

US EPA ARCHIVE DOCUMENT

BIOLOGICAL ASSESSMENT

DELAWARE BASIN JV GATHERING LLC

**AVALON MEGA CENTRAL GATHERING
FACILITY**

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C-K Associates' Project 8509

LIST OF ACRONYMS

AERMOD	American Meteorological Society EPA Regulatory Model
AHPS	Advanced Hydrologic Prediction Service
AOI	Area of Impact
AQRV	Air Quality Related Values
AVO	Audio/Visual/Olfactory
BA	Biological Assessment
BACT	Best Available Control Technology
BGEPA	Bald and Golden Eagle Protection Act
BISON	Biota Information System of New Mexico
CFC	Chlorofluorocarbons
CGF	Central Gathering Facility
CH ₄	Methane
CO	Carbon Monoxide
CO ₂	Carbon Dioxide
CO ₂ e	Carbon Dioxide Equivalent
dB	Decibel
dBA	A-weighted Decibel
DBJVG	Delaware Basin JV Gathering
ESA	Endangered Species Act
ESL	Effects Screening Levels
EO	Element of Occurrence
ESA	Endangered Species Act
EPA	Environmental Protection Agency
FIP	Federal Implementation Plan
FEMA	Federal Emergency Management Agency
GHG	Greenhouse Gas
GPM	Gallons per Minute
HAP	Hazardous Air Pollutants
HFC	Hydrochlorofluorocarbons
HUD	U.S. Department of Housing and Urban Development
km	kilograms
LDAR	Leak Detection and Repair
Ldn	Daynight Sound Level
Leq	24-hour Equivalent Sound Level
Pb	Lead
MAOI	Maximum Area of Impact
MBTA	Migratory Bird Treaty Act
MMscfd	Million Standard Cubic Feet per Day
MMBtu/hr	Million British thermal units/hour
MSS	Maintenance, Start-up and Shutdown
NAAQS	National Ambient Air Quality Standards
NCDC	National Climatic Data Center
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
N ₂ O	Nitrous Oxides

LIST OF ACRONYMS

NO _x	Nitrogen Oxides
NPDES	National Pollutant Discharge Elimination System
NWS	National Weather Service
NWI	National Wetland Inventory
NRCS	Natural Resources Conservation Service
NO ₂	Nitrogen Dioxide
NO _x	Nitrogen Oxide
NSR	New Source Review
O ₃	Ozone
PM	Particulate Matter
PM ₁₀	Particulate Matter with an aerodynamic diameter of 10 microns
PM _{2.5}	Particulate Matter with an aerodynamic diameter of 2.5 microns
PSD	Prevention of Significant Deterioration
PTE	Potential to Emit
RBLC	RACT/BACT/LAER Clearinghouse
RN	Regulated Entity Number
ROI	Radius of Impact
SCR	Selective Catalytic Reduction
SER	Significant Emission Rates
SIC	Standard Industrial Code
SIL	Significant Impact Level
SO ₂	Sulfur Dioxide
TAC	Texas Administrative Code
TCEQ	Texas Commission on Environmental Quality
TEG	Triethylene glycol
TNDD	Texas Natural Diversity Database
TPWD	Texas Parks and Wildlife Department
tpy	Tons per year
US	United States
USFWS	US Fish and Wildlife Service
USGS	US Geological Survey
VOC	Volatile Organic Compound

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1.0 INTRODUCTION

Delaware Basin JV Gathering LLC (DBJVG) is proposing to construct and operate the Avalon Mega Central Gathering Facility (CGF). The proposed Avalon Mega CGF facility will be located approximately 15 miles north of Mentone, Texas in Loving County (Figure 1). The Avalon Mega CGF facility is in Section 37, Abstract Number 301110, Survey Name Texas and Pacific Railroad Company, Block Number 55 T1, Survey Number 37. The primary Standard Industrial Classification (SIC) code of the proposed Avalon Mega CGF is 1321 (Natural Gas Liquids).

The proposed Avalon Mega CGF is subject to Federal Prevention of Significant Deterioration (PSD) requirements for Greenhouse Gas (GHG) emissions. In Texas, at the time of the initial application, the Environmental Protection Agency (EPA) was solely responsible for issuing PSD permits for major sources of GHGs. DBJVG submitted a GHG PSD permit application which was received by the EPA on January, 22, 2013. In addition to GHG, the Avalon Mega CGF will be a major stationary source for nitrogen oxides (NO_x) and carbon monoxide (CO). Significant emission rates (SERs) were exceeded, requiring PSD review for volatile organic compounds (VOC), sulfur dioxide (SO₂), particulate matter (PM) with an aerodynamic diameter of 10 microns or less (PM₁₀), and PM with an aerodynamic of 2.5 microns or less (PM_{2.5}). DBJVG also submitted a PSD permit application for the non-GHG PSD pollutants which was received by Texas Commission on Environmental Quality on December 5, 2012.

Prior to issuing the federal PSD permit, EPA must comply with Section 7 of the Endangered Species Act (ESA) (pursuant to 50 CFR Part 402) by preparing a Biological Assessment (BA). This BA was prepared to analyze any potential impacts from the proposed activities described in the PSD Permit Application for the Avalon Mega CGF project. The conclusion of this BA will include a recommended determination of effect on federally threatened, endangered, and candidate species, migratory birds, and bald and golden eagles. The three possible determinations offered by the U.S. Fish and Wildlife Service (USFWS) for a BA are described below.

