Natural Heritage Inventory of Buckley Air National Guard Base, Arapahoe County, Colorado



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July 2000

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Natural Heritage Program COLORADO

Natural Heritage Inventory of Buckley Air National Guard Base, Arapahoe 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 such projects as this.

Objectives

The objective of this study is to document the locations of rare or imperiled species and significant natural communities occurring on Buckley ANG and to provide Buckley 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 Buckley ANG 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 Buckley ANG. A variety of information sources were searched for this information, including Colorado universities museum and herbaria collections as well as available literature sources. 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 criterion for ranking elements is the number of occurrences, i.e., the number of known distinct localities or populations, are 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, which is thought to be secure in northern North America but is known from less than 5 current locations (excluding recent transplants) in Colorado, is ranked G5S1. The Rocky Mountain Columbine which is known only from Colorado, from about 30 locations, is ranked a G3S3. Further, a tiger beetle that is only known from 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 (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. Those 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 terms 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 this notation are believed to be year-round residents within the state.

Element Occurrence (EO) Tracking Status

CNHP uses a combination of factors to determine the conservation priority status of zoological elements in Colorado. The global rank, the state rank, and the EO tracking status are used in conjunction to express the conservation priority of a particular species. There are three categories of the EO tracking status:

Y = "Yes" indicates that this species is rare, evolutionary distinct or isolated, endemic, or following a downward trend

P = "Partial" indicates that the species has a restricted geographic range or that the majority of populations with its range occurs in Colorado.

W = "Watchlisted" indicates that the species harbors conservation priority but that it does not meet the criteria discussed in the above two categories.

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

---

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". While 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 In Buckley ANG

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 prefer habitats that are not included in this study area were removed from the list.

Table 3. Rare Animal and Plant Species Potentially Occurring on Buckley Air National Guard Base

Elements	Common Name	Global/ State Ranks	Federal/ State Status	Forest Service/ BLM Status	EO tracking status
VERTEBRATES					
Athene cunicularia	burrowing owl	G4 S4B	T	FS	W
Cynomys ludovicianus	black-tailed prairie dog	G4 S4			P
Zapus hudsonius preblei	Preble's meadow jumping mouse	G5T2 S1	T/SC	FS	Y
INVERTEBRATES					
Anodonta grandis	giant floater	G5 S1			Y
Euphilotes rita coloradensis	Colorado blue	G4T2T3 S2			Y
Hesperia ottoe	Ottoe skipper	G3G4 S2			Y
Ischura barberi	desert forktail	G4 SU			Y
Sympetrum costiferum	saffron-bordered meadowfly	G5 S1?			Y
PLANTS					
Ambrosia linearis	plains ragweed	G2 S2		FS	Y
Asclepias uncialis	dwarf milkweed	G3T1T2 S1S2			Y
Eustoma russelianum	showy prairie gentian	G5 S3			Y
Gaura neomexicana var. *coloradensis*	Colorado butterfly plant	G4T2 S1			Y
Hypoxis hirsuta	yellow stargrass	G5 S1			Y
Ribes americanum	American currant	G5 S1			Y
Scirpus saximontana	Rocky Mountain bulrush	G5 S1			Y
Spiranthes diluvialis	Ute's ladies tresses	G2 S2	LT		Y
Viola pedatifida	prairie violet	G5 S2			Y
PLANT COMMUNITIES					
Andropogon gerardii-Schizachyrium scoparium	xeric tallgrass prairie	G2 S2			Y
Andropogon gerardii-Sorghastrum nutans-Spartina pectinata	wet prairie	G2G3 S1			Y
Populus deltoides spp. *monilifera- Salix amygdaloides/ Salix exigua*	plains cottonwood riparian woodland	G3 S3			Y
Stipa comata	mixed grass prairie	G2 S2			Y

Conduct Field Surveys

The methods used in the surveys necessarily vary according to the elements that were being targeted. In most cases, the appropriate habitats were visually searched in a systematic fashion that would attempt to cover the area as thoroughly as possible in the given time. Some types of

organisms require special technique in order to capture and document their presence. These are summarized below:

Small Mammals: sherman live traps
Birds: visual or by song/call, evidence of breeding sought
Insects: aerial net
Plant communities: visual, collect qualitative or quantitative composition data

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

Results

CNHP scientists visited the Buckley ANG June 5-June 8. No rare plants, animals or significant natural communities were found. Although a rapid ecological assessment of this nature cannot rule out the undetected existence of such rare species, it is unlikely based on the amount of potential habitat for rare flora and fauna.

