Natural Heritage Inventory of Schriever Air Force Base, El Paso County, Colorado

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Natural Heritage Program COLORADO

Natural Heritage Inventory of Schriever Air Force Base, El Paso County, Colorado

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Acknowledgements
We would like to thank the Department of Defense for providing the funding for this project through the Legacy Fund which is granted to The Nature Conservancy annually to support projects such as this.

Objectives

The objective of this study is to document the locations of rare or imperiled species and significant natural communities occurring on Schriever AFB and to provide Schriever personnel the biological information needed to effectively manage natural heritage resources found on the property. Additionally, surveys of this nature help to continually re-evaluate the conservation status of rare species and help further biologists' understanding of the natural resources of Colorado.

Methods

The Colorado Natural Heritage Program follows a general method that is continuously being developed specifically for the purpose of biological inventories such as this. The Natural Heritage Inventory of Schriever AFB was conducted in several steps summarized below.

Collect Available Information

The CNHP databases were updated with information regarding the known locations of species and significant plant communities within and immediately surrounding Schriever AFB. A variety of sources were searched for this information, including museum and herbaria collections at Colorado universities, as well as available literature. Both general and specific information was incorporated into CNHP databases, in the form of either locational information or as biological data pertaining to a species in general. Such information covers basic species and community biology including range, habitat, phenology (reproductive timing), food sources, and substrates. This information was entered into CNHP databases.

Element Ranking

Information is gathered by CNHP on Colorado's plants, animals, and plant communities. Each of these species and plant communities is considered an element of natural diversity, or simply an element. Each element is assigned a rank that indicates its relative degree of imperilment on a five-point scale (e.g., 1 = extremely rare/imperiled, 5 = abundant/secure). The primary criteria for ranking elements is the number of occurrences, i.e., the number of known distinct localities or populations, the size of the geographic range, the number of individuals, trends in both population and distribution, identifiable threats, and the number of already protected occurrences.

Element imperilment ranks are assigned both in terms of the element's degree of imperilment within Colorado (its State or S-rank) and that across its global range (its Global or G-rank). Taken together, these two ranks give an instant picture of the degree of imperilment of an element. For example, the lynx (*Lynx canadensis*), which is thought to be secure in northern North America but is known from less than 5 extant locations in Colorado (excluding recent transplants), is ranked G5S1. The Rocky Mountain Columbine (*Aquilegia saximontana*) which is known only from Colorado, from about 30 locations, is ranked a G3S3. Further, a tiger beetle (*Cicendela theatina*) that is known from only one location in the world (at the Great Sand Dunes

National Monument) is ranked G1S1. CNHP actively collects, maps, and electronically processes specific occurrence information for elements considered globally rare (G1-G3) or state rare (generally S1-S3). A complete description of each of the Natural Heritage ranks is provided in Table 1.

This single-rank system works readily for all species except those that are migratory. Animals that migrate may spend only a portion of their life cycles within the state. In these cases, it is necessary to distinguish between breeding, non-breeding, and resident in Colorado. As noted in Table 1, ranks followed by a "B", e.g., S1B, indicate that the rank applies only to the status of breeding occurrences. Similarly, ranks followed by an "N", e.g., S4N, refer to non-breeding status, typically during migration and winter. Elements without these notations are believed to be year-round residents within the state.

Table 1. Definition of Colorado Natural Heritage Imperilment Ranks

Global imperilment ranks are based on the range-wide status of a species. State imperilment ranks are based on the status of a species in an individual state. State and Global ranks are denoted, respectively, with an "S" or a "G" followed by a character. These ranks should not be

