this summer, but it is not expected that this project will impact Gaura populations.⁵⁹
108. Construction is set to begin the spring of 2005 and is expected to continue for four to five months, followed by restoration activities.⁶⁰ Since the proposed route of the

⁵⁵ Federal Energy Regulatory Commission, Office of Energy Projects, "National Environmental Policy Act Pre-Filing Environmental Review and Scoping for the Entrega Pipeline Project," Docket No. PF04-7-000. Available at <http://www.entregapipeline.com/pdfs/ferc/2004/openhouse-mar26.pdf>

⁵⁶ Personal communication with Kristi Aarsby-Kail, Natural Resource Group, Inc., June 29, 2004.

⁵⁷ This analysis attributes administrative costs of consultation to reach 3 of Unit 7 (the closest reach to the proposed route).

⁵⁸ Federal Energy Regulatory Commission, "Cheyenne Plains Pipeline Company, LLC and Colorado Interstate Gas Company: Notice of Availability of the Final Environmental Impact Statement for Proposed Cheyenne Plains Pipeline Project," February 20, 2004.

⁵⁹ Personal communication with Floyd Robertson, El Paso Pipeline Company, June 22, 2004.

⁶⁰ Cheyenne Plains Gas Pipeline Company, LLC, "Fact Sheet." From: <http://www.cmenergy.com/cheyenne/fact.asp>, as viewed on June 30, 2004.

project does not cross Gaura habitat, this analysis assumes an informal consultation will occur with the Service regarding the Cheyenne Plains Pipeline project and attributes these costs to Reach 3 of Unit 7. Total costs of Gaura mitigation efforts are expected to range from \$3,500 to \$13,900 for the Cheyenne Plains Pipeline Project.

109. In summary, the analysis forecasts two informal consultations regarding natural gas pipeline projects over the next 10 years. Both projects may potentially impact Reach 3 of Unit 7 of the proposed critical habitat designation. Total administrative costs are anticipated to range from \$7,000 to \$27,800 for these projects. Project modifications are not expected since neither project crosses Gaura habitat directly.

4.2.3 Residential and Commercial Development

110. Future residential and commercial development has been identified as a potential threat to Gaura. The development of houses and residential-related infrastructure (i.e. roads, water supply, and sewage treatment) could cause direct take of the species. Additionally, Gaura prefers grazed pasture, and as development increases, more land is left idle, increasing competition from other species.⁶¹
111. Reductions in property value may occur through public perception that the designation will restrict land uses, inhibit private development, or cause project delays. Such loss in property value can be experienced for as long as such perception persists. Thus, any potential reduction in property value would primarily be due to the regulatory uncertainty, engendered by critical habitat designation, concerning land use within critical habitat areas. No development-related effects are anticipated, however, for the following reasons:
- While uncertainties about the impacts of the proposed critical habitat designation and the perception that the designation will impose land use restrictions can cause reduction in property value, this effect is likely to be temporary in nature as the uncertainties and perceptions dissipate and/or become clarified over time;
 - Consultation under section 7 only applies to activities that are carried out, permitted, or funded by a Federal agency. As such, the designation of critical habitat will not afford any additional protections for species with respect to strictly private activities. Because the entire designation is on non-Federal property and development on private land is not usually federally funded or permitted, there is no Federal nexus for development activities under section 7 of the Act. However, the Gaura habitat consists of a narrow riparian zone, and while unlikely for rural residential development on private land, regulation under Section 10 of the Rivers and Harbors Act or Section 404 of the Clean Water Act are possible Federal nexuses for development if the activity occurs in or around the water.⁶²

⁶¹ Personal communication with Jim Cochran, Laramie County Conservation District, June 14, 2004.

⁶² Personal communication with Matthew Bilodeau, Army Corps of Engineers, June 14, 2004.

Development within the proposed critical habitat designation areas is described in more detail below.

4.2.3.1 Nebraska

112. A portion of Unit 6 is located in Kimball County, Nebraska. Kimball County is a sparsely populated area with a population numbering fewer than 4,000, or about 4.3 people per square-mile.⁶³ While the 2000 to 2020 population forecast for the County projected slight growth, the county has actually lost six percent of its population since 1990. Conservation measures for Gaura are not expected to impact development activities for this unit in Nebraska.

4.2.3.2 Colorado

113. Unit 8 is located on the border of Larimer and Weld counties in Colorado, both of which are forecasting strong growth. While the unit does front Interstate Highway 25 North, and is located less than one-half mile from exit 293, the unit is located in a sparsely populated area. Wellington, about 15 miles south of the unit on Interstate Highway 25, is the closest town of any sizeable population (2,672 individuals as of 2000).⁶⁴ The City of Ft. Collins, population 120,000,⁶⁵ is located another 13 miles further south from Wellington. The City of Cheyenne, Wyoming, is the closest town north of the unit, and it is located about 18 miles north on Interstate Highway 25.
114. This unit contains Meadow Springs Ranch and Soapstone Ranch, two properties owned and managed by the City of Fort Collins.⁶⁶ The Fort Collins Utilities Department uses the Meadow Springs Ranch for the application of biosolids, and there are currently no plans for development on this site. As for the recently acquired Soapstone Ranch, the City intends to continue leasing the property to a local rancher for grazing and allowing the public use of the land for recreation. With the exception of road improvements to improve public access and the development of a parking lot, there are no plans for development in this unit. These improvements will be planned to avoid Gaura populations, and the additional costs, if any, are expected to be minor.⁶⁷

4.2.3.3 Platte County, Wyoming

115. Unit 1 is located on the upper reaches of the Richeau Creek drainage, and except for ranching and the Diamond Guest Ranch, there is no development in this area. The

⁶³ U.S. Census Bureau, "State and County Quick Facts." From: <http://quickfacts.census.gov/qfd/>, as viewed on June 30, 2004.

⁶⁴ City-data.com. From: <http://www.city-data.com/city/Wellington-Colorado.html>, as viewed on June 30, 2004.

⁶⁵ City-data.com. From: <http://www.city-data.com/city/Fort-Collins-Colorado.html>, as viewed on June 30, 2004.

⁶⁶ Personal communication with Meegan Flenniken, Larimer County Parks and Open Lands, May 26, 2004.

⁶⁷ Personal communication with Mark Sears, City of Fort Collins, June 14, 2004.

Platte County Planning Department does not foresee future development in this part of the County.⁶⁸

4.2.3.4 Rural Laramie County

116. Laramie County experienced steady population growth throughout the 1990s.⁶⁹ Should the County's population continue to increase over the next twenty years at a rate similar to the 1990s (one percent), the population will increase from just over 81,000 in 2000, to nearly 86,000 in 2005 and to nearly 100,000 by 2020.⁷⁰ However, the Wyoming Business Council forecasts a more modest growth rate, 0.5 percent, suggesting a County population of approximately 90,000 by 2020. This increase in population may see a corresponding growth in infrastructure, including the expansion of existing roads and highways to meet the County's growing needs.⁷¹ However, according to Cheyenne Metropolitan Planning Organization, the extent and location of future development are unknown at this time.⁷²
117. Regardless of the location of future development activities within the County, the designation of critical habitat is unlikely to substantially affect the course of regional development in the County. Given the population of the County (approximately 85,000) relative to the County area (2,688 square miles, or about one person per 20 acres), substitute home sites would be available, if necessary. Furthermore, the existing County regulations already require a minimum lot size of five acres for homes utilizing a small private wastewater system (septic) and water supply (well).⁷³ While the designation could influence the siting of a future home on a rural lot, sufficient space remains to site the home to avoid areas of concentrated plant populations. The implications of this re-siting, if any, would be site specific and are anticipated to be modest. Because the proposed designation is not expected to prohibit home development (i.e., the number of homes) in rural areas of the County, and because the costs, if any, are anticipated to be modest, this analysis does not anticipate any impacts regarding development activities in rural areas of Laramie County.

