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Colorado Governor's Energy Office

# Renewable Energy Development Infrastructure (REDI) Project

## ENVIRONMENTAL, SITING, AND LAND USE ISSUES

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## 1.0 ENERGY DEVELOPMENT / TRANSMISSION SITING ISSUES

This report addresses constraints to energy development, focusing on the Generation Development Areas (GDAs) that have been identified as most suitable for wind or solar energy development in Colorado. The focus in this section is on ecological features as well as on land jurisdictions that affect project permitting and project location. County permitting processes are complex and are discussed separately in Section 2.0.

### 1.1 Introduction

The siting of energy development and transmission lines is affected by the presence of ecologically sensitive areas, federal and state protected species and lands, land use compatibility, and various government regulatory and permitting requirements at the Federal level.

### 1.2 Overall Constraints

The analyses of siting constraints posed by ecologically sensitive lands and protected species were based on Ecoregional Assessment Reports on the Central Shortgrass Prairie (CSP) and Southern Rocky Mountains (SRM) coordinated by The Nature Conservancy (TNC). The analysis established conservation areas (CAs) in these ecoregions where native species, communities and ecosystems of the ecoregion are located. The CSP Ecoregional Assessment Report includes eastern Colorado, GDAs 1 – 7 and the South/Southeast Pueblo Solar GDA. The SRM Ecoregional Assessment Report includes the San Luis Valley Solar GDA and GDA 8.

The full results of the ecological constraints analyses for the SB 100 corridors and GDAs are presented in Section 1.3. The conservation areas vary in how well the natural systems are represented and have a range of conservation values (low to very high) that is based on:

- Contribution towards conservation goals for each target (identified features of biodiversity that warrant conservation attention, ranging from ecological systems to species),
- Irreplaceability or number of G1 and G2 (globally imperiled) species and communities and
- Existing protection, i.e., percent of area in stewardship status.

The low to very high conservation value ratings were used along with the locations of irreplaceable species to indicate the probability of encountering sensitive or rare species and communities and to develop a constraints map indicating high, moderate, and low avoidance criteria (Figures 1.1 and 1.2). Irreplaceable resources were designated as having a high probability of encountering threatened or endangered, and/or globally imperiled species and communities and given a high avoidance criterion.

Federal lands are present within GDAs 1, 2, 6 and 8, and in both solar GDAs (see Figure 1.1). The federal agencies that manage lands within these GDAs are summarized in Table 1.1. Each of these agencies must comply with the National Environmental Policy Act (NEPA) when siting transmission line corridors through their lands and have developed their own regulations to comply with NEPA, which are summarized in Table 1.2. These agencies also have right-of-way (ROW) processes to grant easements or permits to use their lands for transmission projects. A summary of ROW processes is also presented in Table 1.2.

Federal lands within Colorado were also considered in designating energy transport corridors under Section 368 of the Energy Policy Act of 2005, which directed the Secretaries of Agriculture, Commerce, Defense, Energy and Interior to designate these corridors in the 11 Western States, perform the required environmental reviews and incorporate the designated corridors into the relevant agency land use and resource management plans. The Final Programmatic Environmental Impact Statement (PEIS), Designation of Energy Corridors on Federal Land in the 11 Western State (DOE/EIS-0386), released in November 2008, did not include any portion of the GDAs, eastern Colorado or the San Luis Valley. Solar development on public lands in the southwestern states including Colorado is being evaluated by the BLM and DOE. The Draft Solar Energy Development PEIS was schedule for release in Spring 2009, however, its completion is being delayed so that the preliminary results of the Western Governor's Association's Western Renewable Energy Zone transmission study can be considered to more closely align the proposed alternatives in the Draft PEIS with the Secretary of the Interior's recently announced policies for renewable energy development on public lands. The new estimated release date for the Draft PEIS is the fall of 2009.

Non-land administering Federal agencies also influence the siting of transmission lines. The Western Areas Power Administration (WAPA) is part of the Department of Energy, so compliance with DOE's NEPA regulations for its projects is required. Tri-State Generation and Transmission Association obtains loans through the U.S. Department of Agriculture (USDA) Rural Utilities Services (RUS) for many of its projects and must comply with the RUS NEPA regulations in order to receive these loans.

Overhead utility clearances should be conducted for proposed transmission lines within a few miles of existing airports and heliports. The Federal Aviation Administration (FAA) will conduct aeronautical studies to determine if these proposed facilities pose a hazard to air traffic and safety. Eastern Colorado and the San Luis Valley are also used by the U.S. Military for Special Use Airspace (SUA) and Military Training Routes (MTRs). MTRs below 1,000 feet above ground level and SUAs in these areas are shown in Figure 1.2. All counties in the study area, except for Douglas County, have SUA or MTRs. All GDAs also include SUA and MTRs, except for GDAs 1 and 4.

The different requirements for federal and state lands can be confusing since each agency has their own specific permitting requirements. To aid in understanding how all these requirements could affect a transmission line project, a flow chart capturing relevant summary details for these agencies is shown in Figure 1.3. For example, if a transmission line was proposed for the western portion of Conejos County to connect a proposed solar field to existing transmission line running northward into Rio Grande and Alamosa Counties leading to Alamosa, the following agency lands may be traversed (see Figure 1.1):

- U.S. Forest Service (Rio Grande National Forest)
- Bureau of Land Management (La Jara Field Office)
- U.S. Fish and Wildlife Service (Alamosa National Wildlife Refuge)

These agencies would determine who would be the lead agency for the NEPA process, if the transmission line was not a WAPA or Tri-State project. If either of these utilities was proposing the project, then the Department of Energy or Department of Agriculture, Rural Utilities Service would be the lead agencies if WAPA or Tri-State, respectively was proposing to build this transmission line (see boxes 1-3 in Figure 1.3).

Interagency coordination would occur so that it is likely a single NEPA document would be prepared to fulfill each agency's NEPA requirements. Each agency, however, would conduct their own decision-making to determine whether or not to grant right-of-way (ROW) approvals

for the portion of the proposed project crossing lands under their jurisdiction (see Table 1.2). FAA coordination would not be required, since there are no airports in Conejos County, unless the project was proposed along the southern edge of the county near an MTR (see Figure 1.2). Utilities and energy developers can reduce the time needed to obtain Federal approvals, if concurrent ROW applications are submitted.

The time needed to obtain permits and other approvals for upgrading of existing transmission lines would be expected to be shorter than the time needed to acquire approvals for a transmission line within a new corridor. The need for additional ROW would be reduced or eliminated. If the increased electrical capacity of new lines requires a wider ROW, most of the additional land needed to accommodate the larger corridor would be expected to be on parcels with existing utility easements. The need for natural and cultural resource surveys, and FAA coordination would likely be reduced or even possibly eliminated due to the existing corridor location within a previously disturbed area where resource surveys have previously been conducted. Less lead time would be needed to prepare federal, state and local permit applications for upgrading transmission lines within existing corridors compared to the time needed to apply for approvals within new power corridors.

The key factor in determining whether transmission line projects will require an Environmental Assessment (EA) or EIS is whether or not significant environmental effects could or will occur. If the environmental analyses show that no significant effects are anticipated, an EA would be a sufficient level of documentation. EAs can generally be completed in as little as 6 months or require up to one year in the worst cases. If significant effects are anticipated, an EIS would be required. Non-controversial EISs can be completed in a minimum of 18 months. Large, complex projects can require up to 3 years to complete an EIS. Where new project corridors are planned, the NEPA process can require a longer period than these timeframes if natural and cultural resource surveys are not accomplished in a timely manner.

Federal agencies generally prepare land use management plans for each land unit within their jurisdiction. Existing land management plans for all Federal lands within the GDAs were examined to determine the compatibility of utility corridor development with agency land use policies and designated uses for these areas (see Table 4.4.2-2). Utility corridor land uses within the following federal lands would be incompatible with current uses or be very restricted:

- Great Sand Dunes National Park & Preserve (San Luis Valley Solar GDA)
- Alamosa, Monte Vista and Baca National Wildlife Refuges (likely very restricted although there is some oil and gas development at Baca)(San Luis Valley Solar GDA)
- Bureau of Land Management designated Areas of Critical Environmental Concern within the San Luis Valley (6 units) (San Luis Valley Solar GDA)
- Campo Research Natural Area and OU Creek areas at the Comanche National Grasslands (GDA 6 and South/Southeast Pueblo Solar GDA)
- San Isabel National Forest Spanish Peaks Wilderness Area (GDA 8 and South/Southeast Pueblo Solar GDA)
- Rio Grande National Forest (limited to the existing utility corridor along Pinos Creek Road to Del Norte)(San Luis Valley Solar GDA)

The Colorado State Land Board can grant right-of-ways (ROWs), easements and road access permits under their policies for transmission line development across their lands. The Colorado Division of Wildlife (CDOW) may grant leasing rights for energy-related purposes in instances where they have sole ownership of surface and subsurface mineral rights per the Wildlife Commission Energy Development Policy. A detailed summary of these state requirements are included Table 1.2.

## 1.3 Ecological (Wildlife) Constraints Analysis

### 1.3.1 Background

The primary objective of the ecological constraints analysis is to identify sensitive biological resources that should be factored into the siting process for either renewable energy generation or transmission. Thus, the analysis identified areas of sensitive species and habitats of eastern Colorado as well as the San Luis Valley, and more specifically within or in close proximity to the Generation Development Areas (GDAs) that have been identified as having the best wind and solar resources for energy development in the SB 91 report.

### 1.3.2 Methods

Data files were researched of the following organizations:

- Colorado Division of Wildlife,
- Colorado Natural Heritage Program,
- Audubon Society
- U.S. Fish and Wildlife Service, county listings of Threatened and Endangered species

However, the Central Shortgrass Prairie (CSGP) Ecoregional Assessment and Partnership Initiative (Neely *et al*. 2006) provides a compilation of information from these agencies, as well as other sources, for the eastern plains of Colorado, which includes GDAs 1 – 7 and the eastern portion of the solar South/southeast Pueblo GDA. Similarly, the Southern Rocky Mountains (SRM): An Ecoregional Assessment and Conservation Blueprint (Neely *et al*. 2001) developed an assessment of south-central Colorado and provides information on important or sensitive species and natural systems of the San Luis Valley and the solar GDA of this area, as well as for the western portion of the South/southeast Pueblo solar GDA and GDA 8, which is designated for wind (Figure 1.4). These compilations include information from a variety of sources on Threatened and Endangered species, species designated as globally imperiled, and on rare communities.

The conservation areas identified for the CSGP (Neely *et al*. 2006) and SRM (Neely *et al.* 2001) provide a framework of land units containing species, communities, and ecosystems that best reflect the remaining natural biotic systems of these areas. Each of the conservation areas that were established contain ecological integrity, which is a measure of the capacity to support and maintain a functional ecological system and provide landscape integrity; that is, support a suite of targeted species and communities that mirror some aspects of the natural communities of the area.

The conservation areas vary in how well the natural systems are represented and were assigned a range of conservation values (low to high [SRM] or very high [CSGP]) that are based on:

- Contribution towards conservation goals for each target (identified features of biodiversity that warrant conservation attention, ranging from ecological systems to species),
- Irreplaceability or number of G1-G2 (globally imperiled) species and communities, and
- Existing protection, i.e., percent of area in stewardship status (Neely *et al.* 2001 and 2006).

The low to very high conservation value ratings were used along with the locations of irreplaceable species to indicate the probability of encountering sensitive or rare species and communities and to develop a constraints map indicating high, moderate, and low constraints for siting generation and transmission facilities. Vulnerability to development was also part of the rating, depending on whether there is existing protection for the CA (Neely *et al.* 2006) or the degree the CA has retained the original landscape integrity (Neely *et al.* 2001). Irreplaceable resources were identified as locations having a high probability of encountering threatened or endangered, and globally imperiled species, as well as communities and a high avoidance designation (Pague 2009).

### 1.3.3 Results

#### 1.3.3.1 Conservation Areas

A portion of all the GDAs contain at least one conservation area (Figure 1.4). Nearly all of GDA 1 and the South/southeast Pueblo Solar GDA are covered by at least one conservation area. Much of GDA 1 includes the Mountain to Plains and Greater Pawnee Conservation Areas. Most of GDA 6 is covered by the Lower Purgatoire Conservation Area. Much of the South/southeast Pueblo Solar GDA is covered by the Huerfano Uplands, Lower Purgatoire, and Mesa de Mayo Conservation Areas. Conversely, in many other instances, only a small part of a GDA contains a conservation area (e.g., GDA 3, 4, 5, 7, and 8). The solar GDA in the San Luis Valley intersects with 13 conservation areas, but these occur primarily at the periphery of the GDA mostly on BLM or National Forest land (Figure 1.4).

Ten CSGP conservation areas occur within GDAs, whereas 15 conservation areas of the SRM occur within the GDAs (Table 1.3). All of the CSGP conservation areas within the GDAs were rated as high to very high in containing sensitive resources or conservation value. The highest conservation values within the SRM GDAs in the San Luis Valley and western portion of the South/southeast Pueblo Solar GDA were moderate-high. None of these conservation areas were rated as high (Table 1.3).

#### 1.3.3.2 Central Shortgrass Prairie Ecoregion Conservation Areas

**Mountain to Plains (Conservation Area 4)**
This conservation area was designated for a section of upper prairie near the Front Range north of Fort Collins to the Wyoming border in northeast Larimer County, and from there extending slightly into northwest Weld County. Seven species were indicated as conservation targets, including six bird species and one insect (Colorado blue) (see Table 1.4 for target species lists for the conservation areas). The conservation value (how well it represents the shortgrass prairie system) was rated as very high and the vulnerability (to development or trends away from the natural system) as medium.

**Greater Pawnee (Conservation Area 9)**
This conservation area occurs along the Colorado-Wyoming boundary in northern Weld County, from approximately I-25 on the west to near Peetz in Logan County on the east, with a narrow band extending south toward Fort Morgan in Morgan County (Figure 1.4). Ten species were designated as conservation targets, including mountain plover, a globally imperiled species and meadow jumping mouse (Preble's subspecies is federally listed as threatened) (Table 1.4). The conservation value was rated as high and the vulnerability as medium (Neely *et al*. 2006).

**South Platte Sandhills (Conservation Area 11)**
The South Platte Sandhills Conservation Area extends along the South Platte drainage, mostly to the south of the river valley from approximately Keenesburg in Weld County through Morgan, Logan, and Sedgwick Counties to Julesburg (Figure 1.4). Seven species were designated as conservation targets (Table 1.4), as well as the Cottonwood – Peachleaf Willow Floodplain plant community. The conservation value was rated as high, as was the vulnerability (Neely *et al*. 2006).

**Big Sandy (Conservation Area 16)**
The Big Sandy conservation area occurs in a northwest-southeast orientation between Deer Trail and Kiowa in Elbert County on the west to the center of Lincoln County south of Hugo and into western Kit Carson County and northern Cheyenne County (Figure 1.4). Ten species were designated as conservation targets, including mountain plover, and lesser prairie-chicken, as well as the sandhill goosefoot, a plant species considered globally imperiled or rare throughout its range (Table 1.4) (Neely *et al*. 2006). The conservation value of this area was rated as high and the vulnerability as low.

**Republican River Sand Hills (Conservation Area 18)**
This conservation area occurs south of Otis, Yuma, and Wray in Washington and Yuma Counties, as well as encompassing the Republican River where it intersects with GDA 4 near the Kansas state line. Eight species were designated as conservation targets, including two amphibians, five birds, and one insect (dusted skipper) (Table 1.4). The conservation value was rated as very high and the vulnerability as low (Neely *et al*. 2006).

**Indian Lakes (Conservation Area 27)**
The Indian Lakes Conservation Area occurs north of Las Animas and Lamar and angles north and slightly northeast towards Cheyenne Wells in Cheyenne County where it intersects with GDA 5 (Figure 1.4). Nine species, eight of which are birds (Cassin's sparrow, ferruginous hawk, McCown's longspur, mountain plover, long-billed curlew, western snowy plover (state species of concern), and piping plover (state threatened) were designated as target conservation species (Table 1.4). The conservation value and vulnerability were both rated as medium (Neely *et al*. 2006).

**Huerfano Uplands (Conservation Area 28)**
A large area east of I-25 and south of Pueblo, extending south of Walsenburg in Pueblo, Huerfano, and east to near Rocky Ford in Las Animas Counties, and a small area in Otero County was identified as Huerfano Uplands Conservation Area. This conservation area intersects with a small part of GDA 6, as well as with the solar GDA South and Southeast of Pueblo (Figure 1.4). Nine species were designated as conservation targets (Table 1.4). Of these, mountain plover is a key element with 223 mapped locations. The conservation value was rated as very high and the vulnerability as low (Neely *et al.* 2006).

**Lower Purgatoire (Conservation Area 29)**
This conservation area occurs south and east of the Huerfano Uplands, extending east from I-25 near Trinidad, north to Rocky Ford and across Las Animas, Baca, Bent, and Prowers Counties to near the Colorado – Kansas state line. Nine species have been designated as conservation targets, including four amphibians, as well as mountain plover (Table 1.4). This latter species was mapped at 856 locations within the conservation area. The conservation value is rated as very high and the vulnerability as low (Neely *et al*. 2006).

**Mesa de Mayo (Conservation Area 30)**
Mesa de Mayo is located in the southeastern part of the state in Las Animas and Baca Counties where it intersects with GDA 6. Nine species were designated as conservation targets, including Great Plains narrowmouth toad, which was not designated in the other conservation areas within the GDAs (Table 1.4). The conservation value was rated as very high and the vulnerability as low (Neely *et al*. 2006).

**Upper Cimarron (Conservation Area 31)**
The Upper Cimarron Conservation Area extends into the southeastern corner of Colorado in Baca County where it intersects with GDA 6. Nine species have been designated as conservation targets, of which the lesser prairie chicken, a state threatened species, is the conservation value was rated as high and the vulnerability as low (Neely *et al*. 2006).

#### 1.3.3.3 Southern Rocky Mountains Ecoregion Conservation Areas

The San Luis Valley Solar GDA encompasses numerous conservation areas that were established through the SRM Ecoregional Assessment (Neely *et al*. 2001). The reason for the large number is that the GDA covers a wide range of elevations and a wide array of ecosytems, stemming from sand dunes and greasewood communities of the valley floor to mountains and subalpine forests. Thus, a large number of target conservation species also occur within this GDA area (Table 1.5).

**Carnero Creek (Conservation Area 19)**
This conservation area is located in southern Saguache County, mostly in federal land. A total of 32 communities and species were designated as targets for conservation (Table 1.5) including Rio Grande sucker (state endangered) and Rio Grande chub and peregrine falcon (state special concern). The CA value was rated as moderate with a medium vulnerability (Neely *et al*. 2001).