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G/S1 Critically imperiled globally/state because of rarity (5 or fewer locations in the world/state; or very few remaining individuals), or because of some factor of its biology making it especially vulnerable to extinction.
G/S2 Imperiled globally/state because of rarity (6 to 20 locations), or because of other factors demonstrably making it very vulnerable to extinction throughout its range.
G/S3 Vulnerable through its range or found locally in a restricted range (21 to 100 locations).
G/S4 Apparently secure globally/state, though it might be quite rare in parts of its range, especially at the periphery.
G/S5 Demonstrably secure globally, though it may be quite rare in parts of its range, especially at the periphery.
GX Presumed extinct.
G#? Indicates uncertainty about an assigned global rank.
G/SU Unable to assign rank due to lack of available information.
G/TQ Indicates uncertainty about taxonomic status.
G/SH Historically known, but not verified for an extended period.
G#T# Trinomial rank (T) is used for subspecies or varieties. These species or subspecies are ranked on the same criteria as G1-G5.
S#B Refers to the breeding season imperilment of elements that are not permanent residents.
S#N Refers to the non-breeding season imperilment of elements that are not permanent residents. Where no consistent location can be discerned for migrants or non-breeding populations, a rank of SZN is used
SZ Migrant whose occurrences are too irregular, transitory, and/or dispersed to be reliable identified, mapped, and protected.
SA Accidental in the state.
SR Reported to occur in the state, but unverified.
S? Unranked. Some evidence that species may be imperiled, but awaiting formal rarity ranking.

Notes: Where two numbers appear in a state or global rank (e.g., S2S3), the actual rank of the element falls between the two numbers.

Legal Designations

Natural Heritage imperilment ranks are not legal designations and should not be interpreted as such. Although most species protected under state or federal endangered species laws are extremely rare, not all rare species receive legal protection. Legal status is designated by either the U.S. Fish and Wildlife Service under the Endangered Species Act or by the Colorado Division of Wildlife under Colorado Statutes 33-2-105 Article 2. In addition, the U.S. Forest

Service recognizes some species as "Sensitive," as does the Bureau of Land Management. Table 2 defines the special status assigned by these agencies and provides a key to the abbreviations used by CNHP.

Please note that the U.S. Fish and Wildlife Service has issued a Notice of Review in the February 28, 1996 Federal Register for plants and animal species that are "candidates" for listing as endangered or threatened under the Endangered Species Act. The revised candidate list replaces an old system that listed many more species under three categories: Category 1 (C1), Category 2 (C2), and Category 3 (including 3A, 3B, 3C). Beginning with the February 28, 1996 notice, the Service will recognize as candidates for listing most species that would have been included in the former Category 1. This includes those species for which the U.S. Fish and Wildlife Service has sufficient information on their biological status and threats to propose them as endangered or threatened under the Endangered Species Act.

Candidate species listed in the February 28, 1996 Federal Register are indicated with a "C". Although obsolete legal status codes (Category 2 and 3) are no longer used, CNHP will continue to maintain them in its Biological and Conservation Data system for reference.

Table 2. Federal and State Agency Special Designations

Federal Status:
1. U.S. Fish and Wildlife Service (58 Federal Register 51147, 1993) and (61 Federal Register 7598, 1996)
LE Endangered; species or subspecies formally listed as endangered.
E(S/A) Endangered due to similarity of appearance with listed species.
LT Threatened; species or subspecies formally listed as threatened.
P Proposed Endangered or Threatened; species or subspecies formally proposed for listing as endangered or threatened.
C Candidate: species or subspecies for which the Service has on file sufficient information on biological vulnerability and threat(s) to support proposals to list them as endangered or threatened.

2. U.S. Forest Service (Forest Service Manual 2670.5) (noted by the Forest Service as "S")
FS Sensitive: those plant and animal species identified by the Regional Forester for which population viability is a concern as evidenced by:
a. Significant current or predicted downward trends in population numbers or density.
b. Significant current or predicted downward trends in habitat capability that would reduce a species' existing distribution.

3. Bureau of Land Management (BLM Manual 6840.06D) (noted by BLM as "S")
BLM Sensitive: those species found on public lands, designated by a State Director, that could easily become endangered or extinct in a state. The protection provided for sensitive species is the same as that provided for C (candidate) species.

State Status:
1. Colorado Division of Wildlife
E Endangered
T Threatened
SC Special Concern

Identify Rare Or Imperiled Species And Significant Plant Communities With Potential To Occur on Schriever AFB

The information collected in the previous step was used to refine the potential element list and to refine our search areas. In general, species and plant communities that have been recorded from El Paso County are included in this list. Species or plant communities that occur only in habitats that are not present in this study area were removed from the list.