4.2.3.5 City of Cheyenne

118. Areas close to the city of Cheyenne are most likely to experience development pressures in the coming years (Unit 7).⁷⁴ Crow Creek in Unit 7 is a large drainage and

⁶⁸ Personal communication with Marlin Johnson, Platte County Planning Department, May 26, 2004.

⁶⁹ Laramie County Planning Department, "Laramie County Comprehensive Plan, 2001 Final Draft." Available at http://webgate.co.laramie.wy.us/departments/planning/documents/comprehensive_plan.pdf

⁷⁰ Laramie County Planning Department, "Laramie County Comprehensive Plan, 2001 Final Draft." Available at http://webgate.co.laramie.wy.us/departments/planning/documents/comprehensive_plan.pdf

⁷¹ Personal communication with Lee Potter, Federal Highway Administration. June 14, 2004.

⁷² Personal communication with Mark Matsen, Cheyenne Metropolitan Planning Organization, June 3, 2004.

⁷³ Laramie County Planning Department, "Laramie County Comprehensive Plan, 2001 Final Draft." Available at http://webgate.co.laramie.wy.us/departments/planning/documents/comprehensive_plan.pdf

⁷⁴ Personal communication with Jim Cochran, Laramie County Conservation District, June 1, 2004.

most of the western portion of the drainage runs through WAFB. While some development pressures will be seen around Crow Creek west of the base, according to the Cheyenne Metropolitan Planning Organization, it is unclear when, or to what extent development will occur.⁷⁵

4.2.4 Road and Bridge Construction and Maintenance

119. Interstate and state highways, as well as county roads cross the proposed critical habitat in several places. Therefore, future road and bridge construction and maintenance activities have the potential to impact Gaura.

120. The main Federal nexus for road and bridge construction and maintenance is Federal funding from the Federal highway Administration (FHWA). FHWA has consulted with the Service on other species within the proposed critical habitat area, but no consultations have been conducted on Gaura to date.⁷⁶

4.2.4.1 Colorado and Nebraska

121. Representatives from the Colorado Department of Transportation (CDOT) have stated that one major project is planned along Interstate Highway 25 (I-25) in the vicinity of Unit 8 during the next twenty years.⁷⁷ This project, the expansion of I-25 from Denver to Exit 286, will occur nearly 15 miles south of Unit 8. Thus, there are no potential impacts from road and bridge projects to this unit. Additionally, the Nebraska Department of Roads (NDOR) has identified one planned project for Kimball County during the next 20 years, the resurfacing of Interstate Highway 71 (I-71) from Kimball City to Interstate Highway 80 (I-80).⁷⁸ The plan indicates the project will occur several miles east of Unit 6, and thus, there are no expected impacts to Gaura habitat.

4.2.4.2 Wyoming

122. The majority of road and bridge development with the proposed critical habitat designation would be within the Cheyenne area (Unit 7).⁷⁹ Cheyenne has shown consistent growth and expansion and is currently developing commercial areas to the south and to the west of the current urban limits. This growth may impact the tributaries of Crow Creek in Unit 7.⁸⁰

⁷⁵ Personal communication with Martin Matsen, Cheyenne Metropolitan Planning Organization, June 14, 2004.

⁷⁶ Personal communication with Lee Potter, Federal Highway Administration, June 3, 2004.

⁷⁷ Personal communication with Rolland Harris, Colorado Department of Transportation on June 7, 2004.

⁷⁸ Personal communication with Cindy Veys, Nebraska Department of Roads, June 6, 2004.

⁷⁹ Personal communication with Lee Potter, Federal Highway Administration, June 3, 2004.

⁸⁰ Laramie County Planning Department, "Laramie County Comprehensive Plan, 2001 Final Draft." Available at http://webgate.co.laramie.wy.us/departments/planning/_documents/comprehensive_plan.pdf

123. Presently, three major projects along I-25 and I-80 are being developed within the Cheyenne area: (1) I-25 expansion from the Colorado border to Cheyenne; (2) installation of a new I-25 interchange south of Cheyenne; and (3) installation of a new I-80 interchange immediately west of Cheyenne. These improvements are not expected to impact the drainages identified in the proposed critical habitat designation. In addition, Wyoming Highway WYO-210 immediately west of Cheyenne and continuing approximately seven miles to the west is currently under construction. Improvements to this highway will continue west in future years. Finally, future projects along I-25 in northern Laramie County have the potential to impact the habitat, but there are no proposed Wyoming Department of Transportation (WYDOT) projects that would impact the Horse Creek and Bear Creek drainages (Units 2-4).⁸¹
124. The Cheyenne Metropolitan Planning Organization (MPO) has published a Transportation Improvement Plan (TIP) which includes capital transportation improvements within the City of Cheyenne for 2004-2006.⁸² The TIP indicates that the majority of future development will occur within central Cheyenne, with a few projects planned west of the city limits. All federally-funded projects planned for years 2004-2006 that occur within close proximity of Gaura populations are presented in Exhibit 4-5.

EXHIBIT 4-5				
FUTURE TRANSPORTATION PROJECTS PLANNED WITHIN GAURA HABITAT				
Year	Project Name	Description	Action Agency	CH Unit
2004	Happy Jack Road	Widening and Overlay From Roundtop Rd. West	FHWA	Unit 7
2005	I-25 Reconstruction	Concrete Reconstruction	FHWA	Unit 7
2005	Fort Access Road Separation	Add ramps to the separation	FHWA	Unit 7
2005	Cheyenne Speer Interchange	Design New Interchange	FHWA	Unit 7
2005	WYDOT Reconstruction between I-25 and Westland Rd.	Extend 12" diameter water main	FHWA	Unit 7

125. Although all projects listed in Exhibit 4-5 will pass through Unit 7, FHWA expects that none of the projects will impact drainages or Gaura habitat. Thus, FHWA does not foresee any future consultations with the Service regarding Gaura.⁸³

4.2.5 Agriculture

126. As discussed in Section 4.2.1, agricultural activities on private lands that may adversely impact Gaura and/or its habitat do not typically involve a Federal nexus. The

⁸¹ Personal communication with Lee Potter, Federal Highway Administration, June 3, 2004.

⁸² Cheyenne Metropolitan Planning Organization, "Transportation Improvement Program, Annual and Three Year Element, For Fiscal Years 2004-2006."

