

Recovery Outline
for
Gaura neomexicana* ssp. *coloradensis
(Colorado Butterfly Plant)

May 2010



Photo by U.S. Fish and Wildlife Service

I. INTRODUCTION

This document lays out a preliminary course of action for the recovery of *Gaura neomexicana* ssp. *coloradensis* (Colorado butterfly plant). It serves to guide recovery efforts and inform consultation and permitting activities until a comprehensive recovery plan for this species is approved. *G. n.* ssp. *coloradensis* is a regional endemic historically found from Boulder, Douglas, Larimer, and Weld Counties in Colorado, Laramie County in Wyoming, and western Kimball County in Nebraska. Colonies are often found in low depressions or along bends in wide, active, meandering stream channels a short distance upslope of the actual channel. The plant requires early- to mid-succession riparian habitat. The most immediate and severe threat to *G. n.* ssp. *coloradensis* is the effect of residential and urban development. Some agricultural practices that impact riparian habitats, such as mowing and haying, in some cases also may pose a threat to the species.

Listing and contact information:

Scientific Name:	<i>Gaura neomexicana</i> ssp. <i>coloradensis</i>
Common Name:	Colorado Butterfly Plant
Listing Classification:	Threatened rangewide
Effective Listing Date:	October 18, 2000 (65 FR 62302)
Critical Habitat Designation:	January 11, 2005 (70 FR 1940)
Lead Agency, Region:	U.S. Fish and Wildlife Service, Region 6
Lead Field Office:	Wyoming Field Office
Contact Biologist:	Jan McKee, 307-772-2374, ext 242, jan_mckee@fws.gov
Cooperating Offices:	Colorado Field Office

II. RECOVERY STATUS ASSESSMENT

A. BIOLOGICAL ASSESSMENT

Taxonomy: *G. n. ssp. coloradensis* was initially described as *G. coloradensis* by Rydberg (1904) based on material collected in 1895 near Fort Collins, Colorado. Munz (1938) changed the species to *G. neomexicana* and reduced it to the variety *coloradensis*. At present, the taxon is recognized as *G. n. ssp. coloradensis* (Rydb.) P.H. Raven and Gregory (Colorado butterfly plant or Colorado bee blossom) (U.S. Department of Agriculture, Natural Resource Conservation Service 2008).

Recent molecular data demonstrate that *Gaura*, together with the unispecific genus *Stenosiphon*, comprise a monophyletic group. This group is embedded within the diverse genus *Oenothera*, and may be best treated as part of that genus. The morphological characters used to delimit the genus are: nutlike, indehiscent capsules with one to four seeds; and flowers mostly zygomorphic with short stigma lobes. These characters still delimit the group, but now are viewed as specializations derived within *Oenothera* (Hoggard et al. 2003). Wagner has proposed a name change to *Oenothera coloradensis ssp. coloradensis* (Wagner et al. 2007); however, U.S. Department of Agriculture, Natural Resource Conservation Service's Plants Database (2008), the International Plant Name Index (2008), and the Integrated Taxonomic Information System (2008) have *G. n. ssp. coloradensis* as the accepted name. The U.S. Fish and Wildlife Service (Service/USFWS) is considering whether to formally accept the proposed taxonomic revision. Until the taxonomy is formally changed in 50 CFR 17.12, we will continue to refer to this species as *G. n. ssp. coloradensis*.

Description, Habitat, and Life History: *G. n. ssp. coloradensis* is a short-lived, perennial herb that lives vegetatively in a basal rosette of leaves for several years before bearing fruit once and then dying. It has one to a few reddish, hairy stems that are 50 to 80 centimeters (2 to 3 feet) tall. The lower leaves are lance-shaped with smooth or wavy-toothed margins and average 5 to 15 centimeters (2 to 6 inches) long, while those on the stem are smaller and reduced in number. Flowers are arranged in a branched, elongate inflorescence above the leaves. Only a few flowers are open at any one time. Flowers are located below the rounded buds and above the mature fruits. Individual flowers are 5 to 14 millimeters (0.25 to 0.5 inch) long with four reddish sepals and four white petals that turn pink or red with age. The hard, nutlike fruits are 4-angled and have no stalk. Non-flowering plants consist of a stemless, basal rosette of oblong, hairless leaves 3 to 18 centimeters (1 to 7 inches) long (Marriott 1987; Fertig 1994; Fertig et al. 1994; Fertig 2000a, 2000b, 2001).