Table 3. Rare Species and Communities Potentially Occurring at the Schriever Air Force Base

Elements	Common Name	Global/ State Ranks	Federal/ State Status	Forest Service/ BLM Status
VERTEBRATES				
Buteo regalis	Ferruginous Hawk	G4 S3	SC	FS/BLM
Charadrius montanus	Mountain Plover	G2 S2	C/SC	FS/BLM
Rana pipiens	Northern Leopard Frog	G5 S3	SC	FS/BLM
Zapus hudsonius preblei	Preble's Meadow Jumping Mouse	G5T2 S1	T/SC	FS
INVERTEBRATES				
Amblyscirtes simius	Simius roadside skipper	G4 S3		
Euphilotes rita coloradensis	Colorado blue	G4T2T3 S2		
Hesperia ottoe	Ottoe skipper	G3G4 S2		
Ischura barberi	desert forktail	G4 SU		
Sympetrum costiferum	saffron-bordered meadowfly	G5 S1?		
PLANTS				
Ambrosia linearis	plains ragweed	G2 S2		FS
Asclepias uncialis	dwarf milkweed	G3T1T2 S1S2		
Eustoma russelianum	showy prairie gentian	G5 S3		
Gaura neomexicana var. *coloradensis*	Colorado butterfly plant	G4T2 S1		
Hypoxis hirsuta	yellow stargrass	G5 S1		
Ribes americanum	American currant	G5 S1		
Scirpus saximontana	Rocky Mountain bulrush	G5 S1		
Spiranthes diluvialis	Ute's ladies tresses	G2 S2	LT	
Viola pedatifida	prairie violet	G5 S2		
PLANT COMMUNITIES				
Andropogon gerardii- Calamovilfa longifolia	tallgrass prairie	G3 S2		
Andropogon gerardii- Schizachyrium scoparium	xeric tallgrass prairie	G2 S2		
Andropogon gerardii- Sorghastrum nutans- Spartina pectinata	wet prairie	G2G3 S1		
Populus deltoides ssp. *monilifera- Salix amygdaloides/ Salix exigua*	plains cottonwood riparian woodland	G3 S3		
Stipa comata	mixed grass prairie	G2 S2		

Conduct Field Surveys

The methods used in the surveys varied according to the elements that were being targeted. In most cases, the appropriate habitats were visually searched in a systematic fashion in an attempt to cover the area as thoroughly as possible in the given time. Some types of organisms require special techniques to capture and document their presence. These are summarized below:

Insectivores: sherman live traps
Birds: visual or by song/call, evidence of breeding sought
Insects: aerial net

When necessary and permitted, voucher specimens were collected and deposited in regional university museums and herbaria.

When a rare species or significant plant community was discovered, its precise location and known extent was recorded on 1:24,000 scale topographic maps. Other data recorded at each occurrence included numbers observed, breeding status, habitat description, disturbance features, observable threats, and potential protection and management needs. The overall significance of each occurrence, relative to others of the same element, was estimated by rating the quality (size, vigor, etc.) of the population or community, the condition or naturalness of the habitat, the long-term viability of the population or community, and the defensibility (ease or difficulty of protecting) of the occurrence. These factors were combined into an element occurrence rank that is useful in refining conservation priorities.

Element Occurrence Ranking

Actual locations of elements, whether they are single organisms, populations, or plant communities, are referred to as element occurrences. The element occurrence is considered the most fundamental unit of conservation interest and is at the heart of the Natural Heritage Program Methodology. To prioritize element occurrences for a given species, an element occurrence rank (EO-Rank) is assigned according to the estimated viability or probability of persistence (whenever sufficient information is available). This ranking system is designed to indicate which occurrences are the healthiest and the most ecologically viable, thus focusing conservation efforts where they will be most successful. The EO-Rank is based on 3 factors:

- Size – a quantitative measure of the area and/or abundance of an occurrence such as area of occupancy, population abundance, population density, or population fluctuation.
- Condition – an integrated measure of the quality of biotic and abiotic factors, structures, and processes within the occurrence, and the degree to which they affect the continued existence of the occurrence. Components may include reproduction and health, development/maturity for communities, ecological processes, species composition and structure, and abiotic physical or chemical factors.
- Landscape Context – an integrated measure of the quality of biotic and abiotic factors, and processes surrounding the occurrence, and the degree to which they affect the continued existence of the occurrence. Components may include landscape structure and extent, genetic connectivity, and condition of the surrounding landscape.

