# Appendix H – Biological Assessment

Ecosphere
Environmental Services

Durango, CO
Cortez, CO
Pagosa Springs, CO
Farmington, NM

January 22, 2013

Bureau of Indian Affairs
Southern Ute Agency
Ignacio, Colorado

Re: North Carracas Plan of Development Biological Assessment

Dear Reader,

In March 2012, a revised Biological Assessment for the proposed North Carracas Plan of Development was submitted to the Bureau of Indian Affairs (BIA) Southern Ute Agency (SUA). On April 2, 2012 the Southern Ute Indian Tribe Department of Natural Resources Division of Wildlife Resource Management concurred with the findings in the revised Biological Assessment. On November 27, 2012, the United States Fish and Wildlife Service concurred with the findings in the revised Biological Assessment following a the BIA-SUA commitment to require Knowlton's cactus spring surveys when site specific habitat conditions warrant and to consider avoidance and other measures to minimize impacts, as required by informal or formal section 7 consultation.

An inaccurate location of one proposed well pad was included on the Proposed Action Map in Attachment A of the March 2012 revised Biological Assessment. Attached is a map showing the correct proposed well location, which should be used in place of the original map.

The March 2012 Biological Assessment stated that the Non-development Minerals Agreement (NMDA) prohibits drilling on the surface of tribal trust lands (page 2, paragraph 2). To clarify this statement, the terms of the North Carracas lease prohibit drilling wells on the described Tribal Trust lands within the boundaries of the lease; therefore, as to the NMDA, in almost all instances, wells associated with the proposed project would be located on private lands accessing Federal minerals held in trust for the Tribe. In one instance, however, the surface of private lands where a well would be located (Section 22, Township 32 North, Range 4 West) has been acquired by the Tribe and placed into federal trust status since approval of the NDMA, subject to pre-existing private mineral development rights. A well is anticipated to be located on those acquired Tribal Trust surface lands and directionally and horizontally drilled into the neighboring, subsurface oil and gas resources underlying NDMA Tribal Trust lands.

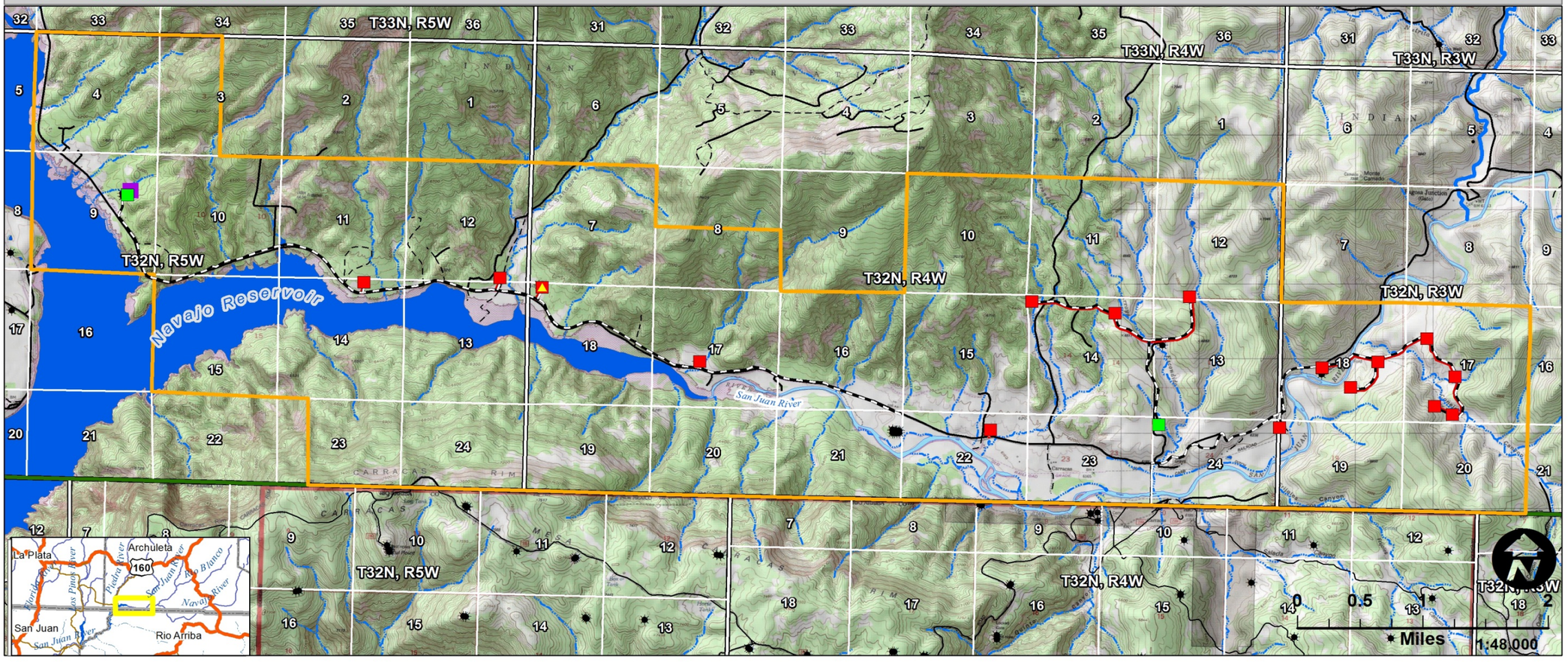
If you have any questions regarding the proposed project, please contact me at 505-327-3088.

Sincerely,

Joey Herring, Project Manager
Ecosphere Environmental Services

Ecosphere
Environmental Services

# Southern Ute Indian Tribe




## LEGEND

- Existing Well Pad
- Proposed New Well Pad
- Proposed Salt Water Disposal Well
- Proposed Compressor Station
- Existing Oil and Gas Wells
- Proposed Pipeline
- Proposed Access Roads
- Existing Roads
- Southern Ute Reservation Boundary
- North Carracas Area of Mutual Interest

Coordinate System: NAD 1983 UTM Zone 13N

## NORTH CARRACAS PLAN OF DEVELOPMENT

### PROPOSED ACTION

ARCHULETA COUNTY, CO

TOWNSHIP 32 NORTH, RANGE 3, 4, & 5 WEST

CARRACAS AND PAGOSA JUNCTION,
CO QUADRANGLES

DATE: 1/17/2013

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Ecosphere
Environmental Services

# North Carracas Plan of Development Biological Assessment

**Prepared for:**

**Bureau of Land Management Tres Rios Field Office**

**Bureau of Indian Affairs Southern Ute Agency**

**Southern Ute Indian Tribe**

**Revised March 2012**

**Durango, CO**
**Cortez, CO**
**Pagosa Springs, CO**
**Farmington, NM**

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# 1. INTRODUCTION

Ecosphere Environmental Services (Ecosphere) was contracted by the Southern Ute Indian Tribe (SUIT) to conduct a Biological Assessment (BA) for the proposed North Carracas Plan of Development (POD). The POD contemplates the drilling of 48 Fruitland coal bed methane (CBM) wells located on 18 well pads utilizing horizontal, vertical and s-shaped drilling techniques, one salt water disposal well, associated roads and pipelines, and a compressor facility located on Tribal Trust and private (fee) lands in Archuleta County, Colorado.

A BA is required by law (Endangered Species Act [ESA] of 1973, 16 United States Code [USC] 1531 et seq.) for projects on Tribal or Federally managed lands. A BA is the means to review, analyze, and document the direct, indirect, interrelated, interdependent and cumulative effects on U.S. Fish and Wildlife Service (USFWS) federally listed endangered, threatened, proposed, or candidate species as well as proposed or designated critical habitats thereof, as a result of development actions on Federally managed lands.

This BA was prepared for the POD and is therefore programmatic in nature. Site specific consultation will be conducted once locations of specific project components are identified for any elements of the project that may affect listed species.

## 1.1 Background

The SUIT, U.S. Bureau of Indian Affairs (BIA), U.S. Bureau of Land Management (BLM), and Colorado Oil and Gas Conservation Commission (COGCC) have signed a Memoranda of Understanding (MOU) and Interagency Agreements, as appropriate, that outline how these Tribal and government entities work together to regulate oil and gas operations within the exterior boundaries of the Southern Ute Indian Reservation (Reservation). These Memoranda simplify procedures for the many operators who conduct business on the Reservation and help eliminate duplication of effort by the agencies themselves. The Memorandum and Agreements state that all matters which would require COGCC approval for actions involving non-Tribal, non-Federal minerals shall be submitted initially to the COGCC. The COGCC must notify the BLM of applications pertaining to Federal or Tribal minerals and may not consider an application regarding Tribal lands without the express consent of the BLM. The BLM is responsible for notifying the SUIT about applications involving Tribal minerals. If the SUIT has an objection or wishes to make stipulations on approval of the application ("conditions of protest"), then the BLM must convey the details thereof to the COGCC. The COGCC must either incorporate the conditions of protest submitted by the BLM (on behalf of the BLM or the SUIT) or relinquish jurisdiction on the issue to the BLM, insofar as it relates to Federal or Tribal lands.

The Tres Rios Field Office is preparing a programmatic environmental assessment for the SUIT proposal and various federal actions that would be required by the BLM and the BIA to proceed with the SUIT proposal. The proposed Federal actions would be the approvals to be issued by the BLM and BIA in

order to implement the POD. Specifically, those approvals would be (1) the subsequent issuance by the BLM of Applications for Permit to Drill (APDs) for all wells in the affected area whose laterals would penetrate Tribal Trust minerals, (2) the approval by the BLM of drilling and operation of the salt water disposal well (to the extent that the salt water disposal well is intended for injection of produced water in Tribal Trust subsurface formations), (3) the approval by the BIA of communitization agreements that pool natural gas resources from Tribal Trust and fee mineral lands within designated spacing units, (4) the possible approval by the BIA of a unit agreement that pools natural gas resources and governs operations on a POD-wide basis; (5) the issuance by the BIA of any rights-of-way (ROWs) for roads or pipelines needed to implement the POD, and (6) the approval by the BIA of any surface lease agreements associated with any other POD facilities located on Tribal Trust land including the compressor facility. Although surface disturbance of Tribal Trust lands under the POD is limited, specific road, pipeline, or facility installation on tribal trust lands would be subject to on-site review, location approval, and stipulations designed to eliminate or minimize adverse impacts to valued resources.

In 2007, pursuant to the Indian Mineral Development Act of 1982 (25 USC 2101 et seq.) and its implementing regulations (25 Code of Federal Regulations [CFR] Part 225), the SUIT (as lessor) and the SUIT doing business as (dba) Red Willow Production Company (Red Willow) (as lessee) entered into a Non-Development Minerals Agreement (NDMA) for the North Carracas Area. The NDMA, as amended, was approved by an authorized representative of the Secretary of the Interior and became effective on November 1, 2007 (#750-08-2008). The terms of the NDMA prohibit the drilling of wells on the surface of Tribal Trust lands, but authorize the subsurface extension of well laterals from neighboring private lands into Tribal subsurface mineral formations. The terms of the NDMA further expressly contemplate and authorize the pooling of private and tribal mineral lands within the area of mutual interest (AMI), either on a spacing unit basis through communitization, or on an AMI basis through unitization. The terms of the NDMA also contemplate the potential location of roads, pipelines or other non-well facilities on the surface of tribal trust lands; however, because the associated wells would be located on neighboring private fee lands, most road, pipeline, and facility locations would also be located on private fee lands.

