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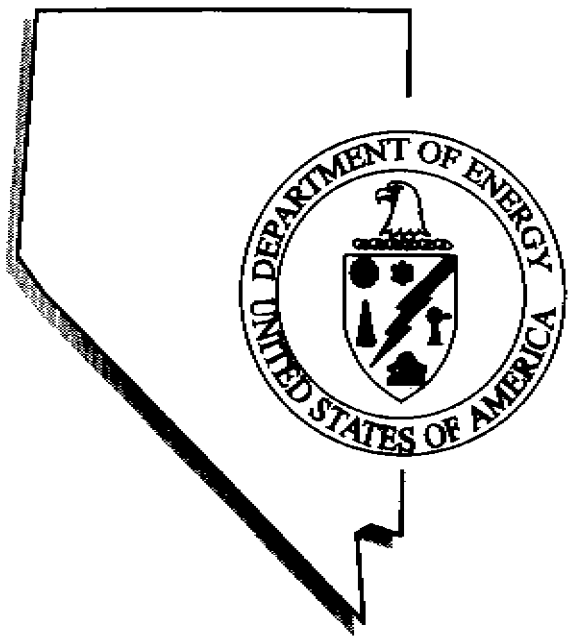
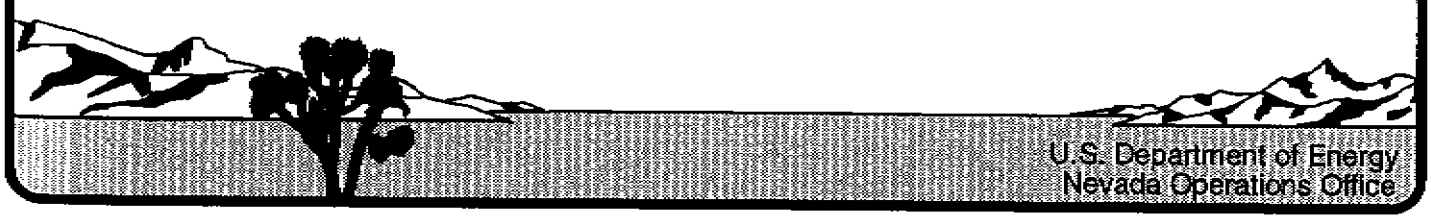


Sensitive Species Survey Results for the Rulison and Rio Blanco Sites, Colorado

December 1993

Environmental Restoration



U.S. Department of Energy
Nevada Operations Office

DOE/NV/10972--55

Sensitive Species Survey Results for the Rulison and Rio Blanco Sites, Colorado

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List of Acronyms and Abbreviations

AEC	Atomic Energy Commission
BLM	Bureau of Land Management
CDNR	Colorado Department of Natural Resources
CDOW	Colorado Division of Wildlife
DOE	U.S. Department of Energy
DOE/NV	U.S. Department of Energy, Nevada Operations Office
ESA	Endangered Species Act
ft	feet
km	kilometer(s)
m	meter(s)
mi	mile(s)
NEPA	National Environmental Policy Act
RI/FS	Remedial Investigation/Feasibility Study
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey

1.0 Introduction

In 1957, the U.S. Atomic Energy Commission (AEC) initiated the Plowshare Program to explore peaceful uses of nuclear explosives in science and industry. Under this program, the AEC [and later, the U.S. Department of Energy (DOE)] studied the economic feasibility of stimulating the flow of natural gas by fracturing rock formations with underground nuclear explosions. Between 1961 and 1973, twenty-seven Plowshare tests were conducted (DOE, 1992). Although the majority of those tests were conducted on the Nevada Test Site, other locations were also used. Project RULISON and Project RIO BLANCO were conducted in western Colorado (Figure 1-1). In September, 1969, a single underground nuclear explosion was detonated at the Rulison site, and in May 1973, three almost simultaneous nuclear explosions were detonated at the Rio Blanco site. The DOE Nevada Operations Office (DOE/NV) inherited the responsibility for these sites from the AEC and will be conducting a Remedial Investigation/Feasibility Study (RI/FS) at each site to determine the extent of residual subsurface contamination and the potential for surface contamination.

Before a RI/FS can be initiated, the National Environmental Policy Act (NEPA) of 1969 requires that the DOE evaluate the potential impacts that may occur as a result of performing remedial activities. DOE Order 5440.1E implementing NEPA requires that the presence of environmentally sensitive resources such as cultural resources, sensitive species, wetlands, and floodplains be determined at such sites so that the appropriate level of NEPA documentation can be established and adequate mitigation measures implemented. To this end, plans to conduct field surveys for these resources at the Rulison and Rio Blanco sites, as well as five other locations outside of Colorado, were developed and presented in *Survey Plans for DOE/NV Sites Outside of Nevada* (DOE, 1993a), hereafter referred to as the "survey plan".

This report summarizes the sensitive species surveys conducted under the survey plan at the Rulison and Rio Blanco Gas Stimulation Test Sites. Level I reconnaissance surveys were conducted at each site to identify the potential biological resources and to obtain information that may be used to design future specific surveys. In addition, if Federal- and state-listed sensitive species are present, these reconnaissance surveys may be used to design subsequent species-specific (Level II) surveys. The surveys covered a combined 160-hectare (400-acre) area. This report provides descriptions of habitats and lists the amphibian, reptile, bird, and mammal species observed at the Rulison and Rio Blanco sites.