G. n. ssp. coloradensis occurs on subirrigated, alluvial soils on level or slightly sloping floodplains and drainage bottoms at elevations of 1,524 to 1,951 meters (5,000 to 6,400 feet). Colonies are often found in low depressions or along bends in wide, active, meandering stream channels a short-distance upslope of the actual channel. The plant requires early- to mid-succession riparian habitat. It commonly occurs in communities dominated by: *Agrostis stolonifera* (red top) and *Poa pratensis* (Kentucky bluegrass) on wetter sites; and *Glycyrrhiza lepidota* (wild licorice), *Cirsium flodmanii* (Flodman's thistle), *Grindelia squarrosa* (curlytop gumweed), and *Equisetum laevigatum* (smooth scouring rush) on drier sites. Both of these

habitat types are usually intermediate in moisture between: wet, streamside communities dominated by sedges, rushes, and cattails; and dry, upland short-grass prairie. Typically, *G. n. ssp. coloradensis* habitat is open, without dense or overgrown vegetation. *Salix exigua* (coyote willow) and *Cirsium arvense* (Canada thistle) may become dominant in areas of *G. n. ssp. coloradensis* habitat that are not periodically flooded or otherwise disturbed. The plant occurs on soils derived from conglomerates, sandstones, and tuffaceous mudstones and siltstones of the Tertiary White River, Arikaree, and Oglalla Formations (Love and Christiansen 1985). These soils are common in eastern Colorado and Wyoming.

G. n. ssp. coloradensis is an early successional species (although probably not a pioneer) adapted to use stream channel sites that are periodically disturbed. Historically, flooding was probably the main cause of disturbances in the plant's habitat, although wildfire and grazing by native herbivores also may have been important. Although flowering and fruiting stems may exhibit increased mortality because of these events, vegetative rosettes appear to be little affected (Mountain West Environmental Services 1985). The establishment and survival of seedlings appears to be enhanced at sites where tall and dense vegetation has been removed by some form of disturbance. In the absence of occasional disturbance, the plant's habitat can become choked by dense growth of willows, grasses, and exotic plants (Floyd 1995a; Fertig 1996). This prevents new seedlings from becoming established and replacing plants that have died (Floyd 1995a; Fertig 1996).

Individual populations of *G. n. ssp. coloradensis* typically consist of numerous subpopulations, each with dozens to hundreds of flowering stems and rosettes. These subpopulations are often widely scattered and may be isolated by gaps of seemingly suitable habitat. It is not uncommon for subpopulations to be scattered along stream channels, with gaps of up to 6.4 kilometers (4 miles) between neighboring subpopulations. Because these gaps are probably too small to prevent the dispersal of pollinators or fruits between subpopulations, colonies along the same stream reach should be considered part of the same population.

Population growth rates in *G. n. ssp. coloradensis* appear to be influenced by rates of seedling establishment and survival of vegetative rosettes to reproductive maturity. These factors may be influenced by summer precipitation (Marriot et.al 1988; Floyd 1995a; Fertig 1996, 1997, 1998a, 1998b; Floyd and Ranker 1998). During the drought of 1994, Floyd measured 47% less seedling recruitment at sample plots on Francis Emroy (F.E.) Warren Air Force Base (Warren AFB) than in the preceding year (Floyd and Ranker 1998). Differences in soil moisture and vegetative cover may also influence recruitment success (Munk et al. 2002). Vegetative rosette populations may be relatively stable and capable of surviving adverse climatic years when new seedling establishment is low. Therefore, episodic establishment of large seedling recruitment classes may be important for the long-term growth, replenishment, and survival of populations (Floyd and Ranker 1998).