1. “No effect” means there will be no impacts, positive or negative, to listed or proposed resources. Generally, this means no listed resources will be exposed to action and its environmental consequences. Concurrence from the USFWS is not required.
2. “May affect, but not likely to adversely affect” means that all effects are beneficial, insignificant, or discountable. Beneficial effects have contemporaneous positive effects without any adverse effects to the species or habitat. Insignificant effects relate to the size of the impact and include those effects that are undetectable, not measurable, or cannot be evaluated. Discountable effects are those extremely unlikely to occur. These determinations require written concurrence from the USFWS.
3. “May affect, and likely to adversely affect” means that listed resources are likely to be exposed to the action or its environmental consequences and will respond in a negative manner to the exposure.

2.0 PROJECT DESCRIPTION

The Avalon Mega CGF will be designed to treat up to 200 million standard cubic feet per day (MMscfd) of sweet natural gas in six identical processing trains. The Avalon Mega CGF will consist of inlet separation of liquids from the gas, amine treating to remove of carbon dioxide (CO₂) from natural gas, glycol dehydration to remove water from natural gas, natural gas compression, pipeline loading of high-pressure condensate liquids, and truck loading of low-pressure condensate and produced water liquids. The proposed Avalon Mega CGF will include six amine unit reboilers, six dehydrator reboilers, twelve compressor engines, six diesel emergency power generators, six thermal oxidizers, three process flares, truck loading operations, six produced water tanks, planned maintenance, start-up, and shutdown (MSS) activities, and equipment leak fugitives as emission sources.

The Avalon Mega CGF will be a major source (greater than 250 tons per year (tpy)) with respect to the non GHG criteria pollutants NO_x and CO (Trinity, 2012a; Trinity, 2012b). According to EPA's "major for one, major for all" PSD policy, if a site is major for a regulated pollutant or GHG, then the remaining regulated pollutants need to be compared to the Significant Emission Rates (SERs) when determining PSD applicability for these pollutants. The SER for NO_x, SO₂, and VOCs is 40 tpy, 100 tpy for CO, 25 tpy for PM₁₀, and PM_{2.5}. Based on the potential to emit calculations, the project will also trigger PSD review based on SER for VOC, SO₂, PM₁₀, and PM_{2.5} (Trinity, 2012a; Trinity, 2012b).

GHGs occur in the atmosphere naturally and as a result of human activities, such as burning fossil fuels. GHG are gases that trap heat in the atmosphere. They include water vapor, CO₂, methane (CH₄), nitrous oxide (N₂O), fluorinated gases including chlorofluorocarbons (CFC) and hydrochlorofluorocarbons (HFC), and halons, as well as ground level O₃.

Avalon Mega CGF will utilize Best Available Control Technology (BACT) to reduce emissions of air pollutants and therefore reduce the impacts to the environment. The Avalon Mega CGF will be designed and constructed using new or updated energy efficient equipment. The Avalon Mega CGF was designed with heat and process integration in mind for increased energy efficiency. Where feasible, available process streams will be used that will transfer heat to reduce the combustion heating requirements. Equipment (vessels), piping, and components in hot service to will be designed to prevent heat lose to the atmosphere from equipment containing hot streams.

Flash gas from the amine unit reboilers, and flash gas and still vent from the glycol dehydrator reboiler, will be recycled back to the fuel gas system instead of sending these vents to a control device. The recycling will reduce the amount of natural gas required to fuel the facility's combustion sources and will avoid the formation of additional GHG from combusting this material in a control device.

Process control instrumentation and pneumatic components will be operated using compressed air rather than fuel gas or off-gas; therefore, no GHG emissions will be emitted to the atmosphere from these components. The plant will be built using new, state-of-the-art equipment and process instrumentation and controls. DBJVG operating and maintenance

policies will maintain all equipment according to manufacturer specifications in order to keep all equipment operating efficiently. The BACT analysis performed is described in the PSD permit application (Trinity, 2012a and 2012b).

Construction of the proposed Avalon Mega CCF, associated infrastructure, and auxiliary equipment will take place within the 1,500 ft x 1,500 ft (50 acre) fenced area. Minimal earth disturbance is anticipated outside of this 1,500 ft x 1,500 ft area as existing roads and other existing infrastructure will be used (Figures 2 and 3).

3.0 DETERMINATION OF ACTION AREA

The EPA established National Ambient Air Quality Standards (NAAQS), for specific pollutants to protect the health and welfare of the general public. Ambient air quality standards are classified as either primary or secondary standards. Primary standards define levels of air quality necessary to protect the public health. Secondary ambient air quality standards define levels of air quality necessary to protect the public welfare from any known or anticipated adverse effects of a pollutant. The major pollutants of concern, or criteria pollutants, are CO, SO₂, NO₂, O₃, PM₁₀, and lead (Pb).

The EPA designates the attainment status of an area on a pollutant-specific basis based on whether an area meets the NAAQS. Areas that meet the NAAQS are termed attainment areas. Areas that do not meet the NAAQS are termed nonattainment areas. Areas for which insufficient data are available to determine attainment status are termed unclassified areas. Areas formerly designated as nonattainment areas that have subsequently reached attainment are termed maintenance areas (USEPA, 2014b).

Trinity used EPA's American Meteorological Society/EPA Regulatory Model (AERMOD) for dispersion modeling. PSD air quality analysis was triggered for the emissions of CO, NO₂, SO₂, PM₁₀, and PM_{2.5}.