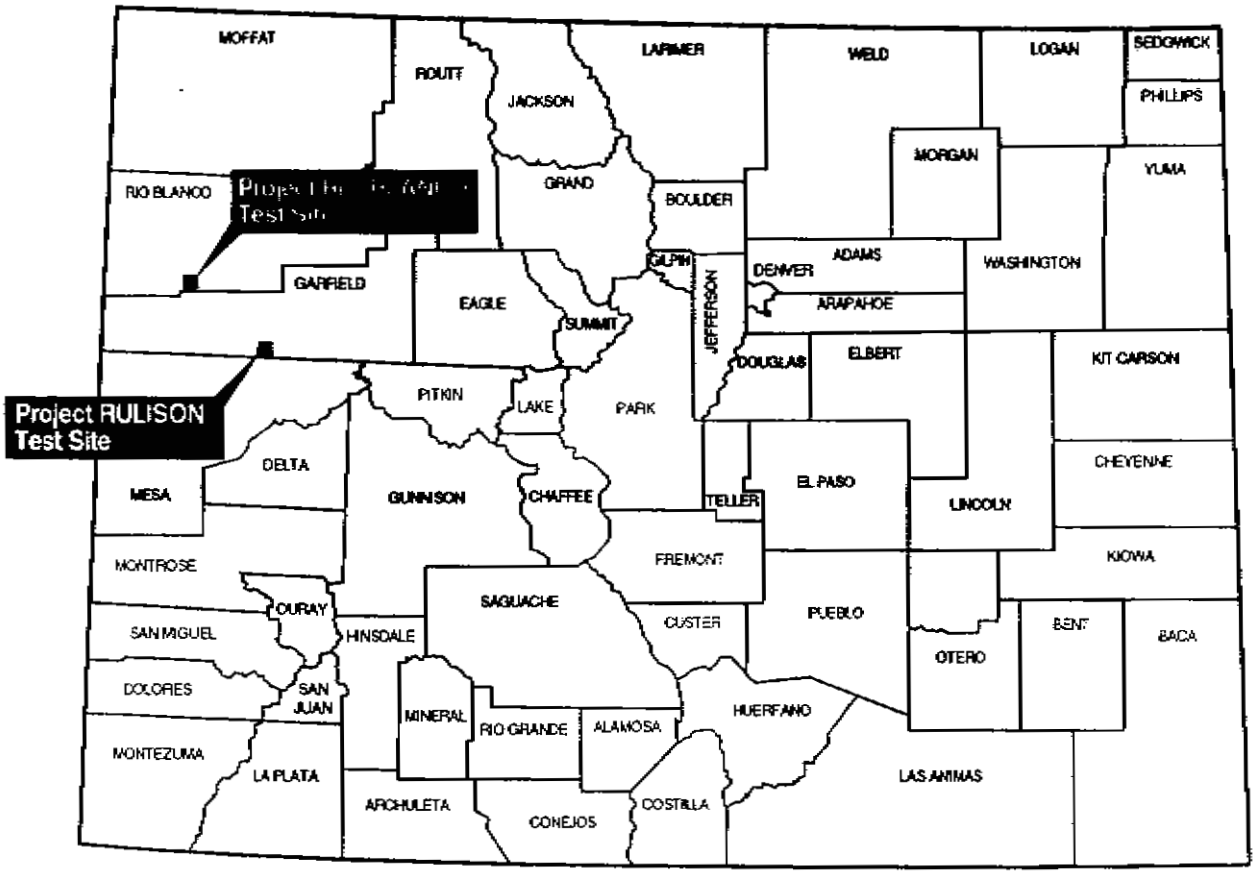


Figure 1-1
Locations of Project RULISON and Project RIO BLANCO Test Sites in Colorado

2.0 Background

2.1 Definition of Sensitive Species

For the purposes of these surveys, sensitive species include both Federally- and state-listed threatened and endangered species, candidate species, and species of special concern. The Endangered Species Act of 1973 (ESA) prohibits any Federal agency from conducting or supporting activities that might lead to the extinction of plants and animals. The U.S. Fish and Wildlife Service (USFWS) has authority under ESA to list plant and animal species as either endangered or threatened, thereby affording the species legal protection from being further imperiled through human impacts.

The USFWS listing process results in two other categories of species, proposed and candidate species, which are here included under the definition of sensitive species. Proposed species are those for which a formal proposal for listing has been published in the Federal Register, but a Final Rule has not yet been made. Proposed species are afforded legal protection under ESA. Candidate species are listed as such in the Federal Register and comprise those species under consideration for listing. Two categories of candidate species are defined. C1 species are those for which it is felt that enough information currently exists to support listing. C2 species are those for which additional information is required to determine the species' status. All USFWS listed threatened, endangered, proposed, and candidate species (C1 and C2) that have been recorded in the areas of the Rulison and Rio Blanco test sites were included in the surveys as targeted sensitive species.

The State of Colorado's Division of Wildlife (CDOW) is responsible for the protection of state listed threatened and endangered wildlife. CDOW also designates species of special concern, which is defined as "a native species or subspecies which has been threatened or endangered or could become threatened or endangered due to low population levels" (CDOW, 1985). Both state listed threatened and endangered species and state designated species of special concern that have been recorded in the areas of the Rulison and Rio Blanco test sites were also included in the surveys as targeted sensitive species.

2.2 Background for the Rulison Site Survey

Project RULISON was one of three joint government-industry gas stimulation experiments conducted under the Plowshare Program. The Rulison Gas Stimulation Test Site is located in Garfield County, west-central Colorado, 22.4-kilometers (km) (14-miles [mi]) southwest of

the town of Rifle and 9.6-km (6-mi) southeast of Grand Valley (Figure 2-1). The test site comprises 16-hectares (40-acres) within T.7S, R.95W (6th Principal Meridian), Section 25, E 1/2. The elevation of the site is 2,480-meters (m) (8,150-feet [ft]) above mean sea level. On September 10, 1969, a single underground nuclear explosion was detonated at this site. Ownership of this area is held by the Federal government [managed by the U.S. Bureau of Land Management (BLM)] and private owners.

The list of the sensitive wildlife species that may be encountered at the Rulison site was compiled through the CDOW's WILDDATA data base (CDNR, 1993). Seven species were identified through this process, two Federally-listed endangered species, four Federally-listed C2 candidate species, and one Colorado species of special concern. These are:

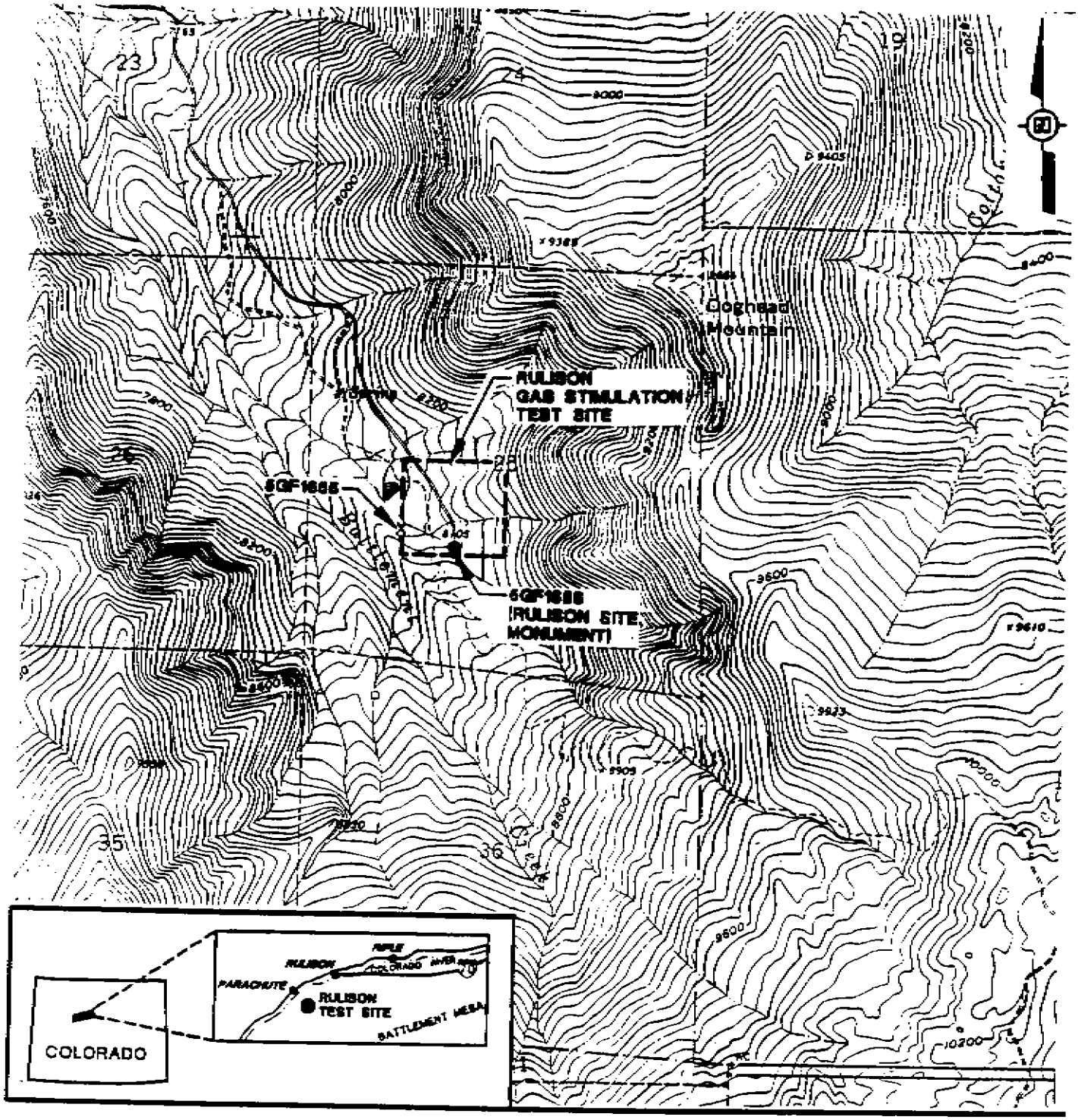
Bald eagle (*Haliaeetus leucocephalus*)—Status: Federally-Listed as Endangered.
Bald eagles are resident to the area of the Rulison test site and may breed here during the period from April to July. The typical breeding habitat for this species is riparian transitional forest (CDNR, 1993).

Peregrine falcon (*Falco peregrinus*)—Status: Federally-Listed as Endangered.
After near extinction from the effects of DDT, this high-profile endangered species is a potential breeding species in the Rulison test site area. Its typical habitat types include conifer forests (e.g., limber pine, spruce/fir, lodgepole pine, ponderosa pine, and Douglas-fir), pinyon/juniper woodland, and transitional and highland riparian forest (CDNR, 1993).

Northern goshawk (*Accipiter gentilis*)—Status: Federal C2 Candidate.
The northern goshawk is a resident to the higher elevations of Colorado, typically nesting in areas above 2,290-m (7,500-ft) in elevation (Andrews and Righter, 1992). It is, therefore, a potential breeding species at the Rulison site. Its breeding season is from June through August and typical breeding habitat is conifer forest (e.g., limber pine, spruce/fir, lodgepole pine, ponderosa pine, and Douglas-fir), pinyon/juniper woodland, and transitional and highland riparian forest (CDNR, 1993).

White-faced ibis (*Plegadis chihi*)—Status: Federal C2 Candidate.
The white faced ibis is a common spring migrant and less common fall migrant in the valleys of western Colorado, including the Colorado River valley in Garfield County (Andrews and Righter, 1992). It uses wetland and aquatic habitats for feeding and resting during these periods. Its typical migratory habitats are not found on the Rulison site (CDNR, 1993).

Black tern (*Chlidonias niger*)—Status: Federal C2 Candidate.
The black tern is a migrant in western Colorado, more common in the spring than in the fall (Andrews and Righter, 1992). It typically inhabits lakes, reservoirs, marshes, bogs and wet hummocks (CDNR, 1993). Although recorded in Garfield County, it more



LEGEND

- PROJECT BOUNDARY
- X ISOLATED FIND
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SOURCE: USGS 7.5' RULISON, CO. TOPOGRAPHIC MAP.