Ecology

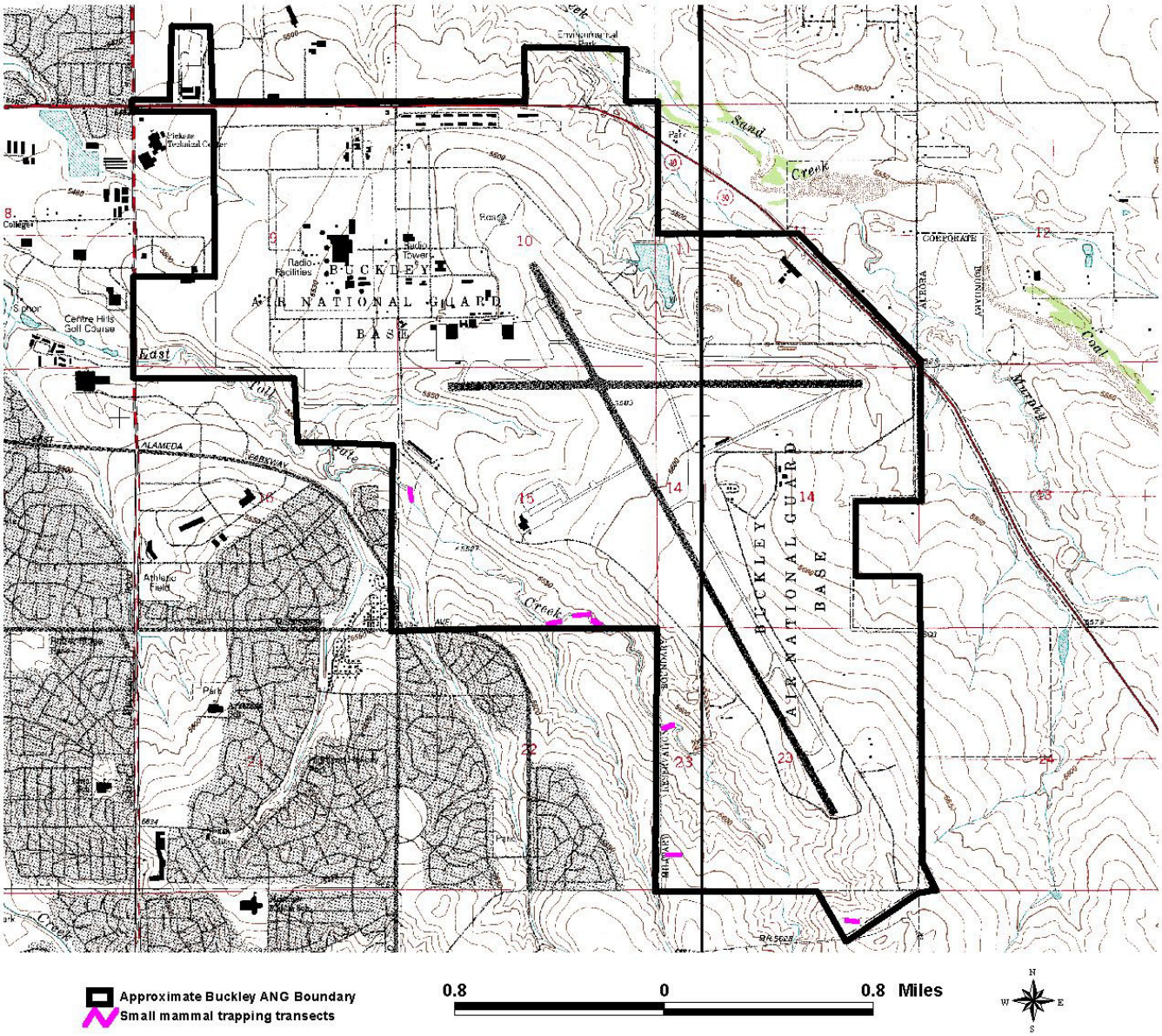
Most of the northern half of the property is developed. The undeveloped areas west of the runway appear to have been heavily disturbed in the past and include little native vegetation. The southwest portion of the property is the most ecologically intact. The native community (shortgrass prairie) is recognizable and native species dominate. Although recognizable, the quality, size and landscape context of the communities are not significant according to CNHP methodology.