The pollutants PM₁₀, PM_{2.5}, NO₂ and SO₂ were above the Significant Impact Levels (SIL) designated by EPA for each pollutant and averaging period (Table 1). However, all predicted concentrations from the proposed project comply with the applicable NAAQS. The action area was created by plotting the radius of impact (ROI). The largest ROI was for NO₂ which had a maximum distance of approximately 28 miles (45.835 km) (Figure 4). The action area occurs in Loving County with Ward County to the south, the Pecos River and Reeves County to the west, and Eddy and Lea Counties to the north. Culberson, Loving, and Reeves Counties in Texas and Eddy and Lea Counties in New Mexico are currently classified as being attainment/unclassified for all criteria pollutants (40 CFR 81.332 New Mexico and 40 CFR 81.344 Texas) (USEPA, 2014b).

Table 1
 Summary of Modeled Air Quality Impacts for the Proposed Project, Compared with Applicable Significant Impact Levels

Primary Emissions Scenario							
Pollutant	Averaging Period	NAAQS	SIL	Maximum Modeled Concentration	Compliance with SIL? Y/N	ROI	
		($\mu\text{g}/\text{m}^3$)	($\mu\text{g}/\text{m}^3$)	($\mu\text{g}/\text{m}^3$)	(<SIL)	(km)	(mi)
PM ₁₀	24-hour	150	5	10.4	No	0.54	0.336
PM _{2.5}	24-hour NAAQS	35	1.2	8.24	No	1.3	0.808
NO ₂	ARM 1-hour	100	7.5	114.82	No	45.835	28.481
CO	1-hour	35,000	2,000	258.11	Yes		
	8-hour	9,000	500	227.80	Yes		
SO ₂	1-hour	75	7.8	66.87	No	12.06	7.829

4.0 EXISTING REGIONAL CONDITIONS

The physical site for the Avalon Mega CGF is in Loving County, Texas. Loving County remains generally undeveloped with scarce water sources (USDA/NRCS, 1999). The economy is primarily based on oil and gas production (USDA/NRCS, 1999). Elevations in the area range from approximately 2,640 to 3,000 feet above sea level (NRCS/USDA, 1999; Griffith et al., 2004). Temperatures vary from an average low of 29° F in January to an average high of 96° in July and August. The prevailing winds are from the south-southeast. The growing season extends approximately 222 to 226 days, and rainfall averages nine to 13 inches per year (USDA/NRCS, 1999; Griffith et al., 2004). Loving County consists of 671 square miles of flat desert terrain with a few low-rolling hills stretching over calichified bedrock and wash deposits of pebbles, gravel, and sand (USDA/NRCS, 1999). Large areas in northern Loving County are composed of active, windblown sand dunes, subject to wind erosion and sediment transport (Griffith et al, 2004). The soils of the county consist of sandy loams, chalk, clays, and sands-support desert shrubs, cacti, range grasses, and salt cedars along the Pecos River (USDA/NRCS, 1999; Griffith et al., 2004). Wildlife includes waterfowl, quail, deer, badgers, javelinas, rabbits, bobcats, coyotes, armadillos, skunks, opossums, raccoons, rattlesnakes, killifish, brine shrimp, and turtles (USDA/NRCS, 1999).

The action area is located within the Chihuahuan Deserts Level III eco-region of Texas and New Mexico (Griffith et al., 2004; Griffith et al., 2006) which is in the Pecos Valley physiographic province of North America (USGS, 2003). The Level III ecoregion was further refined into seven Level IV ecoregions (Griffith et al., 2004; Griffith et al., 2006).

The portion of the action area in Culberson, Loving, and Reeves County, Texas is in the Chihuahuan Basin and Playas Level IV ecoregion (Griffith et al., 2004). The portion of the action area in Eddy and Lea County, New Mexico is mostly in the Chihuahuan Basin and Playas Level IV ecoregions and a very small portion in the Chihuahuan Desert Grasslands Level IV ecoregion (Griffith et al., 2006; USDA/NRCS, 2013, 1999, 1980, 1974, 1971). The Chihuahuan Basins and Playas that formed during Tertiary Basin and Range tectonism include alluvial fans,

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internally drained basins, and river valleys mostly below 4,500 feet. In general, relatively high average temperatures, low humidity, and often-extreme temporal and spatial variability in precipitation amounts characterize this region. Saline or alkaline soils and areas of salt flats, dunes, and windblown sand are typical of the playas and basin floors (Griffith et al., 2004). Soils are generally dry, poorly developed, low in percentage of organic matter and high in carbonates (USDA/NRCS, 2013, 1999, 1980, 1974, 1971). Creosotebush (*Larrea tridentata*) is the dominant specie and other common species are tarbush (*Flourensia cernua*), fourwing saltbush (*Atriplex canescens*), acacias (*Acacia* sp.), gyp grama (*Bouteloua breviseta*), alkali sacaton (*Sporobolus airoides*), horse cripper (*Echinocactus texensis*) and other cacti are common (Griffith et al., 2004; USDA/NRCS, 2013, 1999, 1980, 1974, 1971). The area has large seasonal and diurnal ranges in temperature, low available moisture, and a high evapotranspiration rate (Griffith et al., 2004).