Figure 2-1
Site Location Map Project Rulison

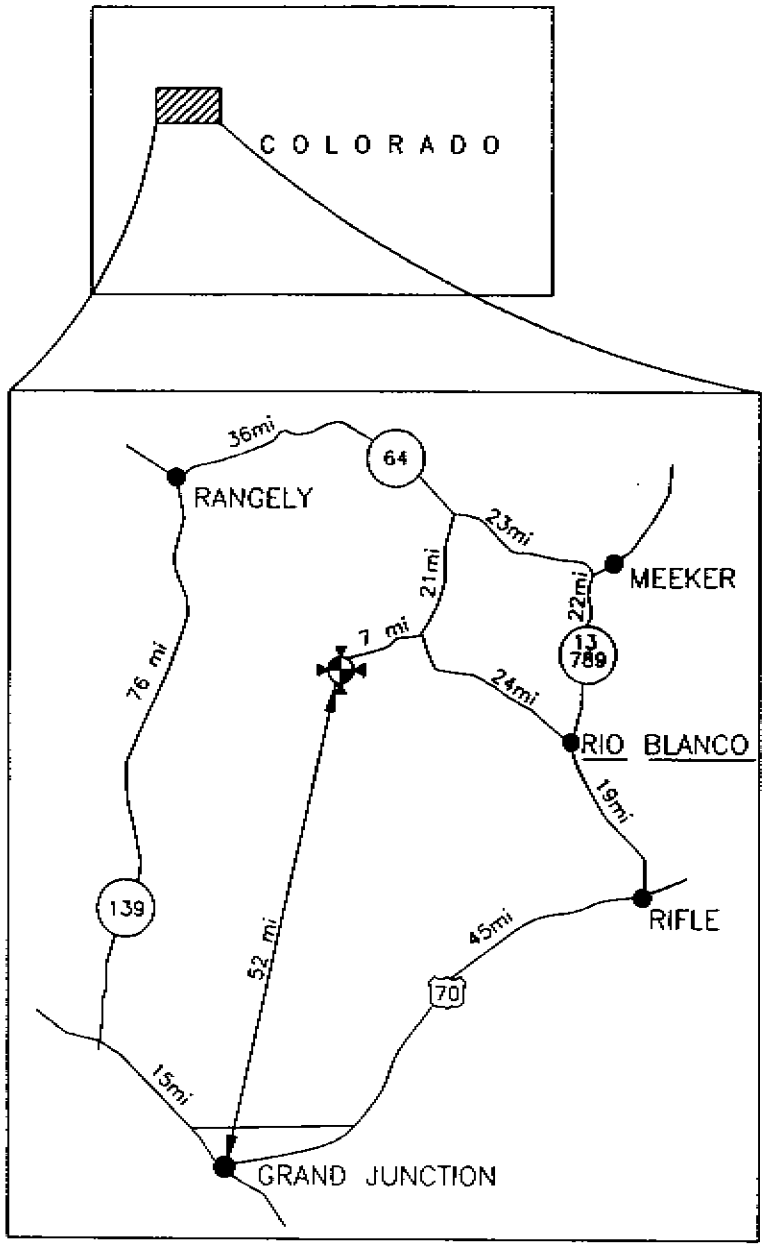

Figure 2-2
Site Location Map Project Rio Blanco

NOT TO SCALE

SOURCE: DRI, 1988

commonly occurs farther south along the Colorado and Gunnison Rivers in Mesa and Delta Counties (Andrews and Righter, 1992).

Boreal toad (*Bufo boreas*)—Status: Federal C2 Candidate.
The boreal toad inhabits wetland sites, such as marshes, wet meadows, streams, and beaver ponds, in the higher elevations of Colorado. This species typically occurs between 2,590 and 3,350 m (8,500 and 11,000 ft) in elevation and rarely has been found as low as 2,130-m (7,000-ft) (Hammerson, 1986).

Tiger salamander (*Ambystoma tigrinum*)—Status: Colorado Species of Special Concern.
The tiger salamander occurs throughout Colorado at all elevations up to 3,660-m (12,000-ft). They can occur in almost any wetland habitat, from clear mountain lakes to livestock watering tanks that are heavily disturbed by cattle (Hammerson, 1986).

2.3 Background for the Rio Blanco Site Survey

Like Project RULISON, Project RIO BLANCO was one of three joint government-industry gas stimulation experiments conducted under the Plowshare Program. The Rio Blanco site is located in Rio Blanco County, northwestern Colorado, 58-km (36-mi) northwest of the town of Rifle, Colorado (Figure 2-2). This site comprises 144-hectares (360-acres) within T.3S, R.98W (6th Principal Meridian) and consists of the following tracts: Section 10, SE 1/4, SE 1/4; Section 11, S1/2, SW 1/4; Section 14, NW 1/4, and Section 15, E 1/2, NE 1/4. The elevation of the site is 2,020-m (6,630-ft) above mean sea level. On May 17, 1973, three almost simultaneous nuclear explosions were detonated at this site. Ownership of this area is held by the Federal government (managed by the BLM) and private owners.

The list of the sensitive wildlife species that may be encountered at the Rio Blanco site was compiled through the CDOW's WILDDATA data base (CDNR, 1993). Seven species were identified through this process, two Federally-listed endangered species, four federally-listed C2 candidate species, and one Colorado species of special concern. These are:

Bald eagle (*Haliaeetus leucocephalus*)—Status: Federally-Listed as Endangered.
Bald eagles are unlikely breeders at the Rio Blanco test site, but may occur as a winter visitor. Its typical feeding (fishing) habitat includes lakes and streams surrounded by riparian transitional forest (CDNR, 1993). The Rio Blanco site does not offer good wintering habitat for this species.

Peregrine falcon (*Falco peregrinus*)—Status: Federally-Listed as Endangered.
After near extinction from the effects of DDT, this high-profile endangered species is a potential breeding species in the Rio Blanco test site area. Its typical habitat types include conifer forests (e.g., limber pine, spruce/fir, lodgepole pine, ponderosa pine, and Douglas-fir), pinyon/juniper woodland, and transitional and highland riparian forest

(CDNR, 1993). Cliffs suitable for peregrine falcon nesting occur within three miles of the Rio Blanco site.

Northern goshawk (*Accipiter gentilis*)—Status: Federal C2 Candidate.
The northern goshawk is a resident to the higher elevations of Colorado, typically nesting in areas above 2,290-m (7,500-ft) in elevation (Andrews and Righter, 1992). Based on elevation, the Rio Blanco site is a marginal habitat to support breeding goshawks, although the site may be used for hunting by birds breeding in adjacent highlands. Its breeding season is from June through August and typical breeding habitat is conifer forest (e.g., limber pine, spruce/fir, lodgepole pine, ponderosa pine, and Douglas-fir), pinyon/juniper woodland, and transitional and highland riparian forest (CDNR, 1993). The northern goshawk is a likely winter visitor in the area.

White-faced ibis (*Plegadis chihi*)—Status: Federal C2 Candidate.
The white-faced ibis is a common spring migrant and less common fall migrant in the valleys of western Colorado, including the Colorado River valley (Andrews and Righter, 1992). It uses wetland and aquatic habitats for feeding and resting during these periods. Its typical migratory habitats are not found on the Rio Blanco site (CDNR, 1993). Due to the lack of suitable habitat conditions and the rarity of occurrence in Rio Blanco County, the white-faced ibis is unlikely to occur at the Rio Blanco site.

Black tern (*Chlidonias niger*)—Status: Federal C2 Candidate.
The black tern is a migrant in western Colorado, more common in the spring than in the fall (Andrews and Righter, 1992). It typically inhabits lakes, reservoirs, marshes, bogs and wet hummocks (CDNR, 1993). Suitable habitat conditions for this species are lacking at the Rio Blanco site. Further, Andrews and Righter (1992) indicate no records of the black tern in Rio Blanco County.

Boreal toad (*Bufo boreas*)—Status: Federal C2 Candidate.
The boreal toad inhabits wetland sites, such as marshes, wet meadows, streams, and beaver ponds, in the higher elevations of Colorado. This species typically occurs between 2,590 and 3,350 m (8,500 and 11,000 ft) in elevation and rarely has been found as low as 2,130-m (7,000-ft) (Hammerson, 1986). Due to its marginally low elevation and generally poor wetland conditions at the Rio Blanco site, this species is unlikely to occur here.