# 2. PROPOSED ACTION

## 2.1 Summary of the Proposed Action

The North Carracas AMI is an 18,123 acre parcel located in Archuleta County, Colorado within the exterior boundaries of the Reservation as shown on Map 1 in Attachment A. The AMI consists of Tribal Trust, Indian-owned fee, U.S. Bureau of Reclamation (USBR), and non-Indian owned fee lands. The AMI and the proposed components of the POD are shown on Map 2 in Attachment A. The legal description of the AMI and the land involved in this analysis is listed below:

W/2 of Section 3; all of Sections 4, 9, 10, 11, 12, 13, 14, 15, 24; E/2 and E/2 of the W/2 of Section 23, Township 32 North, Range 5 West, New Mexico Principal Meridian (NMPM);

All of Section 7, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24; and the S/2 of Section 8, Township 32 North, Range 4West, NMPM; and

All of Section 17, 18, 19, and 20, Township 32 North, Range 3 West, NMPM.

The SUIT proposes to develop the oil and gas resource in the North Carracas area of the Reservation. The proposed POD would include 48 Fruitland coal bed methane wells located on 18 well pads, one salt water disposal well, associated roads and pipelines, and a compressor facility. To minimize surface disturbance, (1) two existing pads would be utilized, (2) multiple wells would be drilled from individual well pads, and (3) existing corridors would be used to the greatest extent practicable for flow lines and access roads. Three drilling techniques would be used to optimize resource recovery—horizontal, vertical, and vertical s-shaped wells. The development is proposed to occur over an estimated 4 to 5 year period.

The stipulations of the North Carracas AMI lease prohibit drilling wells on Tribal Trust lands; therefore, wells associated with the proposed action would be located on fee lands accessing federal minerals held in trust for the Tribe. Flow lines and access roads would be constructed on fee lands to the maximum extent practicable; however, impacts to Tribal Trust lands would occur. Tribal surface use for flow lines and roads would be subject to the issuance of the Tribe's consent to the location of such surface facilities, as is permissible under the lease terms and conditions.

In the future, APDs would be prepared as specified by BLM for the drilling program. Each well pad would be subject to additional site-specific environmental and cultural analysis at the time of the APD submittal, as determined by the BLM and BIA. ROW grants would be prepared as specified by the BIA and SUIT. The pipeline and/or access roads would also be subject to site-specific environmental and cultural analysis at the time of the grant submittal.

### 2.1.1 Drilling

The proposed action is shown on Map 2 in Attachment A. The proposed action components as shown on Map 2 have been identified based on land status, access, spacing, and reservoir characteristics. The exact well pad locations are expected to be in the same general locations but could be adjusted based on future site-specific environmental and cultural analyses.

Well pad size would vary based on the number of wells drilled from the pad. Short-term disturbance would range from 3 to 6.25 acres per pad. Following interim reclamation, long-term disturbance associated with the well pads would range from 1 to 3.65 acres per pad. Two existing well pads would be utilized as co-locations (twinned locations), which would overlap existing disturbance. Total short-term disturbance from new well pad construction and expansion of existing pads would be approximately 56.25 acres. Long term disturbance would be approximately 35.45 acres.

Activities associated with the proposed action alternative would include well pad construction, drilling, stimulation and completion of the proposed natural gas wells, and the installation of any surface

equipment necessary for natural gas production. At each well pad, construction crews would remove vegetation from the proposed location and the pad would be leveled and contoured. Existing pads would be expanded. Cuts and fills would vary between the proposed pads based on specific location characteristics. Excavated materials from the cuts would be used on the fill portion of the location to level the pad. Clearing and leveling is needed to provide a level surface for rig and equipment access, and drilling. There would be no reserve pit, blow pit; or flare stack.

Natural gas well drilling facility assembly would occur on the well pad after site clearing and leveling. Drilling equipment located on each drilling pad would include the drilling rig and associated equipment (e.g., blowout preventer, separator, etc.), pipe storage, one 400 barrel flow line tank, pumps, generators, a forklift, four to five housing trailers, three additional 400 barrel storage tanks, and mud pallets.

Multiple wells on individual pads would be spaced to emphasize safe operation and maintenance, optimize rig movement, minimize surface disturbance, and to allow for simultaneous completion operations. After drilling, the pad design would also allow for uninterrupted operation of an artificial lift pump while a workover (if needed) is proceeding on an adjacent well. A workover is the process of performing major maintenance or remedial treatments on an oil or gas well.

Closed-loop systems would be utilized for all wells. The drilling mud would be water-based. Closed-loop systems employ a suite of solids control equipment to minimize drilling fluid dilution. This results in a “dry” location where a reserve pit is not required, used fluids are recycled, and solid wastes can be land farmed, hauled off, or injected downhole. After the majority of the water is removed from the cuttings with the shaker and centrifuge, the cuttings would be stored in a bermed and lined “drying pit” and allowed to dry further. Cuttings would be transported to the Bondad Landfill—an approved disposal facility. Total cuttings removed volume from a “typical” wellbore, not including any kind of excess, would be about 2,710 cubic yards. Cuttings transport bins would be 20 cubic yard containers, but would only transport 12 cubic yards at a time for weight reasons. The total number of cutting haul loads per well would be approximately 10 to account for any residual liquid.

### 2.1.2 Completion

The majority of wells would be horizontally drilled. A 9-5/8 inch surface casing would be set to a depth of no less than 400 feet total vertical depth. The 8-3/4 inch intermediate well bore would then be drilled with a curve being built and landed in the target coal at an inclination of approximately 88 degrees. A 7 inch intermediate casing would then be run, set to depth, and cemented to the surface. A 6-1/4 inch production lateral would then be drilled to the total depth and a pre-perforated liner with no less than 8 shots per foot would then be run to provide wellbore integrity over the life of the well.

Hydraulic fracturing is not proposed for any horizontal wells for the North Carracas development. Vertical completion techniques may be utilized on the eastern portion of the action area due to specific geologic conditions. It is anticipated that wells utilizing vertical completion techniques would require

hydraulic fracturing. If needed, a Halliburton Delta 140 fracturing fluid (or similar fluid) would be used. Each vertical or deviated s-shaped well would require approximately 60,000 gallons for fracturing. If needed, approximately 100,000 gallons of water would be used to stimulate the salt water disposal well. Water for hydraulic fracturing would be obtained under existing water rights or from commercial sources.

Green completion technology would be used. Green completions take place during the flowback stage of the completion. The flowback involves removing the water necessary to stimulate the well. During this flowback, natural gas is produced with the water. What makes the well completion "green," or environmentally friendly, is that the gas is separated from the water and placed in a pipeline instead of being released to the atmosphere.

### 2.1.3 Pipelines

A pipeline gathering system would be constructed to transport both gas and produced water from the proposed wells. Red Cedar Gathering Company has been designated as the primary recipient of produced gas from the North Carracas AMI. Pipelines would be located adjacent to existing or proposed disturbance to the maximum extent practicable. All pipelines would be constructed within 40-foot wide ROWs. The Middle pipeline would be a subsurface 20 inch outside diameter welded steel line. The Middle pipeline would be approximately 7.1 miles in length. A pipeline would also be constructed beneath the San Juan River on the eastern portion of the action area. This pipeline would be 8 to 12 inch outside diameter and approximately 3.9 miles in length. Shorter pipelines from the proposed wells would connect to the Middle and East gathering lines. These pipelines would be 8 to 12 inch outside diameter welded steel lines. The total disturbance associated with the pipeline gathering system would be approximately 70.8 acres.

### 2.1.4 Access

Archuleta County Road (CR) 500 (aka Trujillo Road) bisects the North Carracas area from west to east and is the primary access. Access to the North Carracas area would also be south from New Mexico using Forest Service Road 218 and the North Carracas Road.

Under the proposed action, approximately 4.5 miles of access roads would be constructed. Proposed well pad access roads would be constructed from CR 500 within the same ROW as the proposed pipelines to the maximum extent practicable in order to minimize surface disturbance.

A bridge would be constructed over the San Juan River to access the proposed wells pads in the easternmost portion of the project area. Access to the bridge and wells will be acquired from a private land owner. The bridge design would be similar to the bridge constructed over the river to connect Carracas to CR 500. The bridge would be constructed with steel risers into competent bed rock within the river, and steel beams across to support. Surface will be an all-weather maintainable finish. Bridge

design and construction would comply with all Colorado Department of Transportation (CDOT) regulations and U.S. Army Corps of Engineers (USACE) permitting requirements.

### 2.1.5 Production

Pumping units would be used for artificial lift at each well. Pumping units would consist of natural gas-powered engines. The North Carracas POD would include the drilling of a salt water disposal well located adjacent to proposed disturbance in the NW ¼ of Section 18, Range 4 West, Township 32 North. Produced water would be transported via subsurface 6-inch polyethylene pipe to the proposed salt water disposal well facility. The water pipelines would be constructed concurrently with the gas pipelines and laid within the same trench, resulting in no additional surface disturbance. Water pipelines would be 6-inch outside diameter and constructed of fiberspar or comparable material. The produced water would be injected into the target formations; Bluff Sandstone and/or Entrada Sandstone. These formations are located at approximately 8,000 to 9,000 feet below ground surface in the project area. The salt water disposal well would be completed using techniques protective of fresh-water bearing zones. The salt water disposal well would not be a commercial disposal site.

A compressor station would be constructed adjacent to an existing well pad in the NE ¼ of Section 9, Range 5 West, Township 32 North. This facility would disturb a total of approximately 4 acres. Approximately 8,200 horsepower (hp) is projected to compress gas produced from the proposed development. To achieve sufficient hp, six 1,380 hp engines with oxidation catalysts would be installed. No well head compression is anticipated.

### 2.1.6 Reclamation

The proposed well pads would be partially reclaimed following drilling and completion operations. A portion of the pad not required for production equipment and vehicular access would be recontoured and reclaimed. Reclamation would typically consist of respreading topsoil, preparing the seedbed, seeding and mulching and crimping with a certified weed free straw or native hay mulch. Depending on the number of wells per pad, approximately 1 to 3.65 acres for production facilities on each well pad would remain in use for production and vehicle access. These areas would not be reclaimed until final abandonment of the wells. Production equipment that would remain on site would include the wellheads, production unit, separators, and meter runs. Ancillary equipment could also be installed at the well pad site, such as a Christmas tree (i.e., valves, spools, and fittings on the well head), storage tank(s), dehydrator, and separator.

The majority of proposed pipelines would parallel and overlap existing roads. Approximately 4.5 miles of pipeline ROW would parallel proposed new roads. Therefore, approximately half of the proposed pipeline ROWs would be reclaimed following construction, with the other half remaining for access. On Tribal Trust lands, access roads would be reclaimed at final abandonment per BIA stipulations.