⁸³ Personal communication with Lee Potter, Federal Highway Administration, June 14, 2004.

main Federal nexus for agriculture activities on private land is the Natural Resource Conservation Service (NRCS). The NRCS provides funding for several agriculture-related activities, including property fencing, grazing, and the development of stock ponds and reservoirs.⁸⁴ The proposed rule for Gaura identifies these types of activities as potentially harmful to the survival of the species.⁸⁵

127. The NRCS has identified three main conservation programs that exist within the study area. First, the Environmental Quality Incentives Program (EQIP) provides a voluntary conservation program for farmers and ranchers that promote agricultural production and environmental quality as compatible national goals. Second, the Grassland Reserve Program (GRP) is a voluntary program offering landowners the opportunity to protect, restore, and enhance grasslands on their property. The GRP helps landowners restore and protect grassland, rangeland, pastureland, and shrubland. Finally, the Wetlands Reserve Program (WRP) is a voluntary program offering landowners the opportunity to protect, restore, and enhance wetlands on their property. The NRCS provides technical and financial support to help landowners with their wetland restoration efforts.⁸⁶ NRCS is required to consult with the Service if projects associated with these programs are anticipated to impact the habitat of federally listed species. The consultation history indicates that NRCS has not consulted with Service in the past for Gaura.

128. 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 Gaura 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 Wyoming (Laramie and Platte County), and that consultation with the Service for Gaura is not likely for these projects. Additionally, NRCS does not anticipate changes in conservation program participation due to Gaura.⁸⁷

129. Considering NRCS has not previously consulted with the Service for Gaura, that participation in NRCS programs in Laramie and Platte counties is low, and because future program participation is not expected to differ from the past rates, this analysis does not foresee economic impacts related to NRCS-funded activities within the proposed designation.

4.2.6 Oil and Gas Drilling

130. There is minimal oil and gas drilling in Laramie County (Units 2-7). 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.

⁸⁴ Personal communication with Paul Obert, Natural Resource Conservation Service, June 7, 2004.

⁸⁵ Federal Register, "Endangered and Threatened Wildlife and Plants: Proposed Threatened Status for the Plant Gaura Neomexicana ssp. Coloradens," March 24, 1998.

⁸⁶ U.S. Department of Agriculture, Natural Resource and Conservation Service. From: <http://www.nrcs.usda.gov/>, accessed on June 30, 2004.

⁸⁷ Personal communication with Paul Obert, Natural Resource Conservation Service, June 7, 2004.

For comparison, 7,404 APDs were issued statewide in 2000, 10,514 in 2001, and 6,473 in 2002. Furthermore, during the period October 1, 2000 (approximate date of listing) through March 31, 2004, county oil and gas production accounted for less than 0.6 percent and 0.01 percent of statewide production, respectively.⁸⁸

131. Personal communication with the Wyoming Oil and Gas Conservation Commission⁸⁹ and the Petroleum Association of Wyoming⁹⁰ indicates that the level of oil and gas drilling in Laramie County is likely to remain low. Therefore, impacts to Gaura habitat are not anticipated in the County.
132. Oil and gas development in the rest of the designation is not expected. A review of the county records indicates little or no annual oil or gas production in Platte County during the past 25 years, and no oil or gas drilling activities is currently occurring in the County (Unit 1).⁹¹ There are no oil and gas wells in the vicinity of Unit 8, and there have been no drilling permits allotted in this area.⁹² Furthermore, the Colorado Oil and Gas Conservation Commission (COGCC) does not anticipate future drilling in this area.⁹³

4.3 Summary of Impacts

133. The analysis estimates the pre-designation costs incurred between the time of listing in October 2000 through the final critical habitat designation in December 2004 and the potential future costs associated with conservation activities for the species from 2005 through 2024. Total estimated pre-designation costs are estimated to have ranged from \$260,000 to \$395,000. The vast majority of these historic costs, more than 96 percent, are administrative costs associated with the consultation process. Most of the past consultations were either general in nature (non-species and non-project specific), requests for comments and information from the Service, or findings by the Service of “no effect” or “not likely to adversely affect.” The total present value of post-designation costs are forecast to be as high as \$232,600, or upwards of \$22,000 annually. Most of the forecast costs (up to 56 percent) are comprised of the administrative costs of the consultation process associated with the voluntary conservation agreements (\$129,600).
134. Because the entire designation is non-Federal land, and the primary land use is cattle ranching and irrigated hay production, the activity that may be most affected by future conservation measures to protect Gaura and/or its habitat is ranching. The analysis

⁸⁸ Wyoming Oil and Gas Conservation Commission, “Database.” From: <http://wogcc.state.wy.us/>, as viewed on June 30, 2004.

⁸⁹ Personal communication with Don Likwartz, Wyoming Oil and Gas Conservation Commission, June 17, 2004.

⁹⁰ Personal communication with Dru Bauerm, Petroleum Association of Wyoming, June 6, 2004.

⁹¹ Wyoming Oil and Gas Conservation Commission, “2003 Oil and Gas Statistics,” 2003 County Report with Percentage of State Total. From: <http://wogcc.state.wy.us/>, as viewed on June 30, 2004.

⁹² Colorado Oil and Gas Conservation Commission, “Map Database.” From: http://oil-gas.state.co.us/?main_src=/cogis/DrillingPermits.asp, as viewed on June 27, 2004.

⁹³ Personal communication with the Colorado Oil and Gas Conservation Commission, June 15, 2004.

forecasts 39 informal consultations during the next 20-years, 37 between ranchers and the Service developing conservation agreements throughout the designation, and two in Reach 3 of Unit 7 (Borie) for natural gas pipeline projects. The agriculture-related conservation agreements account for up to 90 percent of forecast costs (\$258,900). The two natural gas pipeline projects account for the remaining ten percent of total costs (\$27,800).