Botany

There is little potential habitat for the upland plant species that had been targeted. There is low potential for the occurrence of the riparian species targeted. This survey was incompatible for identification of several of these species, including the federally threatened Ute's ladies tresses, due to phenological seasonality.

Zoology

Small mammals and birds were the main focus for the field surveys conducted on June5-June 8, 2000. A total of 527 trap nights for small mammals resulted in a total of 134 captures (see Figure 1 for trap locations). The Preble's meadow jumping mouse (PMJM) was the primary target of these efforts but was not documented. The willow community was well developed and there was a some herbaceous undergrowth, but the soil was dry and devoid of moisture. With the Preble's meadow jumping mouse's association to open water it is unlikely that East Toll Gate Creek provides adequate habitat. Furthermore, much debris was found along the former creek bed including tires, concrete slabs, and military equipment evidence that this area has changed over the course of military occupation. It is likely that the willow development that is now evident has been historically degraded and PMJM that may have once inhabited the area are no longer present (Fitzgerald et al. 1994).



Base Layer: Digital Raster Graphics (DRG) produced by the U.S.G.S., 1996

Figure 1: Location of transects trapped for small mammals

Disclaimer: The accuracy of the data shown on this map is not guaranteed. The Colorado Natural Heritage Program is not responsible and shall not be liable to the user for incidental, consequential or special damages arising from data use or interpretation. The absence of data for a particular area or habitat does not necessarily mean that the species does not occur on or adjacent to the project site, rather that our files do not currently contain information to document their presence. Although every attempt is made to provide the most current and precise information possible, please be aware that some of our sources provide a higher level of accuracy than others, and some interpretation may be required. CNHP's data system is constantly updated and revised. Please contact CNHP for an update or assistance with interpretation of this natural heritage information. Data are not appropriate for site level planning or evaluation.

These surveys resulted in the documentation of two significant species on the property: the burrowing owl and the black-tailed prairie dog. The following pages provide background information about these two species which will help in the management of these unique elements.

Vertebrate Characterization Abstracts

Burrowing owl (*Athene cunicularia*)



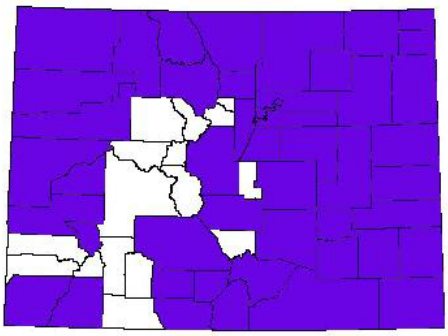
Taxonomy:
Class: Aves
Order: Strigiformes
Family: Strigidae
Genus: *Athene*

Taxonomic Comments: This species has been variously placed in the genus *Speotyto* or in *Athene*. The American Ornithologists' Union now places it in *Athene* (1998).

CNHP Ranking: G4 S4

State/Federal Status: Threatened State Status/ Forest Service Sensitive Species List

Habitat Comments: This species is found in dry open treeless areas and is associated with burrowing mammals. Burrows are usually surrounded by bare ground and provide protection from weather extremes (Haug et al. 1993).