**Conejos River (Conservation Area 26)**
The Conejos River Conservation Area occurs in southern Conejos County and extends into New Mexico. A total of 15 species and communities were designated as key elements and included bald eagle (state threatened) and peregrine falcon (state special concern) and Parry oatgrass and Arizona willow, which are globally imperiled (Table 1.5). The conservation value was rated as moderately low with a medium high vulnerability (Neely *et al*. 2001).

**Culebra Range (Conservation Area 36)**
This conservation area is located in western Las Animas County and in the southwestern portion of the South/SE Pueblo solar GDA (Figure 1.4). A large number (42) target species and communities were designated for the area, including the greenback cutthroat trout (federally and state-listed as threatened) and the Rio Grande sucker (state endangered). The conservation value was rated as moderately high and the vulnerability as medium (Neely *et al*. 2001).

**Great San Dunes/San Luis Lakes (Conservation Area 64)**
This conservation area is located in northeastern Alamosa County adjacent to the Great Sand Dunes National Park and extends north into Saguache County. This area is also relatively diverse ecologically and 39 species and communities were designated as conservation targets, including state endangered species such as the Rio Grande sucker and boreal toad, as well as the greater sandhill crane and Botta's pocket gopher, both state special concern species, and the Great Sand Dunes anthicid beetle and Great Sand Dunes tiger beetle, both critically

imperiled globally (Table 1.5). The value of this area was rated as moderately high and the vulnerability as medium.

**Greenie Mountain (Conservation Area 67)**
Greenie Mountain Conservation Area occurs in eastern Rio Grand County, western Alamosa County and extends south into northeastern Conejos County (Figure 1.4). Species designated as conservation targets include greater sandhill crane, a state special concern species and bald eagle, a state threatened species. Another six species of the area are considered to have global rankings (Table 1.5). The value of this area was rated as low and the vulnerability medium high (Neely *et al*. 2001).

**Huerfano Grasslands (Conservation Area 77)**
This conservation area occurs in a narrow band west of I-25 in Huerfano and Las Animas Counties in the South/SE Pueblo solar GDA (Figure 1.4).Only one target conservation species, greenback cutthroat trout, a Federally and state-listed Threatened species, was identified for the area (Table1.5), along with three mountain aquatic systems. The value of this CA was rated as moderate and the vulnerability as medium (Neely *et al*. 2001).

**LaVeta Pass Link (Conservation Area 86)**
The La Veta Pass Link Conservation Area only occurs in a small portion of GDA 8 (wind). Seven communities and two species were indicated as conservation targets, and include Rio Grande cutthroat trout (state species of concern) and pine marten with global rankings (Table 1.5). The value of this area was rated as moderately low and the vulnerability as medium.

**Punche Valley (Conservation Area 132)**
This conservation area occurs primarily in southeastern Costilla County. Numerous species and communities (30) were designated as conservation targets, including Rio Grande sucker, a state endangered species, and Rio Grande chub, ferruginous hawk, mountain plover, and Botta's pocket gopher, all state special concern species (Table 1.5). The value of this CA was rated as moderately low, and the vulnerability as medium high (Neely *et al*. 2001).

**Rajadero Canyon (Conservation Area 134)**
This conservation area extends across the middle of Conejos County and into southern Rio Grande County. A total of 21 species and communities were designated as conservation targets, including the Rio Grande sucker, state-listed as endangered, and Rio Grande chub and Botta's pocket gopher, both state special concern species (Table 1.5). The value for this area was rated as moderate, and the vulnerability as medium (Neely *et al*. 2001).

**Rio Grande (Conservation Area 140)**
The Rio Grande Conservation Area is relatively small (Figure 1.4), straddling the Costilla and Alamosa County line. Species designated as conservation targets include greater sandhill crane, a state special concern species, and bald eagle, a state threatened species. The value of this area was rated as moderate, and the vulnerability as medium low (Neely *et al*. 2001).

**Sangre de Cristo Mountains (Conservation Area 154)**
This conservation area occurs in eastern Saguache County near the northeastern perimeter of the San Luis Solar GDA and GDA 8 for wind (Figure 1.4). Because of the diverse ecosystems, the conservation area contains a large number (52) of target species, including the greenback cutthroat trout (federally listed as threatened) and the Rio Grande sucker (state endangered), and Rio Grande cutthroat trout (state special concern species), as well as a host of bird, invertebrate, and plant species that are globally imperiled (Tables 1.4 and 1.5). This area was rated as moderately high in value and, vulnerability as medium (Neely *et al*. 2001).

**South San Juan (Conservation Area 166)**
The South San Juan Conservation Area occurs in southwestern Conejos County near the southwestern periphery of the San Luis Solar GDA (Figure 1.5). Key target species include the Colorado River cutthroat trout and peregrine falcon, both state special concern species (Table 1.5). This area was also rated as relatively valuable with a moderately high rating, and vulnerability at medium (Neely *et al*. 2001).

**St. Charles River (Conservation Area 170)**
This small conservation area is located in western Pueblo County and is touched by the western periphery of the South/SE Pueblo Solar GDA. The area is mountainous and contains only one target species, the Mexican spotted owl, which is federally listed as threatened (Table 1.5). The value of this CA was rated as moderate, and the vulnerability as high (Neely *et al*. 2001).

**Upper San Juan Valley (Conservation Area 180)**
The Upper San Juan Valley Conservation Area occurs in the upper, higher elevation portions of the San Luis Valley in northeastern Saguache County and overlaps with the northern and northeastern portion of the San Luis Valley Solar GDA (Figure 1.4). Target species of note include Rio Grande chub, and Gunnison sage-grouse, both state special concern species (Table 1.5). The value of this area was rated as moderately low, and the vulnerability as medium (Neely *et al*. 2001).

**Vermejo Park/Lower Purgatoire (Conservation Area 182)**
This conservation area occurs in southwestern Las Animas County and in the southwestern portion of the South/SE Pueblo Solar GDA (Figure 1.4). Target species of note include the Rio Grande cutthroat trout and Botta's pocket gopher, both state special concern species, and northwestern fritillary, a butterfly considered to be critically imperiled globally (Table 1.5). The value of this area was rated as moderate, and the vulnerability as medium high (Neely *et al*. 2001).

### 1.3.3.4 Irreplaceable Species/Communities

Irreplaceable species include those listed federally as threatened (FT) or endangered (FE), or are candidates for such listing, state-listed threatened and endangered species (ST, SE), and species that are globally imperiled (G1-G5) due to population declines. All of the species listed are susceptible to extinction or extirpation, including those with declining populations, i.e. are susceptible to development and habitat modification (Pague 2009). In addition to species, irreplaceable resources include rare communities that have been declining in abundance (distribution) and/or species diversity) (see Tables 1.4 and 1.5). The areas of irreplaceable species and communities are shown on Figure 1.5, and those within or adjacent to GDAs are indicated as follows:

- GDA 1 - Preble's meadow jumping mouse – FT
  Ute ladies tresses orchid – FT
  Colorado butterfly plant – FT
  Plains sharp-tailed grouse - SE
- GDA 2 - Plains sharp-tailed grouse - SE
- GDA 3 - Cottonwood – peachleaf willow community – G3
  Greater prairie-chicken - ST
- GDA 4 – Greater prairie-chicken – ST
  Riparian communities

- GDA 5 - Lesser prairie-chicken southwest of GDA (see Figure 4.4.2.1-2)
- GDA 6 - Lesser prairie-chicken – ST
- GDA 7 - Lesser prairie-chicken southwest of GDA
- GDA 8 - Greenback cutthroat trout – FT
  Pine marten – G5 (global ranking)
  Small alpine and montane stream systems
- South/SE Pueblo Solar GDA – Greater sage grouse – SC
  Lesser prairie-chicken – ST
  Rayless goldenweed – G2
  Pueblo goldenweed – G1G2
- San Luis Valley Solar GDA – Lynx habitat – FT
  Pine marten - G5

Siting of facilities must be done carefully in areas where irreplaceable species/communities occur. The sensitivity of the species to disturbance must be understood and factored into the siting decision. Biological Assessments are required under the Endangered Species Act if federally listed species or their critical habitat have potential to be affected and the project has a federal nexus (oversight by a federal agency and/or federal funding). Specifics concerning the irreplaceable species or communities/systems are discussed in the following text.

### 1.3.3.5 Plant Species/Communities

Ute ladies tresses orchid and Colorado butterfly plant are restricted to riparian and alluvial systems of the upper plains of Colorado and areas along the Front Range. Distributions of these species are small-scale issues and known populations should be avoided. Cottonwood – Peachleaf willow floodplain communities (*Populus deltoides – Salix amygdaloides / S. exigua*) represent a mature community along the South Platte River (Figure 1.5) that provides habitat for numerous wildlife species and also provides surface stability to the floodplain (Morgan, Logan, and Sedgwick Counties). Disturbance (construction work) in these communities should be avoided or at least minimized. Rayless goldenweed (*Oonopsis foliosa* var. *monocephala*) of south central Las Animas County and Pueblo goldenweed (*Oonopsis pueblonsis*) of west-central Pueblo County (both rare and imperiled in Colorado) are relatively widespread (Spakman *et al*. 1997), but avoidance of known populations should be feasible during project siting (Pague 2009). In cases where the species is relatively widespread and cannot be avoided, other mitigation measures may be required, and will vary depending on the species (e.g., habitat enhancement, land stewardship-conservation, germination and transplant studies).

### 1.3.3.6 Animal Species

The lesser prairie-chicken is an umbrella species (indicator of ecosystem health) for short- and mixed-grass prairie ecosystems, and as this habitat has disappeared and become fragmented, so has this species, with large population declines. It is estimated that this species has declined 92% of it original population from habitat conversion and development, although populations in portions of its range (e.g., Comanche National Grassland) have been stable over the last 10 years (U.S. Forest Service 2005). This species is prominent in the southern portion of GDA 6 and the southern portion of South/SE Pueblo Solar GDA (irreplaceable polygons on Figure 1.5). Lesser prairie-chicken is sensitive to development, specifically to larger structures, including transmission towers and lines and buildings (Pruett *et al*. 2009). Such sensitivity translates as well to wind generation towers. Greater prairie chicken and greater sage-grouse also appear to

eschew such structures, and it is hypothesized that in some cases, avoidance of transmission towers may be a result of increased predation from raptors (Pruett *et al*. 2009). These upland bird species occur in the South/Southeast Pueblo GDA and western GDA 6.

Plains sharp-tailed grouse is considered the umbrella species in the northern part of the state, occurring in GDA 1 and 2. When siting generation facilities or transmission lines, the leks of these species should be avoided and impacts to other primary habitat should be minimized.

Preble's meadow jumping mouse is federally listed as threatened and occurs along the Front Range of northern Colorado, extending south into El Paso County, and in GDA 1. Key irreplaceable species of the San Luis Valley Solar GDA and GDA 8 include lynx (federally listed as Threatened) and pine marten (globally imperiled and considered to be rare), although both of these species occur primarily at the periphery of the San Luis Valley GDA in higher elevation forested habitats.

A number of other animal species considered to be irreplaceable resources occur in Colorado, and would need to be considered when siting energy generation or transmission. Most of these species occur on a small-scale basis and can generally be avoided. Species with a relatively wide distribution within portions of the GDAs include mountain plover, which though not considered particularly sensitive to development, can be avoided by avoiding the larger prairie dog towns (Pague 2009).

An important aspect of irreplaceable species is that they have a common link of being susceptible to extinction or extirpation (Pague 2009). Occurrences of these species within the GDAs should be avoided, especially those known to be highly sensitive to development.

#### 1.3.3.7 Playas and River Systems

Playas have been designated as important areas from the standpoint of providing essential habitat for numerous shorebird species. Most of the original areas of playas have been cultivated, whereby only a small proportion is located in conservation areas (Figure 1.6). One of these playas overlaps GDA 5 . However, the presence of playas should be considered when transmission projects are sited, especially those that occur in conservation areas, where they provide important habitat for shorebirds, and in wet years waterfowl. These areas also may be problematic to transmission construction and to tower bases during wet years when intermittent lakes and ponds are formed.

Similarly, drainages provide essential habitat for numerous species and are essential for waterfowl and shorebirds during migration as stopover and rest areas. All waterfowl and shorebird species are protected under the Migratory Bird Treaty Act. Drainage systems, and especially the major drainages, should be crossed as expeditiously as possible (i.e., at right angles) by transmission lines in order to present the least intersection potential as possible to incoming and outgoing waterfowl that use the rivers for nocturnal refuge (Burnidge and Pague 2009).

### 1.3.4 Summary

The constraints mapping was based on the conservation area values and irreplaceable resources, which were used to develop constraint ratings of very high, high, moderate, and low (Table 1.6). The irreplaceable resources, which represent threatened and endangered, or rare

species and communities are considered to be avoidance criteria, although in many instances facilities have been permitted in these areas. However, avoiding such species and their habitats is the recommended strategy to avoid impacts and permitting requirements.

The constraints analysis provides a guide for areas where sensitive biological resources occur and this should be taken into account when siting facilities. The higher the rating of the constraint the more likely that impacts could occur to these resources. This information should be used as an initial guide in planning, but site specific surveys are required to understand whether or not a facility is likely to affect such resources and to develop measures to avoid or minimize such effects. The conservation values and the corresponding constraints ratings used in the GIS mapping are cross-referenced in Table 1.6 as follows.

**Table 1.7 Conservation Value and Constraints Ratings**

| **Conservation/Sensitivity Values** | **Constraints Rating (**map color) |
|---|---|
| Irreplaceable Resources, | Very High (red) |
| High to Very High | High (orange) |
| Moderate to Moderately High | Moderate (yellow) |
| Low to Moderately Low | Low (tan) |

## 2.0 COUNTY PERMITTING RESEARCH

The objectives for the county research were to identify and summarize the regulatory, policy, and permitting framework for counties within the study area (Figure 4.6.2-1) as they apply to electrical power plant, electrical transmission line, and electrical substation development for renewable and non-renewable energy projects.

### 2.1 Study Area

The study area is comprised of counties that are located within SB-91 General Development Areas (GDAs), and counties that are crossed by proposed SB 100 transmission lines and are outside of the GDAs. In addition, El Paso County was included. In total, 31 counties are located within the study area. Of those counties, there are 24 located within GDAs and seven located outside of GDAs. Table 2.1 lists the counties that are included in the study area.

#### 2.1.1 Counties with Known Renewable Energy Development

Table 2.2 summarizes the renewable energy projects in the study area and Figure 2.1 presents the counties with renewable energy developments.

Within the study area, wind energy developments and associated transmission lines have been constructed in Baca, Bent, and Powers Counties in southeast Colorado, and in Logan, Morgan and Weld Counties in northeast Colorado. These windfarms range in size from 7.5 to 400 MW for which more than 150 miles of overhead transmission lines have been constructed (Figure See Nat).

Phase II of the Peetz Table Windfarm (the largest wind farm in the state) and an additional windfarm in Logan County have completed the county permitting process. Additional windfarms

in Lincoln, Elbert and Arapahoe have received county permits, but have not yet begun the construction phase. Additional windfarms have been proposed for Huerfano, Pueblo, El Paso, and Yuma Counties. Pioneer Solar LLC has also proposed a solar facility in Sagauche County.

### 2.1.2 Counties with No Known Renewable Energy Development

There are 17 Counties in the study area with no known renewable energy development of significance. These counties include Adams, Alamosa, Cheyenne, Conejos, Costilla, Crowley, Denver, Douglas, Kiowa, Kit Carson, Larimer, Las Animas, Phillips, Otero, Rio Grande, Sedgwick, and Washington. However, among these counties Sedgwick, Kiowa, Cheyenne, Washington, Costilla, Las Animas, Conejos, and Philips have proposed, permitted or constructed meteorological monitoring stations for wind energy development, but these developments have not been proposed or permitted at a county level. In addition, land has been reportedly leased in Washington, Sedgwick, and Phillips counties for wind farm development. The status of these potential developments is unknown.

## 2.2 Methods

Research methods included review of readily available public documents found from internet searches (county websites and other applicable websites), information communicated through phone interviews for selected counties and developers, and information provided from the interviewees following communication.

## 2.3 Permitting Analysis

The following is a discussion of the findings of the county permitting analysis. Table 2-3 summarizes the applicable county permits for power plant (renewable and non-renewable), transmission line, and substations development for the counties within the study area.

### 2.3.1 Counties with 1041 Permit Requirements

The following is a discussion of those counties in the study area with applicable 1041 permit requirements. Arapahoe, Elbert and Prowers Counties have 1041 and Special Use requirements, which are discussed in Section 2.2.3. Adams and Saguache Counties have 1041 and Condition Use permit review requirements which are discussed in Section 2.3.5.
1041 permits are generally required for the site selection and construction of transmission lines, power plants (renewable and non-renewable), and substations with capacities that exceed a specified threshold. The process generally includes a pre-application meeting/conference, public notice, submittal of the permit application, public hearing, approval of the permit, and post-approval requirements, if applicable. Permit applications are approved by the Board of County Commissioners. The environmental impact assessments (EIA) can be a major component of the 1041 permit application and are required by some counties and are encouraged in others (counties are not federal agencies so references to EIA in this section do not refer to federal actions subject to National Environmental Policy Act requirements, but to non-federal environmental requirements). At a minimum, the Colorado Division of Wildlife (CDOW) will require avian and bat studies as part of the EIA for wind farm developments.

**Weld County**
Weld County Code, Chapter 21 - Areas and Activities of State Interest (1041 Regulations), Article III addresses the site selection and construction of major facilities of a public utility. Major facilities of a public utility include any transmission lines (115 kV or greater), power plants (50 MW or greater), and substations of electrical utilities (115 kV or greater) that are located wholly or partially within the unincorporated territory of the County. The siting and construction of a major facility of a public utility requires a 1041 permit that is submitted to the Board of County Commissioners. The application includes 17 mandatory submittal requirements and five specific submittal requirements that are at the discretion of the County Planning Department. The specific submittal requirements may include an environmental impact analysis. According to personal communication with Chris Gathman (2009) of Weld County, 1041 applications take approximately 4 months to reach public hearing. The cost for the 1041 Permit application is approximately $10,000.

*Weld County Code, Chapter 22 – Weld County Comprehensive Plan, Article IV, Section 22-4-40, AIR.Policy 1.4* states "the County encourages innovative and creative approaches to alternative energy sources."

The Ponnequin (31.5 MW) and Cedar Creek (300 MW) wind farms were constructed in 1999 and 2007, respectively (Table 4.6.2-2). The Cedar Creek development included a 75 mile transmission line. According to personal communication with Chris Gathman (2009) of Weld County, separate 1041 Permits were used to permit the wind farm and the transmission line for the Cedar Creek facility. The 1041 applications were processed simultaneously and took approximately 4 months to reach public hearing. The cost for the 1041 permit application was approximately $10,000. Following a public hearing, the permits were conditionally approved, but were not formally approved until oil and gas rights agreements were reached with the land owners, which took approximately one year. The EIA was a major component of the permitting process, which took approximately 12 months. Building permits were required for the construction of the Cedar Creek facility and the fees were based on mega watt hours. The total Building permit fee was $830,520. The Ponnequin wind farm was constructed prior to 1041 regulations and the County was unable to comment on the permitting process. The County does not have a separate permitting process for renewable energy development and they do not have any plans to develop a separate permitting process.