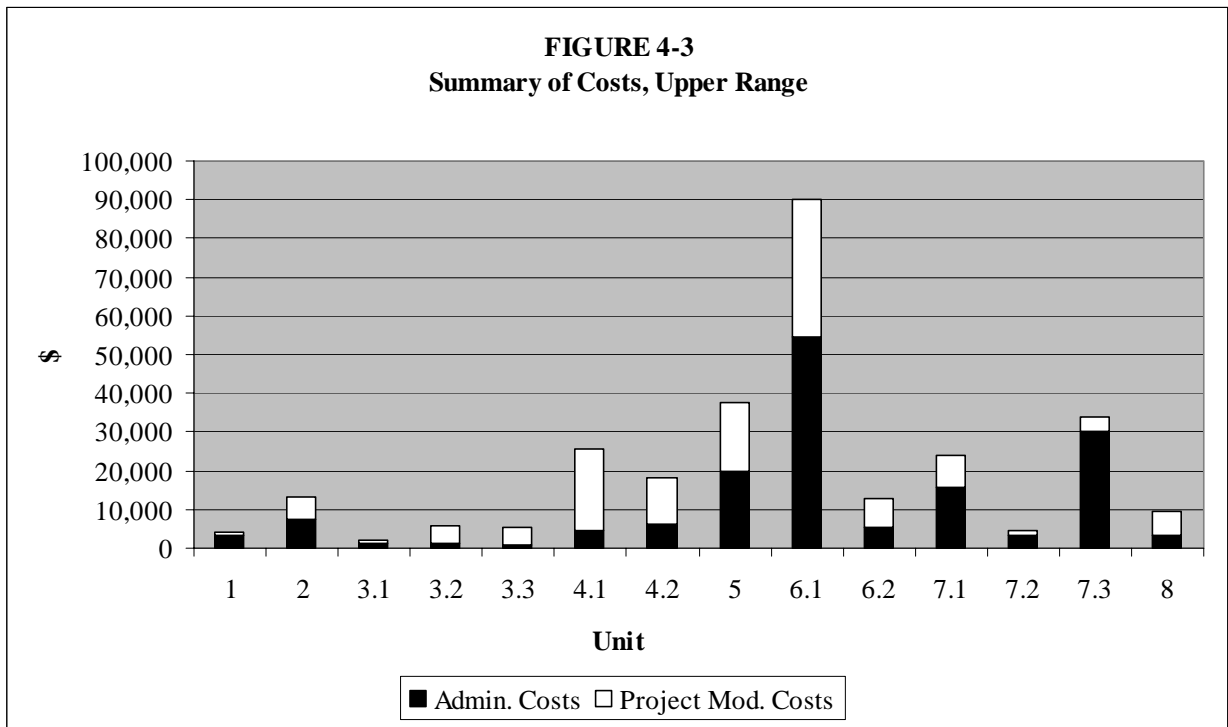
135. As mentioned above, the economic impacts to ranchers will be manifested primarily as the administrative cost of the consultation process associated with the voluntary conservation agreement program. The administrative cost of the consultation process with the Service to set up the conservation agreement in 2004 is forecast to comprise approximately two-thirds of the costs related to the conservation agreements. Post-2004 project modification costs associated with the voluntary conservation agreements comprise the remaining one-third of conservation agreement-related costs.⁹⁴ Project modifications may include the installation of additional fencing and additional annual costs for supplemental feed, fence repairs and maintenance and herbicide spraying. The analysis expects that ranchers who install additional fencing will also participate in a PFW cost share program, and that PFW will pay the entire cost of the fence (materials and installation).
136. All of the agriculture-related costs forecast in the analysis are associated with voluntary conservation agreements that target specific threats to Gaura on private agriculture lands. Because landowner participation in the conservation agreement program is voluntary, and thus uncertain, the impact of conservation measures for Gaura related to agriculture activities is presented as a range. The analysis assumes the upper bound for program participation is the number of individual landowners within the designation (37). Conversely, the lower bound on program participation is zero (i.e., no landowners participate in the program).
137. Assuming full program participation, private entities are forecast to bear up to approximately 59 percent of the total cost of Gaura conservation, the Service (including PFW) is anticipated to bear approximately 38 percent of forecast costs, and Federal agencies other than the Service less than three percent of total costs. Exhibit 4-6 represents the distribution of costs borne by party.
138. The only other category of costs is related to two informal consultations regarding natural gas pipeline projects over the next 10 years. Both projects may potentially impact Reach 3 of Unit 7 of the proposed critical habitat designation. Total administrative costs are anticipated to range from \$7,000 to \$27,800 for these projects. Project modifications are not expected since neither project crosses occupied Gaura habitat.

⁹⁴ Twenty-percent of the proposed designation (1,707 acres) is owned by the City of Fort Collins (708 acres), the City of Cheyenne (254 acres), and the State of Wyoming (745). The City of Fort Collins leases its land to a local rancher. This analysis assumes the designation owned by the City of Cheyenne and the State of Wyoming are also leased for ranching, and that the rancher (lessee) bears the costs associated with the conservation agreements.

EXHIBIT 4-6					
SUMMARY OF COSTS ASSOCIATED WITH EACH PARTY					
Cost Category	Range	Service	Other Federal Agencies	Private Entities	Total
Administrative	Low	\$2,000	\$2,600	\$2,400	\$7,000
	High	\$91,200	\$7,800	\$58,400	\$157,300
Project Modification	Low	\$0	\$0	\$0	\$0
	High	\$18,200	\$0	\$111,100	\$129,300
Total	Low	\$2,000	\$2,600	\$2,400	\$7,000
	High	\$109,400	\$7,800	\$169,500	\$286,700

*Note totals may not sum due to rounding.

139. Costs are driven primarily by the acres of habitat occupied by concentrated Gaura subpopulations within the units. Figure 4-3 is a graphical representation of the costs by unit over the next 20 years, based on the proportion of habitat occupied by concentrated subpopulations within each unit or reach (sub-unit). On a cost per unit basis the largest portion of forecast costs are expected to occur in Reach 1 of Unit 6, Lodgepole Creek East (32 percent). The next most costly units are Unit 5, Lodgepole Creek West (13 percent), and Reach 3 of Unit 7, Borie (12 percent). Together, these three units account for approximately 56 percent (\$161,400) of forecast costs. The three units also contain approximately 44 percent (approximately 1,029 acres) of the area of concentrated subpopulations within the proposed critical habitat designation.



140. Costs are driven primarily by the acres of habitat occupied by concentrated subpopulations within the units. The three largest units, in terms of area of concentrated subpopulations, account for almost 60 percent of the area occupied by concentrated subpopulations (1,341 acres) and approximately 54 percent of forecast costs (approximately \$153,400). These units are Reach 1 of Unit 6 (Lodgepole Creek East), Reach 1 of Unit 4 (Little Bear Creek/Horse Creek) and Unit 5 (Lodgepole Creek west).

141. Exhibit 4-7 provides an overview of the present value of costs associated with conservation measures for Gaura over the next 20 years. To discount and annualize costs, guidance provided by the Office of Management and Budget (OMB) specifies the use of real rates of three and seven percent.

EXHIBIT 4-7		
PRESENT VALUE OF TOTAL ECONOMIC COSTS (20 Years)		
	Total Cost	
	Low	High
Total Activity Cost	\$7,000	\$286,700
Present Value (3%)	\$6,800	\$257,200
Present Value (7%)	\$6,600	\$232,600
Annualized (3%)	\$500	\$22,000
Annualized (7%)	\$600	\$17,300

Note: This table presents nominal costs as well as discounted present value of total costs based on three and seven percent discount rates. Discounted costs are then annualized.

142. Exhibit 4-8 provides a detailed summary of the total costs associated with conservation activities for Gaura by unit over the next 20 years. Exhibit 4-9 presents the present value of these costs using a seven-percent discount rate.

EXHIBIT 4-8					
SUMMARY OF COSTS BY UNIT, HIGH RANGE					
Unit or Reach	Number of Informal Consultations	Service Costs	Total Action Agency Costs	Total Third Party Costs	Total Costs
1	1.0	\$2,400	\$0	\$1,900	\$4,300
2	2.1	5,700	0	7,600	13,300
3.1	0.3	800	0	1,100	1,900
3.2	0.3	1,400	0	4,500	5,900
3.3	0.2	1,200	0	4,200	5,400
4.1	1.3	6,000	0	19,600	25,600
4.2	1.8	5,900	0	12,500	18,400
5	5.6	15,400	0	22,000	37,400
6.1	15.6	40,900	0	49,400	90,300
6.2	1.5	4,500	0	8,200	12,700
7.1	4.5	11,600	0	12,400	24,000
7.2	1.0	2,400	0	2,000	4,400
7.3	2.6	8,100	7,800	17,800	33,700
8	1.0	3,100	0	6,300	9,400
TOTAL	39.0	\$109,400	\$7,800	\$169,500	\$286,700