Colorado Breeding Range
(Andrews and Righter 1992; Kingery 1998)

Distribution: Global: The burrowing owl is restricted to the Americas (Haug et al. 1993). Populations in the northern portion of its range are migratory. Some U.S. and Canadian birds may winter in Mexico and possibly Central America (James and Ethier 1989). State: Breeding records cover much of the state, although it is more common on the plains of eastern Colorado (Andrews and Righter 1992, Kingery 1998).

Important Life History Characteristics: Burrowing owls are semi-colonial species and are predominately monogamous. They are known to be diurnal or nocturnal depending on the time of year. Their home range is thought to be at most 5 square kilometers nocturnally and as small as 0.05 square kilometers during the day. Although capable of digging their own burrows where burrowing mammals are absent, burrowing owls usually use

existing burrows. Birds migrate south from Colorado during September and October and return during March and April. Information on life span is not known for migratory populations, however, in one non-migratory populations one banded bird survived eight years. The burrowing owl is an opportunistic feeder. Their diet includes arthropods, small mammals and birds. Mammals, such as badgers, weasels, and domestic cats, as well as many raptors, are documented predators of burrowing owls (Haug et al. 1993).

Reproduction: Eggs are usually laid (typically 7-9) in late March or Early April and are incubated for approximately one month by the female (males provide food). Young fledge after 44 days (Haug et al. 1993).

Known Threats and Management Issues: Human-related impacts can be detrimental to burrowing owl populations. Agricultural activities, roadkills and development, as well as the eradication of burrowing mammals (i.e. prairie dog), threaten this species. Additionally, domestic cats are known to predate on burrowing owls (Haug et al. 1993).

Black-tailed prairie dog (*Cynomys ludovicianus*)



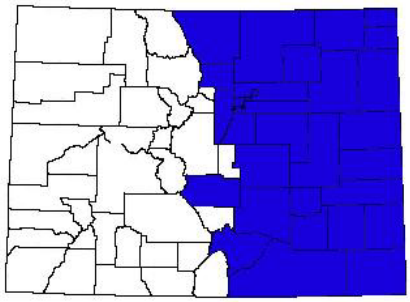
Taxonomy:
Class: Mammalia
Order: Rodentia
Family: Sciuridae
Genus: *Cynomys*

Taxonomic Comments: There are five species of prairie dogs in North America (Black-tailed, White-tailed, Gunnison's, Utah, and the Mexican prairie dog).

CNHP Ranking: G4 S4

State/Federal Status: USFWS warranted, but precluded

Habitat Comments: Prairie dogs live in "towns" located in shortgrass or midgrass prairie. They create a habitat which is highly diverse, and are often thought of as a "keystone" species (Fitzgerald et al. 1994).



Colorado Distribution (Fitzgerald et al. 1994)

Distribution: Global Distribution: The prairie dog is known from the Great Plains of the United States. It is known from Montana, North and South Dakota, Colorado, Wyoming, Nebraska, Oklahoma, Kansas, New Mexico, and Texas. State Distribution: In Colorado, the black-tailed prairie dog can be found throughout the eastern half of the state (Fitzgerald et al. 1994).