**Morgan County**
According to personal communication with Kevin Guilday (2009) of NextEra, a portion of the 82-mile long transmission line for the Peetz Table wind farm crosses Morgan County (Table 2.2). According to personal communication with Barbra Gorrell (2009) of Morgan County, a 1041 permit is required for a major facility of a public utility (transmission lines, substations, and electrical generating facilities); however, she was unable to answer any questions regarding the Peetz Table transmission line. The permit application requires a minor EIA which is reviewed by the CDOW. The 1041 permit fee is $800 and takes approximately 90 days to process. The County is currently considering developing a separate permitting process for wind farm development.

**Pueblo County**
*Title 17- Land Use, Division II – Areas and Activities of State and Local Interest (1041 Regulations)* of *Pueblo County Code*, addresses the permit program for site selection and construction of a major facility of a public utility. Major facilities of a public utility include any transmission lines (greater than 115 kV), power plants (greater than 100 MW) and substations

(greater than 115 kV) of electrical utilities that are located wholly or partially within the unincorporated territory of the County. The siting and construction of a major facility of a public utility requires a 1041 permit that is submitted to the Board of County Commissioners.

According to Babcock & Brown (2009), the Pole Canyon Wind Farm and Pole Canyon transmission line developments are currently going through the permitting process with Huerfano and Pueblo Counties. The proposed project includes a 300 MW wind farm in Huerfano County and a 40-mile long 345 kV transmission line in Huerfano and Pueblo Counties that will interconnect with the Comanche Substation in Pueblo County. The project was permitted in Pueblo County with a 1041 permit. Most of the environmental studies/surveys have been completed and the Pueblo County 1041 permit is secured for the transmission lines. All of the environmental studies, cultural surveys and related permit work will be completed by the end of the third quarter of 2009. More than 80% of the right-of-way has been secured for the transmission line corridor with the goal of securing 100% of the right-of-way by the end of the second quarter of 2009. The transmission line route is identical to planned Xcel/Tri-State Calumet to Comanche 345 kV transmission line upgrade plans and the upgrade has been assigned the highest priority by Xcel/Tri-State for connecting new solar, wind and other new generation in the San Luis Valley and Southern Colorado area.

**Larimer County**

According to *Larimer County Land Use Code, Part II, Section 14 – Areas and Activities of State Interest*, a 1041 permit is required for the following activities:

- Siting and development of any electrical power plant with a generating capacity of 50 MW or more or any addition to an existing power plant which increases the existing generating capacity to 50 MW or more.
- Conversion of an existing electrical power plant to a new type of fuel or energy, but not including a change from coal to natural gas, and also not including a change in start-up fuel.
- Siting and development of a nuclear power plant of any size or addition thereto.
- Siting and development of a wind power plant in which there are more than three wind towers or where any wind generator tower exceeds a hub height of 80 feet or any addition increasing the design capacity or area of the facility by ten percent or more.
- Siting of above ground and below ground electrical transmission lines and appurtenant facilities that are designed to transmit electrical voltages of 69,000 volts or greater.
- Any existing transmission line upgrade that involves expanding an easement or right-of-way or increases the height of transmission structures by more than ten feet.
- Siting of an electrical substation or transmission site designed to provide switching, voltage transformation or voltage control required for the transmission of electricity at 69,000 volts or greater.

There are 12 general requirements for approval of the permit application and there are three additional specific review and criteria standards for proposed transmission facilities and wind power plants. Wind power plants must meet specified standards.
Small-scale wind energy facilities with three or less towers and hub heights of less than 80 feet do not require a 1041 permit; however, they require a minor special review application. Utility substations also require a minor special review application.
A Right-of-Way Permit is required for construction in public rights-of-way in unincorporated Larimer County.

**Otero County**

According to *Guidelines and Regulations for Areas and Activities of State Interest, County of Otero, State of Colorado,* a 1041 permit is required for a major facility of a public utility which

includes power plants, transmission lines, and substations. The 1041 permit fee is assessed based on the time required for County staff to review the application. The fee is based on a rate of $40 per hour. The permit takes approximately 4 to 6 months to process and it includes an EIA.

**Las Animas County**
According to *1041 Regulations for Site Selection and Construction of Major Facilities of a Public Utility*, a 1041 permit is required for transmission lines, power plants and substations of electrical utilities. This permit does require an EIA. According to personal communication with Robert Valdez (2009) with Las Animas County, there are currently no renewable energy developments in the county; however, they have granted 10 to 12 Conditional Use permits for meteorological towers.

### 2.3.2 Counties with Use by Special Review Permit Requirements

The following is a discussion of those counties in the study area with applicable Use by Special Review permit requirements.

Use by Special Review or Special Use permits are generally required for the site selection and construction of major facilities of a public utility which includes transmission lines, power plants (renewable and non-renewable), and substations with capacities that exceed a specified threshold. The process generally includes a pre-application meeting/conference, public notice, submittal of the permit application, public hearing, approval of the permit, and post-approval requirements, if applicable. Permit applications are approved by the Board of County Commissioners. EIAs can be a major component of the Use by Special Review permit application and are required by some counties and are encouraged in others (counties are not federal agencies so references to EIA in this section do not refer to federal actions subject to National Environmental Policy Act requirements, but to non-federal environmental requirements). At a minimum, the CDOW will require avian and bat studies as part of the EIA for wind farm developments.

**Lincoln County**
The Limon (270 MW) and Genoa (120 MW) wind farms have been permitted in Lincoln County (Table 2.2). The Cedar Point Wind Project (300 MW) is proposed in part of Arapahoe, Lincoln and Elbert Counties (Table 4.6.2-2). The project consists of over 40 miles of transmission line, two on-site substations, and an interconnection switch yard. Wind turbines will be located in eastern Elbert County and western Lincoln County and will occupy approximately 20,000 acres of land. According to personal communication with Ken Morgan (2009) of Lincoln County, the wind developments were permitted through a Use by Special Review. The permit process takes approximately 3 to 4 months to process. The permit fee was $250. The Use by Special Review was modelled after Logan County Conditional Use requirements. The permit does not formally require an EIA; however, the County requires the CDOW to comment on the project. This resulted in an EIA which included an avian study and a review of each tower site following construction. According to personal communication with James Given (2009) of RES, a combined environmental assessment was conducted for Lincoln and Elbert Counties. The assessment was regulated by the CDOW and took approximately 12 months. The overall cost of the permits for Elbert, Lincoln and Arapahoe counties was moderate (estimated between $100,000 and $500,000). Building permits were required at a cost of $150 per land owner. There is no fee for a right-of-way permit.

**Bent County**
The Twin Buttes (75 MW) wind farm was constructed in 2007. According to Bill Long (2009) of Bent County, this facility was permitted under a Use by Special Review. This process was required to construct the facility, including transmission lines, because the land was zoned for agricultural use. The process is very simple and takes approximately 30 days at a cost of approximately $25 to $50. A building permit was required for the construction of the facility. The cost of the building permit was tied to the cost of the facility and was approximately $64,000.

**El Paso County**
According to personal communication with Craig Dossey (2009) of El Paso County, renewable energy (solar and wind projects) and transmission line projects are subject to the county's Special Use permit review procedures in Chapter 5 of the Land Development Code.

Required county fees for electrical energy development projects include separate $4,000 fees for "Major Special Reviews" and "Approval of Location" for utilities, a maximum of $2,620 for various "Construction-Related" fees, which could cover Septic, Driveway, Grading and Builder Erosion and Sediment Quality Control Permits. "Early Assistance" or pre-application conferences with County staff can also be requested. The flat fee for these conferences is $472.50.

If the Site Development Plan, Approval Location and Special Use permit are all applied for concurrently, project approvals can be obtained in a six to eight month timeframe. If these applications are not provided concurrently, approvals can take up to a year. These applications all require separate approvals.

In recent years no major transmission lines have been constructed in the County. The gas-fired Squirrel Creek Energy Plant application received a Special Use permit two years ago, but construction has not started yet. The developer will need to file for a time extension for the project or lose the approvals. C2 Consulting has obtained a Special Use permit for the Clipper Wind Power Project along Highway 24 near Calhan. A transmission line is being considered for this project. No other transmission line project proposals have been submitted to the County. The Board of County Commissioners is currently considering Special Use permits for three to five met towers.

The County will not require each parcel of property to be included in a project site plan. Each parcel that includes portions of staging areas or substations, however, will need to be included in these plans.

**Washington County**
According to personal communication with David Foy (2009) of Washington County, a Use by Special Review is required for renewable energy facilities. This process takes approximately $300 to $400 and expires in 5 years. Approximately 48,000 acres of land have been leased for three separate wind farms. The status of any potential development is unknown. Building permits are required for each wind tower, substation and transmission tower at a negotiated cost of approximately $500 to $600. The county is encouraging the development of co-ops for land owners.

**Conejos County**
According to personal communication with Linda DeHerrera (2009) of Conejos County, a Use by Special Review is required for Major Electric Facilities. Invenergy set up meteorological

towers in the Pinon Hills area, but could not pursue the project further because of the area's status as an Area of Critical Environmental Concern managed by the Bureau of Land Management.

**Douglas County**
According to the *Douglas County Zoning Resolution*, *Section 21 – Use by Special Review*, major facilities of a public utility (includes power plants [50 MW or more] substations [greater than 115 kV], and transmission lines [greater than 115 kV], and wind energy conversion systems (up to 100 kilowatts) require a Use by Special Review Application with a completed Land-Use Application.

**Sedgwick County**
According to personal communication with Bob Johnson (2009) of Sedgwick County, a Special Use permit is required for siting and constructing power plants (renewable and non-renewable), transmission lines, and substations. There is no fee for the Special Use permit application. However, there are right-of-way permits and fees required for crossing paved ($5,000 per crossing) and gravel roads ($500 per crossing) and for subsurface borings ($1,000 per boring). A building permit fee of 0.34% of the total cost of the project is assessed for all developments including power plants, transmission lines, and substations. The County has granted Special Use permits for 4 or 5 wind companies to erect meteorological towers on land leased in the southern half of the County. No wind farms have been proposed nor are any transmission line projects planned.

### 2.3.3 Counties with Use by Special Review and 1041 Permit Requirements

The following is a discussion of those counties in the study area with applicable Use by Special Review and 1041 permit requirements.

In Prowers and Arapahoe Counties, a 1041 permit is required for public electrical utility developments and a Use by Special Review permit is required for private electrical energy developments. In Elbert County, a 1041 permit is required for transmission lines and substations and a Use by Special Review permit is required for a wind farm development.

**Elbert County**
Elbert County *Guidelines and Regulations for Areas and Activities of State Interest (1041 Regulations), Article 3,* addresses the permit program for site selection and construction of a major facility of a public utility. Major facilities of a public utility include any transmission lines (115 kV or greater), power plants (50 MW or greater), and substations of electrical utilities (69 kV or greater) that are located wholly or partially within the unincorporated territory of the County. The siting and construction of a major facility of a public utility requires a 1041 permit that is submitted to the Board of County Commissioners. The permitting process includes a pre-application conference, submittal of the permit application, and approval of the permit application. The specific submittal requirements may include an environmental assessment. According to personal communication with Curtis Carlson (2009) of Elbert County, a 1041 permit is not required for a wind farm. The 1041 permit is required for transmission lines and substations associated with wind farm facilities and the cost of the 1041 permit ranges from $600 (minor review) to $25,000 (major review). The 1041 permitting process takes approximately 8 to 12 months.

Transmission lines must comply with the following:

- Transmission Lines may not be constructed within 1/4 mile of an existing residential subdivision, town or agricultural development or within a treed area.
- Locations on hilltops or ridgelines are discouraged.
- At all stream crossings designated on the Elbert County Flood-plain maps as a one hundred (100) year flood-plain area, the line must be constructed in such a manner that the transmission line cannot be severed by the impact of flood waters on the support structures in the flood-plain areas.
- The application must include results of an on-site survey of the proposed location to determine if any wetlands, as shown on the National Wetlands Inventory Maps, will be negatively impacted and a proposed program of mitigation of the impact made available. For potential wetland impacts a detailed jurisdictional wetland survey would be needed to determine if a Clean Water Act Section 404 permit from the U.S. Army Corps of Engineers is required.
- The applicant shall submit a complete analysis of the proposed facilities which shall include the advantages and disadvantages of any alternative routes or sites considered. The applicant must include in the analysis the projected costs of the alternative routes or sites, including the comparative costs of operation over a twenty to thirty-year period of operation, and the comparative effect of such costs of required facilities on County residents and utility consumers.
- Exceptions may be granted when deemed appropriate by the Elbert County Planning Commission and the Board of County Commissioners.

Substations must comply with the following:

- May not be located within one mile of an existing subdivision, town or agricultural development.
- Circumstances may exist when substations may be located within the one mile limitation from an existing subdivision when deemed appropriate by the Elbert County Planning Commission and the Board of County Commissioners, but more stringent requirements may be stipulated.
- Locations on hilltops or ridgelines are discouraged.
- In floodplain areas, substation locations must maintain a horizontal setback of 250 feet or ten vertical feet above the maximum 100-year flood water elevation, whichever is greater.
- All substation components must meet any National Electric Safety Code Regulations.
- Landscaping and berming will be required and must achieve a significant amount of screening within a reasonable amount of time. This will be considered on a case-by-case basis.

As discussed in Section 2.3.2 (under Lincoln County), the Cedar Point Wind Project (300 MW) is proposed in parts of Arapahoe, Lincoln and Elbert Counties. The project consists of over 40 miles of transmission line, two on-site substations, and an interconnection switch yard. Wind turbines will be located in eastern Elbert County and western Lincoln County and will occupy approximately 20,000 acres of land. According to personal communication with Curtis Carlson (2009) of Elbert County, this facility required a Use by Special Review which took approximately 7 to 8 months. The Use by Special Review permit fee is $400. The permit was issued with a condition of approval to satisfy the requirements of the CDOW. According to personal

communication with James Given (2009) of RES, a combined environmental assessment was conducted for Lincoln and Elbert Counties. The assessment was regulated by the CDOW and took approximately 12 months. The overall cost of the permits for Elbert, Lincoln and Arapahoe counties was between $100,000 and $500,000.

**Prowers County**

According to the Prowers County *Master Plan*, Goal 9, Objective 9.1 is to "attract a large-scale energy producer (wind farms) in the southwestern portion of the county." Economic Recommendation 15 states that "the County should promote the use and integration of wind farms in the southwestern portion of the county." The attraction of a large-scale energy producer is funded by the Energy Impact Assistance Fund.

Prowers County *Guidelines and Regulations for Areas and Activities of State Interest (1041 Regulations), Article 3,* addresses the permit program for site selection and construction of a major facility of a public utility. Major facilities of a public utility include any transmission lines, power plants (25 MW or greater), and substations of electrical utilities that are located wholly or partially within the unincorporated territory of the County. The siting and construction of a major facility of a public utility requires a 1041 permit that is submitted to the Board of County Commissioners. According to personal communication with Mary Root (2009) of Prowers County, a 1041 permit is not required for private electrical energy developments including wind farms, transmission lines and substations.

According to the Prowers County *Zoning Regulations*, private power plants and electrical wind generation facilities require a Special Use permit issued by the Planning Commission in lieu of a 1041 permit. According to personal communication with Mary Root (2009) of Prowers County, The Special Use permit costs $350 and takes approximately 6 months to complete. The CDOW is notified and they are asked to comment on environmental impacts. As a result, environmental impact analyses are required. The Colorado Green Wind Project (162 MW) and ARPA (7.5 MW) wind farms were constructed in 2003 and 2004, respectively. The ARPA wind farm was also constructed in Baca County and both facilities were permitted through a Special Use permit. The wind farms and transmission lines were permitted separately, so that one did not hold up the other. This process took approximately 6 months. The CDOW requested environmental impact studies be conducted for the facilities.

**Arapahoe County**

The following policies from the Arapahoe County Comprehensive Plan are applicable:

- Policy PFS 1.6 – Arapahoe County will consider the need for power energy facilities on a case by case basis except in sensitive development and riparian areas. Each use or facility will be considered based upon its location, associated impacts and all necessary approval criteria established for such use.
- Policy PFS 4.2 – Arapahoe County will require regional utilities such as power substations to build in locations and in a manner that is safe and compatible with surrounding land uses and to minimize negative visual impact.

Arapahoe County *Regulations Governing Areas and Activities of State Interest in Arapahoe County (1041 Regulations)* address the permit program for site selection and construction of a major facility of a public utility. Major facilities of a public utility include any transmission lines, power plants, and substations of electrical utilities that are located wholly or partially within the unincorporated territory of the County. The siting and construction of a major facility of a public utility requires a 1041 permit that is submitted to the Board of County Commissioners. An EIA may be required. According to personal communication with Sherman Feher (2009) of Arapahoe County, this process takes approximately 6 to 8 months and a 1041 permit is not

required for private electrical energy developments. Private electrical energy developments are permitted through a Use by Special Review; however, 1041 and Special Use permits are intended to be equal and both require a $10,000 deposit. Funds are tracked and when they expire additional funds are requested.

As discussed in Section 2.3.2 (under Lincoln County), the Cedar Point Wind Project (300 MW) is proposed in part of Arapahoe, Lincoln and Elbert Counties. The project consists of over 40 miles of transmission line, two on-site substations, and an interconnection switch yard. Wind turbines will be located in eastern Elbert County and western Lincoln County and will occupy approximately 20,000 acres of land. According to personal communication with Sherman Feher (2009) of Arapahoe County, the Cedar Point Wind Project was permitted through a Use by Special Review which took approximately 6 to 8 months; however, the process is still ongoing and the permit was not issued at the time of this report. This process is very similar to the 1041 permitting process and did require an EIA. The EIA took approximately 12 months. A 1041 permit was not required because it was a private electrical energy development. The Special Use permit required a $10,000 deposit. Funds are tracked and when they expire additional funds are requested. The proposed transmission line for the Cedar Point Wind Project generally follows a WAPA and Tri-State corridor that has been study extensively. This reduced the level of effort for the EIA. The route was determined based on the least amount of environmental impacts. According to personal communication with James Given (2009) of RES, the environmental impact assessment was regulated by the CODW and took approximately 12 months. The overall cost of the permits for Elbert, Lincoln and Arapahoe Counties was moderate (estimated between $100,000 and $500,000).

### 2.3.4 Counties with Conditional Use Permit Requirements

The following is a discussion of those counties in the study area with applicable Conditional Use permit requirements.