Table 1 summarizes the total disturbance associated with the proposed action.

Table 1. Total surface disturbance associated with the proposed North Carracas Plan of Development.

| | Short-term Disturbance (acres) | Long-term Disturbance (acres) |
|---|---|---|
| **Well Pads** | 65.75 | 35.45 |
| **Salt Water Disposal Well** | 1.50 | 1.50 |
| **Pipelines/Roads** | 71.52 | 35.76 |
| **Compressor Station** | 4.0 | 4.0 |
| Totals | **142.77** | **76.71** |

## 2.2 Design Features

Design features are an integral part of the proposed action. The environmental effects are analyzed assuming that design features are in place and are successful. For the proposed action, standard and project-specific design features have been derived from the Programmatic Environmental Assessment for 80-Acre Infill Oil and Gas Development on the Southern Ute Indian Reservation (USDI 2009) and the Southern Ute North Carracas Energy Development: Guidance and Protocol to Reduce Wildlife Impacts (SUIT 2010). Design features for the proposed action include the following.

### 2.2.1 Vegetation

- All oil and gas operators will obtain a permit from the SUIT Forestry Division prior to the removal of wood materials greater than 4 inches in diameter from well pads or pipelines.
- Separate topsoil and set aside for reclamation purposes.
- Limit construction activities to dry conditions to reduce soil compaction and rutting, as appropriate.
- Reclaim and revegetate all disturbed areas of soil with approved, certified weed free seed mixes, fertilizer, and/or mulch.
- Use spark arresters on chainsaws and mufflers on vehicles to prevent wildland fires.
- Burning brush, trash, scrap materials, etc. is restricted by state agency or Reservation rules.
- Apply herbicide only under the supervision of a licensed pesticide applicator, and ensure that application, storage, and disposal procedures meet state and federal requirements.
- Identify unavoidable direct and indirect impacts on wetland areas during individual project planning. Develop a wetland mitigation/monitoring plan and obtain necessary permits, prior to initiation of construction activities.

- When it is necessary to cross streams and riparian areas, design facilities to cross at right angles, rather than parallel, in order to minimize the area of impact on these resources. Use BMPs at any temporary stream crossings, and rehabilitate wetlands as soon as possible.
- Monitor invasive species populations.
- Use BMPs to minimize the introduction of invasive species.
- Require operators to control noxious weeds in disturbed areas.

### 2.2.2 Wildlife

- Conduct on-site inspections of potential development locations to ensure avoidance of wooded riparian areas to the greatest extent possible.
- Minimize the number of well monitoring trips by coordinating well visits to limit traffic or by installing automated monitoring systems.
- Where development in unique habitats cannot be avoided, mitigation, such as habitat enhancement and restoration, shall be considered. SUIT DNR or Division of Wildlife Resource Management (DWRM) will coordinate with the operator in the development of appropriate wildlife habitat mitigations and enhancements, and the operator will be responsible for construction of these improvements as a condition of approval (COA) to proceed with the development activity.
- Maintain appropriate speed limits on access roads to minimize wildlife injuries or mortalities due to vehicle-wildlife collisions.
- All fences and cattle guards will be removed from well pads once 70 percent of vegetation has been established on site for all wells unless requested by landowners. Oil and gas operators will install pipe barriers or panels around wellheads, meters, valves, and other equipment to minimize impacts to wildlife and livestock.
- Restrict new well locations and ROWs to at least 0.25 mile from a raptor nest or winter roost.
- A migratory bird survey prior to construction during the migratory bird breeding season (March through August) will be conducted.
- SUIT DWRM biologists shall conduct yearly raptor nesting surveys to document known nest sites and monitor nesting success. These surveys are focused mainly on eagles, but also consider red-tailed hawks. Annual winter roost surveys would also be conducted to identify and record additional winter roost sites. These data would be used to evaluate the effectiveness of mitigation measures for wooded riparian habitat and develop additional mitigation criteria as necessary.

- *Recommended Buffer Zones and Seasonal Restrictions for Colorado Raptors* (CDOW 2008) will be implemented, with the exception of bald eagle.

- To the extent practicable restrict timing of drilling activities in undisturbed areas to reduce disturbance impacts on deer and elk. Unless otherwise agreed by SUIT DNR/Wildlife, no drilling activities will be allowed from December 1st through April 30th ("Closure Period") for any projects more than a 1/3-mile distance from Archuleta County Road 500 ("Buffer Area"). Routine maintenance, construction, and/or completion activities being conducted outside of the Buffer Area, during the Closure Period, may only occur between 8:30 am and 3:30 pm. Prior approval of SUIT DNR/Wildlife is required for drilling activities outside of the Buffer Area prior to April 30th. The April 30th start date may be altered at the discretion of SUIT DNR/Wildlife based on severity of snowpack conditions.

- Regardless of distance from Archuleta County Road 500 construction, drilling, and completion activities should be scheduled to avoid particularly sensitive seasonal wildlife sites, specifically bald eagle winter roost sites, southwestern willow flycatcher nest sites, and raptor nest sites. SUIT DNR/Wildlife should be consulted on sensitive sites, timing considerations, and buffer distances.

- As much as possible, drilling activities outside of the Buffer Area should be scheduled to avoid annual big game hunting seasons, when tribal use of land is at its highest (i.e., generally from September through December). If the operator believes that drilling activities outside of the Buffer Area are necessary between September and December, consultation with SUIT DNR/Wildlife should occur to address the issue on a site-specific basis.

- Corridors for pipeline ROWs should be shared or consolidated to the extent practicable.

- The number, length, and footprint of all gas development roads should be minimized. Use existing routes where possible and combine planning for utility infrastructure (gas, electric, and water) with roadway planning to avoid separate utility corridors.

- Establish company policies to protect wildlife and other natural resources while employees are on SUIT or SUIT partner lands (e.g., no poaching, no firearms, no dogs on location, no feeding of wildlife, no littering, bear proof trash containment, use restrooms or porta-johns only).

- Reduce noise by using current and effective sound dampening devices or techniques such as hospital grade mufflers, equipment housing, insulation, installation of sound barriers, earthen berms, and vegetative buffers. Specific sound dampening mitigation can be determined for new facilities at a site-specific level in consultation with SUIT DNR/Wildlife.

- Install exclusionary devices to prevent bird and other wildlife access to equipment stacks, vents and openings, and reserve pits.

- Install signage notifying the public that unauthorized vehicular travel on roads and facility ROWs is not permitted. If future activities indicate that signage is not sufficient to prevent unauthorized traffic, consider the use of locked gates.
- Any fencing required around facilities or along roads should use wildlife friendly designs to readily allow wildlife passage.
- Design and maintain access roads in light of the anticipated volume of traffic and the weight and speed of vehicles using these roads to minimize environmental damage, including the generation of fugitive dust and contribution of sediment to downstream areas.
- Promptly report all spills to the appropriate Tribal/State authorities.
- Close and immediately reclaim all roads that are redundant, or have been abandoned to the maximum extent possible to minimize disturbance and habitat fragmentation.
- Ensure that site reclamation occurs as early as possible after development. For well sites, reclamation should occur immediately after reserve pits have dried. Reclamation should include re-vegetation with native shrubs, grasses, and forbs appropriate to the ecological site disturbed.

### 2.2.3 Special Status Species

- No disturbance will be allowed within 20 meters of federally listed plant occupied habitat, and any disturbance proposed within 200 meters of listed plants occupied habitat would be analyzed in a separate site specific consultation.
- Conduct southwestern willow flycatcher (*Empidonax traillii extimus*) surveys within suitable habitat prior to any construction activities to determine presence or absence.
- If southwestern willow flycatchers are located during survey efforts, no surface disturbing activities will be conducted from May 1 through August 15.
- Minimize construction activities in wooded riparian habitat, or any other potential southwestern willow flycatcher nesting habitat.
- No disturbance will be allowed within 200 meters of known or discovered occupied southwestern willow flycatcher breeding habitat.
- Pre-construction surveys for Gunnison (*Cynomys gunnisonii*) prairie dogs will be conducted on proposed well pad and access route locations. Direct impacts to prairie dog colonies will be avoided where possible, and in the light of other resource tradeoffs resulting from access road and well pad relocation.

Bald Eagle Winter Roosting (November 15 to March 15)

- For a construction project planned during the bald eagle winter roosting period and within 0.25 mile of a riparian zone with a mature cottonwood component, a pre-construction survey shall be initiated within 10 days prior to the start of construction to verify the presence or absence of bald eagle roosting activity. The surveys must be conducted by qualified biologist(s) according to protocol as set forth by the USFWS. Generally, the survey should be performed during dawn and dusk periods on two or more days immediately prior to the construction start date. The survey should be documented and results sent to the Division Head of the SUIT DWRM.

- If one or no bald eagles are found to be roosting within 0.25 mile of the study area during the pre-construction survey, work may proceed with no time of day restrictions.

- If two or more bald eagles are found to be roosting within 0.25 mile of the proposed construction site study area during the pre-construction survey, the operator will be restricted to working between 10:00AM and 2:00PM on a daily basis.

- If bald eagles continue to occupy or enter the area within 0.25 mile of the construction site between the 10:00AM and 2:00PM time window, work will stop until the bald eagles leave the area. Under no circumstances shall bald eagles be harassed in order to disperse them from the area.

Bald Eagle Spring/Summer Nesting (March 16 to July 1)

- For a construction project planned during the bald eagle nesting period and within 0.5 mile of suitable bald eagle nesting habitat (i.e., a riparian area with a mature cottonwood component), a pre-construction survey will be initiated within 10 days prior to the start of construction to verify the presence or absence of bald eagle nesting activity. The survey will be conducted by qualified biologist(s) according to protocol as set forth by the USFWS. Generally, the surveys should be performed during dawn and dusk periods on two or more days immediately prior to the construction start date. The survey will be documented and results sent to the Division Head of the SUIT DWRM.

- If no bald eagles are found to be nesting within 0.5 mile of the proposed construction site during the pre-construction survey, work may proceed with no restriction. If bald eagles are found to be nesting within 0.5 mile of the construction area, the construction must stop until all signs of nest use have stopped for the year.

- If an active bald eagle nest is known to exist within 0.5 mile of a proposed construction project, the construction project may not proceed until all signs of nest use have stopped for the year.

### 2.2.4 Water Quality

- Protect water quality within, and downstream of, the study area from soil erosion and sedimentation by BMPs that include erosion control devices and management procedures,

retention of a vegetation buffer strip (minimum of 100 feet) between water bodies and disturbed areas, and spill prevention procedures.