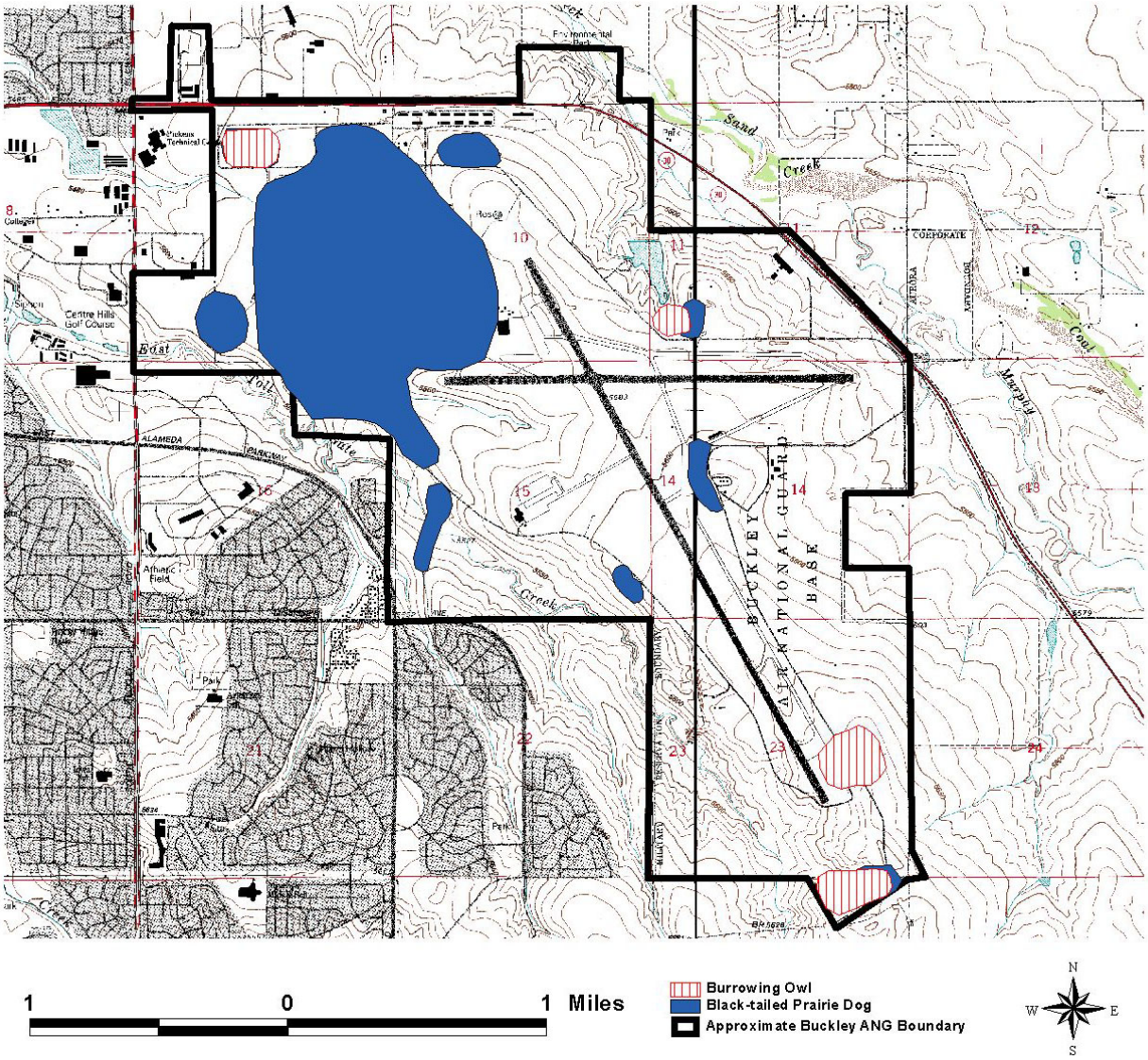
Life History Characteristics: This species is nearly blind in dim light and therefore primarily active in the middle of the day. This species is diurnal and active all year. Prairie dogs are predated by raptors, mammals (i.e. coyotes, badgers, and back-footed ferrets) and rattlesnakes. Life expectancy for prairie dogs average 2-4 years (Biodiversity Legal Foundation and J.C. Sharps 1994).

Diet: Prairie dogs primarily eat grasses and sedges in the summer and turn to the roots of forbs to sustain them though the winter (Fitzgerald et al. 1994), but they also eat insects. They are known to clip vegetation to increase their ability to detect aerial predators. This practice often changes the original habitat significantly which may explain the high biodiversity (Biodiversity Legal Foundation and J.C. Sharps 1994).