Conditional Use permits are generally required for the site selection and construction of transmission lines, power plants (renewable and non-renewable), and substations with capacities that exceed a specified threshold. The process generally includes a pre-application meeting/conference, public notice, submittal of the permit application, public hearing, approval of the permit, and post-approval requirements, if applicable. Permit applications are approved by the Board of County Commissioners. EIAs can be a major component of the Conditional Use permit application and are required by some counties and are encouraged in others (counties are not federal agencies so references to EIA in this section do not refer to federal actions subject to National Environmental Policy Act requirements, but to non-federal environmental requirements). At a minimum, the CDOW will require avian and bat studies as part of the EIA for wind farm developments.

**Logan County**
The Logan County Master Plan addresses renewable energy development through the following energy policy and energy implementation goals:

- *Policy 5.4* – Logan County shall support the use of wind-generated energy opportunities through its rural/agricultural/large lot zoning and building regulations.
- *E1* – Encourage developers and public utilities to take advantage of solar energy opportunities in designing projects

- *E6* – Logan County shall amend its zoning regulation to assure accommodation of wind and solar energy development in Logan County.

The Peetz-Ridgecrest (29.7 MW), Peetz-Spring Canyon (60 MW) and Peetz Table (400 MW) wind farms were constructed in 2001, 2006 and 2007, respectively, and the Peetz-Phase II (327 MW) and Fleming (132 MW) wind farms have been permitted. NextEra constructed an 82-mile 230 KV transmission line for the Peetz Table facility (Table 4.6.2-2). According to personal communication with Jim Neblett (2009) of Logan County, these facilities, including the wind turbines, transmission lines and substations, were permitted with a Conditional Use permit. The Conditional Use permit included a contract between the developer and the County. The permit fee was $100. The Conditional Use permit required an environmental impact analysis and a letter of approval from the CDOW following their review of the impact analysis. According to personal communication with Kevin Guilday (2009) of NextEra, the Peetz Table wind farm took approximately 12 to 18 months to permit including 12 months of environmental impact analysis (avian and bat studies) at a moderate cost (estimated between $100,000 and $500,000). Building permits were required for the construction of the wind turbines but were not required for the transmission lines. The costs of the building permits for the Peetz Table facility were approximately $3 million. According to personal communication with Kenny Stein (2009) of NextEra, easements were negotiated with property owners for the transmission line corridor for the Peetz Table facility. These easements took approximately 1 year to negotiate with an aggressive schedule and team of dedicated staff. The cost of the easements could not be disclosed. NextEra's general assessment of the process was that transmission lines are easier to permit in Colorado than in the other states they have worked in.

According to personal communication with Jim Neblett (2009) of Logan County, a crop duster recently clipped a meteorological station tower. As a result, the County requires all meteorological stations to have orange balls on the guy wires and reflective panels on the tower. Although Federal Airline Administration (FAA) maps are updated to reflect the location of new meteorological stations, pilots often do not purchase the new maps frequently enough to become aware of the meteorological stations when making flight plans. Mr. Neblett has also indicated that farmers in the County are considering forming a land use co-op for wind farm development.

**Kiowa County**

According to personal communication with Don Oswald (2009) of Kiowa County, a Conditional Use permit is required for electrical energy developments including substations, power plants (renewable and non-renewable), and transmission lines. Two companies currently have leases in the County for wind farm development; however, the status of any potential development is unknown. The Conditional Use permit requires a site plan, drawn to scale, showing the dimensions and arrangement of the proposed development and a fee of $100.

**Alamosa County**

According to personal communication with Juan Altamirano (2009) of Alamosa County, the County is in the process of revising the Comprehensive Plan, Land Regulations Manual, and the 1041 Regulations to address solar energy development and power transmission needs. They hope to have these documents finalized by July 2009. Tri-State/Xcel Energy proposed a 230 kV line in the San Luis Valley that crosses the County. This project is being evaluated under the Conditional Use permit requirements. Routing alternatives for this line are still being evaluated so no Conditional Use permit application has been submitted yet.

**Phillips County**
According to personal communication with Randy Schafer (2009) of Phillips County, a Conditional Use permit is required for siting and construction of substations, power plants and transmission lines. The Conditional Use permit must include route information, and data on agricultural lands and land owners affected, but does not require any other environmental data. Several meteorological towers have been installed in the County, but the towers were not subject to Conditional Use permit requirements. A company known as Northeast Colorado Wind has been assembling leases for wind project development in Logan, Sedgwick, and Phillips County. The status of any potential development is unknown. There has been no transmission line development in the county since the early 1980s.

**Cheyenne County**
According to personal communication with Norman Akers (2009) of Cheyenne County, the Comprehensive Plan was recently updated to address wind power development requirements. A Conditional Use permit is required for power plant, wind farm, substation, and transmission line development. Currently there are five land leases with meteorological towers. Meteorological towers are subject to a Conditional Use Permit. The County recently adopted a wind development agreement as part of the Comprehensive Plan that would apply to any proposed wind project.

**Rio Grande County**
According to personal communication with Rose Vanderpool (2009) of Rio Grande County, a Conditional Use permit is required for siting and construction of power plants (renewable and non-renewable), transmission lines and substations. Conditional Use permit applications are evaluated using the policies and guidelines in the Rio Grande County Master Plan, which address protection goals for traffic, soil, water, air, and aesthetics. The Conditional Use permit fee is a flat rate of $500 regardless of the size and complexity of the project. No special use, building, or right-of-way permits are required for these developments. However, a building permit would be required for an enclosed structure such as an on-site building. No renewable energy projects have been proposed in the County.

**Huerfano County**
As discussed in Section 2.3.1 (under Pueblo County), the Pole Canyon Wind Farm and Pole Canyon Transmission Lines are currently going through the permitting process with Huerfano and Pueblo Counties (Babcock & Brown, 2009). The proposed project includes a 300 MW wind farm in Huerfano County and a 40-mile long 345 kV transmission line in Huerfano and Pueblo Counties that will interconnect with the Comanche Substation in Pueblo County. The project was permitted in Huerfano County with a Conditional Use permit. Most of the environmental studies/surveys have been completed and the Huerfano County Conditional Use permits are secured for both the wind farm and the transmission lines. All of the environmental studies, cultural surveys and related permit work will be completed by the end of the third quarter of 2009. More than 80% of the right-of-way has been secured for the transmission line corridor with the goal of securing 100% of the right-of-way by the end of the second quarter of 2009. The transmission line route is identical to planned Xcel/Tri-state Calumet to Comanche 345 kV transmission line upgrade plans and the upgrade has been assigned the highest priority by Xcel/Tri-State for connecting new solar, wind and other new generation in the San Luis Valley and Southern Colorado area.

**Denver County**
According to personal communication with Charlie Meredith (2009) of the City and County of Denver, a Conditional Use permit is required for siting and construction of power plants (renewable and non-renewable), transmission lines, and substations. The permit fee is $100 and the process takes approximately 2 weeks.

### 2.3.5 Counties with 1041 and Conditional Use Permit Requirements

The following is a discussion of those counties in the study area with both applicable 1041 and Conditional Use permit requirements.

1041 permit requirements are described in Section 2.3.1 and Conditional Use permit requirements are described in Section 2.3.4. In Adams County a 1041 permit is required for public electrical utility developments and a Conditional Use permit is required for private electrical energy developments.

**Adams County**
According to *Adams County Development Manual, Chapter 6 – Designated Areas and Activities of State Interest*, a 1041 permit is required for the site selection and construction of Major Facilities of a Public Utility, which includes transmission lines, power plants, and substations of electrical utilities. The application requires an environmental impact analysis among other specific requirements. The application requires an evaluation of at least three alternative transmission line corridors. The cost of the 1041 permit application is $500.

According to personal communication with Shannon McDowell (2009), a 1041 permit is required for public electrical utility developments and a Conditional Use permit is required for private electrical energy developments including power plants (renewable and non-renewable), transmission lines, and substations. The Conditional Use permit process is very similar to the 1041 permit process except it does not formally require an EIA; however, such an analysis is encouraged and will likely be required by the CDOW, as they are asked by the County to comment on both 1041 and Conditional Use permit applications for electrical energy developments. There are currently no renewable energy projects proposed in the County.

**Saguache County**
According to personal communication with Wendi Maez (2009) of Saguache County, the County has both Conditional Use and 1041 permits. A solar energy development was recently proposed in the County by Pioneer Solar. Ms. Maez could not comment on the size of the development and she did not have any contact information for the developer. Originally the developer submitted a Conditional Use permit application and the County then requested a 1041 permit application. Currently, all energy developments will require a 1041 permit. The permit application takes approximately 90 days to approve and the fees are variable, and are assessed after the permit has been submitted. An EIA is required and the County will then solicit comments from the CDOW among other applicable agencies. Building permits are assessed at a rate of 12 cents per square foot for the development.

### 2.3.6 Counties with Land Use Permit Requirements

Land Use permit are generally required for siting and construction of power plants (renewable and non-renewable), transmission lines, and substations with capacities that exceed a specified threshold. The process includes a pre-application meeting, a notice to property owners, a public hearing, and approval by the County Commissioners.

**Yuma County**
According to Yuma County *Land Use Code, Section 5-104 – Additional Standards for Certain Uses*, a major electric facility (electrical generating facilities, substations, and transmission lines [greater than 69 thousand volts) shall apply for Land Use permit for a Major Electrical or Natural Gas Facility as defined by Section 29-20-108 C.R.S. The Land Use permit includes a description of the drainage and erosion control plan, noxious weed control plan, waste water system, water supply system, impact analysis based on standards and criteria of Article 5, and other pertinent information.

According to Linda Brigs (2009) of Yuma County, the regulations for permitting a wind farm are currently being developed. The Land Use permit requires an environmental impact analysis for wind farm developments which includes an avian study. The CDOW is allowed to comment on the impact analysis. The permitting process takes approximately 4 months at a cost of $210. Activity notices are required for each wind tower at a cost of $15.

According to Linda Brigs (2009) of Yuma County, a wind farm has been proposed by Duke Energy. They have been working on their Land Use permit application for several years and have completed their EIA. The permit application is expected to be submitted by June 2009. The proposed facility will consist of 80 to 100 turbines and a transmission line will be constructed to interconnect to a Tri-State transmission line. The project area is within YW Electric's service area and they are opposed to wind farm development.

**Costilla County**
According to *Costilla County Land Use Code*, a Land Use permit is required for the construction of a Major Electrical Facility which includes electrical generating facilities, substations, transmission lines, and any structures associated with the facility.

According to personal communication with Joe Ortiz (2009) of Costilla County, the County is in the process of revising and updating it 2002 Land Use Code, the 1041 Regulations, and the 1999 Comprehensive Plan. Currently there is a moratorium on all major development in the County, including transmission lines, power plants, and substations. The moratorium is a resolution passed by the County Commission and is currently set to expire in July 2009. However, if they have not completed updating the current regulations and comprehensive plan at this time, then the moratorium may be extended. The County has not received any renewable energy permit applications nor have they been approached by developers about the installation of meteorological towers. No transmission lines have been constructed in the County in recent years.

### 2.3.7 Counties with No Permit Requirements

**Baca County**
The ARPA (7.5 MW) wind farm was constructed in Baca and Prowers Counties. One turbine was constructed in Baca County and the transmission lines were constructed in Prowers County. According to personal communication with Kristin Rau (2009) of Baca County, no permits were required for the ARPA facility with the exception of right-of-way permits for underground lines and an oversized load permit for the delivery of the turbine. The total costs of these permits were less than $1,000.

**Kit Carson County**
According to the *Kit Carson Comprehensive Plan*, unincorporated areas should be retained primarily for agricultural uses and in order to minimize conflicts between incompatible uses, the conversion of agricultural land into residential, commercial or industrial development outside of existing municipalities, or their respective town growth areas, is discouraged.

According to the County's website, "at this time there are no specific regulations dealing with wind farms or wind energy within Kit Carson County, besides what is normally required for any structural improvement being made to a property and those imposed by the State of Colorado." A Building Permit and Development Application is required for construction of such facilities. The Board of County Commissioners makes the final approval of the application.

Submittal of an easement and right-of-way form is required for easements across County roads and/or through County property. This form must be approved by the Board of County Commissioners.

**Crowley County**
According to personal communication with Rick Ferraro (2009) of Crowley County, there is no formal process for permitting the siting and construction of a power plant (renewable and non-renewable), transmission lines, and substations. The County requires the developer or utility to meet with the Planning and Zoning Board to discuss the project details and then a public hearing is held. Most of the land in the County is zoned for agricultural use and would require re-zoning. The land is re-zoned once land-owner rights are settled and the Planning and Zoning Board will then permit the project. The costs for this process are variable and based on the size of the development.

## 2.4 Summary and Conclusions

County permitting processes are variable within the study area including timing, permitting requirements, and costs. In general, power plants (renewable and non-renewable), transmission lines and substations are permitted with either a 1041 permit, a Use by Special Review permit, a Conditional Use permit, or a Land Use permit. There are three counties in the study area that do not have any formal permitting requirements (Baca, Kit Carson, and Crowley). In some cases counties have different permit requirements depending on whether the facilities are constructed by public utilities or private developers (Prowers, Arapahoe, and Adams Counties). In one county (Elbert) wind farm developments are permitted with a Use by Special Review and transmission lines and substations are permitted with a 1041 process.

In general, the permitting requirements are very similar; although, the 1041 permit application is typically more comprehensive. In Arapahoe County, the 1041 and the Use by Special Review permits are intended to be equal so there is no preferential treatment of public versus private developers (Feher, 2009). This is generally true of all other counties that were interviewed in

the study area. There is no preference for a public or private developer and in their experience it generally takes an equal effort to permit a project.

Four counties (Morgan, Alamosa, Yuma, and Costilla) are currently revising their regulations and policies to better address permitting renewable energy development. Costilla County currently has a moratorium on new development until their land use regulations, 1041 regulations, and comprehensive plan are revised.

EIAs can be a major component of the permitting process and are required by some counties and encouraged by others (EIAs are not subject to National Environmental Policy Act requirements). In all cases this has resulted in a required EIA study including at least an 8 to 12 month avian and bat study for wind farm developments. This is typically the lengthiest and most costly component of the permit application; although, land owner agreements can take longer if an aggressive approach is not implemented. This is especially true for transmission line corridors. It took NextEra approximately one year to negotiate the easements for an 82-mile long transmission line for the Peetz Table wind farm with an aggressive team of dedicated staff (Stein, 2009). In Weld County, it took approximately one year to negotiate the oil and gas rights agreements with land owners impacted by the Cedar Creek wind farm and the permit was not formally approved until all land owner negotiations were competed (Gathman 2009).

Table 2.3 presents a summary of the county permitting requirements along with an estimated process duration and relative cost. In most cases the estimated process duration is controlled by the EIA or land owner negotiations. As such, each permit has a similar duration and relative cost. The permitting fees are variable between the counties in the study area, but do not represent a major component of the cost, with the 1041 permits having the highest cost (up to $25,000). Building permit fees can be a major cost for the developer. The building permit costs are typically based on the value of the project, the number of structures related to the project, or the size of the project (area and electrical generating capacity). In general, County permitting fees do not represent a major component of development costs, but 1041 permits can cost up to $25,000.

As discussed in Sections 2.3.1 and 2.3.2, the proposed Cedar Creek wind farm consists of more than 40 miles of transmission line across Arapahoe County and the proposed Pole Canyon wind farm consists of a 40-mile long transmission line crossing Huerfano and Pueblo Counties. Both projects are proposing the transmission route to follow existing proposed transmission line corridors, which significantly reduced the permitting costs and duration.

Based on the general feedback from the counties interviewed, there is no opposition to development of renewable energy projects and all counties with current renewable energy facilities are grateful of the economic stimulus related to these developments. The same is true for land owners in counties with renewable energy development. They strongly support development and are grateful for the additional income for use of their property and in some cases for use of air above their property (transmission line overhangs).

In Logan and Washington Counties co-ops are currently being formed to benefit more land owners for proposed renewable energy development. In addition, Logan County indicated that they prefer renewable energy developments over non-renewable energy developments because of the financial benefits to the land owners (Neblett 2009). This may be true for other counties as well. However, Yuma County is served by YW Electric and they are reportedly opposed to wind farm development in the County (Briggs 2009).

According to NextEra, Colorado is generally one of the easier states to develop renewable energy facilities. NextEra also indicated that they are prepared to build additional transmission lines to service additional phases of the Peetz Table wind farm if Xcel Energy agrees to purchase the power (Stein 2009). NextEra and other developers interviewed indicated that they have a number of projects on hold due to the lack of transmission line infrastructure in the State. These developers indicated that they would consider constructing transmission lines if power purchase agreements could be reached with utilities like Xcel.

### 2.5 Recommendations

One way to address the variability in the permitting requirements in the study area is to develop a permitting handbook for developers and utilities that will assist them with the county permitting process. The Counties in the study area and the CDOW should be involved in the development of the handbook. This will help to summarize and document the existing regulations and requirements for renewable energy developments in the study area. Selected counties outside the study area could also be included. Specific County and CODW EIA requirements would also be included in the guidebook. If formal requirements do not exist then they could be developed as part of the handbook development.

For those counties with no regulations or permits related to renewable energy development (Baca, Kit Carson, and Crowley) and for those counties that are revising their regulations (Morgan, Alamosa, Yuma, and Costilla), WorleyParsons recommends using a county or counties with well structured permitting requirements and constructed or permitted renewable energy developments as a model since they have experience with the process (e.g., Prowers, Logan, Elbert, Lincoln, Arapahoe, and Weld). Counties outside the study area with no permit regulations could also use other more experienced counties as a model for permit regulation development or revision. Jim Neblett, of Logan County, has developed a model for permitting wind farms and has been conducting permitting seminars to assist counties with revising and developing their permitting regulations. At the time of this report he had conducted seminars for six counties (Yuma, Cheyenne, Kiowa, Bent, Prowers, and Kit Carson) (Neblett 2009).

Prowers County attracted large-scale energy producers (wind farm developers) with Energy Impact Assistance funding from the State. Other counties could likely do the same, if funding is available, and Prowers County could be used as a model for this process.

## 3.0 TRANSMISSION AND SITING BOTTLENECKS

### 3.1 Regulatory and Siting Constraints

County governments do not address utility corridor development as part of their zoning or master planning processes as a use-by-right, but only as a permissible land use when there are no conflicts or incompatibilities with existing land uses. Federal and state agencies with jurisdiction over government lands, federally protected resources and navigable airspace do not have transmission line siting and renewable energy development as part of their primary or core missions. Federal and state agency policies and regulations do provide for utility corridor rights-of-way siting processes, subject to the lack of interference with their primary missions. The different transmission planning organizations proceed in their efforts with little interaction with county level decision makers.