Each of these factors is rated on a scale of A through D, with A representing an excellent grade and D representing a poor grade. These grades are then averaged to determine an appropriate EO-Rank for the occurrence. If there is insufficient information available to rank an element occurrence, an EO-Rank is not assigned. Possible EO-Ranks and their definitions are as follows:

A	Excellent estimated viability
B	Good estimated viability
C	Fair estimated viability
D	Poor estimated viability
E	Viability has not been assessed, but element is known to be extant
H	Historically known, but not verified for an extended period of time

Delineate Potential Conservation Area Boundaries

Finally, since the objective for this inventory is to prioritize specific areas for conservation efforts, proposed conservation planning boundaries were delineated. These conservation areas focus on capturing the ecological processes that are necessary to support the continued existence of a particular element occurrence of natural heritage significance. Conservation areas may include a single occurrence of a rare element or a suite of rare element occurrences or significant features. These boundaries are considered preliminary and additional information about the site or the element may necessitate alterations to the boundaries.

Data collected in the field are essential to delineating such a boundary, but other sources of information such as aerial photography are also used. Additionally, CNHP staff consider a number of factors that include, but are not limited to:

- the extent of current and potential habitat for the elements present, considering the ecological processes necessary to maintain or improve existing conditions;
- species movement and migration corridors;
- maintenance of surface water quality within the site and the surrounding watershed;
- maintenance of the hydrologic integrity of the groundwater, e.g., by protecting recharge zones;
- land intended to buffer the site against future changes in the use of surrounding lands;
- exclusion or control of invasive exotic species;
- land necessary for management or monitoring activities.

The proposed boundary does not automatically exclude all activity. It is hypothesized that some activities will prove detrimental to the element or to the processes on which they depend, whereas others will not. Specific activities or land use changes proposed within or adjacent to the preliminary conservation planning boundary should be carefully considered and evaluated for their consequences to the element on which the conservation unit is based. Please note that these boundaries are based primarily on our understanding of the ecological systems. A thorough analysis of the human context and potential stresses was not conducted. All land within the conservation planning boundary should be considered an integral part of a complex economic, social, and ecological landscape that requires wise land-use planning at all levels.

Furthermore, it is often the case that all relevant ecological processes are not contained within a site of reasonable size. Taken to the extreme, the threat of ozone depletion could expand every site to include the whole globe. The boundaries illustrated in this report signify the immediate, and therefore most important, area in need of protection. Continued landscape level conservation efforts are needed.

Potential Conservation Area Ranking

One of the strongest ways that CNHP uses element and element occurrence ranks is to assess the overall biodiversity significance of a site. Based on these ranks, each site is assigned a biodiversity (or B-) rank.

Table 4. Biodiversity Rank Definitions

B1	Outstanding Significance: only site known for an element or an excellent occurrence of a G1 species.
B2	Very High Significance: one of the best examples of a community type, good occurrence of a G1 species, or excellent occurrence of a G2 or G3 species.
B3	High Significance: excellent example of any community type, good occurrence of a G3 species, or a large concentration of good occurrences of state rare species.
B4	Moderate or Regional Significance: good example of a community type, excellent or good occurrence of state-rare species.
B5	General or State-wide Biodiversity Significance: good or marginal occurrence of a community type, S1, or S2 species.

Results

Schriever AFB occurs within the shortgrass prairie of the Great Plains. The prairie landscape is dominated by blue grama (*Bouteloua gracilis*), buffalo grass (*Buchloe dactyloides*), three-awned grass (*Aristida purpurea*), dropseed (*Sporobolus cryptandrus*), and needle-and-thread grass (*Stipa comata*). These upland areas are in good condition, although heavy grazing in the past is evident by the species composition. Exotic species are not common in these areas. The prairie is spotted with natural depressions which primarily support saltgrass (*Distichlis spicata*), two spikerushes (*Eleocharis palustris* and *E. acicularis*), and a native sedge (*Carex* sp.). These depressions, or playas, are common throughout the Great Plains. Exotic plant species are present on the Base but are primarily limited to the developed or areas of past disturbance (i.e. Benedict Ranch).