Tiger salamander (*Ambystoma tigrinum*)—Status: Colorado Species of Special Concern.
The tiger salamander occurs throughout Colorado at all elevations up to 3,660-m (12,000-ft). They can occur in almost any wetland habitat, from clear mountain lakes to livestock watering tanks that are heavily disturbed by cattle (Hammerson, 1986).

3.0 Procedure

3.1 Procedure for the Rulison Site Survey

The Level I reconnaissance survey for Rulison site was conducted during one day. A herpetologist and an ornithologist conducted the survey, which was limited to the 16-hectare (40-acre) area, as specified in the survey plan.

The survey method required that the survey team walk the site, using all roads and trails when possible. Transects were walked in areas where no roads or trails existed. The transects were spaced to ensure adequate and representative coverage of the site. The team noted the suitability of each habitat to support the species of concern and searched each habitat for physical evidence of site usage.

All birds, reptiles, and mammals seen on the site were identified and recorded with the use of optical aids, i.e., binoculars and a spotting scope. The team also used bird songs and calls that were heard to aid in the identification of the birds.

Because all of the target sensitive species for the Rulison site are either birds or amphibians, specialized survey techniques were employed for these two classes of wildlife. For birds, the following survey techniques were used:

- Line transects--This method involved slowly walking all roads and trails (wetland lines and stream corridors) and noting all bird species observed, either by sight or sound (Bibby et al., 1993; Cooperrider et al., 1986).

- Point counts--This method used bird counts made from a series of stationary points over a specified time interval (Bibby et al., 1993; Cooperrider et al., 1986). For the Rulison surveys, observers sat quietly in one location for 15 minutes and conducted bird counts.

- Calling surveys--This method used recorded calls of the target sensitive species. These recorded calls were broadcast using a game caller to elicit territorial responses from each species, allowing observation of the species that may have otherwise been undetected (Cooperrider et al., 1986).

Four specialized herpetological survey techniques were used at the Rulison sites to document the presence of either of the two sensitive amphibian species targeted for the site. Each of these methods are generally applied to both amphibians and reptiles and, therefore, their use in the Rulison surveys resulted in observations of species other than the targeted amphibians.

All reptiles and amphibians captured during these surveys were field identified and immediately released unharmed to the site of capture. Whenever possible, organisms were identified without capture. The four survey techniques used were:

- Stump ripping--This technique required the methodical searching of stumps, logs, boards, or other suitable refuge that amphibians may inhabit (Cooperrider et al., 1986). The herpetologist walked along preestablished transects and examined all such sites, often by turning, rolling, or ripping apart potential refuge.

- Diurnal and nocturnal road cruising--This technique involved driving a vehicle at slow speeds along paved or dirt roads at various times of the day and night. Reptiles and amphibians observed on the road were captured, identified, and then released. This technique was effective on warm days with cool nights when these cold-blooded organisms used the roads for warmth and on rainy evenings when amphibian and reptile activity was generally high (Cooperrider et al., 1986).

- General observation--This method involved the observation of surface water bodies, such as ponds and creeks, from a vantage point for the visual observation of basking or swimming reptiles and amphibians. The observer used a pair of binoculars to slowly scan suitable locations for the different species. If a positive identification of an observed individual could not be made, the observer attempted to obtain a closer vantage point to identify the organism in question (Cooperrider et al., 1986).

- Aquatic habitat searches--This method was employed at the Rulison site because two of the species of concern are amphibians and, therefore, require aquatic habitats for breeding. Searches were performed by ocular survey and dip netting for the species of concern, potential prey, and macrophytes (Cooperrider et al., 1986). Special attention was given to the creeks and ponds on the site to ensure that tiger salamander and boreal toad breeding habitats were carefully studied during these surveys.

3.2 Procedure for the Rio Blanco Site Survey

The reconnaissance survey for the Rio Blanco site was conducted over a two-day period. A herpetologist and an ornithologist conducted the survey. The survey was limited to the 144-hectares (360-acre) area, as specified in the survey plan.

The principal survey method required that the survey team walk the site, using all roads and trails when possible. Transects were walked in areas where no roads or trails existed. The transects were spaced to ensure adequate and representative coverage of the site. The team noted the suitability of each habitat to support the species of concern and searched each habitat for physical evidence of site usage.

All birds, reptiles, and mammals seen on the site were identified and recorded with the use of optical aids, i.e., binoculars and a spotting scope. The team also used bird songs and calls that were heard to aid in the identification of the birds.

As at the Rulison test site, all of the target sensitive species for the Rio Blanco site are either birds or amphibian. Therefore, specialized survey techniques were employed for these two classes of wildlife. For birds, the following survey techniques were used:

- Line transects--This method involved slowly walking all roads and trails (wetland lines and stream corridors) and noting all bird species observed, either by sight or sound (Bibby et al., 1993; Cooperrider et al., 1986).

- Point counts--This method used bird counts made from a series of stationary points over a specified time interval (Bibby et al., 1993; Cooperrider et al., 1986). For the Rio Blanco surveys, observers sat quietly in one location for 15 minutes and conducted bird counts.

- Calling surveys--This method used recorded calls of the target sensitive species. These recorded calls were broadcast using a game caller to elicit territorial responses from each species, allowing observation of the species that may have otherwise been undetected (Cooperrider et al., 1986).

Four herpetological survey techniques were used at the Rio Blanco sites to document the presence of either of the two sensitive amphibian species targeted for the site. Each of these methods are generally applied to both amphibians and reptiles and, therefore, their use in the Rio Blanco surveys resulted in observations of species other than the targeted amphibians. All reptiles and amphibians captured during these surveys were field identified and immediately released unharmed to the site of capture. Whenever possible, organisms were identified without capture. The four survey techniques used were:

- Stump ripping-- This technique required the methodical searching of stumps, logs, boards, or other suitable refuge that amphibians may inhabit (Cooperrider et al., 1986). The herpetologist walked along preestablished transects and examined all such sites, often by turning, rolling, or ripping apart potential refuge.

- Diurnal and nocturnal road cruising--This technique involved driving a vehicle at slow speeds along paved or dirt roads at various times of the day and night. Reptiles and amphibians observed on the road were captured, identified, and then released. This technique was effective on warm days with cool nights when these cold-blooded organisms used the roads for warmth and on rainy evenings when amphibian and reptile activity was generally high (Cooperrider et al., 1986).