These different levels of government decision-making and land jurisdictions, and lack of any single agency addressing these agencies as part of their core mission make it difficult to optimize transmission line development or site these projects in a timely manner. This situation has to change in order for transmission projects to be expedited over the time currently required.

The following recommendations are offered in an attempt to create additional decision-making authority within the Colorado Public Utilities Commission (PUC) for siting and to provide a planning forum where there is more interaction and planning information shared between utilities and county-level decision makers.

**Colorado PUC**

1. Add additional government and public participation requirements for transmission planning processes:
   The Minnesota Public Utilities Commission (PUC) "Proposed Permanent Rules Relating to Biennial Transmission Project Reports" provides mechanisms for community and public input into the transmission planning process. These rules are a good model that the Colorado PUC could use to improve transmission planning in Colorado. These rules specifically require:
   - Utilities to seek input of local governments and the public.
   - Mandatory meetings in each transmission planning zone where transmission lines are proposed within the next 5 years or where a certification for a proposed transmission line has been filed.

2. Add a routing decision to PUC's decision-making authority, but separate it from the CPCN process:
   - The South Dakota PUC reviews project application and issues decisions on the "need" and routing. One route is evaluated in CPCN applications.
   - The Wisconsin Public Service Commission (PSC) also evaluates "need" and routing in their CPCN process, but requires evaluation of at least two routes in the CPCN application and relies on the Wisconsin Department of Natural Resources (DNR) to provide guidance on the natural resource data required for CPCN and DNR applications.
   - The Minnesota PUC and North Dakota PSC have separate Certificate of Need and Route Permit processes and decisions. The ND PSC also has a separate Certificate of Corridor Compatibility process.

   Separating the "need" and routing decisions as occurs in Minnesota and ND is useful because it provides regulatory certainty for projects ahead of completing routing analyses. If the Colorado Division of Wildlife is willing to play an active role, the Wisconsin PSC is a better model for Colorado than the SD PUC due to the additional routing analysis.

**Interim Steps**

Adding transmission planning and routing decision rules to the existing Colorado PUC regulations will take time. Until these legislative fixes are made, the Colorado GEO and/or CEDA could improve transmission planning and encourage the development of additional

transmission capacity from the SB 91-identified Generation Development Areas (GDA) by undertaking the following activities:

1. Develop Conceptual Utility Corridor Master Plans
    - Use Federal stimulus funds for planning grants to GDA counties so they could develop Conceptual Utility Corridor Development Plans. Counties outside the GDAs that have proposed renewable energy projects or that are interested in promoting their development should also be included in this grant program.
    - These plans could be adopted in county ordinances or included in existing Comprehensive Plans. The emphasis should not be on developing entire new Master Plans or complex ordinances, but on simple retrofits of existing plans and/or adoption of conceptual utility corridors via county commission resolutions that could be accomplished quickly to guide local decision making.

2. Designate Utility Corridors as "Areas of State Interest"
    - Encourage counties to designate the conceptual utility corridors as Areas of State Interested under the Colorado Land Use Act (CLUA) (Colorado Revised Statutes 24-65). The CLUA allows local governments to designate "site selection and construction of major facilities of a public utility" under the 1041 regulations. As indicated in Table 4.6.2-3 only 1/3 of the counties in eastern Colorado and the San Luis Valley have enacted 1041 regulations. None of the counties with 1041 regulations have designated utility corridors as an Area of State Interest. Designation of utility corridors would allow counties to take full advantage of the CLUA provisions which state "the major facilities of public utilities shall be located so as to avoid direct conflict with adopted local government and regional master plans" (CRS 24-65.1-204) and require public utilities and the Colorado PUC to take into consideration, and when feasible, comply with these master plans (CRS 24-65.1-103 & 105). Under the Local Government Land Use Control Enabling Act, public utilities must consult with local government to identify specific routes or geographic locations under consideration for siting major electric facilities (Article 20, CRS 29-20-108(4)).

3. Conduct transmission planning workshops
    - Hold these workshops in northeast and southeast Colorado and in the San Luis Valley. Xcel, Tri-State and other utilities could brief county official and planners on their transmission planning processes.
    - Make workshop grants available to these utilities to ensure their participation and offset their costs.
    - Have these utilities and counties conduct joint analyses and planning to inform the development of the Conceptual Utility Corridor Development Plans.
    - Make participation grants available to the Wind Landowner's Associations, the Rocky Mountain Farmer's Union and other rural/farm entities to encourage their participation on the transmission planning workshops.
    - Invite energy developers' to participate in these workshops if this is deemed acceptable to the other participants.
    - Use "facilitators" to maximize attendee participation opportunities.

4. Retain additional GEO staff to administer the planning, workshop, and participation grants, and provide documentation and assistance to counties, utilities and non-governmental organizations involved in these planning activities.

## 3.2 Ecological Constraints

The constraints mapping that is described in Section 1.3 indicates areas of the GDAs as well as adjacent areas where sensitive ecological components have been identified. The constraints ratings for these areas of low to very high provide a guide to respective increasing levels of difficulty in siting renewable energy development or transmission, and increasing the potential of affecting sensitive species and communities. Siting in areas with constraints requires that potential effects be determined and may extend the time required for the project in order for potential impacts to be determined and to confer with the appropriate agencies, as follows:

- Species listed federally as Threatened, Endangered or as Candidates for such listing are protected by the Endangered Species Act (1973, as amended). Proponents of projects that are likely to affect threatened and endangered species (mapped as part of irreplaceable resources) are required to assess impacts and to confer with the U.S. Fish and Wildlife Service to develop measures to avoid, minimize, and/or mitigate impacts.
- Species considered by the state of Colorado to be threatened, endangered, or non-game species are protected under Colorado Revised Statutes Title 33, Chapter 10, 33-2-105 and 33-2-104, respectively. The Colorado Division of Wildlife must be consulted if such species are likely to be affected by a project. Most of the species considered to be irreplaceable resources and/or listed as target species of the Conservation Areas occur in either of these two categories.
- Bird species (except English sparrow, starling, and pigeon) are protected by the Migratory Bird Treaty Act (1918), as administered by the U.S. Fish and Wildlife Service, and protected from taking, which extends to feathers, nests, and eggs (50 CFR 10.12).

The constraints analysis prepared in this study is provided to serve as a first analysis of project siting and to provide an awareness of issues that should be included in planning. More detailed and larger-scale GIS analyses are required to understand the implications of a project on particular species or rare communities and how negative effects can either be avoided or minimized. Thus, site-specific studies are required for renewable generation projects and for transmission routes to accomplish this.

The next generation (larger-scale GIS) of constraints analyses should be done now for each GDA and as soon as possible for each transmission route that is planned to identify areas where impacts to these resources are the most benign. This analysis will require information from the U.S. Fish and Wildlife Service, Colorado Division of Wildlife, Nature Conservancy, Colorado Natural Heritage Program, U.S. Forest Service, and U.S. Bureau of Land Management (and others) to ensure that the latest data on species status and distribution are included. A task force headed by the GEO is recommended to facilitate such an effort with advisement from and coordination through the CDOW.

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**TABLE 1.1 SUMMARY OF FEDERAL AND STATE LANDS WITHIN EACH GDA**

| Generation Development Area (GDA) | Federal Land in GDA? | Federal or State Land Unit & Managing Agency |
|---|---|---|
| GDAs 1 & 2 | Yes | Pawnee National Grassland (NG), U.S. Forest Service (USFS) |
| GDA 3 | No | Western Area Power Administration (WAPA) has an existing transmission line |
| GDA 6 | Yes | Comanche NG, USFS Rio Grande & San Isabel National Forests |
| GDAs 4-7 and Solar GDAs | | U.S. Department of Agriculture (USDA) Rural Utilities Service (RUS)(applies to funding of Tri-State Generation & Transmission [G & T] lines in these GDAs) |
| GDA 8 | Yes | San Isabel National Forest, Spanish Peaks Wilderness, USFS |
| South/Southeast Pueblo Solar GDA | Yes | Comanche NG, USFS Rio Grande & San Isabel National Forests |
| | Yes | San Isabel National Forest, USFS |
| | Yes | Pinyon Canyon Maneuver Site, subinstallation of Fort Carson, U.S. Army |
| | Yes | Santa Fe National Historic Trail, National Park Service (NPS) |
| San Luis Valley Solar GDA | Yes | Bureau of Land Management (BLM) Saguache, Del Norte and La Jara Field Offices |
| | Yes | Baca, Alamosa & Monte Vista National Wildlife Refuges (NWRs), U.S. Fish & Wildlife Service (USFWS) |
| | Yes | Great Sand Dunes National Park, NPS |
| | Yes | Rio Grande National Forest. USFS |
| GDAs 3, 5 – 8 and Solar GDAs (no airports in GDAs 1 & 2) | Not Applicable (NA) | Federal Aviation Administration (FAA) Obstruction Standards for airports and heliports |
| GDAs 2, 5-8 and Solar GDAs | NA | FAA Coordination for Special Use Airspace (SUA) and Military Training Routes (MTRs) |
| All GDAs | NA | Colorado State Land Board (CSLB) |
| GDAs 1, 3, 6, 8 and Solar GDAs | NA | Colorado State Wildlife Areas, Colorado Division of Wildlife (CDOW) |
| All GDAs | NA | Colorado Department of Transportation (CDOT), State Highway Crossings |
| South/Southeast Pueblo Solar GDA | NA | Colorado State Parks do not have a ROW process-- The Trinidad Lake State Park Management Plan (2001) does not address utility corridors or energy development. |

**TABLE 1.2 APPLICABLE LAND USE AND ENVIRONMENTAL REGULATIONS FOR FEDERAL AND STATE LANDS WITING GDA'S**

| Federal or State Managing Agency | Agency National Environmental Policy Act (NEPA) Regulation | Agency Right-of-Way (ROW) Process |
|---|---|---|
| U.S. Forest Service Pawnee & Comanche National Grasslands, Rio Grande & San Isabel National Forests | 73 FR 43084 (July 27, 2008 Federal Register amendment of 36 CFR 220) | Special Use Permit (SUP) needed for systems and related facilities for transmission and distribution of electric energy per 36 CFR 251, Subpart B |
| Western Area Power Administration (WAPA) | WAPA is part of the Department of Energy (DOE); NEPA regulations are at 10 CFR 10221 | WAPA does not have any jurisdiction over land within the GDAs. If any state or federal agency owns land, the ROW process for that agency would apply. |
| U.S. Department of Agriculture, Rural Utilities Services (RUS) | RUS funds are used for Tri-State Generation & Transmission projects so they must comply with the RUS NEPA regulation at 7 CFR 1794 | Tri-State G&T does not own any land within these GDAs. If any state or federal agency has jurisdiction over land within Tri State corridors, the ROW process for that agency would apply. |
| U.S. Army Pinyon Canyon Manuever Site, subinstallation of Ft. Carson | The U.S. Army NEPA regulation is at 32 Code of Federal Regulations (CFR) 651 | Electric transmission line easement ROWs may be granted per 10 USC 2668 |
| National Park Service (NPS), Santa Fe National Historic Trail | DOI Manual 516 DM 6, Appendix 7 | The Secretary of the Interior or the Secretary of Agriculture may grant easements and ROWs upon, over, under, acress, or along any components of the National Trails System in accordance with the laws applicablet to the NPS and the National Forest System under Section 9 of the National Historical Trails Act. |
| NPS Great Sand Dunes National Park | DOI Manual 516 DM 6, Appendix 7 | Utility SUP must be approved by Regional Office. |
| Bureau of Land Management Field Offices in Saguache, Del Norte and La Jara | Department of the Interior (DOI) Manual 516 DM 6, Appendix 5 | BLM grants ROWs for electric transmission, distribution and generating facilities under the Federal Land Policy Management Act (43 CFR 2801). Transmission lines 500 kV or larger are “major” projects which require a Plan of Development with the ROW application per BLM Manual 2804 |
| U.S. Fish & Wildlife Service Baca, Alamosa & Monte Vista National Wildlife Refuges (NWRs) | DOI Manual 516 DM 6, Appendix 1 | A ROW easement would be required per the NWR System Administration Act. After the completion of the NEPA process, the Regional Director would issue a Certificate of Compatibility. The USF&WS ROW application procedures are specified at 50 CFR 29.21-2 |

**TABLE 1.2 APPLICABLE LAND USE AND ENVIRONMENTAL REGULATIONS FOR FEDERAL AND STATE LANDS WITING GDA'S**

| Federal or State Managing Agency | Agency National Environmental Policy Act (NEPA) Regulation | Agency Right-of-Way (ROW) Process |
|---|---|---|
| **Federal or State Managing Agency** | **Agency National Environmental Policy Act (NEPA) Regulation** | **Agency Right-of-Way (ROW) Process** |
| Federal Aviation Administration (FAA) Obstruction Standards for airports and heliports | FAA Regulations for Objects Affecting Navigable Airspace, 14 CFR 77. The FAA NEPA regulations is FAA Order 5050.4B. | Flight area clearances should be considered for overhead utilities within 20,000 feet of an airport or within 5,000 feet of a heliport. A Notification of Proposed Construction or Alteration must be given to the FAA Regional Office, which will conduct an aeronautical study and make a Determination of Hazard/No Hazard |
| FAA Coordination for Special Use Airspace (SUA) and Military Training Routes (MTRs) | FAA Order (FAAO) 1050.1, Policies and Procedures for Considering Environmental Impacts | Per FAAO 7400.2D FAA administers navigable airspace including SUA & MTRs where DOD flights at low levels occur. SUA & MTR coordination should be conducted for overhead utilities corridors crossing known SUA and MTRs per FAAO JO 7400.2G (Procedures for Handling Airspace Matters), Chapter 21. |
| Colorado Public Utilities Commission (PUC) | PUC is not a Federal agency and does not have a similar requirement | PUC does not own or lease land so ROW requirements are not applicable |
| Colorado State Land Board (CSLB) | CSLB is not a Federal agency and does not have a similar requirement | The Director of the State Board of Land Commissioners can grant ROWs, easement and Road Access Permits under Board Order 98-88 (Policy No. 98-4) |
| Colorado Division of Wildlife (CDOW) | CDOW is not a Federal agency and does not have a similar requirement | The Colorado Wildlife Commission may grant leasing rights for energy-related purposes in instances where they have sole ownership of surface and subsurface mineral rights (June 7, 2007 Energy Development Policy) |
| Colorado Department of Transportation (CDOT) | NA – However, CDOT requires compliance with state air and water quality, hazardous waste, wetland, and historical and archaeological regulations as well as the Endangered Species and Migratory Bird Treaty Acts | Utility, Special Use and Access Permits are required for utility crossings under the CDOT State Highway Utility Accommodation Code. |

## Table 1.3 GDAs and Conservation Areas

| **Conservation Area (**and Number) | **Conservation Value** | **Vulnerability Rating** | **Generation Development Area (GDA) Number** | **No. of Conservation Target Species & Communities** |
|---|---|---|---|---|
| **Central Shortgrass Prairie Ecosystem Conservation Areas** | | | | |
| Mountain to Plains (4) | Very High | Medium | GDA 1 | 7 |
| Greater Pawnee (9) | High | Medium | GDAs 1 & 2 | 10 |
| S. Platte Sandhills (11) | High | High | GDA 3 | 8 |
| Big Sandy (16) | High | Low | GDAs 5 & 7 | 10 |
| Republican River Sand Hills (18) | Very High | Low | GDA 4 | 8 |
| Indian Lakes (27) | Moderate | Medium | GDA 5 | 9 |
| Huerfano Uplands (28) | Very High | Low | South/SE Pueblo Solar GDA | 9 |
| Lower Purgatoire (29) | Very High | Low | GDA6 & South/SE | 9 |
| Mesa de Mayo (30) | Very High | Low | Pueblo Solar GDA | 9 |
| Upper Cimarron (31) | High | Low | GDA 6 | 9 |
| **Southern Rocky Mountains Ecosystem Conservation Areas** | | | | |
| Carnero Creek (19) | Moderate (Mod) | Medium | San Luis Valley Solar | 32 |
| Conejos River (26) | Mod Low | Medium-High | GDA | 15 |
| Culebra Range (36) | Mod High | Medium | South/SE Pueblo Solar GDA | 30 |
| Great Sand Dunes/San Luis Lakes (64) | Mod High | Medium | San Luis Valley Solar GDA | 39 |
| Greenie Mountain (67) | Low | Medium | | 13 |
| Huerfano Grasslands (77) | Moderate | Medium | | 6 |
| LaVeta Pass Link (86) | Mod Low | Medium | GDA 8 | 7 |
| Punche Valley (132) | Mod Low | Medium-High | San Luis Valley Solar | 30 |
| Rajadero Canyon (134) | Moderate | Medium | GDA | 21 |
| Rio Grande (140) | Moderate | Low-Medium | | 17 |
| Sangre de Cristo Mountains (154) | Mod High | Medium | San Luis Valley Solar GDA/GDA8 | 52 |
| South San Juan (166) | Mod High | Medium | San Luis Valley Solar | 32 |
| St. Charles River (170) | Moderate | High | GDA | 4 |
| Upper San Juan Valley (180) | Mod Low | Medium | | 23 |
| Vermejo Park/Lower Purgatoire (182) | Moderate | Medium-High | South/SE Pueblo Solar GDA | 56 |

**Table 1.4 Conservation Target Species for Each of the Conservation Areas Within the Solar GDAs**

| **Species** | **Global Rank*** | **Species Status**** | **Conservation Area Numbers (**San Luis Valley CAs are in **Bold)** |
|---|---|---|---|
| ***Fish*** | | | |
| Rio Grande cutthroat trout | G3 | | **19, 26, 36, 64, 132, 154, 166,** 182 |
| Rio Grande sucker | G3 | SE | **19, 36, 64, 132, 154** |
| Greenback cutthroat trout | G2 | FT, ST | **36,** 77**, 134, 154** |
| Rio Grande chub | G3 | SC | **19, 132, 134, 140, 180** |
| Colorado River Cutthroat trout | G3 | SC | **166** |
| ***Amphibians*** | | | |
| Couch's spadefoot | G5 | SC | 28 |
| Northern leopard frog | G5 | SC | 29, **140** |
| Plains leopard frog | G5 | SC | 29 |
| Green toad | G5 | | 29, 30 |
| Great plains narrowmouth toad | G5 | SC | 30 |
| Boreal toad | G1 | SE | **64** |
| ***Birds*** | | | |
| Cassin's sparrow | G5 | | 28, 29, 30 |
| Ferruginous hawk | G4 | SC | 28, 29, 30, **64, 132** |
| McCown's longspur | G4 | | 28 |
| Chestnut-colored longspur | G5 | | 28 |
| Mountain plover | G2 | SC | 28, 29, 30, **132** |
| Long-billed curlew | G5 | SC | 30 |
| Lesser prairie-chicken | G3 | ST | 30 |
| Western snowy plover | G4T3 | SC | 29 |
| Piping plover | G3 | FT, ST | 29 |
| Bald eagle | G4 | ST | 30, **26, 67, 140** |
| American peregrine falcon | G3 | SC | **19, 26, 166** |
| Brown-capped rosy finch | G4 | | **36, 154, 166** |
| Sage sparrow | G5 | | **64, 140** |
| Short-eared owl | G5 | | **64, 67** |
| Greater sandhill crane | G4 | SC | **64, 67** |
| Southwestern willow flycatcher | G5 | FE, SE | **140** |
| Brewer's sparrow | G5 | | **140** |
| Black swift | G4 | | **154, 166** |
| American dipper | G5 | | **166** |
| Mexican spotted owl | G3 | FT, ST | 170 |
| Gunnison sage-grouse | G1 | SC | **180** |
| Lazuli bunting | G5 | | 182 |
| Purple martin | G5 | | 182 |
| Virginia's warbler | G5 | | 182 |
| **Species** | **Global Rank*** | **Species Status**** | **Conservation Area Numbers (**San Luis Valley CAs are in **Bold)** |
| ***Insects*** | | | |
| Colorado blue | G3G4T3T4 | | 28, **64** |
| Suwallia wardi (stonefly) | G3 | | **26** |