EXHIBIT 4-9					
SUMMARY OF PRESENT VALUE OF COSTS BY UNIT, HIGH RANGE					
(20-Years at a 7 Percent Discount Rate)					
Unit or Reach	Number of Informal Consultations	Service Costs	Total Action Agency Costs	Total Third Party Costs	Total Costs
1	1.0	\$2,400	\$0	\$1,600	\$4,000
2	2.1	5,700	0	5,200	10,900
3.1	0.3	800	0	700	1,500
3.2	0.3	1,400	0	2,600	4,000
3.3	0.2	1,200	0	2,300	3,500
4.1	1.3	6,000	0	11,200	17,200
4.2	1.8	5,900	0	7,600	13,500
5	5.6	15,400	0	14,900	30,300
6.1	15.6	40,900	0	35,000	75,900
6.2	1.5	4,500	0	5,200	9,700
7.1	4.5	11,600	0	9,100	20,700
7.2	1.0	2,400	0	1,600	4,000
7.3	2.6	7,700	7,300	15,400	30,400
8	1.0	3,100	0	3,900	7,000
TOTAL	39.0	\$109,000	\$7,300	\$116,300	\$232,600

4.4 Small Business Impact Analysis

143. This section considers the extent to which the analytic results presented in the economic analysis reflect impacts to small businesses. The small business analysis presented in this section is based on information gathered from the Small Business Administration (SBA), U.S. Census Bureau, U.S. Department of Agriculture, and Dun and Bradstreet, and comparisons with the results of the economic analysis.⁹⁵ The following summarizes the sources of potential future impacts on small businesses attributable to conservation measures to protect Gaura and/or its habitat.
144. Based on the results reported in the economic analysis, activities undertaken by small business that are potential affected by conservation measures to protect the Gaura and/or its habitat include agriculture production.⁹⁶ SBA's small business size standard for farming and ranching is annual sales of \$750,000.⁹⁷ Recent county-level farm sales data from the NASS 2002 Agriculture Census is used to determine the number of small agribusinesses operating within the proposed critical habitat designation.⁹⁸ Unfortunately, the largest reported category of sales information reported in the 2002 Agriculture Census data is for the number of operations with annual farm sales greater than \$500,000, less than the SBA small business threshold. Nevertheless, the 2002 Agriculture Census data does indicate that 95 percent of the farmers operating within the five counties encompassed by the proposed designation have annual sales less than \$500,000 (see Exhibit 4-10). In Laramie County, where more than 85 percent of the critical habitat is located, 736 of 755 farmers reported annual farm sales less than \$500,000. These data indicate that ranching operations in the area surrounding the proposed designation tend to be small. For the purpose of this small business analysis, because of the high percentage of farming operations with annual sales below \$500,000, all agriculture operations forecast to be impacted by the proposed designation of critical habitat for Gaura are considered small.
145. Assuming all landowners within the proposed designation participate in the voluntary conservation agreement program with the Service, up to 37 small agriculture

⁹⁵ This information was gathered in a Dialog search of File 516, Dun and Bradstreet, "Dun's Market Identifiers."

⁹⁶ The expected cost of Gaura conservation activities (approximately \$14,000) to El Paso Corporation (parent of Cheyenne Plains Pipeline Company) and EnCana (parent of Entegra Gas Pipeline, Inc.) is negligible considering recent annual revenues for each parent company exceeded \$10 billion. From: EnCana Corporation, 2003 Annual Report to Shareholders and El Paso Corporation, Annual Report for Fiscal Year Ended December 31, 2002 (Form 10-K). Available at http://www.encana.com/investor/financial_info/annual2003/pdf/encana_full.pdf and http://www.epenergy.com/investor/03_1q/EPC10K_FINAL.pdf

⁹⁷ U.S. Small Business Administration, "Small Business Size Standards matched to North American Industry Classification System," effective January 28, 2004. From: <http://www.sba.gov/size/sizetable2002.html>, as viewed on June 30, 2004.

⁹⁸ U.S. Department of Agriculture, National Agricultural Statistical Service, "2002 Census of Agriculture," Wyoming State and County Data, Volume 1 Geographic Area Series, Part 50, Chapter 2, Table 2. Market Value of Agricultural Products Sold Including Direct and Organic: 2002 and 1997. Available at <http://www.nass.usda.gov/census/census02/volume1/WYVolume104.pdf>

operations could be impacted by conservation measures for Gaura.⁹⁹ These operations represent less than one percent of the number of small farms operating within the five counties surrounding critical habitat (see Exhibit 4-10). The percent of small agriculture operations impacted ranges from less than one percent in Platt (Wyoming), Larimer (Colorado) and Weld (Colorado) Counties to 1.4 percent in Kimball County (Nebraska).¹⁰⁰ In Laramie County (Wyoming), where more than 85 percent of the designation is located, the 30 small agriculture operations represent approximately four percent of the small farms in the county (755). It is important to note that these costs will only be incurred by ranching operations to the extent that they agree to participate in the voluntary conservation agreement program with the Service.

146. The total annualized costs of conservation measures (\$263 per landowner, or approximately \$10,000 in total) are less than one one-thousandth of a percent of annual farm sales in the five counties that encompass the proposed designation. In Laramie and Kimball counties, the annualized impact represents approximately one one-hundredth of a percent of annual farm sales in the counties. For each of the remaining three counties, the annualized impacts are less than one one-thousandth of a percent of each counties' annual farm sales (see Exhibit 4-10).
147. Assuming an operation is required to implement all of the activities recommended to protect the species and its habitat, the annualized cost of the conservation measures to the operator (\$263) represents one-tenth of a percent of the average annual farm's sales in the five counties surrounding the proposed designation (see Exhibit 4-10). The annualized impact ranges between one-tenth of a percent of a average farm's annual sales in Weld County, to four-tenths of a percent in Larimer and Kimball counties. In Laramie County the annualized impact represents three-tenths of a percent of the average farmer's annual sales.
148. The conservation measures for Gaura are expected to impact the profitability of up to 37 small agriculture operations. For the purpose of this small business analysis, profitability is defined as the net cash farm income of the operator, as reported in the NASS 2002 Agriculture Census.¹⁰¹ As shown in Exhibit 4-10, the total annualized cost of the conservation measures to the operator (\$263) represents 2.5 percent of the average

⁹⁹ Meadow Spring Ranch (Unit 8) in Weld and Larimer counties, Colorado, is owned by the City of Fort Collins. The city leases the land to a local rancher. There are other parcels within the proposed designation owned by the City of Cheyenne and the State of Wyoming. We assume that these parcels are also leased to local ranching operations.

¹⁰⁰ The small business impacts analysis includes Larimer County, Colorado, as Unit 8 abuts the Larimer/Weld county line and the landowner (the City of Fort Collins) is located in Larimer County. County data for Weld and Larimer counties, in Colorado, are then combined.

¹⁰¹ Net cash farm income of the operator is "...the operator's total revenue (fees for producing under contract, total sales not under contract, government payments, and farm-related income) minus total expenses paid by the operator. Net cash farm income of the operator removes the value of contract commodities produced and acknowledges the income the operator(s) received for services performed by the contractor." ¹⁰¹ U.S. Department of Agriculture, National Agricultural Statistical Service, "2002 Census of Agriculture," Wyoming State and County Data, Volume 1 Geographic Area Series, Part 50, Chapter 2, Appendix A, General Explanation. Available at <http://www.nass.usda.gov/census/census02/volume1/WYVolume104.pdf>

farm's annual net cash farm income in the five counties surrounding the proposed designation. The annualized impact ranges between 1.4 percent of an average farm's annual net cash farm income in Weld County, to 34.7 percent of the average farm's annual net cash farm income in Larimer County. Unit 8 in Weld County is owned by the City of Fort Collins, located in Larimer County, and leased to a rancher. The City of Fort Collins would likely bear these costs (either directly or in the form of a lower lease cost). In Laramie County, the annualized impact represents 8.6 percent of the average farmer's annual net cash farm income. Note that, given the very small number of farming operations expected to be impacted by this designation, and the variability of farm revenue and net farm income, actual impacts will likely vary from these estimates.