Social Behavior: They live in colonies with densities ranging from 10 to 55 animals per hectare. These colonies are further broken into family units called coteries. A coterie consists of one male, one to three females and their young. Within their colonies they use an extensive call system to communicate (Biodiversity Legal Foundation and J.C. Sharps 1994).

Reproduction: Breeding occurs during February and early March in Colorado. They have one litter per year, consisting of 4-5 young The young come above ground in May or early June approximately 5 weeks after birth (Fitzgerald et al. 1994).

Known Threats and Management Issues: Since the 1900's the distribution of prairie dog towns has not seen a dramatic change, however, the size of the towns has decreased considerably (numbers of animals is down by 98%) (Fitzgerald et al. 1994). Eradication programs have eliminated prairie dogs from many locations. Also populations fluctuate due to the human-introduced sylvatic plague. Small amounts of grazing appear to be important in maintaining the short-grass habitat on which this species is found.



Base Layer: Digital Raster Graphics (DRG) produced by the U.S.G.S., 1996

Figure 2: Approximate Locations of the Black-tailed Prairie Dog Towns and Burrowing Owl Colonies on Buckley ANG

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Management Recommendations

Exotic plant species are prevalent on the Buckley ANG and should be considered a high priority management issue. Fifteen noxious weeds (Division of Plant Industry Web Page) and 21 non-natives were documented (Appendix 1). This should not be considered a complete list due to the seasonality of our survey. Populations of eight of these 36 species were mapped (Figure 3). These species were chosen due to their limited distributions. These species, if caught now, could be eradicated. Many other species are well distributed and/or spotty throughout the property and will be difficult to control.



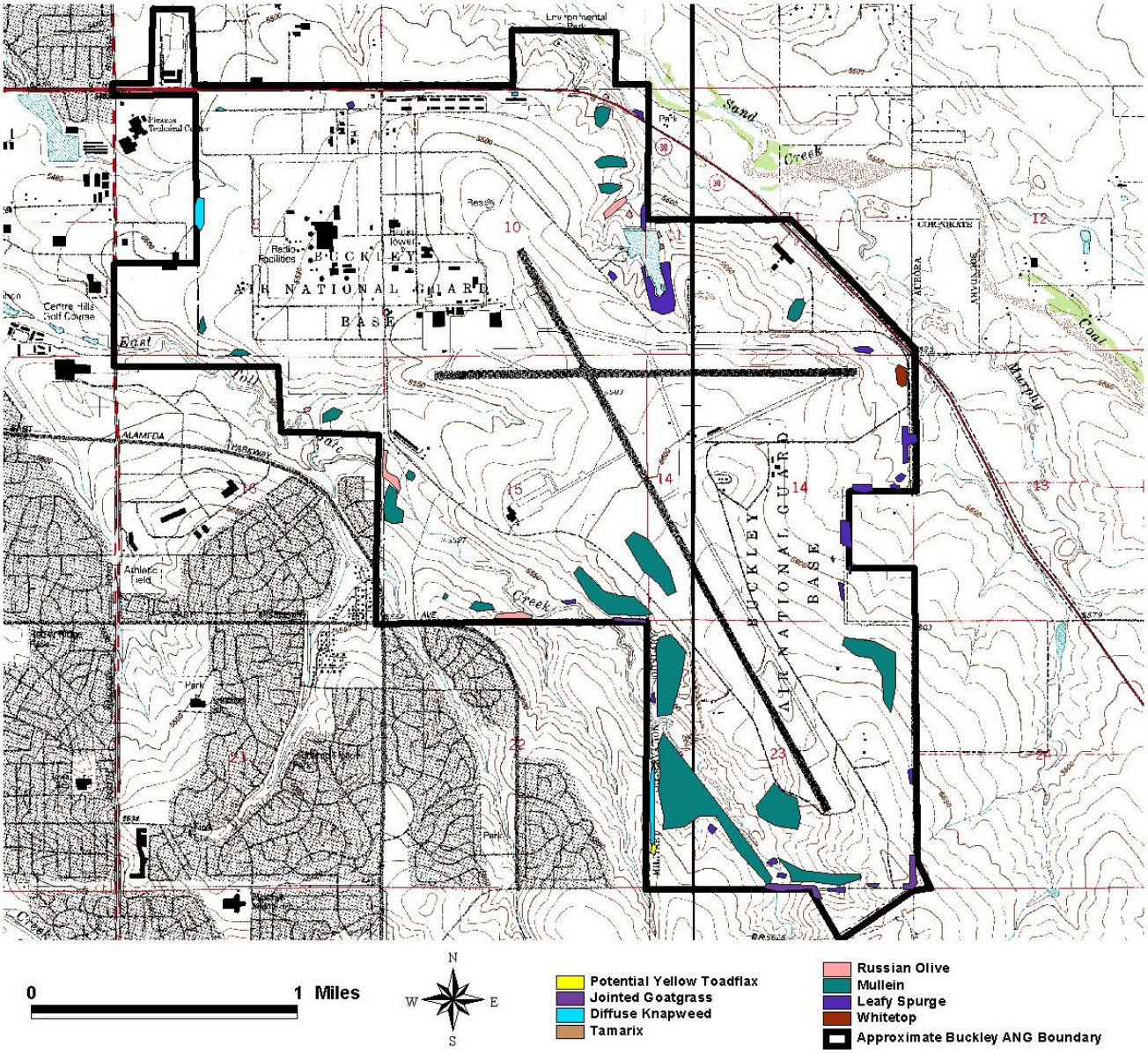
Photo by Dave Anderson
Mullein (*Verbascum th*