- Whenever reasonably possible, bore under jurisdictional waters of the U.S., including drainages and wetlands to avoid and/or minimize surface impacts.
- Monitor bradenhead pressures to identify wells that may be acting as vertical conduits.
- Monitor (frequency dependent on area) methane contamination in water wells and compare to baseline conditions to evaluate concentration trends and correlate with bradenhead testing.
- Cement all production casing strings from the casing shoe or total depth, whichever is shallower, to the surface by circulation methods for all wells heretofore and hereafter drilled and completed in the Fruitland coal seams of the Ignacio Blanco Field.
- Within any areas of concern, the SUIT DOE and BLM may require water well monitoring as part of APD approval.
- Injection well operations will continue to be monitored monthly at each injection well for cumulative injection volumes and pressures in tubing and tubing/casing annulus.
- Meet all applicable water quality standards.
- Avoid construction activities near or through streams during high flows or wet periods.
- Require operators to map and delineate waters of the U.S., as defined at 33 CFR Part 328.3, prior to the planning of any activity at or in the vicinity of such waters.
- Require operators to avoid impacting waters of the U.S. whenever practicable.
- Require operators to obtain 404 permits from the U.S. Army Corps of Engineers (USACE), including 401 certification from the USEPA for land within the boundary of the Reservation.
- Require operators to minimize unavoidable discharges of fill material to waters of the U.S.
- Require operators to mitigate waters of the U.S. that are adversely impacted by their activities.
- The *Stormwater Recommendations for Oil and Gas Operations on Tribal Lands within the Southern Ute Indian Reservation* will be implemented.
- Operators will implement the U.S. Environmental Protection Agency (USEPA) Reasonable and Prudent Practices for Stabilization BMPs to eliminate or minimize adverse impacts to the environmental health of the SUIT natural resources (USEPA 2004).

- Appropriately sized culverts will be installed to convey surface flow under constructed access roads. Reduce erosion impacts from roads through measures described in the standard environmental protection criteria.
- Implement structural erosion and sediment controls such as interim or permanent water bars, detention ponds, straw bales, silt fences, earth dikes, and inlet and outlet protection.
- Implement non-structural control practices such as interim and permanent stabilization, permanent and temporary seeding and re-vegetation, and geotextiles.
- Protect water bodies and drainage pathways near drill sites or roads, which are the most susceptible to erosion by developing buffers or adding erosion control measures.
- Minimize erosion at sites located in steep terrain during the construction phase by measures such as contouring, water bars, temporary ditches, and detention basins, along with minimizing the period of disturbance.
- Timely plug and abandon non-productive wells and associated flowlines and equipment.

# 3. Action Area

## 3.1 Description of the Action Area

The action area is defined as all areas to be affected directly or indirectly by the action and not merely in the immediate area involved in the action (50 CFR 402.02). The North Carracas AMI was delineated as the action area. The AMI encompasses 18,123 acre parcel located in Archuleta County, Colorado within the exterior boundaries of the Reservation as shown on Map 1 in Attachment A. Map 2 shows the proposed action in relation to the action area.

## 3.2 Physical Characteristics of the Action Area

The action area is located in the valley area of the San Juan River at the confluence with Navajo Reservoir. North of the valley is Sandoval Mesa and to the south is Carracas Mesa, south of the San Juan River. The general area consists of moderately incised canyons with a relatively narrow (approximate ½ mile width) valley area associated with the San Juan River. Tributaries in the project area include Sandoval Creek and Cat Creek from the north and Carracas Creek from the south. Elevations range from approximately 6,235 feet in the valley bottom to 7,380 feet on the mesa tops.

Surface geologic material within the project area includes outcrop areas of San Jose and Animas formation materials, with alluvial material present within drainage areas. The tertiary age San Jose Formation consists of siltstones, sandstone and shales. The tertiary age Animas Formation consists of sandstone, shale and conglomerate material.

General soil types within the project area consist of loam and clay loam with variable silt, sand and gravel content. Soils are derived from shale and sandstone material exposed on hills and mesas above/up gradient of the action area.

## 3.3 Biological Characteristics of the Action Area

The water resources in the action area include Navajo Reservoir and the San Juan River and the lower portion of the Piedra River where it empties into the reservoir, the tributary ephemerals to these waterbodies, and groundwater aquifers. Domestic wells are drilled into shallow groundwater aquifers for drinking water, particularly in the action area where alluvial deposits are available.

The majority of the action area is located within the Upper San Juan River watershed sub-basin, with a small portion located in the Piedra sub-basin. In the project area, the Piedra (Segment 4b) and San Juan River (Segment 6b) retain cold water aquatic life Class 1 classifications. These waterways both have a recreation standard and classification of Class E with a 126/100 milliliter E. coli standard (CDPHE 2011). Currently, there are no threatened or impaired surface waters in the action area (USEPA 2006). The drainage area to the USGS San Juan River Gage near Carracas, Colorado is 1,230 square miles. The annual runoff is approximately 402,300 acre-feet. The drainage area to the USGS Piedra River Gage near Arboles, Colorado is 62 square miles. The annual runoff is approximately 287,800 acre-feet (USGS 2002).

Under the Proposed Action, a total of 1.66 acre-feet of fresh water would be consumed for the drilling and completion of nine vertical or deviated s-shaped wells. An additional 0.3 acre-feet could be consumed to drill the salt water disposal well. The fresh water needed to drill and complete the wells would be acquired from a legal supply of water from private or commercial sources. Specifics regarding the acquisition of a legal supply of water to implement the proposed action are unknown. Because water is purchased from decreed commercial sources, depletions do not injure water rights holders in the basin.

During the production of CBM gas, water is typically removed from the producing formation and is referred to as produced water. The Fruitland Formation is recharged by surface water where it is crossed by the Animas, Florida and Los Piños rivers, which is located outside the action area.

The Proposed Action would have no effect on surface water depletions as the entire action area is located within the non-tributary area. Non-tributary water is defined as ground water located outside the boundaries of any designated ground water basins, the withdrawal of which will not, within one hundred years of continuous withdrawal, deplete the flow of a natural stream, including a natural stream at an annual rate greater than one-tenth of one percent of the annual rate of withdrawal (Colorado Revised Statute Sections 37-82-101(2) and 37-82 102(1)(b)). The wells proposed in the action area are non-tributary to surface waters, as determined in *The Coalbed Methane Stream Depletions Assessment Study – Northern San Juan Basin*. This study was jointly sponsored by the Colorado Division of Water Resources, the Colorado Geological Survey, and COGCC in 2006 (SSPA 2006). The findings of the study show that development within 1.5 miles of the outcrop has a more immediate and dramatic

effect on depleting surface water flows within the Animas, Florida and Los Piños river basins, while CBM-associated groundwater production farther from the outcrop has a more tempered effect. Areas in the San Juan Basin greater than approximately 10.5 miles from the Fruitland-Pictured Cliffs outcrop fall within the non-tributary area (SSPA 2006).

Vegetation communities within the action area were derived from the Provisional Data Set for the Southwest Regional Gap Analysis Project (USGS 2005). According to the data set, 15 major vegetation communities occur within the action area. These communities and associated acreages are listed in Table 3 (USGS 2005). It is important to note that the Gap Analysis Program data was based on satellite imagery and that land cover maps are not considered a precise representation of the landscape as they are coarse-grained and have not been ground-truthed. However, for the purposes of broad-scale management activities, the data set provides useful information for land managers and decision makers.

**Table 3. Vegetation communities and associated acreages within the action area.**

| Description | Acres in Action area | Percent of Action area |
|---|---|---|
| **Colorado Plateau Mixed Bedrock Canyon and Tableland** | 12.2 | 0.07% |
| **Colorado Plateau Pinyon-Juniper Woodland** | 10,595.5 | 62.48% |
| **Inter-Mountain Basins Big Sagebrush Shrubland** | 1,240.1 | 7.31% |
| **Inter-Mountain Basins Greasewood Flat** | 3.9 | 0.02% |
| **Inter-Mountain Basins Semi-Desert Grassland** | 24.9 | 0.15% |
| **Inter-Mountain Basins Semi-Desert Shrub Steppe** | 294.0 | 1.73% |
| **North American Arid West Emergent Marsh** | 1.6 | 0.01% |
| **Rocky Mountain Gambel Oak-Mixed Montane Shrubland** | 1,425.3 | 8.41% |
| **Rocky Mountain Lower Montane-Foothill Shrubland** | 49.6 | 0.29% |
| **Rocky Mountain Lower Montane Riparian Woodland and Shrubland** | 1,566.3 | 9.24% |
| **Rocky Mountain Montane Dry-Mesic Mixed Conifer Forest and Woodland** | 8.1 | 0.05% |
| **Rocky Mountain Montane Mesic Mixed Conifer Forest and Woodland** | 19.1 | 0.11% |
| **Rocky Mountain Ponderosa Pine Woodland** | 1,569.1 | 9.25% |
| **Southern Rocky Mountain Montane-Subalpine Grassland** | 146.2 | 0.86% |
| **Southern Rocky Mountain Pinyon-Juniper Woodland** | 1.7 | 0.01% |
| **Total:** | **16,957.6** | |

A search of the USFWS's National Wetland Inventory map database indicated that wetland delineations are currently being processed for Archuleta County, Colorado (USFWS 2011). Scanned vector graphics are available for reference on the USFWS wetlands mapping website; however, no final National Wetland Inventory maps are currently available for the action area. The scanned graphics show riverine wetland complexes in the action area along the San Juan River corridor.

# 4. Description of Listed Species and Critical Habitat

According to the USFWS, there are 10 federally listed or candidate species with potential to occur on the SUIT Reservation including five endangered (E) and two threatened (T) species. The list includes one mammal, two birds, two fish, and two plants. There are three candidate species listed by USFWS with potential to occur on the SUIT Reservation in Archuleta County. The list includes two mammals and one bird.

## 4.1 Critical Habitat

The action area addressed within this BA does not contain any USFWS Designated Critical Habitat for any federally listed species. Designated critical habitat near the action area is shown on Map 3 in Appendix A.

## 4.2 Federally Listed/Candidate Species Eliminated from Detailed Evaluation

Due to the absence of suitable habitat within the action area, seven of the 10 federally listed or candidate species are eliminated from detailed evaluation in this BA. These species include Canada lynx (*Lynx canadensis*), North American wolverine (*Gulo gulo luscus*), Mexican spotted owl (*Strix occidentalis lucida*), Colorado pikeminnow (*Ptychocheilus lucius*), razorback sucker (*Xyrauchen texanus*), Pagosa skyrocket (*Ipomopsis polyantha*), and Knowlton's cactus (*Pediocactus knowltonii*). Table 4 provides the reasoning for eliminating each species from further evaluation.