EXHIBIT 4-10						
COUNTY AGRICULTURE STATISTICS AND SMALL BUSINESS ANALYSIS						
Item	Wyoming		Colorado		Nebraska	Total Area
	Laramie	Platte	Larimer	Weld	Kimball	
Number of farms	755	462	1,564	3,121	362	6,264
Farms with sales <\$500,000	736	446	1,536	2,920	353	5,991
Farms with sales > \$500,000	19	16	28	201	9	273
Percent of farms with sales >\$500,000	3%	3%	2%	6%	2%	4%
Number of small farms impacted by the designation	30	1	1		5	37
Percent of small farms impacted	4.0%	0.2%	0.0%		1.4%	0.6%
Total sales (\$1,000)	\$65,522	\$79,906	\$101,097	\$1,127,854	\$21,873	\$1,396,253
Total annualized cost of designation (\$)	\$7,892	\$263	\$263		\$1,315	\$9,734
Annualized cost as a percent of total farm sales	0.01%	0.00%	0.00%		0.01%	0.00%
Average sales per farm	\$86,784	\$172,957	\$64,640	\$361,376	\$60,424	\$222,901
Average net cash farm income per operator	\$3,059	\$5,918	\$759	\$18,374	\$9,342	\$10,689
Number of farm operators reporting net cash farm losses	422	273	1,162	1,765	111	3,733
Percentage of farm operators reporting net cash farm losses	56%	59%	74%	57%	31%	60%
Annualized cost of designation per operator	\$263					
Annualized cost of designation as a percent of average farm sales per operator	0.3%	0.2%	0.4%	0.1%	0.4%	0.1%
Annualized cost of designation as a percent of average net cash farm income per operator	8.6%	4.4%	34.7%*	1.4%	2.8%	2.5%

Source: U.S. Department of Agriculture, National Agricultural Statistical Service, "2002 Census of Agriculture," Wyoming State and County Data, Volume 1 Geographic Area Series, Part 50, Chapter 2, Table 2. Market Value of Agricultural Products Sold Including Direct and Organic: 2002 and 1997, and Table 4. Net Cash Farm Income of the Operations and Operators: 2002. Available at <http://www.nass.usda.gov/census/census02/volume1/WYVolume104.pdf>

* This unit is owned by the City of Fort Collins and leased to a rancher. The City of Fort Collins would likely bear these costs (either directly or in the form of a lower lease cost).

149. County-level data in the 2002 Agriculture Census indicate that the majority of farms (approximately 60 percent) within the five county area operate at a net cash loss (see Exhibit 4-10). By definition, net cash income is cash sales less cash expenses (ignoring non-cash expenses, such as depreciation), a net cash loss means most of the

small farm operators in the five county area are operating below break-even (i.e., cash expenses exceed cash income). The greatest proportion of farmers operating below break-even are located in Larimer County, where 74 percent of the farms operate at a net loss. Kimball County contains the lowest percentage of farms operating at a net loss (31 percent). In Laramie County, where more than 85 percent of the designation is located, 56 percent of the farms operated at a net loss in 2002.

150. The extent to which impacts are significant to any of the 37 agriculture operations will depend on the individual financial condition of the operation. Considering this analysis assumes each operation implements all of the actions recommended to protect the species and its habitat, this analysis likely overstates the impacts to any one rancher. However, while the annual cost to the typical agriculture operation forecast in this analysis appears small, costs will vary, farming and ranching operations in the region are suffering through a fourth year of drought, and their financial situation suggests the average operation is only marginally profitable.

4.5 Potential Impacts to the Energy Industry

151. Pursuant to Executive Order No. 13211, “Actions Concerning Regulations that Significantly Affect Energy Supply, Distribution, or Use,” issued May 18, 2001, Federal agencies must prepare and submit a “Statement of Energy Effects” for all “significant energy actions.” The purpose of this requirement is to ensure that all Federal agencies “appropriately weigh and consider the effects of the Federal Government’s regulations on the supply, distribution, and use of energy.”¹⁰² The Office of Management and Budget has provided guidance for implementing this Executive Order that outlines nine outcomes that may constitute “a significant adverse effect” when compared without the regulatory action under consideration:

- Reductions in crude oil supply in excess of 10,000 barrels per day (bbls);
- Reductions in fuel production in excess of 4,000 barrels per day;
- Reductions in coal production in excess of 5 million tons per year;
- Reductions in natural gas production in excess of 25 million Mcf per year;
- Reductions in electricity production in excess of 1 billion kilowatts-hours per year or in excess of 500 megawatts of installed capacity;
- Increases in energy use required by the regulatory action that exceed the thresholds above;

¹⁰² U.S. Office of Management and Budget, The Executive Office of the President, “Memorandum For Heads of Executive Department Agencies, and Independent Regulatory Agencies, Guidance For Implementing E.O. 13211, M-01-27,” July 13, 2001. From: <http://www.whitehouse.gov/omb/memoranda/m01-27.html>, as viewed on June 30, 2004.

- Increases in the cost of energy production in excess of one percent;
- Increases in the cost of energy distribution in excess of one percent; or
- Other similarly adverse outcomes.¹⁰³

152. Three of these criteria are potentially relevant to this analysis: 1) potential reductions in crude supply in excess of 10,000 barrels per day; 2) potential reductions in natural gas production in excess of 25 million Mcf per year; 3) and increases in the cost of energy distribution in excess of one percent.

153. The analysis forecasts that oil and gas drilling/production will not be impacted by the conservation measures to protect Gaura and/or its habitat. However, two natural gas pipelines are expected to cross unoccupied Gaura habitat (the Entrega Gas Pipeline, Inc. Pipeline) or nearby Gaura habitat (the Cheyenne Plains Pipeline Company pipeline). Project modifications are not anticipated for either project. Each company will, however, enter into an informal consultation with the Service at an estimated cost of approximately \$14,000 per consultation. Considering the total estimated cost of Cheyenne Plains' 380-mile 36-inch-diameter pipeline project is \$420 million, the cost of consulting with the Service on the project fall far below the one-percent threshold.¹⁰⁴ While specific cost information is not available for Entrega's pipeline project, considering it is similar in length (330-mile) and size (36- to 42-inch-diameter) to Cheyenne Plains' pipeline, this energy impacts analysis also expects the cost of consulting with the Service will fall far below the one-percent threshold.¹⁰⁵

154. As described above, the energy industry will not experience a "significant adverse effect" because of conservation measures to protect Gaura and its habitat.

¹⁰³ U.S. Office of Management and Budget, The Executive Office of the President, "Memorandum For Heads of Executive Department Agencies, and Independent Regulatory Agencies, Guidance For Implementing E.O. 13211, M-01-27," July 13, 2001. From: <http://www.whitehouse.gov/omb/memoranda/m01-27.html>, as viewed on June 30, 2004.