Photo by Robert Masters
Leafy Spurge (*Euphorbia esula*)



Photo by Dave Anderson, CNHP
Diffuse Knapweed (*Centaurea diffusa*)



Base Layer: Digital Raster Graphics (DRG) produced by the U.S.G.S., 1996

Figure 3: Approximate Locations of Eight Exotic Plant Species on the Buckley ANG*

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Appendix 1: Species List for Buckley Air National Guard*

Scientific Name	Common Name
NOXIOUS WEEDS	
Aegilops cylindrica	jointed goatgrass
Bromus tectorum	cheatgrass
Carduus nutans	musk thistle
Centaurea diffusa	diffuse knapweed
Cirsium arvense	Canada thistle
Convolvulus arvensis	bindweed
Descurania sophia	tansy mustard
Euphorbia esula	leafy spurge
Kochia scoparia	kochia
Linaria dalmatica	dalmation toadflax
Linaria vulgaris-uncertain id	yellow toadflax- uncertain id
Onopordum acanthium	scotch thistle
Salsola iberica	Russian thistle
Tamarix ramosissima	saltcedar
Verbascum thapsus	mullein
EXOTIC PLANT SPECIES	
Agropyron cristatum	crested wheatgrass
Allysum parviflorum	allysum
Bromus inermis	smooth brome
Camelina microcarpa	false flax
Cardaria pubescens	whitetop
Dactylis glomerata	orchard grass
Elaeagnus angustifolia	Russian olive
Erodium cicutarium	crane's bill
Grindelia squarrosa	gumweed
Medicago lupulina	black medic
Medicago sativa	alfalfa
Melilotus officinale	yellow sweet clover
Poa pratensis	Kentucky bluegrass
Rumex crispus	curly dock
Salvia reflexa	sage
Secale cereale	rye grass
Sisymbrium altissimum	Jim Hill mustard
Taraxacum officinale	dandelion
Thalaspi arvense	pennycress
Tragopogon dubius	salsify
Verbena bracteata	vervain
NATIVE PLANT SPECIES	
Achillea lanulosa	yarrow
Allium textile	wild onion
Aphylon fasciculatum	Broomrape
Apocynum adrosaemifolium	dogbane
Aristida purpurea	three-awned grass
Artemisia frigida	silver sage
Asclepias speciosa	milkweed
Astragalus gracilis	milkvetch
Astragalus longicarpus	milkvetch