Distribution, Abundance, Trends: *G. n. ssp. coloradensis* is a regional endemic historically found from Boulder, Douglas, Larimer, and Weld Counties in Colorado, Laramie County in Wyoming, and western Kimball County in Nebraska. Prior to 1984, no extensive documentation of the plants' range had been conducted and little is known about *G. n. ssp. coloradensis*'

historical distribution. The plant was known from several historical (and presumably extirpated) locations in southeastern Wyoming and in northern Colorado, as well as from three extant populations in Laramie County in Wyoming and Weld County in Colorado.

In 1979, the total known population size was estimated in the low hundreds (Dorn 1979). Intensive range-wide surveys from 1984 to 1986 resulted in the discovery or relocation of more than 20 populations in Wyoming, Colorado, and Nebraska, containing approximately 20,000 flowering individuals (Marriott 1987). Additional surveys since 1992 resulted in the discovery of additional populations in Wyoming and Colorado (Fertig 1994; Floyd 1995b). However, other historically known populations in Wyoming, Colorado, and Nebraska have not been relocated in the past few years and may no longer be extant (Fertig 1994). In 1998, the rangewide population of flowering individuals, under favorable climate conditions, was estimated at 47,300 to 50,300, with the majority of these occurring in Wyoming (Fertig 1998b). However, a new population of 35,000 to 47,000 plants has been located in Colorado bringing the total rangewide population to approximately 82,300 to 97,000 plants.

Colorado: *G. n. ssp. coloradensis* occurs in Weld and Larimer Counties in northern Colorado. Surveys in 2005 revealed populations in two locations, both currently owned by the City of Fort Collins. One population is located on the Meadow Springs Ranch in northern Weld County where the plant has been known historically. Meadow Springs Ranch is managed for municipal sewage treatment. The other population was unknown prior to the 2005 survey and is located in northern Larimer County on the Soapstone Prairie Natural Area. The population was estimated to be 35,000 to 47,000 plants (City of Fort Collins Natural Areas Program 2007). In addition to the two populations above, in 2004 small populations of *G. n. ssp. coloradensis* were documented in special management areas at Chambers Preserve in Jefferson County. This introduced population was established from seed and transplants from the University of Wyoming in the mid-1980s (Michael pers. comm. 2008).

Nebraska: A survey in 1992 found 2 populations of *G. n. ssp. coloradensis*: 1 population (547 plants) along Lodgepole Creek in Kimball County and 1 population (43 plants) at Oliver Reservoir State Recreation area in the southwest panhandle of Nebraska in Kimball County west of the city of Kimball, Nebraska (Fertig 2000a). Survey results from 2004 suggested the species was extirpated from the State. However, a 2008 *G. n. ssp. coloradensis* survey in Nebraska located only three plants at Oliver Reservoir State Recreation Area and none at the Lodgepole Creek site. No other populations of are presently known to occur in Nebraska (Steinhauer pers. comm. 2009).

Wyoming: Extant populations of *G. n. ssp. coloradensis* appear restricted to Laramie and Platte Counties (USFWS 2004). Approximately 90% of known occurrences in Wyoming are on private lands, almost 10% are on state lands, and three occurrences are on Federal lands. At least three other populations in Wyoming are found partly or fully on state school trust lands managed mostly for agricultural uses.

The populations on Federal lands occur on Warren AFB located in Cheyenne. Two of these populations appear relatively stable or increasing, while one appears to be declining (Heidel 2005). Approximately 7,322 reproductively mature plants occur on Warren AFB. Annual monitoring of these three populations by Wyoming Natural Diversity Database has continued for the past 20 years and is ongoing (Heidel 2005).