Chihuahuan Desert grasslands are located at various elevations throughout mountain valleys and have generally higher annual precipitation (10 to 15 inches) than the Chihuahuan Basins and Playas (Griffith et al., 2006). Silts and clays are characteristic of the desert grassland regions and have a higher water retention capacity than coarser-textured soils (USDA/NRCS, 1971). Grasslands became fragmented in the late 19th and early 20th centuries due to over-grazing and continue to be impacted by erosion, drought, fire suppression, and climate change (Griffith et al., 2006; USDA/NRCS, 1971). Creosotebush, prickly pear (*Opuntia* sp.), and cholla cacti (*Cylindropuntia* sp.) are scattered throughout traditional local grasses that include black, blue, and sideoats grama (*Bouteloua eriopoda*, *Bouteloua gracilis*, and *Buteloua curtispindula*, respectively), dropseeds (*Sporobolus heterolepis*), bush muhly (*Muhlenbergia porteri*), three-awns grasses (*Aristida* sp.), alakali sacaton (*Sporobolus airoides*), big alakali sacaton (*Sporobolus airoides*) and tobosagrass (*Pleuraphis mutica*)(Griffith et al., 2006).

The major river basin in the area is the Pecos River. The Pecos River basin drains toward the Rio Grande River and eventually to the Gulf of Mexico (Griffith et al., 2004; Griffith et al., 2006). Outside the Pecos and Rio Grande River drainages, the landscape is largely internally drained. The Pecos River is the only continuous flowing source of surface water in the area (Smith, 2014). In 1936, Red Bluff Dam was built across the Pecos on the Texas-New Mexico boundary for irrigation and recreation. Water from the Pecos, however, is too saline for drinking. The main tributaries are Salt and Toyah Creeks and Four Mile, Horsehead, and Salt Draws. Along the Pecos River in the south and west are areas of alluvial fans composed of sand, gravel, and mud substrate. Scrub brush and sparse grasses grow in this part of the county (Griffith et al., 2004; Griffith et al., 2006).

5.0 FEDERALLY LISTED THREATENED, ENDANGERED, OR CANDIDATE SPECIES

A number of species are considered to be rare and are protected under federal and state law. The ESA of 1973 designates a number of species as threatened or endangered. These species have been determined to be vulnerable to endangerment or are at a very high risk of extinction. The Texas Parks and Wildlife Department (TPWD) maintains a list of state threatened and endangered species (TPWD, 2014a). This list includes flora and fauna whose occurrence in Texas is or may be in jeopardy or with known or perceived threats or population declines. The

New Mexico Department of Game and Fish and The Fish and Wildlife Information Exchange (Conservation Management Institute, VA Tech, Blacksburg, VA) maintains The Biota Information System of New Mexico (BISON). Accounts for federally threatened, endangered and sensitive species as well as vertebrate and many invertebrate species of wildlife occurring in New Mexico and Arizona are maintained in BISON (BISON, 2013). New information is being added continuously, however, many accounts are incomplete. Species listed in BISON are not necessarily the same as those protected by the federal government under the ESA. Bald and Golden Eagle Protection Act (BGEPA) of 1940 prohibits the taking of bald and golden eagles, including their parts, nests, or eggs. Migratory birds are protected under the Migratory Bird Treaty Act (MBTA, 16 U.S. Code 703-711). Under the MBTA, taking, killing or possessing migratory birds is unlawful. A number of protected species are listed by the USFWS (USFWS, 2014a) and TPWD as occurring in Culberson, Loving, and Reeves Counties, Texas; and BISON for Eddy and Lea Counties, New Mexico. A detailed listing of the federally threatened and endangered species (birds, fish, reptiles and mammals) potentially found within the counties is included as Appendix A.

The TPWD also maintains the Texas Natural Diversity Database (TXNDD). A review of TPWD's TXNDD existing records regarding threatened and endangered species, sensitive natural communities, and other features of concern known or suspected to occur in the proposed project area was done. The TXNDD is a comprehensive source of information on rare, threatened, and endangered plants, animals, invertebrates, exemplary natural communities, and other significant features.

The TXNDD is continually updated, providing current or additional information on statewide status and locations of these unique elements of natural diversity. The data is not all-inclusive, as there may be gaps in coverage and species data, due to the lack of access to land or data. The TXNDD uses information sources, such as museum and herbarium collection records, peer-reviewed publications, experts in the scientific community, organizations, qualified individuals, and on-site field surveys conducted by TPWD staff on public lands or private lands with written permission. The TXNDD can be used to help evaluate environmental impacts of routing and siting options for development projects, environmental review, and permit review. TXNDD is based on the best data available to TPWD for rare species. These data cannot provide a definitive statement as to the presence, absence, or condition of special species, natural communities, or other significant features in any area.

There were several elements of occurrence (EO) located within the action area, however none of these represent a federally listed species. The detailed TXNDD is included as Appendix B and Figure 5.

Current BISON, TPWD, and USFWS lists of threatened and endangered species potentially occurring in Loving County, as well as two adjacent counties (Culberson and Reeves) and two adjacent counties in New Mexico (Eddy and Lea) were reviewed. The TXNDD of documented rare species and resource occurrences within each of the counties of the action area was also reviewed (TXNDD 2011). It should be noted that the TXNDD database query of the action area counties was utilized to help determine trends in rare species occurrences in the region for context and does not in any way represent the action area, which extends up to approximately 46 km (28 miles) from the proposed Avalon Mega CGF facility.