- General observation--This method involved the observation of surface water bodies, such as ponds and creeks, from a vantage point for the visual observation of basking or swimming reptiles and amphibians. The observer used a pair of binoculars to slowly scan suitable locations for the different species. If a positive identification of an observed individual could not be made, the observer attempted to obtain a closer vantage point to identify the organism in question (Cooperrider et al., 1986).

- Aquatic habitat searches--This method was employed at the Rio Blanco site because two of the species of concern are amphibians and, therefore, require aquatic habitats for breeding. Searches were performed by ocular survey and dip netting for the species of concern, potential prey, and macrophytes (Cooperrider et al., 1986). Special attention was given to the creeks and ponds on the site to ensure that potential breeding habitats were carefully studied during these surveys.

4.0 Results

4.1 Results of the Rulison Site Surveys

The habitats present at the Rulison site are a combination of Rocky Mountain Montane and Subalpine forest (Whitney, 1992). At lower elevations [2,290 to 2,440 m (7,500 to 8,000 ft)], the dominant montane vegetation consists of quaking aspen (*Populus tremuloides*), Colorado blue spruce (*Picea pungens*), willow (*Salix* spp.), lodgepole pine (*Pinus contorta*), and Gambel oak (*Quercus gambelii*). At elevations greater than 2,440-m (8,000-ft), subalpine species, such as sub-alpine fir (*Abies lasiocarpa*) and Engelmann spruce (*Picea engelmannii*), become more prevalent in the vegetation. The transition between these two vegetation types at the Rulison site is gradual, making the differentiation of these communities in the field difficult.

Tables 4-1 through 4-3 list the species found on the Rulison site.

Table 4-1
List of Reptile and Amphibian Species Observed During the Sensitive Species Survey of the Rulison Test Site, Colorado

Scientific Name	Common Name
Amphibians	
Order: Caudata	
Family: Ambystomatidae	
Ambystoma tigrinum	Tiger Salamander
Reptiles	
Order: Squamata	
Suborder: Serpentes	
Family: Colubridae	
Opheodrys vernacis	Smooth Green Snake

Table 4-2
List of Bird Species Observed During the Sensitive Species Survey of the Rulison Test Site, Colorado

Scientific Name	Common Name
Order: Falconiformes	
Family: Accipitridae	
Aquila chrysaetos	Golden Eagle
Order: Charadriiformes	
Family: Scolopacidae	
Calidris minutilla	Least Sandpiper
Order: Columbiformes	
Family: Columbidae	
Zenaida macroura	Mourning Dove
Order: Apodiformes	
Family: Trochilidae	
Selasphorus platycercus	Broad-tailed Hummingbird
Order: Piciformes	
Family: Picidae	
Sphyrapicus varius	Yellow-bellied Sapsucker
Colaptes auratus	Northern Flicker
Order: Passeriformes	
Family: Hirundinidae	
Tachycineta bicolor	Violet-green Swallow
Family: Corvidae	
Corvus corax	Common Raven
Family: Paridae	
Parus atricapillus	Black-capped Chickadee
Family: Troglodytidae	
Troglodytes aedon	House Wren
Family: Muscicapidae	
Regulus calendula	Ruby-crowned Kinglet

Table 4-2 (continued)
List of Bird Species Observed During the Sensitive Species Survey of the Rulison Test Site, Colorado

Scientific Name	Common Name
Catharus guttatus	Hermit Thrush
Turdus migratorius	American Robin
Family: Emberizidae	
Subfamily: Parulinae	
Vermivora virginae	Virginia's Warbler
Dendorica petechia	Yellow Warbler
Dendrocia coronata	Yellow-rumped Warbler [Audubon's form]
Oporornis tolmiei	MacGillivray's Warbler
Subfamily: Emberizinae	
Amophila ruficeps	Rufous-crowned Sparrow
Pooecetes gramineus	Vesper Sparrow
Family: Passeridae	
Passer domesticus	House Sparrow

Table 4-3
List of Mammal Species Observed During the Sensitive Species Survey of the Rulison Test Site, Colorado

Scientific Name	Common Name
Order: Lagamorpha	
Family: Leporidae	
Sylvilagus nuttalli	Mountain Cottontail
Order: Rodentia	
Family: Sciuridae	
Eutamias minimus	Least Chipmunk
Marmota flaviventris	Yellow-bellied Marmot
Citellus lateralis	Golden-mantled Ground Squirrel
Family: Castoridae	
Castor canadensis	Beaver
Order: Carnivora	

Table 4-3 (continued)
List of Mammal Species Observed During the Sensitive Species Survey of the Rulison Test Site, Colorado

Scientific Name	Common Name
Family: Procyonidae	
Procyon lotor	Raccoon
Family: Canidae	
Canis familiaris	Domestic Dog
Canis latrans	Coyote
Order: Artiodactyla	
Family: Cervidae	
Odocoileus hemionus	Mule Deer

4.2 Results of the Rio Blanco Site Survey

The Rio Blanco site is dominated by arid pinyon/juniper (*Pinus edulis/Juniperus* sp.) woodland on the rocky slopes and woodlands with dense stands of shrubland vegetation, and dominated by big sagebrush (*Artemisia tridentata*) in the finer alluvial soils between the ridges (Whitney, 1992). The edge between the almost pure sagebrush along the water channels and the pinyon/juniper woodland is clearly defined and determined principally by soil texture.

Tables 4-4 through 4-6 list the species found on the Rio Blanco site.

Table 4-4
List of Reptile and Amphibian Species Observed During the Sensitive Species Survey of the Rio Blanco Test Site, Colorado

Scientific Name	Common Name
Amphibians	
(none)	
Reptiles	
Order: Squamata	
Suborder: Lacertilia	
Family: Iguanidae	
Sceloporus graciosus	Sagebrush Lizard

Table 4-5
List of Bird Species Observed During the Sensitive Species Survey of the Rio Blanco Test Site, Colorado

Scientific Name	Common Name
Order: Falconiformes	
Family: Accipitridae	
Buteo jamaicensis	Red-tailed Hawk
Buteo regalis	Ferruginous Hawk
Aquila chrysaetos	Golden Eagle
Family: Falconidae	
Falco sparverius	American Kestrel
Order: Charadriiformes	
Family: Scolopacidae	
Calidris minutilla	Least Sandpiper
Order: Columbiformes	

Table 4-5 (continued)
List of Bird Species Observed During the Sensitive Species Survey of the Rio Blanco Test Site, Colorado