Critical Habitat: On January 11, 2005, seven units in Wyoming were designated as critical habitat for *G. n. ssp. coloradensis* (70 FR 1940). The units are: 1) Tepee Ring Creek; 2) Bear Creek East; 3) Bear Creek West; 4) Little Bear Creek/Horse Creek; 5) Lodgepole Creek West; 6) Lodgepole Creek East; and 7) Borie (see Figure 1). At the time of the designation, only one naturally occurring population was known in Colorado. This site was excluded from the final critical habitat designation under section 4(b)(2) of the Act because the benefits of exclusion outweigh the benefits of inclusion. Specifically, this area was covered by Wildlife Extension Agreement which provided for the conservation of the *G. n. ssp. coloradensis*. Other historical locations in Boulder, Douglas, and Larimer Counties in Colorado were not included in the designation because the areas did not contain the Primary Constituent Elements. The critical habitat designation did not include any portions of Nebraska as we knew of no areas in the State containing subpopulations or suitable habitat at the time of the designation (70 FR 1940, January 11, 2005).

The final designation of critical habitat for *G. n. ssp. coloradensis* included the following critical habitat primary constituent elements: 1) Subirrigated, alluvial soils on level or low-gradient floodplains and drainage bottoms at elevations of 1,524 to 1,951 meters (5,000 to 6,400 feet); 2) A mesic moisture regime, intermediate in moisture between wet and dry, streamside communities dominated by sedges, rushes, cattails, and dry upland shortgrass prairie; 3) Early- to mid-succession riparian (streambank or riverbank) plant communities that are open and without dense or overgrown vegetation (including hayed fields that are disced every 5 to 10 years at a depth of 20 to 30 centimeters (8 to 12 inches), grazed pasture, other agricultural lands that are not plowed or disced regularly, areas that have been restored after past aggregate extraction, areas supporting recreation trails, and urban/wildland interfaces); and 4) Hydrological and geological conditions that maintain stream channels, floodplains, floodplain benches, and wet meadows that support patterns of plant communities associated with *G. n. ssp. coloradensis* (65 FR 62302, January 11, 2005).

B. ASSESSMENT OF VULNERABILITIES, THREATS, AND CONSERVATION ACTIONS

A detailed evaluation of threats to *G. n. ssp. coloradensis* can be found in the original listing determination (65 FR 62302, October 18, 2000). In this outline we provide an update concerning the threats and the conservation actions to date. The primary concern is for maintaining the species' early successional riparian habitat and the surface or subsurface water flows that provide the essential hydrological regime that supports the species. When we are able to do so, we also characterize the magnitude, immediacy, and severity of the threats. Our summary is ordered by our qualitative assessment of the severity of the threat:

Residential and Urban Development: The most immediate and severe (moderate) threat to *G. n. ssp. coloradensis* is residential and urban development around the cities of Cheyenne and Fort Collins. Although difficult to quantify, many acres of formerly suitable have been and continue to be converted to residential and urban sites, contributing to loss of habitat (Mountain West Environmental Services 1985; Marriott 1987; Fertig 1994). According to the National Research Council (2002), “Urbanization and development have profound impacts on watershed hydrology and vegetation, and consequently on the structure and functioning of riparian areas. Among the most important impacts of urbanization are the increased frequency and magnitude of flooding and decreased baseflow that result from land-use changes typical of development.”

Agricultural Practices: Of the known populations of *G. n. ssp. coloradensis*, the vast majority occur on private lands managed primarily for agriculture and livestock. The following is a brief summary of each agricultural practice currently impacting *G. n. ssp. coloradensis*. These agricultural practice threats are considered to be moderate in severity, magnitude, and immediacy:

Herbicides: The non-selective use of broadleaf herbicides on agricultural lands is a moderate threat to *G. n. ssp. coloradensis* and its habitats. This practice is thought to be the most serious threat on agricultural lands. Use of broadleaf herbicides for the control of *Cirsium arvense* (Canada thistle) and *Euphorbia esula* (leafy spurge) are common in agricultural areas of Wyoming. Although competition from these invasive species may have negative impacts on *G. n. ssp. coloradensis*, observations indicate that the butterfly plant is highly susceptible to commonly used herbicides. Alternative means of herbicide application and the use of biological control agents are currently being investigated in weed-infested areas of habitat on Warren AFB (Floyd 1995a; Munk et al. 2002; Burgess et al. 2005).