¹⁰⁴ El Paso Corporation, "El Paso Corporation Provides Financial and Operational Update," May 28, 2004. From: <http://www.epenergy.com/press/newsquery.asp?sId=4279>, as viewed on June 30, 2004.

¹⁰⁵ Federal Energy Regulatory Commission, Office of Energy Projects, "National Environmental Policy Act Pre-Filing Environmental Review and Scoping for the Entrega Pipeline Project," Docket No. PF04-7-000. Available at <http://www.entregapipeline.com/pdfs/ferc/2004/openhouse-mar26.pdf>

REFERENCES

- Center for Economic and Business Data. *Economic Indicators for Greater Cheyenne, Annual Trends Addition*. From: <http://www.lccc.wy.edu/cebd/Default.htm>, as viewed on June 30, 2004.
- Cheyenne Plains Gas Pipeline Company, LLC. *Fact Sheet Web Page*. From: <http://www.cmenergy.com/cheyyenne/fact.asp>, as viewed on June 30, 2004.
- Cheyenne Metropolitan Planning Organization. *Transportation Improvement Program, Annual and Three Year Element, For Fiscal Years 2004-2006*.
- City-data.com. From: <http://www.city-data.com/city/Fort-Collins-Colorado.html>, as viewed on June 30, 2004.
- City-data.com. From: <http://www.city-data.com/city/Wellington-Colorado.html>, as viewed on June 30, 2004.
- Colorado Division of Local Government, Demography Office, *Draft Population Forecasts by County, 2000-2030*. From: <http://dola.colorado.gov/demog/PopulationTotals.cfm>, as viewed on June 30, 2004.
- Colorado Oil and Gas Conservation Commission. *Map Data Base*. From: http://oil-gas.state.co.us/?main_src=/cogis/DrillingPermits.asp, as viewed on June 27, 2004.
- El Paso Corporation. 2002. *Form 10-K. Annual Report Pursuant to Section 13 or 15(d) of the Securities Exchange Act of 1934. For the fiscal year ended December 31, 2002*. From: http://www.epenergy.com/investor/03_1q/EPC10K_FINAL.pdf
- El Paso Corporation. 2004. *El Paso Corporation Provides Financial and Operational Update*, May 28 press release. From: <http://www.epenergy.com/press/newsquery.asp?sId=4279>, as viewed on June 30, 2004.
- EnCana Corporation, 2003 Annual Report to Shareholders. "What Matters." Available at http://www.encana.com/investor/financial_info/annual2003/pdf/encana_full.pdf
- Executive Order 12866 of September 30, 1993. *Regulatory Planning and Review*. Available at http://www.archives.gov/federal_register/executive_orders/pdf/12866.pdf
- Executive Order 13211 of May 18, 2001. *Actions Concerning Regulations That Significantly Affect Energy Supply, Distribution, or Use*. Available at http://frwebgate.access.gpo.gov/cgi-bin/getdoc.cgi?dbname=2001_register&docid=fr22my01-133.pdf
- Federal Register. 1998. *Endangered and Threatened Wildlife and Plants: Proposed Threatened Status for the Plant *Gaura Neomexicana* ssp. *Coloradensis**. March 24, Vol 63, No. 56, page 14,060.
- Federal Register. 2001. *Endangered and Threatened Wildlife and Plants; Annual Notice of Findings on Recycled Petitions*. January 8, 2001, Vol. 66, No. 5, page 1,295.
- Federal Register. 2003. *Endangered and Threatened Wildlife and Plants; Designation of Critical Habitat for the Preble's Meadow Jumping Mouse (*Zapus hudsonius preblei*)*. June 23, Vol. 68, No. 120, page 37,276.

- Federal Register. 2003. *Endangered and Threatened Wildlife and Plants; Withdrawal of the Proposed Rule to List the Mountain Plover as Threatened*. September 9, Vol. 68, No. 174, page 53,083.
- Federal Register. 2004. *Cheyenne Plains Gas Pipeline Company, LLC and Colorado Interstate Gas Company; Notice of Availability of the Final Environmental Impact Statement for the Proposed Cheyenne Plains Pipeline Project*. February 20, Vol 69, No. 38, page 8,957.
- Federal Energy Regulatory Commission. 2003. *Wetland and Waterbody Construction and Mitigation Procedures*. Available at <http://www.ferc.gov/industries/gas/enviro/wetland.pdf>
- Federal Energy Regulatory Commission, Office of Energy Projects. *National Environmental Policy Act Pre-Filing Environmental Review and Scoping For the Entrega Pipeline Project*. Docket No. P404-7-000. Available at <http://www.entregapipeline.com/openhousematerials/fercprojectstatement.pdf>
- Francis E. Warren Air Force Base. *Community/Wyomingites Web Page*. From: <http://www.militarynewcomers.com/FEWARREN03/Resources/Community.html>, as viewed on June 30, 2004.
- Gramlich, E.M. 1990. *A Guide to Benefit-Cost Analysis (2nd Ed.)*. Prospect Heights, Illinois: Waveland Press, Inc.
- Greater Cheyenne Chamber of Commerce. *Community Information Web Page*. From: <http://www.cheyennechamber.org/website/community/index.asp>, as viewed on June 30, 2004.
- Hewlett, J.P., J. Brown and C.E. Olson. 2004. *Custom rates for Wyoming farm and ranch operation: 2000-2002*. University of Wyoming Cooperative Extension Service, B-1142. Available at <http://agecon.uwyo.edu/FarmMgt/PUBS/B1142.pdf>
- Laramie County Planning Department. 2001. *Laramie County Comprehensive Plan, 2001 Final Draft*. Available at http://webgate.co.laramie.wy.us/departments/planning/documents/comprehensive_plan.pdf
- Long, Michael M., Filed Supervisor, Wyoming Field Office, U.S. Fish and Wildlife Service, to Paul Friedman, Federal Energy Regulatory Commission, May 25, 2001, transmitting the Fish and Wildlife Service's biological opinion for Medicine Bow Lateral Loop Natural Gasline project.
- Moline, B.R., R.R. Fletcher, D.T. Taylor, G. Fink, F. Henderson, and L. Bourret. 1994. *Livestock Production, 1992*. University of Wyoming College of Agriculture Publication B-993. Available at <http://www.uwyo.edu/CES/PUBS/B-993.htm>
- Pfost, D., J. Gerrish, M. Davis, and M. Kennedy. 2000. *Pumps and watering systems for managed beef grazing, 2000*. University of Missouri Extension Service, Bulletin EQ380. Available at <http://muextension.missouri.edu/explore/envqual/eq0380.htm>