Scientific Name	Common Name
Family: Columbidae	
Zenaida macroura	Mourning Dove
Order: Caprimulgiformes	
Family: Caprimulgidae	
Chordeiles minor	Common Nighthawk
Phalenoptilus nuttallii	Common Poorwill
Order: Piciformes	
Family: Picidae	
Picoides pubescens	Downy Woodpecker
Colaptes auratus	Northern Flicker
Order: Passeriformes	
Family: Tyrannidae	
Empidonax hammondii	Hammond's Flycatcher
Empidonax oberholseri	Dusky Flycatcher
Family: Hirundinidae	
Tachycineta bicolor	Violet-green Swallow
Riparia riparia	Bank Swallow
Hirundo pyrrhonota	Cliff Swallow
Hirundo rustica	Barn Swallow
Family: Corvidae	
Nucifraga columbiana	Clark's Nutcracker
Family: Paridae	
Parus atricapillus	Black-capped Chickadee
Family: Sittidae	
Sitta canadensis	Red-breasted Nuthatch
Sitta carolinensis	White-breasted Nuthatch
Family: Troglodytidae	

Table 4-5 (continued)
List of Bird Species Observed During the Sensitive Species Survey of the Rio Blanco Test Site, Colorado

Scientific Name	Common Name
Troglodytes aedon	House Wren
Cistothorus palustris	Marsh Wren
Family: Muscicapidae	
Polioptila caerulea	Blue-gray Gnatcatcher
Sialia currucoides	Mountain Bluebird
Catharus guttatus	Hermit Thrush
Turdus migratorius	American Robin
Family: Emberizidae	
Subfamily: Parulinae	
Vermivora virginae	Virginia's Warbler
Dendorica petechia	Yellow Warbler
Mniotilta varia	Black-and-white Warbler
Wilsonia pusilla	Wilson's Warbler
Subfamily: Emberizinae	
Pipilo chlorurus	Green-tailed Towhee
Pooecetes gramineus	Vesper Sparrow
Melospiza melodia	Song Sparrow
Family: Fringillidae	
Carpodacus purpureus	Purple Finch
Carpodacus cassinii	Cassin's Finch
Carpodacus mexicanus	House Finch

Table 4-6
List of Mammal Species Observed During the Sensitive Species Survey of the Rio Blanco Test Site, Colorado

Scientific Name	Common Name
Order: Lagamorpha	
Family: Leporidae	
Sylvilagus nuttalli	Mountain Cottontail

Table 4-6 (continued)
List of Mammal Species Observed During the Sensitive Species Survey of the Rio Blanco Test Site, Colorado

Scientific Name	Common Name
Lepus townsendi	White-tailed Jackrabbit
Order: Rodentia	
Family: Sciuridae	
Eutamias minimus	Least Chipmunk
Marmota flaviventris	Yellow-bellied Marmot
Citellus lateralis	Golden-mantled Ground Squirrel
Family: Castoridae	
Castor canadensis	Beaver
Order: Carnivora	
Family: Procyonidae	
Procyon lotor	Raccoon
Family: Canidae	
Canis familiaris	Domestic Dog
Canis latrans	Coyote
Order: Artiodactyla	
Family: Cervidae	
Cervus canadensis	Elk
Odocoileus hemionus	Mule Deer

5.0 Discussion

5.1 Rulison Gas Stimulation Test Site

The Rulison test site has a high potential for supporting a large diversity of wildlife species. Uplands, wetlands, and surface water bodies offer numerous resources for the organisms that utilize the site. Food resources for deer, rodents, birds, and canids are abundant. Acorns from the Gambel oak and seeds from the conifers provide mast for herbivores, which, in turn, are prey for the carnivores. The beavers on site feed primarily on aspen. Cover required for all wildlife species is abundant and varied.

There are three major water bodies on the Rulison site. First, Battlement Creek is a rushing mountain stream that flows through the southwest corner of the site. Battlement Creek is fed principally by snow melt and its flow is regulated upstream (south) of the site by Battlement Reservoir. Second, a smaller, spring-fed tributary of Battlement Creek flows across the site east of Battlement Creek. This stream is impounded by a series of beaver dams, creating a marshy, wetland complex through the middle of the site. Third, an artificially created effluent pond is located at the center of the site. This pond originated when the shot cavity was created.

The effluent pond supports the breeding stage of the tiger salamander (*Ambystoma tigrinum*). At least four sub-adults and numerous larvae were observed in the effluent pond during the Level I survey. It appears that the salamanders may require two years to complete development at this site. The four sub-adults showed no sign of being neotenic while the larvae were obviously the current year's brood. The beaver ponds on this site also have the potential to serve as breeding sites for the tiger salamander. All of the waters on site have diverse populations of aquatic organisms, which serve as a food source for this species.

Although none were seen during this survey, the habitat at the Rulison site is also suitable for the boreal toad (*Bufo boreas*). The beaver ponds and effluent pond contain numerous species of emergent vegetation and filamentous algae, which would serve as food for larval toads.

The black tern (*Chlidonias niger*) and the white-faced ibis (*Plegadis chihi*) are spring migrants along the Colorado River in western Colorado (Andrews and Righter, 1992). Unfortunately, the sensitive species survey at the Rulison site was not conducted during the migratory period for these species. However, based upon the site's proximity to the Colorado River and the diverse aquatic fauna in the streams and ponds of the site, these species could potentially utilize this site as a migratory stop-over point. The black tern feeds primarily on aquatic insects and the white-faced ibis feeds on fish and aquatic insects. The diverse aquatic habitat and associated communities at the Rulison site could provide a food base for both of these species (Thompson, 1993). The probability of these birds utilizing this site as a migratory stop-over is high.

The peregrine falcon (*Falco peregrinus*) is listed as breeding in the area, although no evidence of this species was found during the survey. The preferred breeding habitat for this species is cliffs overlooking rivers or lakes. The nests of this species are generally built on high cliff faces. The Rulison site does not contain suitable nesting habitat for this species; however, the site is within flying range of suitable cliffs on adjacent ridge lines. Falcons potentially nesting on these cliffs could feed at the Rulison site.

The habitat at this site is suitable for the northern goshawk (*Accipiter gentilis*), which are known to breed in the higher elevations [above 2,290-m (7,500-ft)] of Colorado (Andrews and Righter, 1992). However, personal communication with the BLM personnel (Thompson, 1993) and review of the BLM Raptor Nest Site Map indicated that the nearest known raptor nest site was approximately three miles northwest of the Rulison site.