Field surveys were conducted from 5/30-6/2/00. Visual surveys for rare plants, birds, and significant natural communities resulted in the documentation of one rare plant. Small mammal trapping, from May 31-June 2, 2000, resulted in 73 captures over 210 trap-nights but no rare species were discovered. Due to the absence of running or standing water, several of the targeted rare plants and animals are not likely occur on this property. These include the Preble's meadow jumping mouse (*Zapus hudsonius preblei*), showy prairie gentian (*Eustoma russelianum*), Colorado butterfly plant (*Gaura neomexicana* var. *coloradensis*), yellow stargrass (*Hypoxis hirsuta*), American currant (*Ribes americanum*), Rocky Mountain bulrush (*Scirpus saximontana*), and Ute's ladies tresses (*Spiranthes diluvialis*). Plant species which flower later in the season could not be surveyed for and should not be assumed absent.

The following pages provide information on the globally rare plant, the Plains Ragweed, and the area which is important for its continued existence at this location.

Schriever Potential Conservation Area

Location: Approximately 10 miles southwest of Ellicott, El Paso County, Colorado; Corral Bluffs U.S.G.S. quadrangle: T14S R64W S36

Description: This small site includes what was once a natural playa that has been enhanced by a berm on the south side to improve its use as a cattle pond. The playa was dry in early June and is likely dry year-round. The wetland itself supports a wide variety of exotic plant species. The site is surrounded by rolling shortgrass prairie with sandy soils. The prairies are dominated by blue grama (*Bouteloua gracilis*), buffalo grass (*Buchloe dactyloides*), three-awned grass (*Aristida purpurea*), and wild rye (*Elymus elymoides*).

Biodiversity Rank: B3

Biodiversity Rank Justification: Plains ragweed is a globally rare species known only from the Great Plains of Colorado. This species occurs in playas on the prairie. Additionally, it may grow in artificial habitats which mimic the hydrologic setting of a playa, i.e. seasonal moisture with limited vegetation. This occurrence falls into this latter category. Approximately 1000 individuals occur on a man-made berm on the south-side of a natural depression. The natural depression may have included potential habitat for this species prior to the construction of the berm. The surrounding prairie is in fair condition and is largely undeveloped. There are several other man-made and natural playas on this property but they did not support the plains ragweed.

Rare Plant Species found in the Schriever Potential Conservation Area

Elements	Common Name	Global/ State Ranks	Federal/ State Status	Forest Service/ BLM Status	EO* Rank
Ambrosia linearis	plains ragweed	G2 S2		FS	C

*Element Occurrence

Boundary Justification: The PCA boundary surrounds the occurrence and a small amount of surrounding potential habitat including the "playa" and the intermittent drainage leading out of it which may in the future support this species in a more natural setting.

Management Considerations: Exotic plant species (*Polygonum* sp., *Lappula* sp., *Chenopodium* sp., *Lepidium* sp., *Descurania* sp., *Thalspi arvense, Bromus tectorum*) are common and management is needed. The effects of cattle grazing are unknown. Monitoring of this population is recommended.