**Table 1.4 Conservation Target Species for Each of the Conservation Areas Within the Solar GDAs**

| **Species** | **Global Rank*** | **Species Status**** | **Conservation Area Numbers (**San Luis Valley CAs are in **Bold)** |
|---|---|---|---|
| Caddis fly (*Clistoronia maculata*) | G3 | | **19** |
| Great Sand Dunes anthicid beetle (2 species) | G1 | | **64, 154** |
| San Luis dunes tiger beetle | G1 | | **64** |
| *Copablepharon* spp. (moth) | G3 | | **64, 154** |
| Giant sand treader cricket | G3 | | **64** |
| Wiest's sphinx moth | G3 | | **64, 154** |
| Gold-edged gem | G3 | | **64** |
| Great Basin frittilary | G2 | | **134** |
| *Aphelia* spp. (moth) | G3 | | **154** |
| Circus beetle | NA | | **154** |
| Hot Springs *Physa* (mollusk) | G3 | | **180** |
| Northwestern fritillary | G1 | | 182 |
| Capulin mountain arctic | G2 | | 182 |
| ***Mammals*** | | | |
| Black-tailed prairie dog | G3G4 | SC | 28 |
| Pine marten | G5 | | **19, 36, 64, 154, 166** |
| Pale lump-nosed bat | G4 | | **64, 154,** 182 |
| San Luis kangaroo rat | G3 | | **64, 132** |
| Plains pocket mouse ssp | G2 | | **64, 154** |
| Silky pocket mouse ssp | G3 | | **19, 64, 67, 132, 134, 180** |
| Thirteen-lined ground squirrel | G3 | | **64, 67, 132, 180** |
| San Luis least chipmunk | G3 | | **64** |
| Botta's pocket gopher ssp pervagus | G3 | SC | **64, 132, 134,** 182 |
| Gunnison's prairie dog | G5 | | **19, 67, 132, 134, 180,** 182 |
| New Mexico jumping mouse | G2 | | 182 |
| ***Plants*** | | | |
| Dwarf milkweed | G3G4T2T3 | | 28 |
| Ripley milkvetch | G3 | | **26, 36, 132, 134** |
| Mountain bladder fern | G5 | | **26** |
| Brandegee clover | G5 | | **26, 166** |
| Colorado divide Whitlow-grass | G3 | | **36** |
| **Species** | **Global Rank*** | **Species Status**** | **Conservation Area Numbers (**San Luis Valley CAs are in **Bold)** |
| Parry's oatgrass | G2 | | **36** |
| Alpine poppy | G3 | | **36** |
| Arizona willow | G2 | | **36** |
| Slender spiderwort | G2 | | **19, 64, 67, 140** |
| New Mexico needle grass | G2 | | **19, 67** |

## Table 1.4 Conservation Target Species for Each of the Conservation Areas Within the Solar GDAs

| **Species** | **Global Rank*** | **Species Status**** | **Conservation Area Numbers (**San Luis Valley CAs are in **Bold)** |
|---|---|---|---|
| Longroot wild buckwheat | G4 | | **19** |
| *Draba spectabilis* var. *oxyloba* | G3 | | **134, 166** |
| Colorado larkspur | G2 | | **154** |
| Gray's Peak whitlow-grass | G3 | | **154** |
| Porsild's whitlow-grass | G3 | | **154** |
| Smith whitlow-grass | G2 | | **154,** 182 |
| Altai cottongrass | G3 | | **154** |
| Eastwood's podistera | G4 | | **154** |
| Altai chickweed | G4 | | **154** |
| Reflected moonwort | G2 | | **166** |
| Western moonwort | G3 | | **166** |
| Pale moonwort | G2 | | **166** |
| Northern moonwort | G4 | | **166** |
| Pale blue-eyed grass | G2 | | **180** |
| Sharp-leaf gumweed | G2 | | 182 |
| Lavender hyssop | G3 | | 182 |
| ***Reptiles*** | | | |
| Variable skink | G5 | | **36, 132,** 182 |

***Key to global ranking:**

G1 = Critically imperiled globally
G2 = Imperiled globally
G3 = Very rare and local throughout its range, or found locally in a restricted range
G4 = Apparently secure globally, though quite rare in parts of its range
G5 = Demonstrably secure globally, though quite rare in parts of its range
T = trinomial rank for subspecies, same classifications as the global rankings.

**** Key to Species Status** (Colorado Division of Wildlife, 2009):

FE = Federally Endangered
FT = Federally Threatened
SE = State Endangered
ST = State Threatened
SC = State Special Concern (not a statutory category)

## Table 1.5 Conservation Target Species for Each of the Conservation Areas Within the Wind GDAs

| Species | Global Rank* | Species Status** | Conservation Area Numbers | GDA Locations |
|---|---|---|---|---|
| **Fish** | | | | |
| Rio Grande Cutthroat Trout | G3 | SC | 86, 154 | GDA 8 |
| Rio Grande sucker | G3 | SE | 154 | GDA 8 |
| Greenback cutthroat trout | G2 | FT, ST | 154 | GDA 8 |
| Northern leopard frog | G5 | SC | 9, 11, 16, 18, 29 | GDAs 1 – 6 & 8 |
| Plains leopard frog | G5 | SC | 12, 16, 18, 27, 29, 30, 31 | GDAs 4 - 7 |
| Couch's spadefoot | G5 | SC | 29 | GDA 6 |
| Green toad | G5 | | 29, 30 | GDA 6 |
| Great plains narrowmouth toad | G5 | SC | 30 | GDA 6 |
| **Birds** | | | | |
| Cassin's sparrow | G5 | | 4, 9, 11, 12, 16, 18, 27, 29, 30, 31 | GDAs 1 - 7 |
| Ferruginous hawk | G4 | SC | 4, 9, 16, 18, 27, 29, 30, 31 | GDAs 1, 2 & 4 - 7 |
| McCown's longspur | G4 | | 4, 9, 11, 16, 27 | GDAs 1 – 3, 5 & 7 |
| Chestnut-colored longspur | G5 | | 4, 9 | GDAs 1 & 2 |
| Mountain plover | G2 | SC | 4, 9, 11, 12, 16, 18, 27, 29, 30, 31 | GDAs 1 - 7 |
| Long-billed curlew | G5 | SC | 16, 18, 27, 30, 31 | GDAs 5 - 7 |
| Lesser prairie chicken | G3 | ST | 16, 30, 31 | GDAs 5 - 7 |
| Greater prairie chicken | G4T4 | | 11, 12, 18 | GDAs 3 & 4 |
| Western snowy plover | G4T3 | SC | 27, 29 | GDAs 5 & 6 |
| Piping plover | G3 | FT, ST | 27, 29 | GDAs 5 & 6 |
| Greater sandhill crane | NA | SC | 4 | GDA 1 |
| Bald eagle | G4 | ST | 27, 30 | GDAs 5 & 6 |
| Black swift | G4 | | 154 | GDA 8 |
| Brown-capped rosy finch | G4 | | 154 | GDA 8 |
| **Insects** | | | | |
| Colorado blue | G3G4T3T4 | | 4, 9 | GDAs 1 & 2 |
| Dusted skipper | G4G5T3T4 | | 18 | GDA 4 |
| Great Sand Dunes anthicid beetle | G1 | | 154 | GDA 8 |
| Aphelia | G3 | | 154 | GDA 8 |
| Copablepharon | G3 | | 154 | GDA 8 |
| Circus beetle | NA | | 154 | GDA 8 |
| Wiest's sphinx moth | G3 | | 154 | GDA 8 |
| **Mammals** | | | | |
| Black-tailed prairie dog | G3G4 | SC | 9, 16, 31 | GDAs 1, 2 & 5-8 |
| Meadow jumping mouse (Preble's) | G5T2 | FT, ST | 9 | GDAs 1 & 2 |
| Pine marten | G5 | | 86, 154 | GDA 8 |
| Pale lump-nosed bat | G4 | | 154 | GDA 8 |
| Plains pocket mouse ssp. | G2 | | 154 | GDA 8 |
| **Plants** | | | | |
| Hall's milkweed | G3 | | 9 | GDAs 1 & 2 |
| Sandhill goosefoot | G3 | | 11, 16. 31 | GDAs 3, 5 & 7 |
| Andean prairie clover | G3G4 | | 31 | GDA 6 |
| Colorado larkspur | G2 | | 154 | GDA 8 |
| Gray's Peak Whitlow-grass | G3 | | 154 | GDA 8 |
| Porsild's Whitlow-grass | G3 | | 154 | GDA 8 |
| Smith Whitlow-grass | G2 | | 154 | GDA 8 |

## Table 1.5 Conservation Target Species for Each of the Conservation Areas Within the Wind GDAs

| Species | Global Rank* | Species Status** | Conservation Area Numbers | GDA Locations |
|---|---|---|---|---|
| Altai cottongrass | G3 | | 154 | GDA 8 |
| Eastwood's podistera | G4 | | 154 | GDA 8 |
| Altai chickweed | G4 | | 154 | GDA 8 |
| **Reptiles** | | | | |
| Northern many-lined skink | G5T5 | | 11 | GDA 3 |
| Yellow mud turtle | G5 | SC | 12 | GDA 4 |

***Key to global ranking:**

G1 = Critically imperiled globally
G2 = Imperiled globally
G3 = Very rare and local throughout its range, or found locally in a restricted range
G4 = Apparently secure globally, though quite rare in parts of its range
G5 = Demonstrably secure globally, though quite rare in parts of its range
T = trinomial rank for subspecies, same classifications as the global rankings.

**** Key to Species Status** (Source: Colorado Division of Wildlife, 2009):

FE = Federally Endangered
FT = Federally Threatened
SE = State Endangered
ST = State Threatened
SC = State Special Concern (not a statutory category)

## TABLE 1.6 LAND USE CONSISTENCY FOR FEDERALS LANDS WITHIN GDAs

| Federal Land Unit & GDA | Current Land Management Plan & Utility Corridor Compatibility |
|---|---|
| Pawnee National Grassland (GDAs 1 & 2) | Under the National Forest Management Act (NFMA) permits, contracts and other instruments for the use and occupancy of National Forest System lands are required to be consistent with the current Land and Resource Management Plan (LRMP). Land uses authorized by the Land & Realty Management Program include electric transmission facilities.<br><br>1997 Revision of the Arapaho and Roosevelt National Forests and Pawnee National Grassland LRMP designates existing utility corridors as Management Activity 8.3. Requirements include that power transmission and distribution lines minimize electrocution hazards for raptors and provide nests sites where feasible, utility corridors will be designed to blend with the landscape, and no areas of the grassland are designated as incompatible with transmission lines.<br><br>This LRMP was amended by the Final Programmatic EIS, Designation of Energy Corridors on Federal Land in the 11 Western States (DOE/EIS-0386) to provide electric energy corridor width of 200-3,500 feet where consistent with other resource values and uses in the planning area per Energy Policy Act Section 368. The width would be reduced where the corridor is confined by protected lands on each side. |
| Comanche National Grassland (GDA 6 & South/SE Pueblo Solar GDA | Cimarron and Comanche National Grasslands Land Management Plan, 2007. Goal 4: Help meet energy resource needs. Work with other agencies to identify and designate corridors for energy facilities. The Bankhead-Jones Farm Tenant Act 1981 amendment added "developing energy resources to the permissible purposes of the land conservation and utilization program."<br><br>The Campo Research Natural Area and OU Creek areas of the grasslands are not suitable for utility corridors. The Comanche Lesser Prairie Chicken Habitat Zoological Area and Picture Canyon are suitable for utility corridors. The following areas are suitable for utility corridors if species of concern plant habitats and unique geological features are avoided: Bent Canyon Bluffs, Mesa de Maya, Picture Canyon and Vogel Canyon. No ground disturbing activities are allowed within 300 feet of the Santa Fe National Historical Trail. |
| San Isabel National Forest (GDA 8 & South/SE Pueblo Solar GDA) | Pike & San Isabel National Forests Land and Resource Management Plan (LRMP), 1984. Only the Spanish Peaks area falls within the South/SE Pueblo Solar GDA. The Spanish Peaks vicinity within the San Isabel National Forest was designated as Management Areas 2B, 3A and SL. Areas 2B and 3A have a recreation emphasis. The SL designation is for the Spanish Peaks National Natural Landmark and Wilderness Study Area. The Spanish Peaks area was subsequently designated a Wilderness Area. Utility corridors are excluded from wilderness areas in the LRMP. |

## TABLE 1.6 LAND USE CONSISTENCY FOR FEDERALS LANDS WITHIN GDAs

| Federal Land Unit & GDA | Current Land Management Plan & Utility Corridor Compatibility |
|---|---|
| Santa Fe National Historic Trail (NHT) (South/SE Pueblo Solar GDA) | The Santa Fe Trails and Historic Byway was designated by the Colorado Department of Transportation. This byway encompasses the Mountain Route of the Sante Fe NHT and is generally 5-10 miles wide. The Corridor Management Plan for the byway does not address utility corridors or utility development. NHTs may contain campsites, shelters, and related-public-use facilities. Other uses along NHTs may be permitted if they will not substantially interfere with the nature and purposes of the trail under Section 7 of the NHT Act. |
| BLM Saguache, Del Norte and La Jara Field Offices (San Luis Valley Solar GDA) | San Luis Resource Area Proposed Resource Management Plan (RMP) and Final EIS, 1991. The RMP adopted utility corridor routes, identified by the Western Utilities Group (WUG) and included in the Rio Grande National Forest Plan with the following exceptions: 1) no utility corridor from the New Mexico State line north along the Rio Grande River to Alamosa; and 2) no major utility corridors will be allowed in existing Areas of Critical Environmental Concern (ACEC). ACECs within this GDA include the Blanca Wetlands ACEC, the San Luis Hills ACEC, Rio Grande Corridor ACEC, the Los Mogotes ACEC, the Ra Jadero Canyon ACEC, and the Cumbres & Toltec Railroad Corridor ACEC. |
| Alamosa & Monte Vista National Wildlife Refuges (NWRs)(San Luis Valley Solar GDA) | The National Wildlife Refuge System Administration Act (NWRSAA) requires that any use of a NWR must be compatible with refuge purposes and the mission of the NWR system. Before activities or uses can be allowed on a NWR, uses must be formally determined to be compatible by the Refuge Manager with the major purposes for which such areas were established under the NWR Refuge Recreation and Refuge Improvement Acts. U.S. Fish & Wildlife Service policy is to discourage the types of uses embodied in right-of-way requests (see 340 FW 3).<br><br>Alamosa-Monte Vista NWR Complex Colorado Comprehensive Conservation Plan (CCP), 2003. The CCP addresses public uses of the refuge, such as hunting and wildlife observation, but does not address the compatibility of electric transmission line corridors with refuge operations. |
| Baca NWR (San Luis Valley Solar GDA) | Baca NWR Conceptual Management Plan (CMP), 2005. The CMP is meant to be used for refuge management over a 3 – 5 year period until the CCP planning process was to start in 2008.<br>The CMP addresses public uses of the refuge, such as hunting and wildlife observation, but does not address the compatibility of electric transmission line corridors with refuge operations. |
| Great Sand Dunes National Park & Preserve (San Luis Valley Solar GDA) | Final General Management Plan (GMP)/Wilderness Study/Environmental Impact Statement (EIS) and Summary Document, 2007. The GMP and EIS establishes seven management zones: 1) Frontcountry; 2) Dunes Play; 3) Backcountry Access; 4) Guided Learning; 5) Backcountry Adventure; 6) Natural/Wild; 7) Administrative. Electric transmission corridors would not be considered consistent within the GMP Parkwide Desired Conditions and Strategies and therefore should not be considered. |
| Rio Grande National Forest (RGNF)(San Luis | The Final EIS for the 1996 Revised Land Management Plan (LMP) proposed no changes to existing or proposed utility corridors from the 1985 RGNF Plan. All existing and proposed utility corridors from the WUG Western Regional Corridor Study that was endorsed by the USFS in 1993 will remain as the current inventory. The FEIS |

## TABLE 1.6 LAND USE CONSISTENCY FOR FEDERALS LANDS WITHIN GDAs

| Federal Land Unit & GDA | Current Land Management Plan & Utility Corridor Compatibility |
|---|---|
| Valley Solar GDA) | lists three utility corridors within the RGNF. The utility corridor along Pinos Creek Road to Del Norte is the only one of these corridors that is within the San Luis Valley Solar GDA. The 1996 Revised LMP states that existing and designated utility corridors are to be conserved for future construction and occupancy.<br><br>Portions of the RGNF south of Highway 160 within the solar GDA are Inventoried Roadless Areas (IRAs) and Colorado Roadless Areas (CRAs), which are currently protected from road construction under the 2001 Roadless Area Conservation Rule at 36 CFR 294. Utility corridor development in IRAs and CRAs would not be consistent with USFS policy for roadless area development. Colorado has petitioned the Secretary of Agriculture to undertake state specific road area rulemaking for Colorado that would allow greater flexibility to adjust roadless area boundaries to more accurately reflect roadless characteristics, and correct outdated boundaries and mapping errors. The proposed roadless boundaries are the CRAs. The environmental affects of this rulemaking are analyzed in the Rulemaking for Colorado Roadless Areas Draft EIS, July 2008. |

Pinyon Canyon Maneuver Site (South/SE Pueblo Solar GDA) - The Master Plan for the installation is being updated and should be made publicly available by the Spring of 2009.