The habitat on this site is marginally suitable for bald eagles (*Haliaeetus leucocephalus*). While there is the potential for these birds to nest in the forested areas, the bald eagle is a fish-feeding bird. Battlement Creek, while supporting trout and other fish species (Thompson, 1992), is a fast-flowing river, which would limit the eagles' ability to catch fish. As mentioned above, there are no known nests within three miles of the site.

5.2 Rio Blanco Gas Stimulation Test Site

The Rio Blanco test site is bisected north-south by the steeply walled Fawn Creek, the only surface water on site. The creek is ephemeral and is often dry by mid-July (E. Holloway, 1993). Heavy cattle use has created access to the creek from the sagebrush above the creek bed. Use of the site by resident and migrant wildlife is limited to travel from the ridges to the creek and back. The dense sagebrush provides poor forage for deer and elk, but does offer nesting habitat and singing perches for song birds. Least chipmunks and ground squirrels burrow under the sagebrush.

On the ridges, pinyon nuts and juniper berries provide forage along with browse provided by the grasses. The shores of Fawn Creek are vegetated with willow and other wetland shrubs and herbs that provide food for beaver and ducks. A small cliff complex along the road provides nesting cavities for flycatchers and a large bat colony. Violet-green and cliff swallows use the steep banks of Fawn Creek for nesting sites. Elk that summer at higher elevations use the site for wintering habitat. Mule deer occupy the ridge areas year round. Heavy cattle grazing in the sagebrush and along Fawn Creek has limited the diversity of the site.

The habitat at the Rio Blanco site could potentially support the tiger salamander (*Ambystoma tigrinum*); however, there was no evidence of vernal pools for breeding, and Fawn Creek is not suitable for use as breeding habitat for this species. At 2,020-m (6,630-ft) in elevation, the site is probably too low in elevation for the boreal toad, which is rarely found at elevations as low as 2,130-m (7,000-ft) (Hammerson, 1986).

The black tern (*Chlidonias niger*) and the white-faced ibis (*Plegadis chihi*) are listed as migrants for this region of Colorado. The survey did not occur during the migratory period for these species; however, based upon the site habitat, it is unlikely that these species would utilize this site as a migratory stop-over point due to a lack of suitable habitat conditions. The black tern feeds primarily on aquatic insects and the white-faced ibis feeds on fish and aquatic insects. Although a few miles downstream, Fawn Creek is classified as a trout maintenance stream (Holloway, 1993), the reach of Fawn Creek that transects the Rio Blanco site is ephemeral and its water quality appears to be compromised by cattle use. The presence of water in Fawn Creek during the migratory period and the creek's ability to support a diverse aquatic community is questionable. Although Black Sulfur Creek and Piceance Creek, into which Fawn Creek flows, may contain adequate habitat for these two species, the probability of these birds utilizing the Rio Blanco site as a migratory stop-over site is small.

The peregrine falcon (*Falco peregrinus*) is listed as breeding in the area, although no evidence of this species was found during the survey. The preferred breeding habitat for this species is cliffs overlooking rivers or lakes. The nests of this species are generally built on high cliff faces. The Rio Blanco site does not contain suitable nesting habitat for this species; however, the site is within three miles of suitable cliffs. Falcons potentially nesting on these cliffs could feed at the Rio Blanco site.

The habitat at this site is suitable for the northern goshawk (*Accipiter gentilis*). They are known to breed in the juniper/pinion pine areas, which comprise at least 50 percent of the site. However, personal communication with BLM personnel (Holloway, 1993) confirmed IT's finding that there were no goshawks on site. The BLM has no records of the birds breeding in this area.

The habitat on this site is not suitable for bald eagles (*Haliaeetus leucocephalus*). While there is the potential for these birds to nest in the juniper/pinion pine areas, the bald eagle is a

fish-feeding bird. Fawn Creek, for reasons listed earlier, does not provide suitable feeding habitat for this species.

6.0 Conclusion

6.1 The Rulison Site

During the Level I field investigation conducted in June 1993 at the Rulison Gas Stimulation Test Site, a total of 1 amphibian, 1 reptile, 20 bird, and 9 mammal species was observed. Of the threatened and endangered species and species of special concern targeted in this survey, only the tiger salamander was observed; however, suitable breeding habitat exists for the boreal toad, and the site has suitable habitat (adequate food resources and sufficient cover) to serve as a migratory stop-over point for the black tern and white-faced ibis. Also possible is the use of the site by nesting northern goshawks and bald eagles. Peregrine falcons may use the area for hunting. The following recommendations should be followed to protect sensitive species during field activities at this site:

- The Field Supervisor should consult with the local BLM Resource Management Area biologist prior to the initiation of field activities to ensure that there have been no recent developments at the site with regard to sensitive species for which impact mitigation measures would need to be implemented.

- Activities that may result in adverse impacts to any wetland habitat on or downstream of the Rulison test site should be preceded by a Level II sensitive species survey conducted by an experienced biologist to ensure that sensitive species will not be impacted by the action.

- Field personnel should be instructed against handling or in any other way molesting or harming animals, including birds and/or their nests.

- Unusual sightings made during field activities, such as an active raptor nest; a suspected bald eagle, peregrine falcon, or northern goshawk hunting or roosting in the area; or an unusual number of deer or elk should be reported to the BLM at the earliest convenient time.

6.2 The Rio Blanco Site

During the Level I field investigation conducted in June 1993 at the Rio Blanco Gas Stimulation Test Site, a total of 1 reptile, 36 bird, and 11 mammal species was observed. No threatened and endangered species or species of special concern were observed on this site. The site does, however, contain habitat suitable to support the peregrine falcon (hunting) and northern goshawk (nesting and hunting).

The potential for adverse impacts to sensitive species at the Rio Blanco site resulting from RI/FS activities is low. Attention should be given to potential effects of disturbances to Fawn Creek on downstream waters with higher value to fish and wildlife. In addition, the following recommendations should be followed to protect sensitive species and other biological resources during field activities at this site:

- The Field Supervisor should consult with the local BLM Resource Management Area biologist prior to the initiation of field activities to ensure that there have been no recent developments at the site with regard to sensitive species for which impact mitigation measures would need to be implemented.

- Activities that may result in adverse impacts to any wetland habitat on or downstream of the Rio Blanco test site should be avoided.

- Field personnel should be instructed against handling or in any other way molesting or harming animals, including birds and/or their nests.

- Unusual sightings made during field activities, such as an active raptor nest, a suspected peregrine falcon or northern goshawk hunting or roosting in the area, or an unusual number of deer or elk should be reported to the BLM at the earliest convenient time.

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