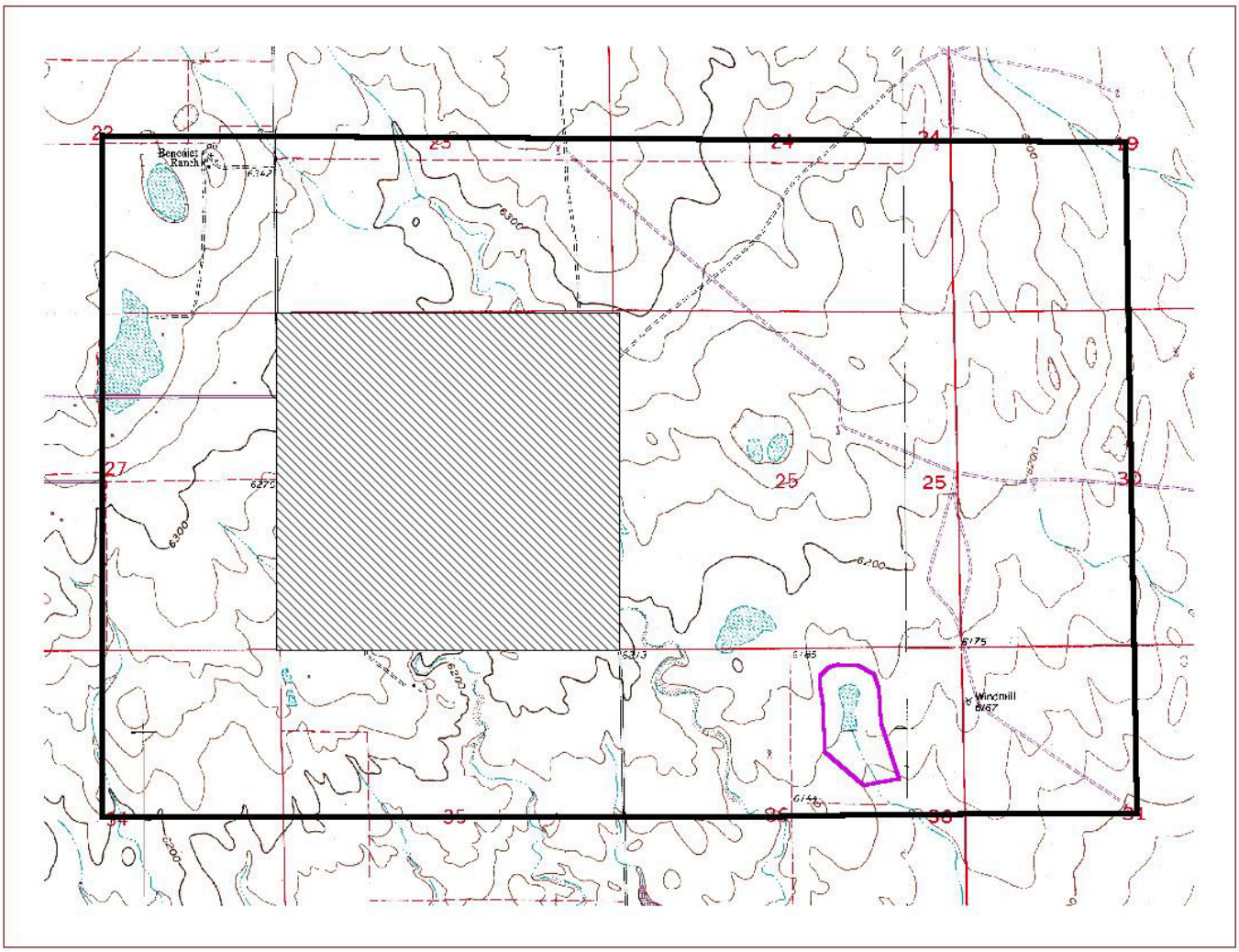


Figure 1: Schriever Potential Conservation Area

*Plant Characterization Abstract: Plains Ragweed (*Ambrosia linearis*)*

Taxonomy:
Class: Dicotyledoneae
Order: Asterales
Family: Asteraceae
Genus: *Ambrosia*

Taxonomic Comments: none

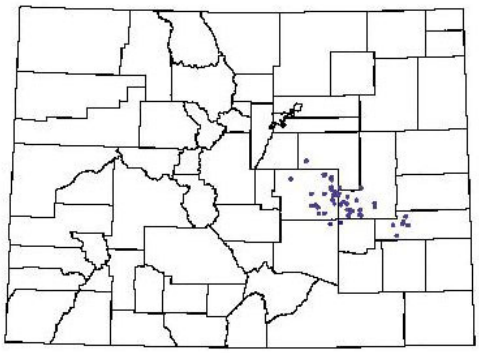
CNHP Ranking: G2 S2

Federal/State Status: Forest Service Sensitive Species List

Phenology: The plains ragweed flowers from mid-June to August and fruits from early August to late September (Locklear 1989).

Reproduction: The plains ragweed is wind pollinated. Asexual reproduction by rhizomes also appears to be important to this species (Locklear 1989).