A number of additional species were included in the USFWS, BISON, or TPWD query of the three Texas and two New Mexico counties that do not have formal regulatory protection due to a lack of federal protection. These species, falling within five categories, were not evaluated in detail as part of this project. A few of the avian species listed below are, however, protected by the MBTA, but it has been concluded that none of these could be affected by the project. Below is a list of the excluded species:

- Concern of TPWD: Plant species occurring in the site vicinity that have no formal protection that are tracked by the TPWD include the dune umbrella sedge (*Cyperus onerosus*) and gyp locoweed (*Astragalus gypsodes*).
- Species with Special Conservation: The dunes sagebrush lizard (*Sceloporus arenicolus*; i.e. sand dune lizard) is no longer being considered for current listing by the USFWS due to the fact that there are voluntary conservation agreements in place in New Mexico and Texas that provide for long-term conservation of the species.
- Federally Delisted: Excluded species that historically were federally listed, but have since been delisted include the American peregrine falcon (*Falco peregrinus anatum*) and Arctic peregrine falcon (*Falco peregrinus tundrius*).
- Threatened in the State of Texas: Excluded species listed only under the State of Texas as Threatened include the false spike mussel (*Quadrula mitchelli*), Pecos pupfish (*Cyprinodon pecosensis*), Chihuahuan Desert lyre snake (*Trimorphodon vilkinsonii*), mountain short-horned lizard (*Phrynosoma hernandesi*), Texas horned lizard (*Phrynosoma cornutum*), American peregrine falcon, zone-tailed hawk (*Buteo albonotatus*), common black-hawk (*Buteogallus anthracinus*), and reddish egret (*Egretta rufescens*).
- Federally Protected Elsewhere: The whooping crane (*Grus americana*) and black bear (*Ursus americanus*) were not discussed based on project location. An experimental population of whooping cranes once wintered at Bosque del Apache National Wildlife Refuge in New Mexico, but that population did not survive and no whooping cranes are known to occur in West Texas or New Mexico. The species of black bear that is federally and state listed as Threatened is the Louisiana black bear (*Ursus americanus luteolus*) which has a restricted territory of eastern Texas, Louisiana, and southern Mississippi.

Additionally, six West Texas invertebrates were listed as federally endangered on August 8, 2013 (as well as associated critical habitat), but were not evaluated as part of the project. These species include Phantom springsnail (*Pyrgulopsis texana*), Phantom tryonia (*Tryonia cheatumi*), diminutive amphipod (*Gammarus hyalleloides*), diamond tryonia (*Pseudotryonia adamantina*), Gonzales tryonia (*Tryonia circumstriata*), and Pecos amphipod (*Gammarus pecos*). The current range for the Phantom springsnail, Phantom tryonia, and diminutive amphipod is limited to spring outflows in the San Solomon Springs system near Balmorhea in Reeves and Jeff Davis Counties, Texas. The current range for the Diamond tryonia, Gonzales tryonia, and Pecos amphipod is restricted to spring outflow areas within the Diamond Y Spring system north of Fort

Stockton in Pecos County, Texas. The range and designated critical habitat is outside the action area, therefore, these species are not included in this document.

Table 2 is a brief listing of these federally threatened or endangered species and their habitat.

Table 2
Rare Species Known to Occur in the Project Vicinity

Species Common Name (<i>Scientific name</i>)	Federal Status ¹	Listing Agency and Reported County				Habitat
		ECOS ²	SW Region ³	TPWD ⁴	BISON ⁵	
Plants						
Wright's Marsh Thistle (<i>Cirsium wrightii</i>)	C	Eddy	Eddy			Wetland obligate that occurs in alkaline soils in spring seeps and marshy edges of streams and ponds between 1,150 and 2,390 meters (3,450 and 7,850 feet). Historically known from New Mexico, Arizona, and Mexico. Currently only known from eight localities in New Mexico. Typically blooms in May.
Lee Pincushion Cactus (<i>Coryphantha sneedii</i> var. <i>leei</i>)	LE	Eddy	Eddy			Occurs in scrub to conifer woodlands, rock outcrops (rarely alluvial rubble) in the Chihuahuan desert. Typically in narrowly confined to cracks in limestone; 600-2,600 meters (2,000-8,500 feet); also cultivated as an ornamental. Found only in the Guadalupe Mountains of New Mexico, near Carlsbad Caverns National Park. Blooms between March and June.
Sneed Pincushion Cactus (<i>Coryphantha sneedii</i> var. <i>sneedii</i>)	LE	Eddy	Eddy			Occurs in cracks on vertical limestone cliffs or ledges in Chihuahuan desert scrub between 1,190 and 2,345 meters (3,900 and 7,700 feet). Known from two counties in New Mexico and one in Texas. Blooms between March and June.
Kuenzler Hedgehog Cactus (<i>Echinocereus fendleri</i> var. <i>kuenzleri</i>)	LE	Eddy	Eddy			Known from four counties in New Mexico in the lower fringes of pinyon-juniper woodlands on gentle slopes in cracks of limestone outcrops or in the shallow soils of the flat steps of hillsides between 1,770 and 1,950 meter (5,805 and 6,400 feet). Blooms between May and June.
Gypsum Wild Buckwheat (<i>Eriogonum gypsophilum</i>)	LT	Eddy	Eddy			A gypsophile that occurs on outcrops of gypsum rock and areas with gypsum soils in dry, nearly barren habitats between 900 and 1,000 meters (2,955 and 3,610 feet). Known only from Eddy County, New Mexico. Blooms between May and September.