continued Appendix 1: Species List for Buckley Air National Guard*

Scientific Name	Common Name
Bouteloua curtipendula	sideoats grama
Bouteloua gracilis	blue grama
Buchloe dactyloides	buffalo grass
Carex sp.	sedge
Castilleja sp.	paintbrush
Chenopodium berlandieri	goosefoot
Chrysothamnus sp.	rabbitbrush
Cirsium canescens	thistle
Distichlis spicata	saltgrass
Echinocereus viridulus	hedgehog cactus
Eleocharis palustris	spikerush
Elymus elymoides	rye
Elymus trachycaulus	rye
Equisetum arvense	horsetail
Eriogonum effusum	wild buckwheat
Erysimum sp.	wallflower
Gaura coccinea	
Gaura parviflora	
Guttierizia sarothrae	snakeweed
Hedeoma hispida	pennyroyal
Helianthus anua	sunflower
Heterotheca canescens	golden aster
Hordeum jubatum	barley
Koelaria macrantha	june grass
Kraschenikovia lanata	winter fat
Lathyrus c.f. eucosmus	peavine
Linum lewisii	flax
Oenothera sp.	evening primrose
Opuntia polyacantha	prickly pear
Packera tridenticulata	groundsel
Penstemon albens	beard-tongue
Plantago patagonica	wooly plantain
Poa arida	plains bluegrass
Populus acuminata	cottonwood
Populus deltoides	cottonwood
Psoralidium tenuiflorum	
Rhus trilobata	skunkbrush
Ribes aurea	gooseberry
Rosa woodsii	wild rose
Salix exigua	sandbar willow
Schedonnardus paniculatus	tumblegrass
Scirpus americanus	bulrush
Spheralcea coccinea	globemallow
Sporobolus cryptandrus	dropseed
Stipa comata	needle-thread grass
Stipa viridula	needle grass
Tradescantia occidentalis	spiderwort
Vicia americana	vetch
Vulpia octoflora	six week fescue
Yucca glauca	yucca

continued Appendix 1: Species List for Buckley Air National Guard*

Scientific Name	Common Name
BIRD SPECIES	
Falco sparverius	American Kestrel
Euphagus cyanocephalus	Brewers Blackbird
Molothrus ater	Brown Headed Cowbird
Icterus galbula	Bullocks Oriole
Athene cunicularia	Burrowing Owl
Aimophila cassinii	Cassins Sparrow
Tyrannus tyrannus	Eastern Kingbird
Ammodramus savannarum	Grasshopper Sparrow
Ardea herodias	Great Blue Heron
Bubo virginianus	Great Horned Owl
Carpodacus mexicanus	House Finch
Passer domesticus	House Sparrow
Charadrius vociferus	Killdeer
Calamospiza melanocorys	Lark Bunting
Lanius ludovicianus	Loggerheaded Shrike
Pica pica	Black-billedMagpie
Mimus polyglottos	Northern Mockingbird
Zenaida macroura	Mourning Dove
Chordeiles minor	Common Nighthawk
Columba livia	Rock Dove
Sturnus vulgaris	European Starling
Buteo swainsoni	Swainsons Hawk
Cathartes aura	Turkey Vulture
Pooecetes gramineus	Vesper Sparrow
Tyrannus verticalis	Western Kingbird
Sturnella neglecta	Western Meadowlark
Dendroica petechia	Yellow Warbler
MAMMALS	
Cynomys ludovicianus	black-tailed prairie dog
Canis latrans	coyote
Peromyscus maniculatus	deer mouse
Chaetodipus hispidus	hispid pocket mouse
Lepus californicus	jack rabbit
Microtus pennsylvanicus	meadow vole
Sylvilagus floridanus	eastern cottontail
Spermophilus tridecemlineatus	thirteen-lined ground squirrel
Reithrodontomys megalotis	western harvest mouse

*This list is based on one visit 6/5/00-6/8/00.

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.