Habitat: Plains ragweed is a plant of seasonally moist habitats of sandy soils within the shortgrass prairie region of east-central Colorado between 4,300-6,700 feet elevation. In natural settings it is frequently encountered in association with intermittent streams and about the margins of intermittent ponds or playas. This species also occupies roadside ditches where it may occur in large, vigorous stands (Locklear 1989, 1990).



Colorado Distribution

Global Distribution: This species is endemic to eastern Colorado (Spackman et al. 1997).

State Distribution: Elbert, El Paso, Kiowa, Crowley, Pueblo and Lincoln counties make up the entire range of this species (Spackman et al. 1997).

Abundance: There are approximately 30 known locations for this species, however one-third of these occur in unnatural settings (i.e. roadside ditches).

Known Threats and Management Issues: This species is threatened by the conversion of native grasslands for agriculture and development. Grazing by domestic livestock and wildlife is another management concern, although adverse affects from grazing have not been observed. Land clearing for development, agriculture and

roads has increased water runoff, thus promoting the formation of additional potential habitat for this species (Locklear 1990). One-third of the known populations occupy these newly-created habitats on roadsides. These populations are threatened by road-maintenance activities such as mowing and herbicide spraying.

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Appendix 1. Schriever Air Force Base Species List*

Scientific Name	Common Name
PLANT SPECIES	
Abronia fragrans	sand-verbena
Agropyron cristatum	crested wheatgrass
Allium textile	wild onion
Antennaria sp.	pussytoes
Argemone sp.	prickly poppy
Aristida pupurea	three-awned grass
Artemisia frigida	silver sage
Artemisia ludoviciana	wormwood
Astragalus ceramicus	milkvetch
Astragalus gracilis	milkvetch
Bouteloua gracilis	blue grama
Bromus tectorum	cheatgrass
Buchloe dactyloides	buffalo grass
Calamovilfa longifolia	sandreed
Cardaria sp.	whitetop
Carex spp.	sedge
Castilleja sp.	paintbrush
Chaenactis sp.	pincushion
Cirsium c.f. undulatum	thistle
Convolvulus arvensis	bindweed
Descurania sp.	tansy mustard
Distichlis stricta	saltgrass
Elaeagnus angustifolia	Russian olive
Eleocharis acicularis	spikerush
Eleocharis palustris	spikerush
Elymus canadensis	Canada wild rye
Elymus elymoides	wild rye
Elymus lanceolatus	wild rye

continued Appendix 1. Schriever Air Force Base Species List*

Scientific Name	Common Name
Erigeron flagellaris	daisy
Eriogonum effusum	wild buckwheat
Eriogonum sp.	wild buckwheat
Erysimum sp.	wallflower
Gilia pinnatifida	gilia
Grindelia sp.	gumweed
Helianthus sp.	sunflower
Heterotheca villosa	golden aster
Koelaria macrantha	june grass
Lappula marginata	stickseed
Lepidium perfoliatum	peppergrass
Lesquerella montanum	bladderpod
Lupinus sp.	lupine
Machaeranthera pinnatifida	tansy aster
Melilotus officinale	yellow sweet clover
Mentzelia sp.	blazing star
Muhlenbergia richardsonii	muhly
Oenothera caespitosa	evening primrose
Opuntia polycantha	prickly pear
Opuntia macrorhiza	prickly pear
Oreocarya sp.	cats-eye
Oryzopsis hymenoides	Indian rice grass
Oxytropis sericea	locoweed
Packera plattensis	groundsel
Penstemon albens	beard-tongue
Phacelia sp.	phacelia
Picaridiniopsis woodhousei	
Plantago patagonica	wooly plantain
Polypogon monspeleniensis	rabbitfoot grass
Potentilla sp.	cinquefoil
Psoralidium tenuiflorum	
Ratibida tagetes	cone flower
Rosa woodsii	wild rose
Salsola iberica	Russian thistle
Schizachyrium scoparium	little bluestem
Spartina pectinata	cordgrass
Spheralcea coccinea	globemallow
Sporobolus cryptandrus	dropseed
Stipa comata	needle-thread grass
Taraxacum officinale	dandelion
Thelesperma filifolia	
Thermopsis sp.	golden banner
Tradescantia occidentalis	spiderwort
Tragopogon dubius	salsify
Vulpia octoflora	six week fescue
Xanthium stramarium	cocklebur
Yucca glauca	yucca