Table 2
Rare Species Known to Occur in the Project Vicinity

Species Common Name (<i>Scientific name</i>)	Federal Status ¹	Listing Agency and Reported County				Habitat
		ECOS ²	SW Region ³	TPWD ⁴	BISON ⁵	
Guadalupe Mountains Fescue (<i>Festuca ligulata</i>)	C	Culberson	Culberson	Culberson		Occurs in pin-oak-juniper woodlands on mesic slopes and in creek bottoms above 1,800 meters (5,900 feet). Substrates are gravelly and sandy loam derived from igneous materials (Chisos Mountains) and presumed to be loamy soils over limestone (Guadalupe Mountains). Blooms between August and September (occasionally in the spring following sufficient rainfall).
Pecos/Puzzle Sunflower (<i>Helianthus paradoxus</i>)	LT	Reeves	Reeves	Reeves		Occurs in saline, calcareous, heavy-textured soils around cienegas (i.e. unique type of spring) typically on perennially wet soils of subirrigated terraces just above the wettest sites between 1,000 and 2,000 meters (3,280 and 6,560 feet). Blooms between August and November.
Mollusks						
Pecos Assiminea Snail (<i>Assiminea pecos</i>)	LE	Reeves	Reeves	Reeves		Semi-aquatic marine snail found on moist ground or beneath emergent plants within a few centimeters of flowing water. In Texas, historically occurred throughout the Pecos River Valley, but currently is only known from a population near Fort Stockton, Pecos County.
Texas Hornshell Mussel (<i>Popenaias popeii</i>)	C	Eddy	Eddy	Loving, Reeves	Eddy	Known from the Rio Grande Basin and several rivers in Mexico. Occurs in areas where small-grained materials collect in crevices along river banks and at the base of boulders at both ends of narrow shallow runs over bedrock (not known from impoundments).
Fishes						
Comanche Springs Pupfish (<i>Cyprinodon elegans</i>)	LE	Reeves	Reeves	Reeves		Restricted to swift-flowing water within San Solomon and Phantom Cave, as well as their associated springs and downstream irrigation canals.
Pecos Gambusia (<i>Gambusia nobilis</i>)	LE	Eddy, Reeves	Eddy, Reeves	Reeves	Eddy	Occurs in the shallow margins of clear, vegetated spring waters high in calcium carbonate and sinkhole habitats of the Pecos River and its tributaries.

Table 2
Rare Species Known to Occur in the Project Vicinity

Species Common Name (<i>Scientific name</i>)	Federal Status ¹	Listing Agency and Reported County				Habitat
		ECOS ²	SW Region ³	TPWD ⁴	BISON ⁵	
Pecos Bluntnose Shiner (<i>Notropis simus pecosensis</i>)	LT	Eddy	Eddy		Eddy	Occurs in the main stream channel of the Pecos River from near the town of Fort Sumner downstream to the town of Artesia within three counties in New Mexico. This reach of river has a sandy substrate with low velocity flow and supports backwaters, riffles, pools, and natural springs.
Birds						
Bald Eagle (<i>Haliaeetus leucocephalus</i>)	BGEPA					Nests in tall trees or on cliffs near rivers and large lakes. Roosts communally, particularly in the winter.
Golden Eagle (<i>Aquila chrysaetos canadensis</i>)	BGEPA					Occur in a variety of habitats, but nest on cliffs or in large trees.
Northern Aplomado Falcon (<i>Falco femoralis septentrionalis</i>)	LE	Culberson ⁶ , Reeves ⁶ , Eddy ⁷ , Lea ⁷	Culberson ⁷ , Eddy ⁷ , Lea ⁷ , Loving ⁷ , Reeves ⁷	Culberson, Reeves	Eddy, Lea	Nests in abandoned stick nests built by other birds. The Northern Aplomado Falcon prefers open habitats such as savannas and open woodland, grassy plains and valleys with scattered mesquite, yucca and cactus with an abundance of nest sites and prey (insects, small to medium-sized birds, small snakes, lizards, and rodents).
Least Tern (<i>Sterna antillarum</i>), interior population (<i>S.a. athalassos</i>)	LE	Eddy		Loving, Reeves	Eddy, Lea	Breeding occurs from late April to August. Nests along barren to sparsely vegetated sandbars along rivers, sand and gravel pits, or lake and reservoir shorelines. Forages within a few hundred feet of its colony on small fish and crustaceans.
Piping Plover (<i>Charadrius melodus</i>)	LT	Eddy			Eddy	An active forager on a variety of aquatic invertebrates such as insects, crustaceans and mollusks. Breeding range is from U.S. and Canadian Great Plains from Nebraska north to Alberta and Manitoba, beaches bordering the Great Lakes, and Atlantic coastal beaches from North Carolina to Newfoundland Winter distribution includes the southern Atlantic and Gulf coast, and several Caribbean Islands.
Sprague's Pipit (<i>Anthus spragueii</i>)	C	Eddy, Lea	Eddy	Culberson, Loving, Reeves,	Eddy, Lea	The Sprague's pipit is a ground nester that occurs in native upland prairie and coastal grasslands (sensitive to patch size and avoids edges). Migrates diurnally between mid-September to early April.