Mowing and Haying: Since much of the agricultural lands are irrigated hay fields, mowing of *G. n. ssp. coloradensis* habitat for hay production has been suggested as a potential threat if conducted at an inappropriate time of year (Jennings et al. 1997). Although this threat can be significant if cutting occurs before the plant’s fruits have ripened, if cutting is delayed until late in the growing season when a hard fruit wall is developed, the seeds are not damaged by cutting and may actually be dispersed in the process. Likewise, early season mowing (before the flower stalks have bolted) may provide some advantages to the plant by reducing the cover of competing vegetation (Fertig 1994).

Water Management: The management of water resources for domestic and commercial uses, coupled with encroaching agricultural land use, has had a tendency to channelize and isolate water resources and fragment, realign, and reduce riparian and moist lowland habitat that could otherwise serve as potential *G. n. ssp. coloradensis* habitat (Compton and Hugie 1993).

Conversion to Croplands and Agricultural Uses: The conversion of moist, native grasslands to commercial croplands has been widespread throughout southeastern Wyoming and northeastern Colorado. These conversions have impacted the available habitat for several threatened or endangered plants and animals, including *G. n. ssp. coloradensis* (Compton and Hugie 1993). In addition, construction of stock ponds and reservoirs have inundated habitat and made it unsuitable for *G. n. ssp. coloradensis*.

Restricted Range: *G. n. ssp. coloradensis* historic populations were restricted to approximately 6,880 hectares (17,000 acres) running from Colorado Springs, Colorado, north to Cheyenne, Wyoming, and spreading into a small portion of southwest corner of Nebraska. However, since many populations *G. n. ssp. coloradensis* in Nebraska and Colorado have been extirpated, the extant range is much less. Because of the small, isolated nature of populations and few numbers present in many of them, the subspecies is much more vulnerable to random events such as fires, insect or disease outbreaks, or other unpredictable events that could eliminate local populations.

Plant Succession: In nonagricultural, undeveloped areas, habitat degradation resulting from succession of the plant community is a significant threat to *G. n. ssp. coloradensis* because it is an early successional species adapted to habitat that is periodically disturbed. Natural disturbances, such as flooding, fire, and native ungulate grazing, were sufficient in the past to create favorable habitat conditions for the plant. However, in many areas, the natural flooding regime within the subspecies' floodplain habitat has been altered by construction of flood control structures and by irrigation and channelization practices. In the absence of disturbance, *G. n. ssp. coloradensis* habitat can become occupied by dense growth of willows, grasses, and exotic plants that prevent new seedlings from becoming established (Fertig 1996). Managed disturbances may be necessary to maintain and create areas of suitable habitat for *G. n. ssp. coloradensis* (Fertig 1994, 1996).

Weather and Insect Herbivory: The original listing of *G. n. ssp. coloradensis* did not include threats from disease or predation. However, in 2007, a precipitous decline in plant numbers was observed in all populations of *G. n. ssp. coloradensis* surveyed in Wyoming. The exact cause of the decline was not positively identified, but weather and insect herbivory are two major factors that may have contributed to the decline (Heidel 2005). Weather-related impacts include: lower than normal spring precipitation levels (which were magnitudes lower than in all previous years); and higher mean temperatures in late summer. Insect herbivory was suspected as many *G. n. ssp. coloradensis* were riddled with holes and many flowering plants were dead. Surveyors identified a flea beetle that appeared to be responsible for the herbivory. Researchers with the University of Wyoming and the Smithsonian Institution are working to identify the genus and species of flea beetle. The purpose of this identification is to determine if the beetle is a native species that is subject to population explosions, and if it has a life history that might directly impact the host plant numbers for longer than 1 year (Heidel pers. comm. 2008).

In 2009, surveys indicated that plant numbers rebounded, and few flea beetles and no dead or dying flowering plants were observed. This incident of insect herbivory may be episodic and is not thought to be a severe or immediate threat to Wyoming populations. This herbivory has not been reported for Colorado populations.