continued Appendix 1. Schriever Air Force Base Species List*

Scientific Name	Common Name
REPTILES	
Holbrookia maculata	lesser earless lizard
MAMMALS	
Antilocapra americana	pronghorn
Canis latrans	coyote
Dipodomys ordii	Ord's kangaroo rat
Lepus californicus	black-tailed jackrabbit
Microtus pennsylvanicus	meadow vole
Peromyscus maniculatus	deer mouse
Procyon lotor	raccoon
Reithrodontomys megalotis	western harvest mouse
Spermophilus tridecemlineatus	thirteen-lined ground squirrel
Sylvilagus audubonii	desert cottontail
Thomomys sp.	pocket gopher
BIRDS	
Anas platyrhynchos	Mallard
Bibo virginianus	Great-horned Owl
Buteo swainsoni	Swainson's Hawk
Calamospiza melanocorys	Lark Bunting
Callipepla squamata	Scaled Quail
Charadrius vociferus	Killdeer
Chordeiles minor	Common Nighthawk
Corvus brachyrhynchos	American Crow
Dendroica coronata	Yellow-rumped Warbler
Eremophila alpestris	Horned Lark
Falco sparverius	American Kestrel
Hirundo rustica	Barn Swallow
Lanius ludovicianus	Loggerhead Shrike
Mimus polyglottos	Northern Mockingbird
Molothrus ater	Brown-headed Cowbird
Passer domesticus	House Sparrow
Sturnella neglecta	Western Meadowlark
Sturnus vulgaris	European Starling
Turdus migratorius	American Robin
Tyrannus verticalis	Western Kingbird
Zenaida macroura	Mourning Dove

*This list is based on one visit on 5/30/00-6/2/00.

Appendix 2: Colorado's Natural Heritage Program

CNHP is the state's primary comprehensive biological diversity data center, gathering information and field observations to help develop state-wide conservation priorities. After operating in Colorado for 14 years, the Program was relocated from the State Division of Parks and Outdoor Recreation to the University of Colorado Museum in 1992, and more recently to the College of Natural Resources at Colorado State University.

The multi-disciplinary team of scientists and information managers gathers comprehensive information on rare, threatened, and endangered species and significant plant communities of Colorado. Life history, status, and locational data are incorporated into a continually updated

data system. Sources include published and unpublished literature, museum and herbaria labels, and field surveys conducted by knowledgeable naturalists, experts, agency personnel, and our own staff of botanists, ecologists, and zoologists. Information management staff carefully plot the data on 1:24,000 scale U.S.G.S. maps and enter it into the Biological and Conservation Data System. The data are also stored in a geographic information system (Arc/INFO and ArcView GIS). A continually updated locational database and priority-setting system such as that maintained by CNHP provides an effective, proactive land-planning tool.

CNHP is part of an international network of conservation data centers that use the Biological and Conservation Data System (BCD) developed by The Nature Conservancy. The Natural Heritage Methodology is used by Natural Heritage Programs throughout North, Central, and South America, forming an international database network. Natural Heritage Network data centers are located in each of the 50 U.S. states, five provinces of Canada, and 13 countries in South and Central America and the Caribbean. This network enables scientists to monitor the status of species from a state, national, and global perspective. It also enables conservationists and natural resource managers to make informed, objective decisions in prioritizing and focusing conservation efforts.

CNHP has effective relationships with several state and federal agencies, including the Colorado Natural Areas Program, Colorado Department of Natural Resources and the Colorado Division of Wildlife, the U.S. Environmental Protection Agency, and the U.S. Forest Service. Numerous local governments and private entities also work closely with CNHP. Use of the data by many different individuals and organizations, including Great Outdoors Colorado, encourages a proactive approach to development and conservation thereby reducing the potential for conflict. Information collected by the Natural Heritage Programs around the globe provides a means to protect species before the need for legal endangerment status arises.