- Reece, P.E., J.T Nichols, J.E. Brummer, R.K. Engel, and K.M. Eskridge. 1994. Harvest date and fertilizer effects on native and interseeded wetland meadows. *Journal of Range Management*. 47:178-183.
- Regulatory Flexibility Act (5 U.S.C. §601 *et seq.*)
- Short, S.D. 2001. *Characteristics and Production Costs of U.S. Cow-Calf Operations., 2001*, U.S. Department of Agriculture, Economic Research Service, ERS Statistical Bulletin No. 974-3. Available at <http://www.ers.usda.gov/catalog/OneProductAtATime.asp?ARC=c&PDT=2&PID=1255>.
- Small Business Regulatory Enforcement Fairness Act of 1996 (Public Law 104-121).
- United States Court of Appeals, Tenth Circuit. 2001. *New Mexico Cattle Growers Association v. U.S.F.W.S. 248 F.3d 1277 (10th Cir. 2001)*. Available at <http://www.kscourts.org/ca10/cases/2001/05/00-2050.htm>
- University of Nebraska-Lincoln, College of Business Administration, Bureau of Business Research, Population Projections Web Page. *Kimball County by Age Group*. From: <http://www.bbr.unl.edu/PopProjections/PopProj.html>, as viewed on June 30, 2004.
- U.S. Census Bureau. *Annual Estimates of the Population for Counties: April 1, 2000 to July 1, 2003*. From: <http://eire.census.gov/popest/data/counties/CO-EST2003-01.php>, as viewed on June 30, 2004.
- U.S. Census Bureau. *CenStats Databases Web Page, County Business Patterns Data (NAICS) 2001*. From: <http://censtats.census.gov>, as viewed on June 30, 2004.
- U.S. Census Bureau. *Incorporated Place Population Estimates and Population Change, Sorted within County: April 1, 2000 to July 1, 2002*. From: <http://eire.census.gov/popest/data/cities/subtab12.php>, as viewed on June 30, 2004.
- U.S. Census Bureau. *State and County Quick Facts*. From: <http://quickfacts.census.gov/qfd/>, as viewed on June 30, 2004.
- U.S. Census Bureau. *Time Series of State Intercensal Population Estimates by County, April 1, 1990 to April 1, 2000*. From: <http://eire.census.gov/popest/data/counties/tables/CO-EST2001-12.php>, as viewed on June 30, 2004.
- U.S. Department of Agriculture, National Agricultural Statistical Service. *2002 Census of Agriculture – Wyoming State and County Data, Volume 1 Geographic Area Series, Part 50*. Available at <http://www.nass.usda.gov/census/census02/volume1/WYVolume104.pdf>
- U.S. Department of Agriculture, National Agriculture Statistics Service. *Agricultural Statistics Data Base, Quick Stats*. From: <http://www.nass.usda.gov:81/ipedb/>, as viewed on June 30, 2004.
- U.S. Department of Agriculture, Natural Resource and Conservation Service. From: <http://www.nrcs.usda.gov/>, as viewed on June 30, 2004.
- U.S. Department of Commerce, Bureau of Economic Analysis. *Regional Economic Accounts, Local Area BEARFACTS 1992-2002*. From: <http://www.bea.gov/bea/regional/bearfacts/countybf.cfm>, as viewed on June 30, 2004.

- U.S. Department of Commerce, Bureau of Economic Analysis. *Regional Economic Accounts, Local Area Personal Income, Total full-time and part-time employment by industry*. From: <http://www.bea.doc.gov/bea/regional/reis/>, as viewed on June 30, 2004.
- U.S. Department of Labor, Bureau of Labor Statistics. *Labor Force Data by County, 2003 Annual Averages*. From: <ftp://ftp.bls.gov/pub/special.requests/la/laucounty.txt>, as viewed on June 30, 2004.
- U.S. Department of Labor, Bureau of Labor Statistics. *Unemployment Rates for States, 2003*. From: <http://www.bls.gov/lau/lastrk03.htm>, as viewed on June 30, 2004.
- U.S. Endangered Species Act, Section 9 (16 U.S.C. §1532, 16 U.S.C. §1538).
- U.S. Endangered Species Act, Section 4 (16 U.S.C. §1533(b)(2), 16 U.S.C. §1533(b)(1)(A)).
- U.S. Environmental Protection Agency (EPA 240-R-00-003). 2000. *Guidelines for Preparing Economic Analyses*. Available at [http://yosemite.epa.gov/ee/epa/eed.nsf/webpages/Guidelines.html/\\$file/Pref-ack.pdf](http://yosemite.epa.gov/ee/epa/eed.nsf/webpages/Guidelines.html/$file/Pref-ack.pdf)
- U.S. Fish and Wildlife Service. 2004. *Draft Proposed Designation of Critical Habitat for the Colorado Butterfly Plant (Gaura neomexicana ssp. coloradensis)*, May 15, 2004 draft.
- U.S. Fish and Wildlife Service. *Endangered Species and Habitat Conservation Planning*. From: <http://endangered.fws.gov/hcp/>, as viewed on June 30, 2004.
- U.S. Office of Management and Budget. 2000. "Appendix 4: Guidelines to Standardize Measure of Costs and Benefits and the Format of Accounting Statements." In: *Report to Congress on the Costs and Benefits of Federal Regulations*. March 22.
- U.S. Office of Management and Budget. 2003. *Circular A-4*. September 17. Available at <http://www.whitehouse.gov/omb/circulars/a004/a-4.pdf>.
- U.S. Office of Management and Budget. 2003. *Draft 2003 Report to Congress on the Costs and Benefits of Federal Regulations; Notice*. 68 *Federal Register* 5492.
- U.S. Office of Management and Budget, The Executive Office of the President. 2001. *Memorandum For Heads of Executive Department Agencies, and Independent Regulatory Agencies, Guidance For Implementing E.O. 13211, M-01-27*. From: <http://www.whitehouse.gov/omb/memoranda/m01-27.html>, viewed on June 30, 2004.
- U.S. Office of Personnel Management. 2002. *Federal Government General Schedule Rates*. Available at <http://www.opm.gov/oca/02tables/02gsh.pdf>
- U.S. Small Business Administration. *Small Business Size Standards matched to North American Industry Classification System, Effective January 28, 2004*. From: <http://www.sba.gov/size/sizetable2002.html>, as viewed on June 30, 2004.
- Wyoming Agricultural Statistical Service. *Wyoming Agricultural Statistics 2003*. Available at <http://www.nass.usda.gov/wy/bulletin/bulletin2003.pdf>
- Wyoming Department of Administration and Information, Economic Analysis Division, *Wyoming Population Estimates and Forecasts for Counties, Cities, and Towns: 1991 to 2010*. Available at <http://eadiv.state.wy.us/pop/Wyc&sc10.pdf>
- Wyoming Department of Administration. Economic Analysis Division. From: <http://eadiv.state.wy.us/pop.htm>, as viewed on June 30, 2004.

Wyoming Department of Employment, Wyoming Labor Market Information: Research & Planning Home Page, Local Area Unemployment Statistics. *2003 Wyoming Benchmark Labor Force Estimates*. From: <http://doe.state.wy.us/lmi/LAUS/03bmk.htm>, as viewed on June 30, 2004.

Wyoming Oil and Gas Conservation Commission. 2004. *2003 Wyoming Oil and Gas Statistics*. From: <http://wogcc.state.wy.us/>, as viewed on June 30, 2004.

Wyoming Oil and Gas Conservation Commission. *Database*. From: <http://wogcc.state.wy.us/>, as viewed on June 30, 2004.

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Ryan Lance, Wyoming Governor's office
Service Biologist, Cheyenne Field Office, June 17, 2004.
Service Biologist, Cheyenne Field Office, June 28, 2004.
Service Biologist, Cheyenne Field Office, July 1, 2004.
Four ranchers in Laramie County that own land within the proposed critical habitat designation area
One rancher in Laramie County that does not own land within the proposed critical habitat designation area
Vern Mickelsen, Federal Highways Administration
Weld County Development Office