**Table 4. Federally listed species with potential to occur in the action area eliminated from detailed consideration.**

| Species | Status [1] | Habitat Description | Potential to Occur in the Action Area |
|---|---|---|---|
| **MAMMALS** | | | |
| **Canada Lynx (*Lynx canadensis*)** | T | Large tracts of high elevation (>8,000 ft) mixed coniferous forest. | Action area does not include high elevation (>8,000 feet) mixed coniferous forest. |

| | | | |
|---|---|---|---|
| **New Mexico Meadow Jumping Mouse (*Zapus hudsonius leteus*)** | C | Mesic meadows and/or contained permanent streams with dense, diverse vegetation. | Action area contains a permanent waterway and wetland vegetation. |
| **North American Wolverine (*Gulo gulo luscus*)** | C | In Colorado, wolverines are present at high elevations or alpine habitat where snow persists late into the spring season. | No alpine or sub-alpine habitat is present in the action area. |
| **BIRDS** | | | |
| **Mexican Spotted Owl (*Strix occidentalis lucida*)** | T | Mature to old growth mixed conifer stands on steep, north-facing slopes with snags, downed wood, and canopy closure. | No mature or old growth mixed conifer stands on cool aspect slopes. Piñon-juniper woodlands not suitable for foraging given the absence of potential nesting habitat. |
| **Southwestern Willow Flycatcher (*Empidonax traillii extimus*)** | E | Dense, shrubby riparian vegetation, usually in close proximity to surface water or saturated soil. | Action area contains suitable habitat in patches along the San Juan River. |
| **Yellow-billed Cuckoo (*Coccyzus americanus occidentalis*)** | C | Gallery cottonwood forest with dense understory vegetation. Minimum habitat patch size is 2 hectares. | Action area contains narrow, open-canopy cottonwood stands. |
| **FISH** | | | |
| **Colorado Pikeminnow (*Ptychocheilus lucius*)** | E | Large rivers with a strong current, deep pools, eddies, quiet backwaters, and relatively warm water temperatures. | The San Juan River within the action area does not provide the deep pools, quiet backwaters, and warm water temperatures preferred by the species. Not known to occur in Navajo Reservoir. No depletions to the San Juan, Animas, or Florida Rivers. |
| **Razorback Sucker (*Xyrauchen texanus*)** | E | Rivers with strong, steady currents over sandy bottoms. | The San Juan River within the action area does not provide the deep pools, quiet backwaters, and warm water temperatures preferred by the species. Not known to occur in Navajo Reservoir. No depletions to the San Juan, Animas, or Florida Rivers. |
| **PLANTS** | | | |

| | | | |
|---|---|---|---|
| **Pagosa Skyrocket (*Ipomopsis polyantha*)** | E | Occur on rocky, clay soils of Mancos Shale, barren shrub lands and roadsides, and montane grasslands under pine around 7,000 feet. | No Mancos Shale derived soils occur within the action area. |
| **Knowlton's cactus *(Pediocactus knowltonii)*** | E | Alluvial deposits that form rolling, gravelly hills in piñon-juniper and sagebrush communities (6,200-6,400 ft). A type locality of the Los Piños River area. | No suitable habitat occurs in the project or action area. No rolling, gravelly river terraces occur in the project or action area. |

(1) E= Endangered; T = Threatened; C = Candidate. Source: USFWS March 6, 2012

## 4.3 Federally Listed Species Warranting Detailed Evaluation

Based on the habitat types within the action area, there is suitable habitat for three federally listed species—New Mexico meadow jumping mouse, southwestern willow flycatcher, and yellow-billed cuckoo.

### 4.3.1 Southwestern Willow Flycatcher

#### 4.3.1.1 Distribution and Habitat

The southwestern willow flycatcher is a neo-tropical migrant that winters in Central and South America and breeds in the southwestern U.S. The southwestern willow flycatcher is one of four subspecies of the willow flycatcher currently recognized. All willow flycatcher subspecies spend time migrating and breeding in the United States from April to September (60 Federal Register [February 27, 1995] 10694).

The southwestern willow flycatcher has experienced extensive loss and modification of breeding habitat, with consequent reductions in population levels. Threats to this species are primarily destruction and modification of riparian habitats caused mainly by: reduction or elimination of surface and subsurface water due to diversion and groundwater pumping; changes in flood and fire regimes due to dams and stream channelization; clearing and controlling vegetation; livestock grazing; changes in water and soil chemistry due to disruption of natural hydrologic cycles; and establishment of invasive non-native plants. Along with habitat loss increases in brood parasitism by the brown-headed cowbird (*Molothrus ater*) have inhibited reproductive success and further reduce population levels (USFWS 2002).

At the time of listing, breeding sites in California, Nevada, Utah, and Colorado were adopted as the subspecies' northern boundary. Since then, genetic material has been collected and analyzed across this part of the bird's range and the boundary has been refined, reducing the extent of the northern boundary of this southwestern subspecies in Utah and Colorado (USFWS 2002). Territories once believed to be held by southwestern willow flycatchers in Utah and Colorado are now known to be occupied by a different, non-listed willow flycatcher subspecies. As a result, the southwestern

subspecies' range only occurs in the southernmost portions of Utah and Colorado (76 Federal Register [August 15, 2011] 50552).

Typical southwestern willow flycatcher breeding habitat consists of relatively dense riparian vegetation along steams or other wetlands, near or adjacent to surface water or underlain by saturated soils (Sogge et al. 1997, USFWS 2002). Historically, southwestern willow flycatchers nested in native riparian vegetation such as willows (*Salix* spp.) and boxelder (*Acer negundo*). Following changes in vegetation patterns, flycatchers still nest in native vegetation where available, but they also nest in riparian exotics such as salt cedar (*Tamarix* spp.) and Russian olive (*Elaeagnus angustifolia*) (USFWS 2002). Riparian patches used by breeding flycatchers vary in size and shape, ranging from a relatively contiguous stand of uniform vegetation to an irregularly shaped mosaic of dense vegetation with open areas. Southwestern willow flycatchers have nested in patches as small as 0.8 ha (1.97 acres) (e.g., in the Grand Canyon) and as large as several hundred hectares (e.g., at Roosevelt Lake, Arizona, or Elephant Butte Reservoir, New Mexico.). They have only rarely been found nesting in isolated, narrow, linear riparian habitats that are less than 98 feet wide, although they will use such linear habitats during migration (Sogge et al. 2010). Nests are found in thickets of trees and shrubs primarily 13 to 23 feet in height, among dense and homogenous foliage (USFWS 2002). Habitat occurs at elevations below 8,500 feet (USFWS 2002).

Many Southwestern willow flycatchers are found along streams using riparian habitat during migration. Migration stopover areas can be similar to breeding habitat or riparian habitats with less vegetation density and abundance compared to areas for nest placement (USFWS 2002). Such migration stopover areas, even though not used for breeding, are critically important resources affecting productivity and survival (USFWS 2002). The variety of riparian habitat occupied by migrant flycatchers ranges from small patches with shorter and sparser vegetation to larger more complex breeding habitats (60 Federal Register [February 27, 1995] 10694).

It is important to recognize that the ultimate measure of habitat suitability is not simply whether or not a site is occupied. Habitat suitability occurs along a gradient from high to poor to unsuitable. The best habitats are those in which flycatcher reproductive success and survivorship result in a stable or growing population (Sogge et al. 2010).

This species breeds locally along the Colorado River in the Grand Canyon near the mouth of the Little Colorado River, and south of Yuma; at the Little Colorado River headwaters near Greer and Eagar; very locally along the middle Gila, Salt, and Verde rivers; middle to lower San Pedro River; and upper San Francisco River near Alpine. The species also breeds along sections of the Rio Grande and at Elephant Butte Lake (USFWS 2002).

At the end of 2007, 1,299 flycatcher breeding territories were estimated to occur throughout southern California, southern Nevada, southern Utah, southern Colorado, Arizona, and New Mexico. Some of the flycatcher breeding sites having the highest number of territories are found along the middle Rio Grande

and upper Gila River in New Mexico, and Roosevelt Lake and the San Pedro and Gila River confluence area in central Arizona (76 Federal Register [August 15, 2011] 50552).

Annual surveys on the Reservation have identified six breeding territories (annual average) on the Los Piños River near Ignacio, Colorado. A portion of the Los Piños River from the Colorado/New Mexico State line north to the confluence with the South Fork Texas Creek has been proposed for designation as southwestern willow flycatcher critical habitat (76 Federal Register 50552).

#### 4.3.1.2 Status in the Action Area

The action area occurs within the northernmost portion of this subspecies range. Southwestern willow flycatcher has not been documented as migrating through or nesting in the action area. No suitable nesting habitat for southwestern willow flycatcher occurs within the action area as willow patches or other dense multi-storied vegetation is limited in size and generally has a high edge to patch ratio; however, there is suitable migratory stopover habitat in the area.

#### 4.3.1.3 Potential Effects

None of the proposed well locations are in close proximity to riparian habitats, based on preliminary information. These locations are either in piñon-juniper woodlands or areas cleared for agriculture. However, road and pipeline construction in riparian habitats could result in a loss or modification of potential southwestern willow flycatcher migratory stopover habitat. Habitat removal or modification could also result in fragmentation of riparian habitats, thereby increasing edge effects and reducing habitat effectiveness. Pipeline and road construction in marginally suitable habitats could also decrease the suitability of these habitats and the likelihood that these could improve over time. When siting of project components is identified at the time of the APD or ROW grant submittal, sites would be selected to avoid or minimize impacts to migratory stopover habitat in the action area.

Potential impacts to Southwestern willow flycatchers could include injury or mortality. The most probable cause of death or injury would be heater-treaters (separators) or other production equipment. Construction, drilling and completion operations that would occur between May and mid-June and late-August to early September could have potential adverse effects to willow flycatchers that may incidentally be migrating through the action area. These effects could include avoidance of the area due to noise or human activity, through the 2016 breeding season. The potential for these effects would be limited to pipeline crossings of the San Juan River, bridge construction, and three well locations near the San Juan River.

The proposed action would not result in changes in streamflows therefore; no indirect effects from the potential alteration of riparian habitats or stream channel morphology would be expected. There is the potential that sedimentation or accidental spills or leaks of hazardous materials could indirectly affect the quality of potential habitat and prey base for Southwestern willow flycatchers. These impacts would be highest in the short-term during construction declining in intensity over the long-term. These impacts would be avoided or minimized by the implementation of design features including the preparation and

implementation of Stormwater Pollution Prevention Plans and Spill Prevention Control and Countermeasure Plans, and BMPs.

Potential direct and indirect impacts would be also be avoided or minimized following the implementation of species-specific design features which include:

- Minimize construction activities in wooded riparian habitat, or any other potential southwestern willow flycatcher nesting habitat;
- Conduct Southwestern willow flycatcher surveys in accordance with standard protocol within suitable habitat prior to any construction activities to determine presence or absence of willow flycatchers. Current standard protocol requires a minimum of one survey during the 1st survey period of May 15 to May 31, a minimum of one survey during the 2nd survey period of June 1 to June 21, and a minimum of three surveys during the 3rd survey period of June 22 to July 17, each at least five days apart (Sogge et al. 2010).
- If Southwestern willow flycatchers are located during survey efforts, no surface disturbing activities will be conducted from May 1 through August 15.
- No disturbance will be allowed within 200 meters of known or discovered occupied southwestern willow flycatcher breeding habitat.

Additional mitigation measures include:

- Pipeline crossings would bore under the San Juan River.
- Closed loop systems will be used for drilling under this POD.
- The proposed bridge would be designed in general conformance to American Association of State Highway and Transportation Officials “Standards Specifications for Highway Bridges.”
- Vegetation replacement and restoration will be conducted in any suitable habitat that is lost due to project implementation (e.g., willow loss at pipeline crossings).
- Water quality within, and downstream of, the action area will be protected from soil erosion and sedimentation through the use of BMPs that include erosion control devices and management procedures and retention of a vegetation buffer strip (minimum of 100 feet) between water bodies and disturbed areas.
- Equipment fueling, maintenance, and storage operations will be conducted at least 300 feet from any wetland or stream system. Whenever reasonably possible, jurisdictional waters of the U.S., including drainages and wetlands, will be bored under.