Table 2
Rare Species Known to Occur in the Project Vicinity

Species Common Name (<i>Scientific name</i>)	Federal Status ¹	Listing Agency and Reported County				Habitat
		ECOS ²	SW Region ³	TPWD ⁴	BISON ⁵	
Mexican Spotted Owl (<i>Strix occidentalis lucida</i>)	LT	Culberson, Reeves, Eddy	Culberson, Reeves	Culberson	Eddy	Occurs in remote, shaded canyons of coniferous mountain woodlands (pine and fir) and roosts in densely vegetated trees, rocky areas, and caves.
Southwestern Willow Flycatcher (<i>Empidonax traillii extimus</i>)	LE	Culberson, Eddy	Eddy, Culberson	Culberson	Eddy	Nests in thickets of willows, cottonwoods, mesquite, and other species along desert springs.
Mammals						
Black-footed Ferret (<i>Mustela nigripes</i>)	LE		Eddy ⁷ , Lea ⁷	Culberson, Loving, Reeves,		Primary habitat includes short grassed prairie land within existing prairie dog colonies. Believed to be extirpated.
Gray Wolf (<i>Canis lupus</i>)	LE			Culberson, Loving, Reeves,		Historically inhabited forests, brushlands, and grasslands of the western two-thirds of Texas, but is believed to be extirpated.

Notes:

¹ LE=Federally Endangered, LT=Federally Threatened; C=Federal Candidate; BGEPA=Bald and Golden Eagle Protection Act

² ECOS=USFWS Environmental Conservation Online Service

³ SW Region=USFWS Southwest Region Ecological Services County-by-County List

⁴ TPWD=TPWD Annotated County List of Rare Species Federal Status

⁵ BISON=Biota Information System of New Mexico County List of Species Federal Status

6.0 PROTECTED SPECIES HABITAT EVALUATION

C-K completed a habitat evaluation on December 3 and 4, 2012 to determine if habitat within the action area was likely to support any of the federally-protected species listed in Table 2. The field surveys also included a windshield survey of accessible habitats visible from public areas within the project site. The majority of the lands are privately-owned and not visible or accessible from public areas or roads. Data were collected to describe resident vegetation communities and assess the potential for occurrence of protected species. Photographs of the proposed project area and accessible surrounding areas are included as Appendix C.

The project site is located within a rural, undeveloped area utilized for cattle grazing, and more recently hydrocarbon exploration. Based upon the field assessment the natural drainage of the site flows generally to the east, via sheet flows and overland flows. Storm water drainage will be expected to continue east and then south through unnamed tributaries of the Pecos River, located south then continuing west of the project site. Common vegetative components identified within the site include creosotebush, with a few scattered prickly pear. The soil conditions observed within the project site were ranged from a 6/3 (pale brown) to 6/4 (light yellowish brown) to 7/4 (very pale brown) on the 10 YR page of the Munsell Soil Color Chart. No mottling or redox formations were observed within the upper 12 inch soil horizon. The soils texture included silty loams underlain by rock.

The action area in Culberson, Loving and Reeves Counties, Texas and the majority of the action area in Eddy and Lea Counties, New Mexico is typical of the Chihuahuan Basin and Playas. The drainages observed were tributaries to the Pecos River. The majority of the area was characterized by gently rolling hills becoming slightly steeper the more northern toward New Mexico. Many areas had visible dunes and windblown sand. Creosotebush was the dominant species. Other common species observed were typical of the region such as Joshua tree (*Yucca brevifolia*), Texas paloverde (*Parkinsonia texana*), ocotillo (*Fouquieria splendens*), mesquite (*Prosopis glandulosa*), fourwing saltbush, acacias, gypsum grama, alkali sacaton, and horse creeper.

7.0 EFFECT ANALYSIS OF THE PROPOSED ACTION

This analysis is based on total emissions and dispersion modeling data provided by Trinity, field survey and background review of data collected by C-K, and literature review and research of potential effects of known pollutants on flora and fauna.

7.1 Air Quality Effects

A review of current literature was performed for data, documentation, or research about the potential effects of GHG (primarily PM₁₀, PM_{2.5}, NO₂ and SO₂) potential effects of air emissions on flora and fauna in the action area. The EPA's document "A Screening Procedure for the Impacts of Air Pollution Sources on Plants, Soils, and Animals," lists the minimum concentration source emissions that may have adverse impacts on plants or animals. Estimates of potential impacts on flora and fauna are variable and dependent upon site-specific conditions (USEPA, 1980).

The results from the ambient air modeling analyses in support of the PSD and TCEQ New Source Review (NSR) modeling for pollutants included SO₂, NO₂ and CO which are included in the screening document (USEPA 1980), show that their maximum predicted concentrations are orders of magnitude lower than their respective AQRV screening concentrations (Table 3). The concentration at which airborne NO₂ impacts vegetation rises with the decrease in length of exposure (EPA, 1980). An EPA screening concentration is not available for 1-Hour NO₂. Screening concentrations not represented in Table 3 were not included because of a lack of data available to provide a suitable screening concentration (EPA, 1980).

The screening concentration for 4-Hour NO₂ will be less than or equal to the screening concentration for 1-Hour NO₂. The value for 1-Hour NO₂ is considerably below the EPA screening concentration for 4-Hour NO₂. Vegetation located within the action area for 1-Hour NO₂ will likely not be adversely affected by the 1-Hour NO₂ source emission.

Table 3
Screening Analysis for SO₂, NO₂, and CO

Pollutant	Averaging Period	Maximum Modeled Concentration ¹ (µg/m ³)	AQRV Screening Concentration ² (µg/m ³)	NAAQS (µg/m ³)
SO ₂	1-Hour	66.87	917	196
NO ₂	1-Hour	114.82	>3,760 ³	188
CO	1-Hour	258.11	>1,800,000 ³	40,000
	8-Hour	227.80	>1,800,000 ³	10,000

¹ µg/m³ = micrograms per cubic meter.