**Table 2.1 - Summary of Counties within the Study Area**

| | |
|---|---|
| Alamosa | Adams |
| Baca | Arapahoe |
| Bent | Crowley |
| Cheyenne | Denver |
| Conejos | Douglas |
| Costilla | El Paso |
| Elbert | Morgan |
| Huerfano | **Total = 7** |
| Kiowa | |
| Kit Carson | |
| Larimer | |
| Las Animas | |
| Lincoln | |
| Logan | |
| Otero | |
| Phillips | |
| Prowers | |
| Pueblo | |
| Rio Grande | |
| Saguache | |
| Sedgwick | |
| Washington | |
| Weld | |
| Yuma | |
| **Total = 24** | |

**Table 2.2 - Renewable Energy Projects in the Study Area**

| Name | County | Contact Info | Developer/Owner | Contact Info | Number of Turbines | Total MW | Start Date | Required Permit Type | Comments |
|---|---|---|---|---|---|---|---|---|---|
| **Constructed** | | | | | | | | | |
| Colorado Green Wind Project | Prowers | Mary Root - Land Use Department ph 719.336.8988 | Iberdrola, Shell, PPM Energy | NA | 108 | 162 | 2003 | Use by Special Review | 108 turbines spanning over 11,840 acres with a 500 GWh capacity. At the time was the fifth largest wind project in the Nation. Completed in late 2003. |
| ARPA | Prowers | Mary Root - Land Use Department ph 719.336.8988 | ARPA, Lamar L&P | Lamar - 719.336.7456<br>ARPA - 719.336.3496 | 5 | 7.5 | 2004 | Use by Special Review | 4 Turbines in Prowers County and 1 turbine in Baca County. |
| | Baca | Kristin Rau - 719.523.6532 | | | | | | None | |
| Peetz-Ridgecrest | Logan | Jim Neblett - 970.522.7879 | EnXco, Caithness | NA | 32 | 29.7 | 2001 | Conditional Use | |
| Peetz-Spring Canyon | Logan | | Invenergy | NA | 40 | 60 | 2006 | Conditional Use | |
| Peetz Table | Logan | | FPL Energy/NextEra | Kenny Stein 561.691.2216<br>Kevin Guilday 561.304.5644 | 267 | 400 | 2007 | Conditional Use | 82-mile long 230 kV transmission line crossing Morgan and Logan Counties |
| | Morgan | Barbra Gorrell - 970.542.3526 | | | | | | 1041 | |
| Cedar Creek | Weld | Chris Gathman - 970.353.6100 | Babcock & Brown and BP Alternative Energy | Matt Dallas 212.796.3981<br>Glen Hodges<br>Glen.Hodges@babcockbrown.com | 274 | 300 | 2007 | 1041 | 75-mile long 230 kV double circuit transmission line. |
| Ponnequin | Weld | | Xcel Energy | NA | 35 | 31.5 | 1999 | 1041 | |
| Twin Buttes | Bent | Bill Long - 719.469.0058 | Iberdrola | NA | 50 | 75 | 2007 | Use by Special Review | |
| **Permitted** | | | | | | | | | |
| Peetz-Phase II | Logan | Jim Neblett - 970.522.7879 | FPL Energy/NextEra | Kenny Stein 561.691.2216<br>Kevin Guilday 561.304.5644 | 218 | 327 | NA | Conditional Use | |
| Fleming | Logan | | Environ | NA | 88 | 132 | NA | Conditional Use | |
| Limon | Lincoln | Ken Morgan - 719.743.2337 | RES | NA | 180 | 270 | NA | Use by Special Review | |
| Genoa | Lincoln | | Iberdrola | NA | 80 | 120 | NA | Use by Special Review | |
| Cedar Point Wind Project | Lincoln | Ken Morgan - 719.743.2337 | RES | Kara Cubbage - 512.617.3544<br>James Given- 303.439.4222 | NA | 300 | NA | Use by Special Review | Proposed 300 MW wind energy project. Would consist of two onsite substations, over 40 miles of overhead transmission line, and an interconnection switchyard. Wind turbines in eastern Elbert County and western Lincoln County across 20,000 acres of land leased by RES Americas. |
| | Elbert | Curtis Carlson 303.621.3130 | | | | | | 1041 | |
| | Arapahoe | Sherman Feher - 720.874.6650 | | | | | | 1041 (public)<br>Use by Special Review (private) | |
| **Proposed** | | | | | | | | | |
| Pole Canyon | Huerfano | NA | Babcock & Brown and BP Alternative | Matt Dallas 212.796.3981<br>Glen Hodges | NA | 300 | NA | Conditional Use | 40 mile transmission line across Pueblo and Huerfano Counties. |
| | Pueblo | NA | | | | | | 1041 | |
| NA | Saguache | Land Use Department Wendi Maez - 719.655.2321 | Pioneer Solar, LLC | NA | NA | NA | NA | 1041 | Solar development |
| NA | Yuma | Land Use Department Linda Briggs - 970.332.5796 | Duke Energy | NA | 80 to 100 | NA | NA | Land Use | |
| Clipper Wind Project | El Paso | Craig Dossey 719.520.6300 | NA | NA | NA | NA | NA | NA | Wind development |

1. NA - not applicable/not available

**Table 2.3 - County Permit Matrix**

| Permit | County | Description | Estimated Preparation and Processing Duration[1] | Relative Cost[2] (Very High [>$500,000], High [ $100,000 - $500,000], Moderate [$25,000 - $100,000], and Low [<$25,000]) |
|---|---|---|---|---|
| 1041 - Areas and Activities of State Interest | Weld | Generally required for siting and construction of a major facility of a public utility which includes transmission lines, power plants (renewable and non-renewable), and substations with capacities that exceed a specified threshold. Environmental impact assessments are required by some counties and are encouraged in others. At a minimum, the Colorado Division of Wildlife will require avian and bat studies as part of the environmental impact assessment for wind farm developments. In Prowers, Arapahoe, and Adams Counties a 1041 permit is only required for public electrical utility developments. in these Counties public electrical energy developments are permitted differently. In Elbert County a 1041 permit is only required for transmission lines and substations associated with a wind farm and not for the wind farm itself, which requires a Use by Special Review. | 8 to 12 months | Moderate to High (Permit fees generally range from $600 to $25,000) |
| | Morgan | | | |
| | Elbert | | | |
| | Prowers | | | |
| | Pueblo | | | |
| | Las Animas | | | |
| | Otero | | | |
| | Larimer | | | |
| | Arapahoe | | | |
| | Adams | | | |
| Use By Special Review or Special Use | Lincoln | Generally required for siting and construction of power plants (renewable and non-renewable), transmission lines, and substations with capacities that exceed a specified threshold. Environmental impact assessments are required by some counties and are encouraged in others. At a minimum, the Colorado Division of Wildlife will require avian and bat studies as part of the environmental impact assessment for wind farm developments. In Elbert County a Special Review Permit is not required for transmission lines and substations but is required for wind farms. In Prowers and Arapahoe Counties a Special Review permit is only required for a private electrical energy developments. In these Counties public electrical utility developments are permitted differently. | 8 to 12 months | Moderate to High (Permit fees generally range from $25 to $10,000) |
| | Elbert | | | |
| | Bent | | | |
| | El Paso | | | |
| | Conejos | | | |
| | Douglas | | | |
| | Prowers | | | |
| | Saguache | | | |
| | Washington | | | |
| Conditional Use | Huerfano | Generally required for siting and construction of power plants (renewable and non-renewable), transmission lines, and substations with capacities that exceed a specified threshold. Environmental impact assessments are required by some counties and are encouraged in others. At a minimum, the Colorado Division of Wildlife will require avian and bat studies as part of the environmental impact assessment for wind farm developments. In Adams County, a Conditional Use Permit is not required for transmission lines and substations but is required for wind farms. In this County transmission lines and substations are permitted differently. | 8 to 18 months | Moderate to High (Permit fees are generally less than or equal to $500) |
| | Logan | | | |
| | Kiowa | | | |
| | Alamosa | | | |
| | Phillips | | | |
| | Cheyenne | | | |
| | Denver | | | |
| | Rio Grande | | | |

| | | | | |
|---|---|---|---|---|
| Land Use | Yuma | Generally required for siting and construction of power plants (renewable and non-renewable), transmission lines, and substations with capacities that exceed a specified threshold. Environmental impact assessments are required by some counties and are encouraged in others. At a minimum, the Colorado Division of Wildlife will require avian and bat studies as part of the environmental impact assessment for wind farm developments. | 8 to 12 months | Moderate to High (Permit fees are generally less than or equal to $200) |
| | Costilla | | | |
| Building | All Counties | Required for construction in unincorporated portions of the county. Will not be issued until all county permitting requirements have been satisfied. The building permit fees are variable and can be based on the value of the development, per mega watt hours generated, per land | 1 to 2 months | Moderate to Very High |
| Easement/Right-of-Way | All Counties | Required for easements across County roads and/or through County property and for construction in public rights-of-way. In Lincoln County the permit is free. | 1 to 2 months | Low |

Notes

1. The estimated preparation and process duration is based on feedback from selected counties and developers and includes all aspects of the permit application including the environmental impact assessment.
2. The relative cost is based on feedback from selected counties and developers and includes all estimated costs associated with the permit application including the environmental impact assessment.

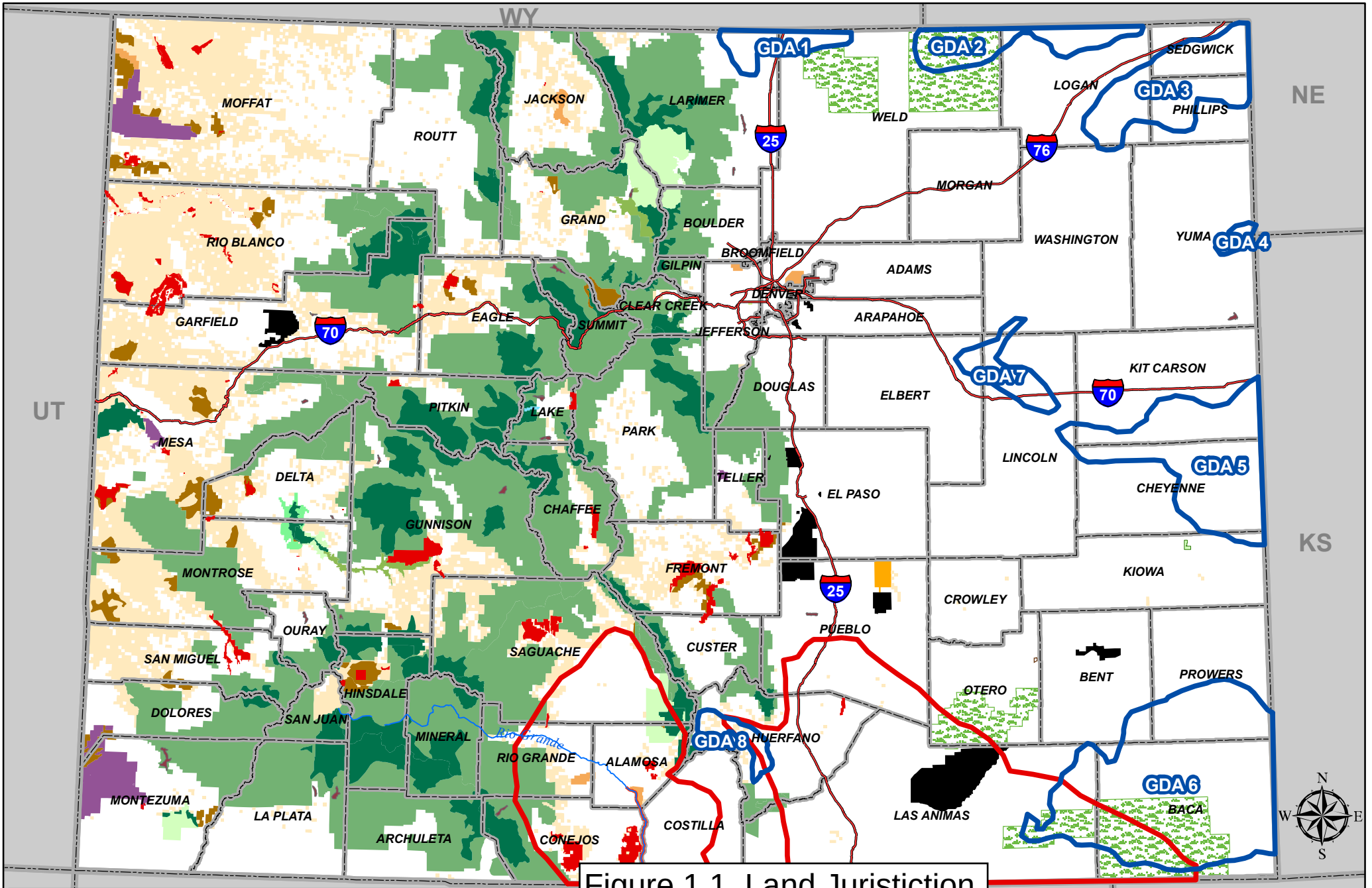



Figure 1.1 Land Juristiction

SOURCE:
Colorado Ownership, Management, and Protection (COMaP), Natural Resource Ecology Lab (NREL), and the Human Dimensions of Natural Resources Department, UCSB_MAD - ESRI Geography Network Colorado Natural Diversity Information Source Colorado Division of Wildlife. Colorado BLM

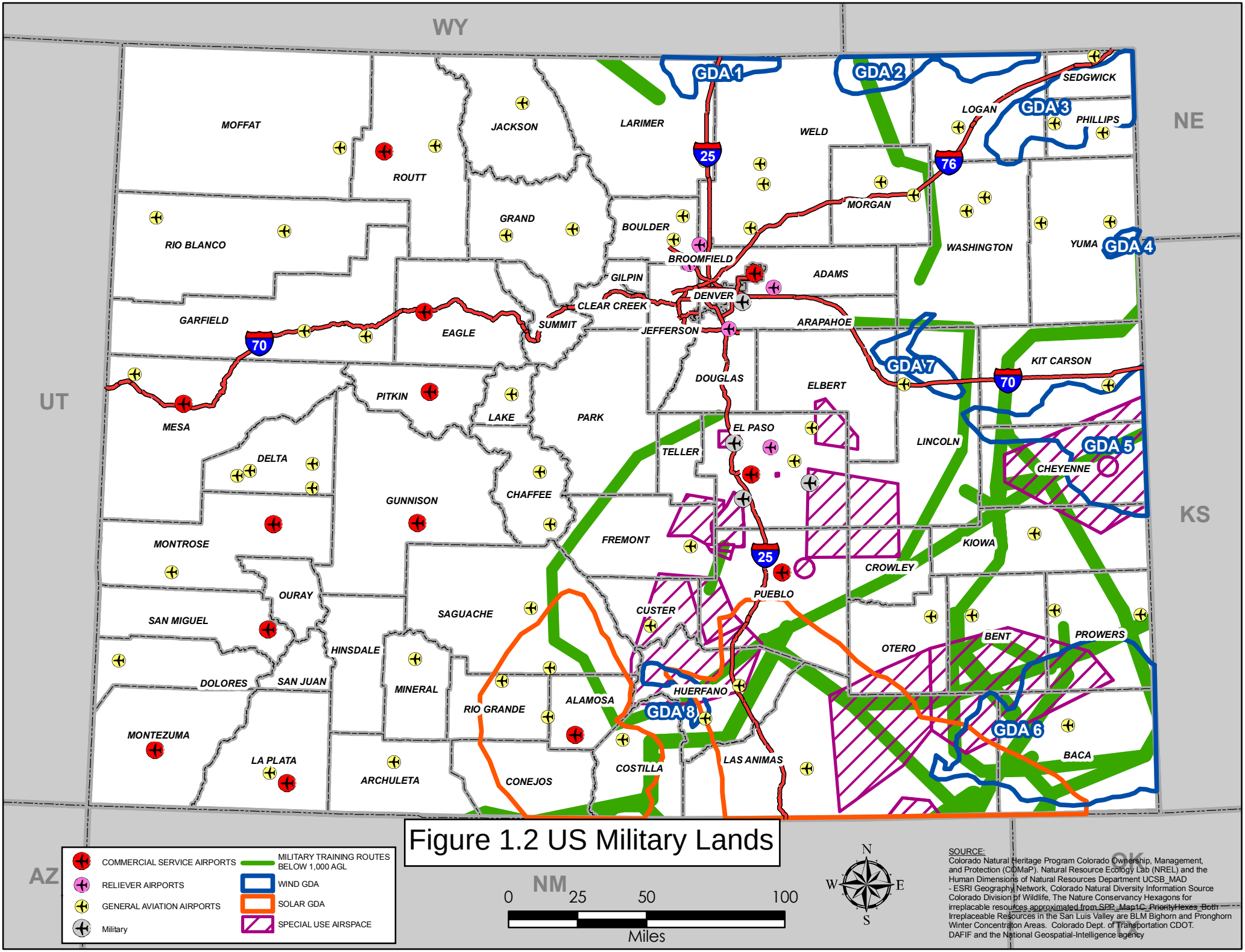
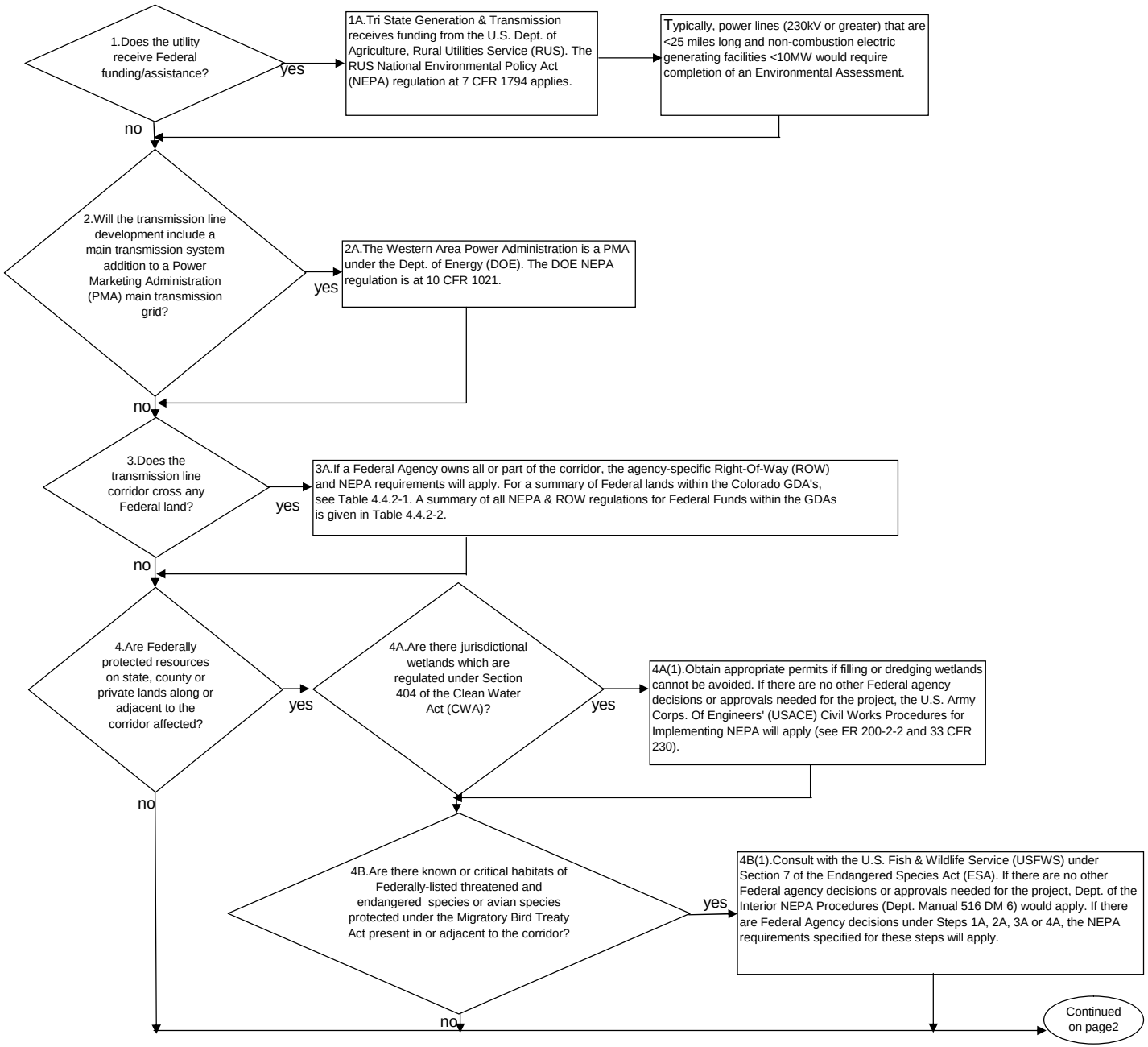