- Standard design features include that heater-treaters will be screened to prevent bird mortalities. Bird netting will be suspended and maintained over all pits and/or open tanks and catchments until reclamation is complete.

#### 4.3.1.4 Effects Determination

There would be no effect to southwestern willow flycatcher designated critical habitat. The proposed action may affect, but is not likely to adversely affect southwestern willow flycatchers. This determination is based on lack of documented occurrence in the action area, the quality of available habitat, the minimal potential for loss of migratory stopover habitat, potential short and long-term changes to water quality from increased sedimentation and accidental spills or releases, and the potential for migrating southwestern willow flycatchers to occur within the action area to be disturbed by noise or human activity.

### 4.3.2 New Mexico Meadow Jumping Mouse

#### 4.3.2.1 Distribution and Habitat

New Mexico meadow jumping mouse was identified as a candidate for Federal listing in December 2007. Identified threats to this species are excessive grazing pressure, water use and management, highway reconstruction, development, recreation, and beaver removal (72 Federal Register [December 6, 2007] 69034).This small brown rodent has an extremely long tail and long hind feet. The hind legs are longer than the front legs. The tail is tapered, sub-cylindrical, and longer than the body. The hind feet have five toes, while the front feet have four toes (72 Federal Register [December 6, 2007] 69034). This is the only mammal with 18 teeth. The mouse is nocturnal and hibernates from October/November to April/May (NMGF 1993).

New Mexico meadow jumping mouse occurs in moist habitats with lush riparian/wetland vegetation consisting of grasses, sedges, and forbs (NMGF 1993) and nests in dry soils (72 Federal Register [December 6, 2007] 69034). Recent genetic studies confirm that the New Mexico meadow jumping mouse is a distinct subspecies from other *Zapus hudsonius* subspecies, validating the currently accepted subspecies designation (72 Federal Register [December 6, 2007] 69034).

This species is endemic to New Mexico, Arizona, and a small portion of southern Colorado and has been documented at 98 localities. The historical distribution likely included riparian wetlands along the eastern front of the Sangre de Cristo Mountains from southern Colorado to central New Mexico. The New Mexico meadow jumping mouse currently occurs in Colorado in Las Animas County. In Arizona it occurs in Apache County. In New Mexico it occurs in Colfax, Mora, Otero, Socorro, and Sandoval Counties (72 Federal Register [December 6, 2007] 69034). Key habitat areas are along the Rio Cebolla in the Jemez Mountains, the vicinity of Espanola, Isleta Marsh (Bernalillo County), Bosque del Apache National Wildlife Refuge, and the Cloudcroft area (NMGF 1993).

#### 4.3.2.2 Status in the Action Area

This species is not known to occur in the San Juan River watershed. There has been one unconfirmed sighting of the species outside the action area on the SUIT Reservation on the Florida River (Whiteman 2011). New Mexico meadow jumping mouse has not been documented in the action area. Suitable habitat for New Mexico meadow jumping mouse would be limited to mesic areas along the San Juan River corridor, which bisects the action area from east to west.

#### 4.3.2.3 Potential Effects

None of the proposed well locations are in close proximity to riparian habitats, based on preliminary information. These locations are either in piñon-juniper woodlands or areas cleared for agriculture. However, road and pipeline construction in riparian habitats could result in a loss or modification of potential habitat for New Mexico meadow jumping mouse. Site specific analysis at the time of the APD or ROW grant submittal would avoid or minimize impacts to New Mexico Meadow jumping mouse.

Potential impacts to New Mexico meadow jumping mouse could include injury or mortality. The most probable cause of death or injury would be earth-moving heavy equipment, vehicle traffic, and drilling or production equipment. Construction, drilling, and completion operations that would occur between May and October could have potential effects such as avoidance of the area due to noise or human activity. These impacts would be short-term (through 2016) and localized. The potential for these effects would be limited to pipeline crossings of the San Juan River, the bridge construction, and three well locations near the San Juan River.

The proposed action would not result in changes in streamflows therefore; no indirect effects from the potential alteration of riparian habitats or stream channel morphology would be expected. There is the potential that sedimentation or accidental spills or leaks of hazardous materials could indirectly affect the quality of potential habitat. These impacts would be highest in the short-term and declining in intensity over the long-term. These impacts would be avoided or minimized by the implementation of design features including the preparation and implementation of Stormwater Pollution Prevention Plans and Spill Prevention Control and Countermeasure Plans, and BMPs. Other mitigation measures include:

- Pipeline crossings would bore under the San Juan River.
- Closed loop systems will be used for drilling under this POD.
- The proposed bridge would be designed in general conformance to American Association of State Highway and Transportation Officials “Standards Specifications for Highway Bridges.”
- Vegetation replacement and restoration will be conducted in any suitable habitat that is lost due to project implementation (e.g., willow loss at pipeline crossings).
- Water quality within, and downstream of, the action area will be protected from soil erosion and sedimentation through the use of BMPs that include erosion control devices and

management procedures, and retention of a vegetation buffer strip (minimum of 100 feet) between water bodies and disturbed areas.

- Equipment fueling, maintenance, and storage operations will be conducted at least 300 feet from any wetland or stream system. Whenever reasonably possible, jurisdictional waters of the U.S., including drainages and wetlands, will be bored under
- Standard design features include that heater-treaters will be screened to prevent bird or small mammal mortalities. Bird netting will be suspended and maintained over all pits and/or open tanks and catchments until reclamation is complete.

#### 4.3.2.4 Effects Determination

The proposed action may affect, but would not jeopardize the continued existence of this species. This determination is based on lack of documented occurrence in the action area, implementation of mitigation measures, only a limited portion of the species range could be affected, the quality of suitable habitat in the action area, and potential short to long-term changes to water quality from increased sedimentation and accidental spills or releases.

### 4.3.3 Yellow-billed Cuckoo

#### 4.3.3.1 Distribution and Habitat

Yellow-billed cuckoos are insectivorous neo-tropical migrants that winter primarily in South America. Suitable habitat for yellow-billed cuckoo is limited to narrow, and often widely separated, riparian cottonwood-willow galleries, as well as tamarisk (66 Federal Register [July 25, 2001] 38611). Dense understory foliage appears to be an important factor in nest site selection, whereas cottonwood trees are an important foraging habitat for the yellow-billed cuckoo. The species is usually found at elevations below 6,600 feet and has been documented in southern and central and extreme northeast Arizona (66 Federal Register [July 25, 2001] 38611). Historically, the yellow-billed cuckoo has been documented as occurring along the San Juan River from Navajo Reservoir to the Arizona state line (Travis 2002).

The yellow-billed cuckoo was separated into eastern (*Coccyzus americanus americanus*) and western (*Coccyzus americanus occidentalis*) subspecies in 1987. However based on available scientific information, it is unclear that eastern and western yellow-billed cuckoos are distinct (66 Federal Register [July 25, 2001] 38611). In the west, the species is widespread and locally common in California and Arizona; locally common in a few river reaches in New Mexico; common very locally in Oregon and Washington; found in portions of western Colorado, western Wyoming, Idaho, Nevada, and Utah; widespread and uncommon to common in portions of Texas (66 Federal Register [July 25, 2001] 38611).

#### 4.3.3.2 Status in the Action Area

Scattered, linear strips of cottonwoods along the San Juan River corridor provide potential habitat for yellow-billed cuckoo. This species has not been documented as occurring in the action area.

#### 4.3.3.3 Potential Effects

None of the proposed well locations are in close proximity to riparian habitats, based on preliminary information. These locations are either in piñon-juniper woodlands or areas cleared for agriculture. However, road and pipeline construction in riparian habitats containing cottonwood trees could result in a loss or modification of potential habitat for yellow-billed cuckoo. Site specific analysis at the time of the APD or ROW grant submittal would avoid or minimize impacts to yellow-billed cuckoo.

Potential impacts could include injury or mortality. The most probable cause of death or injury would be vehicle traffic, and drilling or production equipment. Construction, drilling, and completion operations that would occur between May and October could have potential effects such as avoidance of the area due to noise or human activity. These impacts would be short-term (through 2016) and localized. The potential for these effects would be limited to pipeline crossings of the San Juan River, the bridge construction, and three well locations near the San Juan River.

The proposed action would not result in changes in streamflows therefore; no indirect effects from the potential alteration of riparian habitats or stream channel morphology would be expected. There is the potential that sedimentation or accidental spills or leaks of hazardous materials could indirectly affect the quality of potential habitat. These impacts would be long-term. These impacts would be avoided or minimized by the implementation of design features including the preparation and implementation of Stormwater Pollution Prevention Plans and Spill Prevention Control and Countermeasure Plans, and BMPs. Other mitigation measures include:

- Pipeline crossings would bore under the San Juan River.
- Closed loop systems will be used for drilling under this POD.
- The proposed bridge would be designed in general conformance to American Association of State Highway and Transportation Officials “Standards Specifications for Highway Bridges.”
- Vegetation replacement and restoration will be conducted in any suitable habitat that is lost due to project implementation (e.g., willow loss at pipeline crossings).
- Water quality within, and downstream of, the action area will be protected from soil erosion and sedimentation through the use of best management practices that include erosion control devices and management procedures and retention of a vegetation buffer strip (minimum of 100 feet) between water bodies and disturbed areas.
- Equipment fueling, maintenance, and storage operations will be conducted at least 300 feet from any wetland or stream system. Whenever reasonably possible, jurisdictional waters of the U.S., including drainages and wetlands, will be bored under.

- Standard design features include that heater-treaters will be screened to prevent bird or small mammal mortalities. Bird netting will be suspended and maintained over all pits and/or open tanks and catchments until reclamation is complete.
- A migratory bird survey prior to construction during the migratory bird breeding season (March through August) will be conducted.

#### 4.3.3.4 Effects Determination

The proposed action may affect, but would not jeopardize the continued existence of this species. This determination is based on lack of documented occurrence in the action area, only a limited portion of the species range could be affected, the quality of suitable habitat in the action area, and potential short-term changes to water quality from increased sedimentation and accidental spills or releases.

### 4.3.4 Cumulative Effects

Cumulative impacts include the effects of future State, Tribal, local or private actions that are reasonably certain to occur in the action area considered in this BA. Future federal actions that are unrelated to the proposed action are not considered because they would be subject to separate consultation pursuant to section 7 of the ESA.

Past actions have resulted in a loss or modification of substantial habitat and a reduction in range for Southwestern willow flycatcher, New Mexico meadow jumping mouse, and yellow-billed cuckoo. No non-Federal actions are known to be planned for the action area. However, cumulative impacts to southwestern willow flycatcher, New Mexico meadow jumping mouse, and yellow-billed cuckoo could occur from potential habitat removal or modification from private developments in riparian areas. The amount of development cannot be quantified for this assessment but it would be expected to be minimal given that development on private lands would be subject to Archuleta County regulations. Development on Tribal lands is also expected to be minimal given the Tribe's desire to minimize disturbance on lands within the action area. Any future development on Tribal lands would be subject to regulatory oversight and pre-project planning. Therefore, potential cumulative impacts in the action area would be avoided or minimized.