Climate Change: According to the Intergovernmental Panel on Climate Change (IPCC) (2007) "warming of the climate system is unequivocal, as it is now evident from observations of increases in global air and ocean temperatures, widespread melting of snow and ice, and rising global average sea level." In general, a trend of warming in the mountains of western North America is expected to decrease snowpack, hasten spring runoff, and reduce summer flows (IPCC 2007). While this change could affect the *G. n. ssp. coloradensis* or its habitat, to date, it

is unclear if such changes have played a meaningful role in the species' decline. A significant degree of uncertainty exists as to how projected climate changes, alone and in concert with other threats, will affect the *G. n. ssp. coloradensis* or its habitat in the future.

Conservation Actions: The Service has worked with our partners to protect existing populations. Much of this work has been accomplished through cooperative agreements. For example, the Service has entered into 11 Wildlife Extension Agreements (WEAs) with private landowners to manage riparian habitat for *G. n. ssp. coloradensis*. These 15-year WEAs cover a total of 1,038 hectares (2,564 acres) of *G. n. ssp. coloradensis* habitat along 59 kilometers (37 miles) of stream. This represents approximately one-third of the known populations of *G. n. ssp. coloradensis* in Wyoming and Colorado, including the most important populations on private lands. The Cooperators agree to the following: 1) to allow Service representatives or their designee access to the property for monitoring or fence installation; 2) to coordinate hay cutting activities in areas managed primarily for hay production to consider *G. n. ssp. coloradensis* seed production needs; 3) to prevent application of herbicides closer than 100 feet of known subpopulations of *G. n. ssp. coloradensis*; and 4) to manage livestock grazing activities in conjunction with conservation needs of *G. n. ssp. coloradensis* (70 FR 1940).

Similarly, on January 18, 1982, the Service and the U.S. Air Force signed a Memorandum of Agreement (MOA) to facilitate the preservation, conservation, and management of *G. n. ssp. coloradensis* (USFWS 1982). The Warren AFB contains the habitat of large and important populations of *G. n. ssp. coloradensis*. This MOA has been updated several times since 1982 (USFWS 1999, 2004). In 2004, Warren AFB included a Conservation and Management Plan for Colorado Butterfly Plant in their Integrated Resource Management Plan Management Plan (Warren AFB 2004). These management agreements have provided useful data facilitated good stewardship of this large and important population and resulted in an increasing population trend over the last several decades.

III. PRELIMINARY RECOVERY STRATEGY

A. RECOVERY PRIORITY NUMBER WITH RATIONALE

G. n. ssp. coloradensis is assigned a recovery priority of 9C. This ranking indicates that: 1) the species faces a moderate degree of threats; 2) the species has a high potential for recovery; and, 3) the taxon is a subspecies. The species rank is elevated by the addition of "C" indicating there is or may be a conflict with construction or other development projects, or other forms of economic activity.

B. RECOVERY VISION

The primary focus of the recovery vision for *G. n. ssp. coloradensis* is protection of existing populations, threats abatement, and research as described in the Initial Action Plan below.

C. INITIAL ACTION PLAN

The primary focus of the initial phase of recovery will be to maintain the known distribution of *G. n. ssp. coloradensis* through protection of extant populations and their habitat.

Protection of Existing Populations

The Service will continue to work with Warren AFB and Wyoming Natural Diversity Database to determine and implement appropriate methods for enhancing the protection of *G. n. ssp. coloradensis* on Federal lands. The Service will continue to assist interested private landowners in monitoring and protecting *G. n. ssp. coloradensis* populations. The Service will work cooperatively with other agencies and organizations to protect *G. n. ssp. coloradensis* populations located elsewhere.

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

Surveys and Monitoring

The Service and Wyoming Natural Diversity Database will continue to search for new populations. Survey work on Warren AFB and WEA sites also will continue to document population numbers and trends of known populations.

Research Needs

- Improve our understanding of the effects of drought on *G. n. ssp. coloradensis* conservation as well as the interaction of drought and various land management practices on the species.
- Evaluate predation by flea beetle on *G. n. ssp. coloradensis* in terms of conservation of the *G. n. ssp. coloradensis*.
- Determine if *G. n. ssp. coloradensis* is being affected by applications of broadleaf herbicides.
- Document the tolerance of *G. n. ssp. coloradensis* to different grazing levels (e.g., timing and intensity of various grazing regimes).