Figure 1.2 US Military Lands

SOURCE:
Colorado Natural Heritage Program Colorado Ownership, Management, and Protection (COMaP). Natural Resource Ecology Lab (NREL) and the Human Dimensions of Natural Resources Department UCSB_MAD - ESRI Geography Network, Colorado Natural Diversity Information Source Colorado Division of Wildlife, The Nature Conservancy Hexagons for irreplacable resources approximated from SPP_Map1C_PriorityHexes_Both Irreplaceable Resources in the San Luis Valley are BLM Bighorn and Pronghorn Winter Concentration Areas. Colorado Dept. of Transportation CDOT. DAFIF and the National Geospatial-Intelligence agency

**Figure 1.3 ELECTRIC TRANSMISSION LINE ENVIRONMENTAL DOCUMENTATION PERMITTING FLOWCHART**





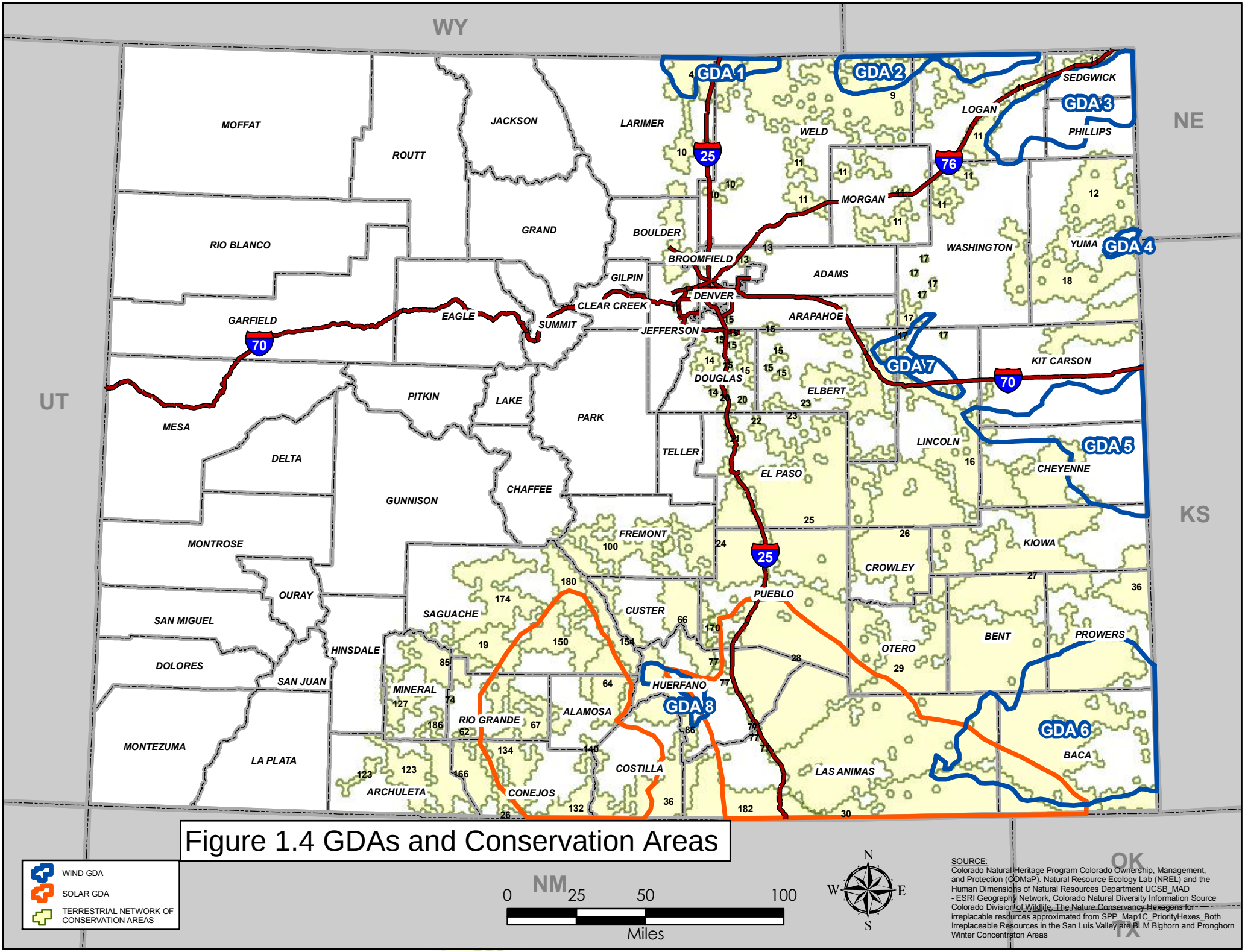
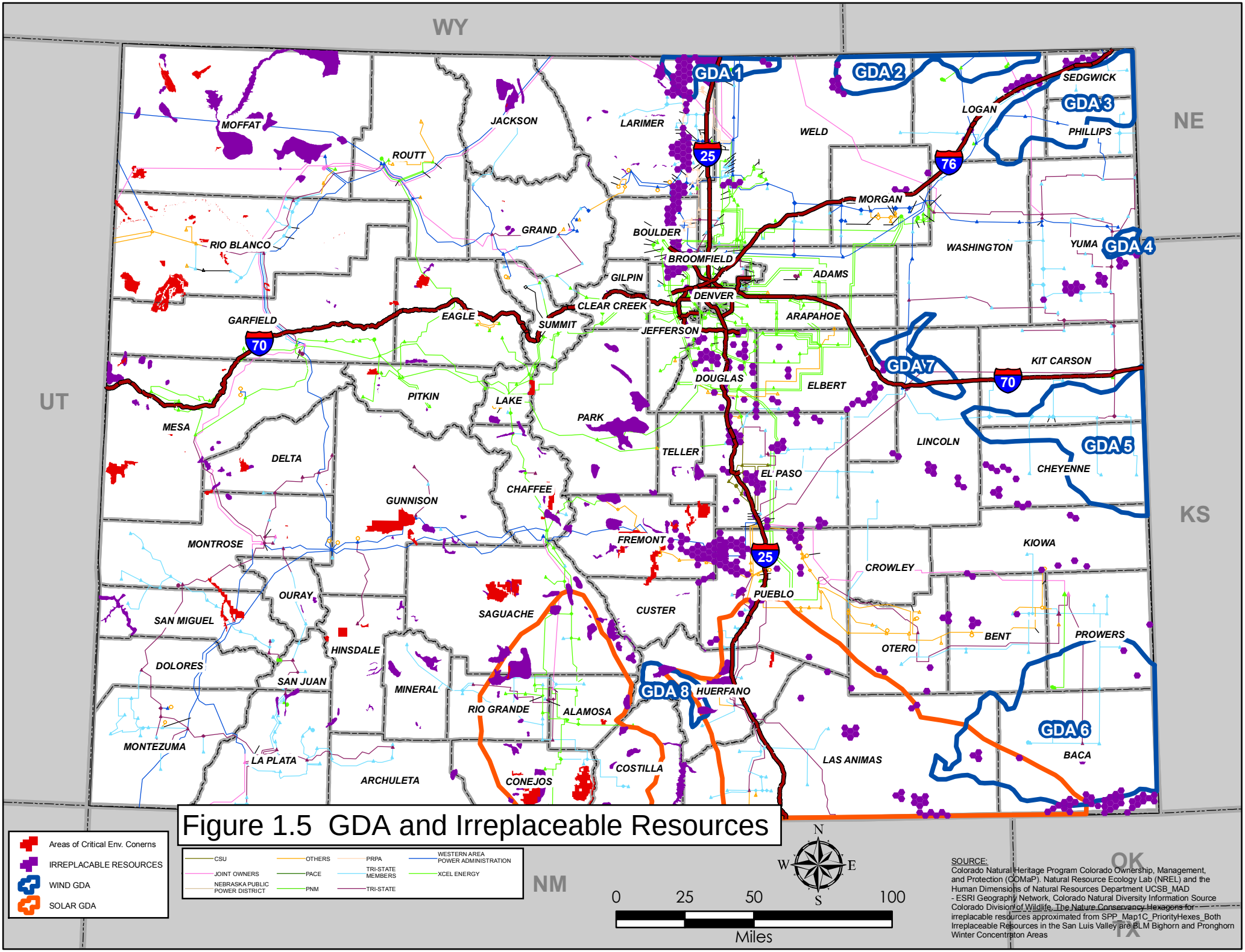



Figure 1.4 GDAs and Conservation Areas




# Figure 1.5 GDA and Irreplaceable Resources

SOURCE:
Colorado Natural Heritage Program Colorado Ownership, Management, and Protection (COMaP). Natural Resource Ecology Lab (NREL) and the Human Dimensions of Natural Resources Department UCSB_MAD
- ESRI Geography Network, Colorado Natural Diversity Information Source Colorado Division of Wildlife, The Nature Conservancy Hexagons for irreplacable resources approximated from SPP_Map1C_PriorityHexes_Both Irreplaceable Resources in the San Luis Valley are BLM Bighorn and Pronghorn Winter Concentraton Areas

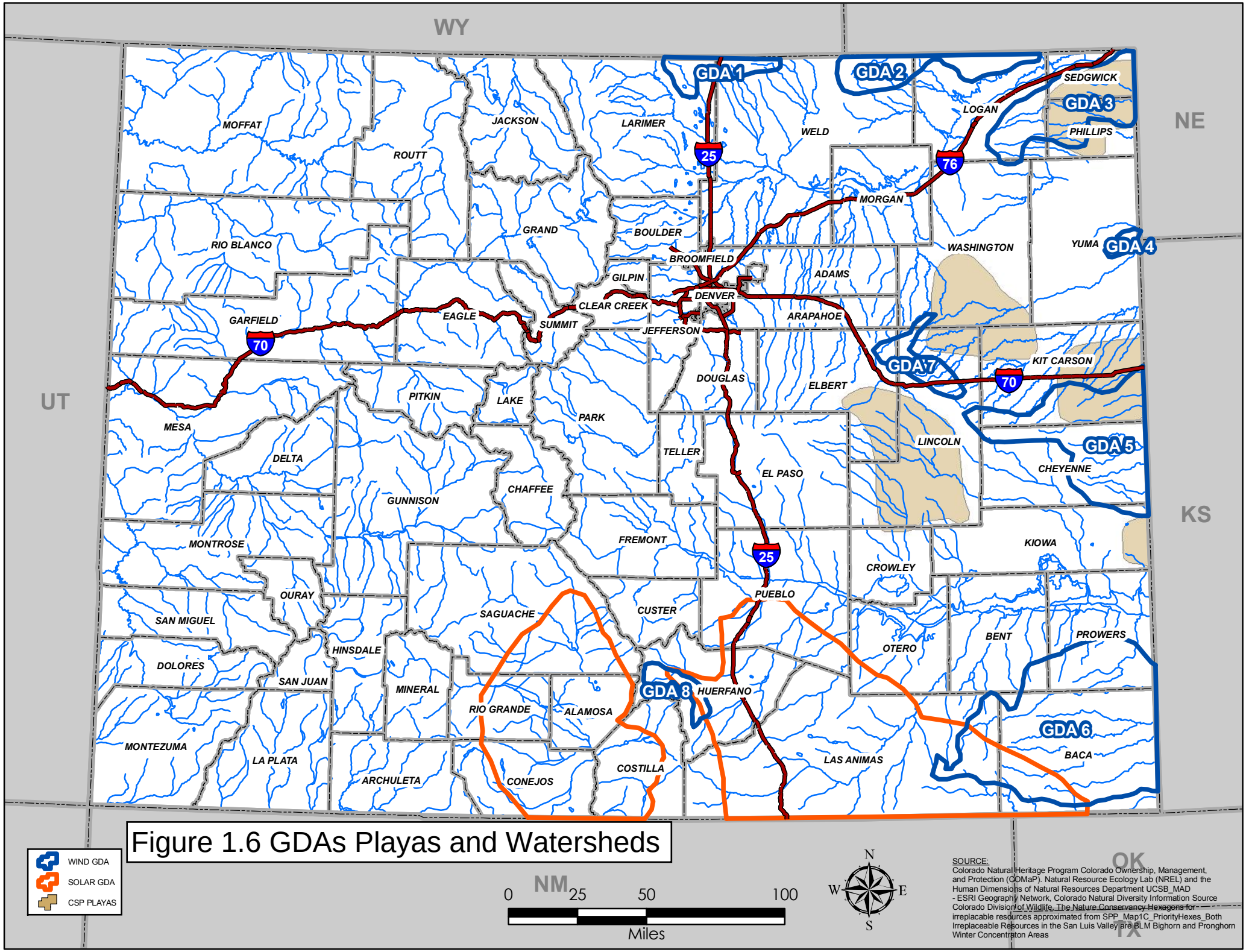



Figure 1.6 GDAs Playas and Watersheds

SOURCE:
Colorado Natural Heritage Program Colorado Ownership, Management, and Protection (COMaP). Natural Resource Ecology Lab (NREL) and the Human Dimensions of Natural Resources Department UCSB_MAD - ESRI Geography Network, Colorado Natural Diversity Information Source Colorado Division of Wildlife, The Nature Conservancy Hexagons for irreplacable resources approximated from SPP_Map1C_PriorityHexes_Both Irreplaceable Resources in the San Luis Valley are BLM Bighorn and Pronghorn Winter Concentraton Areas

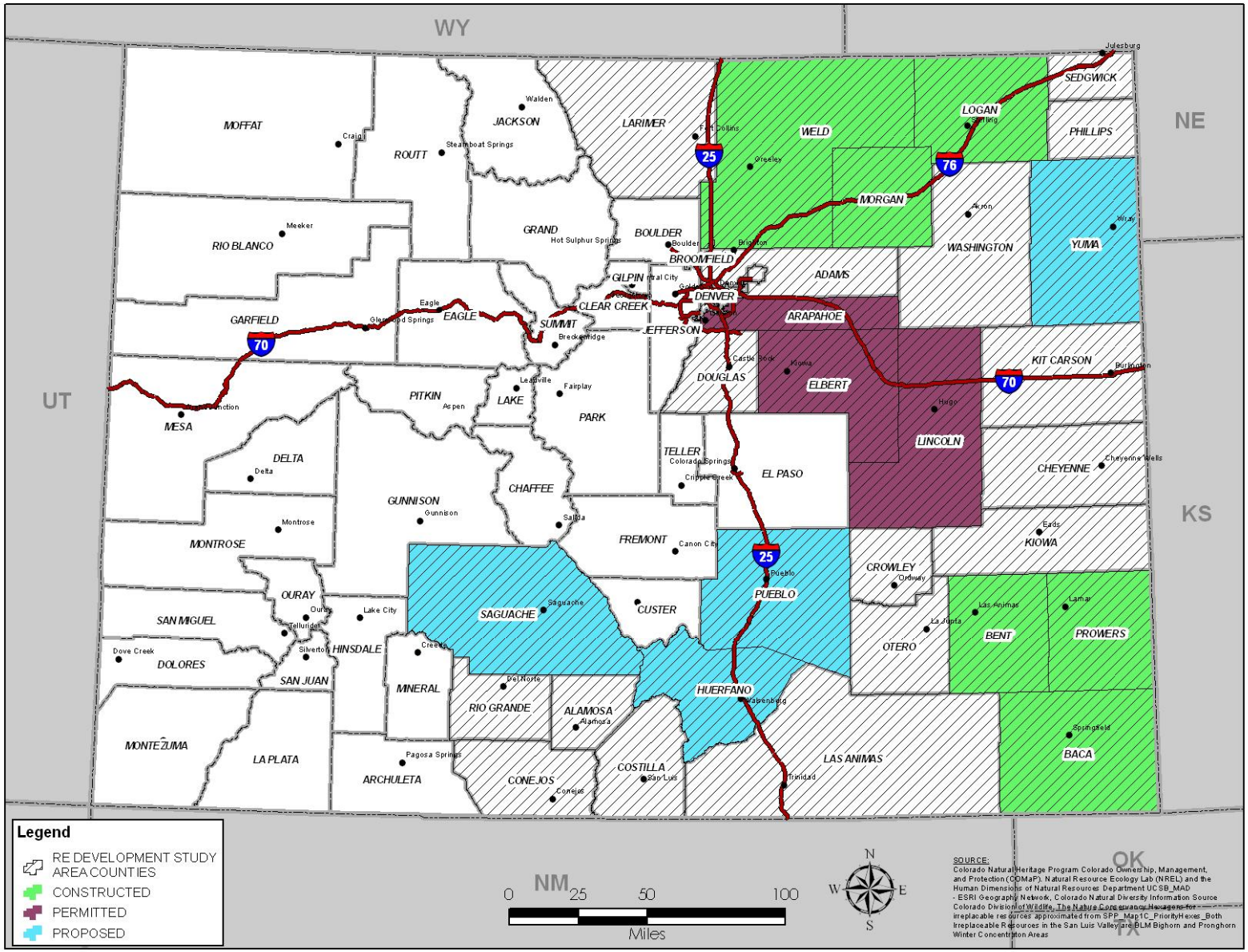



**Figure 2.1 – Study Area and Counties with Renewable Energy Projects**