## 4.4 Migratory Bird Species

In general, all native, non-game bird species, regardless of migratory status, are protected under the Migratory Bird Treaty Act (MBTA). The MBTA and the international migratory bird treaties implemented through the Act, impose substantive obligations on federal agencies to conserve migratory birds and their habitats (16 USC 703-711).

During construction activities, bird mortalities could occur if vegetation containing active bird nests (i.e., with eggs or young) are removed or damaged. Migratory birds would experience long-term habitat loss and fragmentation from implementation of the proposed action. However, migratory birds are mobile

and could readily move to adjacent habitats to compensate for habitat loss and fragmentation. Roads fragment habitats, acting as a movement barrier to some species and disrupting natal dispersal, migration patterns, and gene flow among populations, potentially leading to inbreeding and reduction in genetic variation. However, some bird species have a high tolerance for human and vehicle presence and could occupy habitats adjacent to roads and well pads. Removal of large cottonwood trees in wooded riparian habitats would reduce potential perching, roosting, and nesting habitat for bald eagle (*Haliaeetus leucocephalus*) golden eagle (*Aquila regalis*), red-tailed hawk (*Buteo jamaicensis*), Cooper's hawk (*Accipiter cooperii*), and several owl species. In addition, the removal of snags would reduce available nesting habitat for primary (e.g., woodpeckers) and secondary (e.g., chickadees) cavity nesting birds.

Some individuals could be temporarily displaced during construction, drilling, maintenance, or reclamation activities or when vehicles are in construction areas, but would likely return when humans and vehicles have left the area. Others could be permanently displaced, moving to areas farther removed from disturbances. Human disturbance could cause some nest abandonment in birds. Some nesting raptors have exhibited reduced nesting success (e.g., nest abandonment/failure, reduced productivity) as a response to human disturbance from recreational or industrial activities.

The proposed action would likely result in low to moderate impacts to migratory birds, because less than 1 percent of the action area would be affected, the minimal amount of new road and pipeline construction, the use of existing disturbance, and consolidation of multiple wells on individual pads. Short-term impacts would include avoidance of the area during construction and displacement of individuals to adjacent habitats, while long-term impacts would include a conversion of approximately 76.4 acres of potential nesting and foraging habitat to an industrial use. These impacts would be minimized by following mitigation measures including:

- Conduct on-site inspections of potential development locations to ensure avoidance of wooded riparian areas to the greatest extent possible.
- Maintain appropriate speed limits on access roads to minimize wildlife injuries or mortalities due to vehicle-wildlife collisions.
- Restrict new well locations and ROWs to at least 0.25 mile from a raptor nest or winter roost.
- A migratory bird survey prior to construction during the migratory bird breeding season (March through August) will be conducted.
- SUIT DWRM biologists shall conduct yearly raptor nesting surveys to document known nest sites and monitor nesting success. These surveys are focused mainly on eagles, but also consider red-tailed hawks. Annual winter roost surveys would also be conducted to identify and record additional winter roost sites. These data would be used to evaluate the effectiveness of mitigation measures for wooded riparian habitat and develop additional mitigation criteria as necessary.

- *Recommended Buffer Zones and Seasonal Restrictions for Colorado Raptors* (CDOW 2008) will be implemented, with the exception of bald eagle.

- Regardless of distance from Archuleta County Road 500 construction, drilling, and completion activities should be scheduled to avoid particularly sensitive seasonal wildlife sites, specifically bald eagle winter roost sites, southwestern willow flycatcher nest sites, and raptor nest sites. SUIT DNR/Wildlife should be consulted on sensitive sites, timing considerations, and buffer distances.

- Locate roads as far from streams and bottoms of drainages as possible and outside of riparian habitat unless after consultation with SUIT DNR/Wildlife it is determined that alternative alignments would be more environmentally disruptive. Consult with SUIT DNR/Wildlife when stream/drainage crossings cannot be avoided.

- Establish company policies to protect wildlife and other natural resources while employees are on SUIT or SUIT partner lands (e.g., no poaching, no firearms, no dogs on location, no feeding of wildlife, no littering, bear proof trash containment, use restrooms or porta-johns only).

- Reduce noise by using current and effective sound dampening devices or techniques such as hospital grade mufflers, equipment housing, insulation, installation of sound barriers, earthen berms, and vegetative buffers. Specific sound dampening mitigation can be determined for new facilities at a site-specific level in consultation with SUIT DNR/Wildlife.

- Install exclusionary devices to prevent bird and other wildlife access to equipment stacks, vents and openings, and reserve pits.

- Avoid locating staging, refueling, and storage areas within 300 feet of any reservoir, lake, wetland, or natural perennial or seasonally flowing stream of river to the extent reasonable. If this cannot be avoided in a reasonable manner, consultation with SUIT DNR/Wildlife should occur to address the issue on a site-specific basis.

- Promptly report all spills to the appropriate Tribal/State authorities.

Bald Eagle Winter Roosting (November 15 to March 15)

- For a construction project planned during the bald eagle winter roosting period and within 0.25 mile of a riparian zone with a mature cottonwood component, a pre-construction survey shall be initiated within 10 days prior to the start of construction to verify the presence or absence of bald eagle roosting activity. The surveys must be conducted by qualified biologist(s) according to protocol as set forth by the USFWS. Generally, the survey should be performed during dawn and dusk periods on two or more days immediately prior to the construction start date. The survey should be documented and results sent to the Division Head of the SUIT DWRM.

- If one or no bald eagles are found to be roosting within 0.25 mile of the study area during the pre-construction survey, work may proceed with no time of day restrictions.
- If two or more bald eagles are found to be roosting within 0.25 mile of the proposed construction site study area during the pre-construction survey, the operator will be restricted to working between 10:00AM and 2:00PM on a daily basis.
- If bald eagles continue to occupy or enter the area within 0.25 mile of the construction site between the 10:00AM and 2:00PM time window, work will stop until the bald eagles leave the area. Under no circumstances shall bald eagles be harassed in order to disperse them from the area.

Bald Eagle Spring/Summer Nesting (March 16 to July 1)

- For a construction project planned during the bald eagle nesting period and within 0.5 mile of suitable bald eagle nesting habitat (i.e., a riparian area with a mature cottonwood component), a pre-construction survey will be initiated within 10 days prior to the start of construction to verify the presence or absence of bald eagle nesting activity. The survey will be conducted by qualified biologist(s) according to protocol as set forth by the USFWS. Generally, the surveys should be performed during dawn and dusk periods on two or more days immediately prior to the construction start date. The survey will be documented and results sent to the Division Head of the SUIT DWRM.
- If no bald eagles are found to be nesting within 0.5 mile of the proposed construction site during the pre-construction survey, work may proceed with no restriction. If bald eagles are found to be nesting within 0.5 mile of the construction area, the construction must stop until all signs of nest use have stopped for the year.
- If an active bald eagle nest is known to exist within 0.5 mile of a proposed construction project, the construction project may not proceed until all signs of nest use have stopped for the year.

## 4.5 Summary Determination to Federally Listed Species

Table 4 provides a summary of determinations of effect of the proposed project on federally listed threatened or endangered species. Candidate species are taxa for which the USFWS has on file sufficient information on biological vulnerability and threat(s) to support issuance of a proposal to list, but issuance of a proposed rule is currently precluded by higher priority listing actions (61 Federal Register 7596 [February 28, 1996]). Under both section 7 and 10, of the ESA, the USFWS will continue to encourage the protection of candidate species, but the ESA does not mandate protection for the group.

**Table 4. Summary of the Analysis of Effect on Federally Listed Species**

| Species | Status | Determination of Effect |
|---|---|---|
| **Canada lynx** | Threatened | No effect |
| **Mexican spotted owl** | Threatened | No effect |
| **Southwestern willow flycatcher** | Endangered | May affect, not likely to adversely affect |
| **Colorado pikeminnow** | Endangered | No effect |
| **Razorback sucker** | Endangered | No effect |
| **Pagosa skyrocket** | Endangered | No effect |
| **Knowlton's cactus** | Endangered | No effect |
| **New Mexico meadow jumping mouse** | Candidate | May affect, not likely to jeopardize the continued existence of the species |
| **Wolverine** | Candidate | No effect |
| **Yellow-billed cuckoo** | Candidate | May affect, not likely to jeopardize the continued existence of the species |

## 5. Biological Assessment/Evaluation Preparers

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(505) 327-3088
Joey Herring, Biologist
Elizabeth Burak, Biologist

## 6. Consultation and Coordination

The following individuals were consulted during the preparation of this assessment.

| Name | Organization |
|---|---|
| **Lynn Woomer** | SUIT Growth Fund Safety and Environmental Compliance Management Group |
| **Brendan Cusick** | SUIT Growth Fund Safety and Environmental Compliance Management Group |
| **Kyle Siesser** | SUIT Department of Energy |
| **Jim Friedley** | BIA Southern Ute Agency |
| **Steve Whiteman** | SUIT Department of Natural Resources |
| **Aran Johnson** | SUIT Department of Natural Resources |
| **Ed Hasely** | Energen Resources |
| **Adam Red** | SUIT Department of Energy |
| **Evan Chan** | Energen Resources |
| **Sam Mohler** | Energen Resources |
| **Brooks Boedecker** | Energen Resources |