IV. PREPLANNING DECISIONS

A. PLANNING APPROACH

A recovery plan will be prepared for *G. n. ssp. coloradensis* pursuant to section 4(f) of the Endangered Species Act. The recovery plan will include objective, measurable criteria which, when met, will result in a determination that the species be removed from the Federal List of Endangered and Threatened Plants. Recovery criteria should address all threats meaningfully impacting the species. The recovery plan also should estimate the time required and the cost to carry out those measures needed to achieve the goal for recovery and delisting. The scope of the plan will be single species.

Plan preparation will be under the stewardship of the Wyoming Field Office-Ecological Services. Currently Jan McKee, Region 6, is lead botanist for *G. n. ssp. coloradensis*. Within the Service, we will coordinate with Colorado and Nebraska field office biologists. Other Federal agency personnel involved with the species will be integrally involved in the planning effort. Our field office biologists will coordinate with the Regional endangered species office as planning proceeds. The Service believes this species warrants the appointment of a recovery team. The recovery team will include species' experts and involved parties. This team will develop the recovery plan.

B. INFORMATION MANAGEMENT

General: All information relevant to recovery of the *G. n. ssp. coloradensis* will be housed in administrative files found at our Wyoming Field Office in Cheyenne, Wyoming. The lead botanist will be responsible for maintaining a full administrative record for the recovery planning and implementation process for the species, and copies of new study findings, survey results, records of meetings, comments received, etc., should be forwarded to her. Species occurrence boundaries and available trend data continue to be maintained by Wyoming Natural Diversity Database as the State information clearinghouse.

Reporting requirements: Information needed for annual accomplishment reports, the Recovery Report to Congress, expenditures reports, and implementation tracking should be forwarded by all individuals and offices involved in the *G. n. ssp. coloradensis* recovery effort to Jan McKee. Copies of the completed reports can then be disseminated to all contributors upon request.

C. RECOVERY PLANNING SCHEDULE

The following dates are dependent on personnel and funds available to complete the recovery plan process:

Outreach/Education Effort:	January 2011
Stakeholders Meetings:	March – May 2011
Formation of Recovery Team:	November 2011
Development of Recovery Strategies:	December 2011 to May 2012
Development of Draft Recovery Plan:	September 2012

D. STAKEHOLDER INVOLVEMENT

Key Stakeholders:

- (1) Warren AFB is the primary Federal stakeholder because the only populations on Federal lands occur on the Warren AFB
- (2) Private landowners, grazing leaseholders
- (3) State of Wyoming and local governments
- (4) State of Colorado and local governments, including the City of Fort Collins Natural Areas Program,
- (5) State agriculture agencies, stock growers/ranching groups
- (6) Conservation organizations and cooperating institutions
- (7) The University of Wyoming, Colorado State University, and other academic researchers, including Wyoming Natural Diversity Database and Colorado Natural Heritage Program

Stakeholder Involvement Strategy: Early in the recovery planning process, a meeting of Federal and state endangered species experts and biologists working with *G. n. ssp. coloradensis* will be held to exchange status information and identify recovery issues. The information gathered from this discussion will provide the initial platform for proceeding with public outreach and recovery planning. State and local officials also will be asked to participate on an ongoing basis in the recovery effort, particularly with regard to monitoring and regulatory protection of the species.

As needed, additional meetings and/or conference calls will be held to discuss particular issues, and stakeholders will be invited to participate as warranted by the purposes of the meeting. Advantage will be taken of all opportunities to interact with stakeholders in a productive and meaningful way.

Stakeholders will be afforded an opportunity to review and comment on a draft of the recovery plan in conformance with the Endangered Species Act through participation in the recovery team as well as through public notice and comment. Stakeholders also may be asked to contribute directly in developing implementation strategies for planned actions. Strong, one-on-one working relationships with both experts and stakeholders will be developed over time.

Approve: _____

Deputy

Regional Director, Region 6

Date _____

5/25/10

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FIGURE 1