## 7. References

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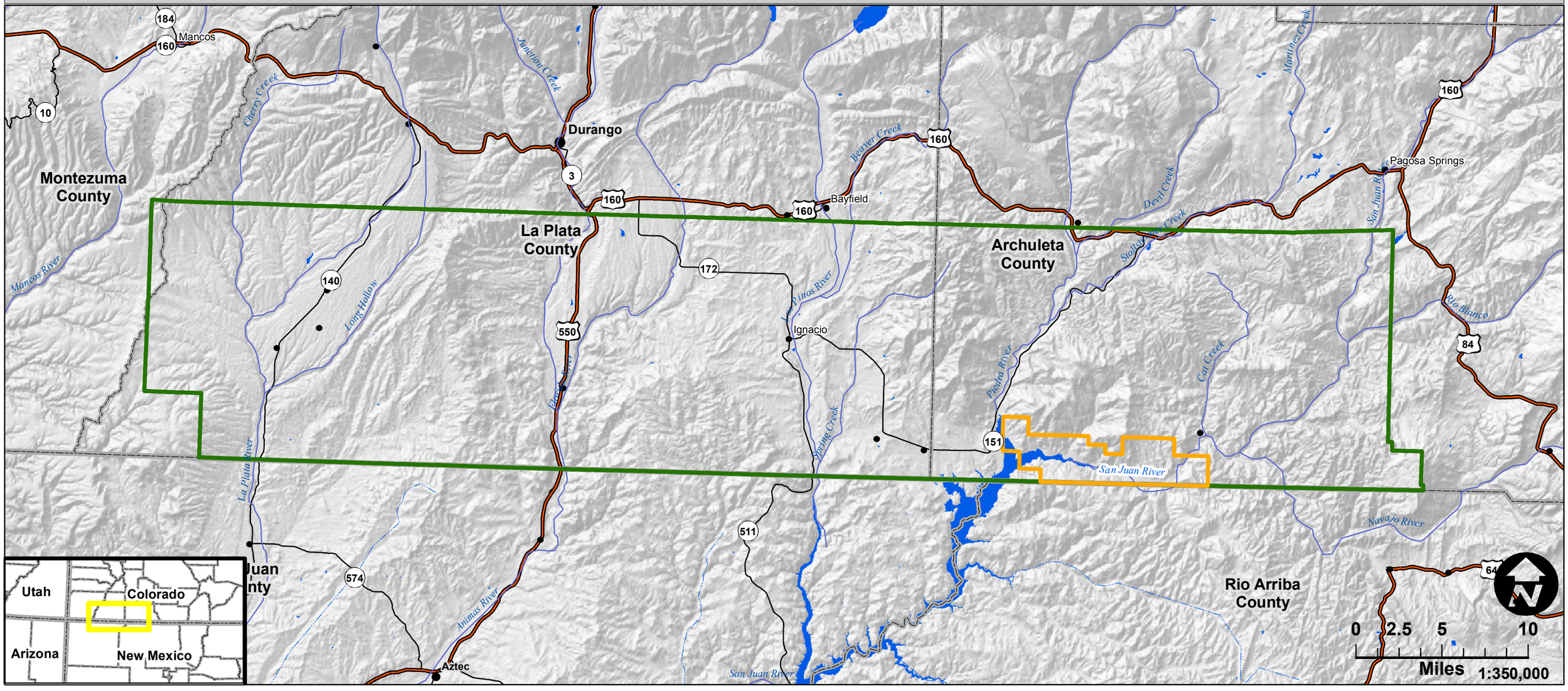
# Attachment A

# Project Maps

Ecosphere
Environmental Services

# Southern Ute Indian Tribe




## LEGEND

- North Carracas AMI
- SUIT Boundary
- Stream
- Stream Intermittent
- Lake
- County/State Boundary
- Highway
- Major Road

Coordinate System: NAD 1983 UTM Zone 13N

## NORTH CARRACAS PLAN OF DEVELOPMENT

### VICINITY MAP

ARCHULETA COUNTY, CO

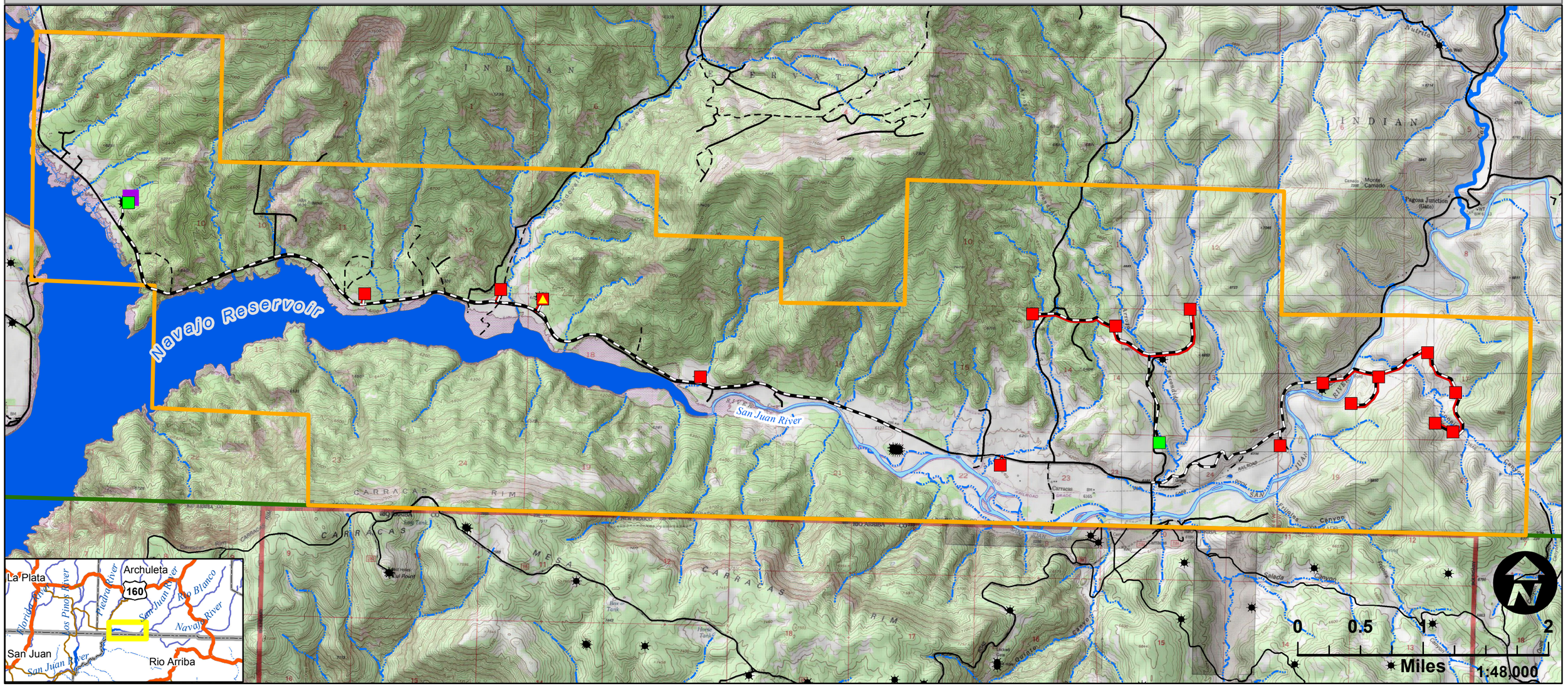
TOWNSHIP 32 NORTH, RANGE 3, 4, & 5 WEST

CARRACAS AND PAGOSA JUNCTION, CO QUADRANGLES

DATE: 3/28/2012

Ecosphere
Environmental Services

# Southern Ute Indian Tribe




## LEGEND

- Existing Well Pad
- Proposed New Well Pad
- Proposed Salt Water Disposal Well
- Proposed Compressor Station
- Existing Oil and Gas Wells
- Proposed Pipeline
- Proposed Access Roads
- Existing Roads
- Southern Ute Reservation Boundary
- North Carracas Area of Mutual Interest

Coordinate System: NAD 1983 UTM Zone 13N

## NORTH CARRACAS PLAN OF DEVELOPMENT

### PROPOSED ACTION

### MAP

ARCHULETA COUNTY, CO

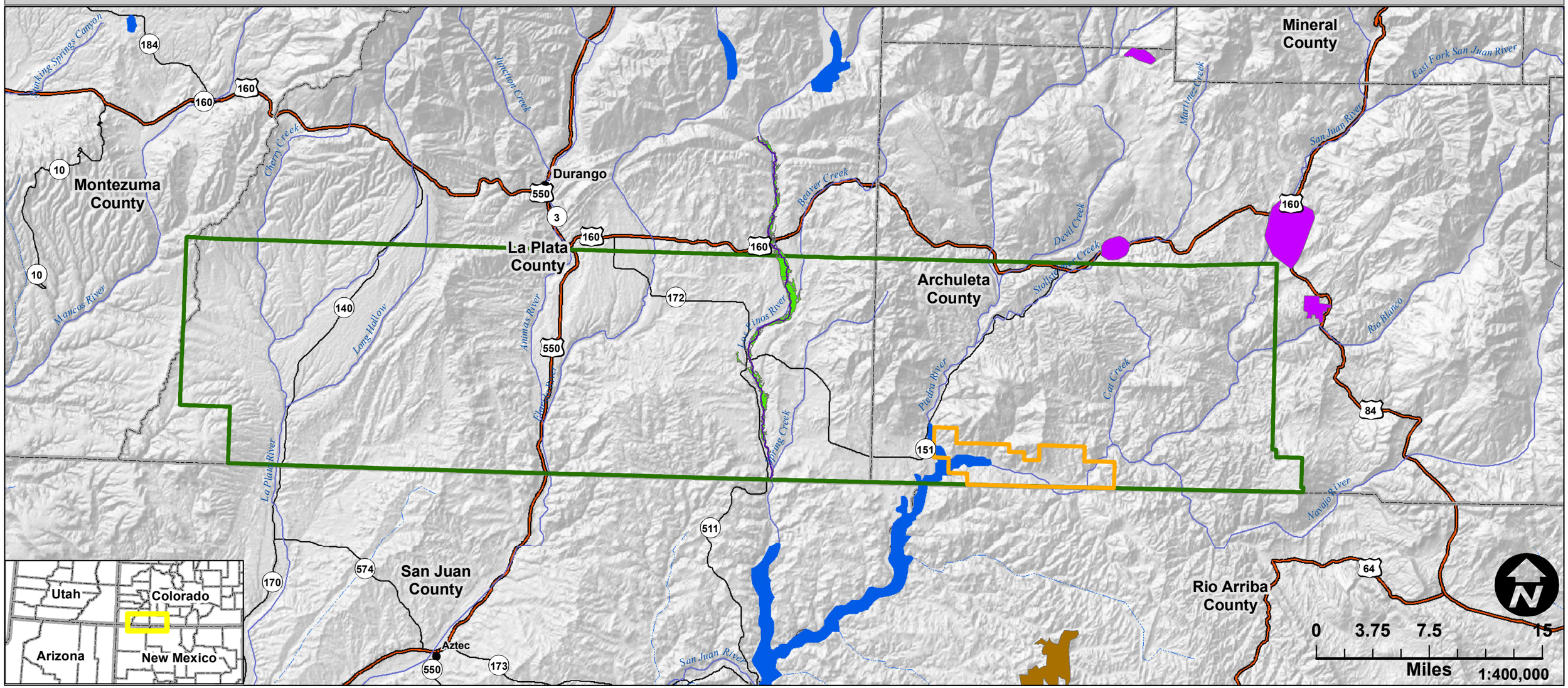
TOWNSHIP 32 NORTH, RANGE 3, 4, & 5 WEST

CARRACAS AND PAGOSA JUNCTION, CO QUADRANGLES

DATE: 3/28/2012

Ecosphere
Environmental Services

# Southern Ute Indian Tribe




## LEGEND

- Highway
- Major Road
- State & County Boundaries
- Southern Ute Reservation Boundary
- North Carracas Area of Mutual Interest
- Stream
- Stream Intermittent
- Pagosa Skyrocket- Proposed Critical Habitat
- Mexican Spotted Owl-Designated Critical Habitat
- Southwestern Willow Flycatcher- Proposed Critical Habitat

Coordinate System: NAD 1983 UTM Zone 13N

## NORTH CARRACAS PLAN OF DEVELOPMENT

### CRITICAL HABITAT FOR FEDERALLY LISTED SPECIES

### MAP

ARCHULETA COUNTY, CO

TOWNSHIP 32 NORTH, RANGE 3, 4, & 5 WEST

CARRACAS AND PAGOSA JUNCTION, CO QUADRANGLE

DATE: 3/28/2012