² Table 3.1, USEPA (1980).

³ Value not available. A conservative value (next the longer averaging period) is provided.

The screening document did not include additional information for total suspended PM other than that used for NAAQS (USEPA, 1980). The current procedure should suffice according to the screening document to demonstrate compliance with the PM₁₀ and PM_{2.5} NAAQS (USEPA, 1980). The air dispersion modeling for PM₁₀ and PM_{2.5} indicates that the modeled concentrations are less than Primary NAAQS and Secondary NAAQS (Table 4). The proposed project will likely not cause considerable impacts on soils, water, vegetation or wildlife.

Table 4
NAAQS Analysis for PM₁₀ and PM_{2.5}

Table 6 NAAQS Modeling results			
Pollutant	Averaging Period	Maximum Modeled Concentration ¹ (µg/m ³)	NAAQS (µg/m ³)
PM ₁₀	24 Hour	10.40	150
PM _{2.5}	24-Hour	8.24	35

¹ µg/m³ = micrograms per cubic meter.

7.2 Air Quality Effects

7.2.1 Emissions

The Avalon Mega CGF is subject to PSD review for NO_x, CO, VOC, and PM/PM₁₀/PM_{2.5}. DBJVG will use BACT to control emissions and thus minimize any potential impacts to the

surrounding environment. The proposed emissions limits of each pollutant are consistent with both the TCEQ BACT guidance and the most stringent limits in the RBLC; and, are considered to be the top level of control available for the new and modified facilities. Emissions resulting from gasoline and diesel-fueled vehicles and equipment during construction and maintenance are considered negligible. The project will not require a significant increase in vehicle and equipment use compared to current operators near the facility.

7.2.2 Fugitive Dust

Dust will be emitted during the clearing and construction of the new facility. There will be a minimal increase in fugitive dust caused by soil disturbances. Increased fugitive dust during construction activities are expected to be minimal and short-term (will last a few days). Dust emissions from this project are expected to be negligible after construction activities are completed.

7.2.3 Impacts of Air Pollution Sources on Flora and Fauna

If a modeled pollutant concentration is predicted to be less than or equal to the SILs, no significant impact on flora and fauna is expected. Four pollutant concentrations and averaging periods predicted to be greater than the SILs (PM₁₀ 24-hour, PM_{2.5} 24-hour NAAQS, NO₂ ARM-1hour, and SO₂ 1-hour) were considered for potential impact to flora and fauna in the areas surrounding the proposed project site.

The modeled concentration of CO, NO₂, SO₂, PM₁₀, and PM_{2.5} are below the NAAQS limit. The potential for airborne NO₂ to directly alter the pH of surface waters was considered. The emission resulting from the project will likely not affect surface water pH. Any possible pH effect will be an infrequent and short-term occurrence. The protected species and their habitats with the potential to occur within the action area for the 1-Hour NO₂ source emission will not likely be directly impacted by the proposed expansion project.

Any indirect effects from 1-hour NO₂ such as nitrogen accumulation and nitrogen leaching into adjacent surface waters will more likely to be the result of an annual NO₂ concentration, rather than an infrequent 1-Hour NO₂ concentration as the one modeled. It is likely the terrestrial ecosystems in the vicinity of the project are currently cycling nitrogen. The addition of short-term, infrequent NO₂ concentrations by the proposed project will not likely cause indirect, long-term effects to terrestrial ecosystems.

7.3 Water Quality Effects

7.3.1 Wastewater

Process areas will be located in a covered building. Process wastewater will be collected in tanks and trucked off of the facility to an appropriate disposal facility. There will be no effect from wastewater as a result of the project.

7.3.2 Surface Water

Process areas will be located in a covered building. Overland sheet flows of rainwater continues towards the natural drainage to the east. Storm water drainage will be expected to continue east and then south through unnamed tributaries of the Pecos River, located south then continuing west of the project site. There will likely not be any additional effect from surface water as a result of the project.

7.4 Noise Effects

Noise is generally described as unwanted sound, which can be based on objective effects (e.g., hearing loss, damage to structures) or subjective judgments (e.g., community annoyance). Sound levels are expressed in units called the decibel (dB). The A-weighted decibel (dBA) is a measurement of sound pressure adjusted to conform to the frequency response of the human ear. The dBA is most commonly used for the measurement of environmental and industrial noise (FHWA, 2006).

The magnitude and frequency of environmental noise may vary over the course of the day, the week, and across seasons, in part due to changing weather conditions and the effects of seasonal vegetative cover. Two measures to relate the time-varying quality of environmental noise are the 24-hour equivalent sound level (Leq) and daynight sound level (Ldn). The Leq is the level of steady sound with the equivalent energy as the time-varying sound of interest, averaged over a 24-hour period. The Ldn is the Leq plus 10 decibels on the A-weighted scale (dBA) added to account for people's greater sensitivity to nighttime sound levels (generally between the hours of 10 p.m. and 7 a.m.).

Acceptable noise levels have been established by the U.S. Department of Housing and Urban Development (HUD) for construction activities in residential areas (HUD, 1984). Sound not exceeding 65 dBA is considered acceptable. The exposure may be of some concern, but the indoor and the outdoor environment will be reasonably pleasant for recreation and play. Sound above 65 but not greater than 75 dBA is considered normally unacceptable. The exposure is more severe; barriers and special building construction may be necessary. Sound greater than 75 dBA is considered unacceptable. The exposure is so severe that the construction costs to make the indoor noise environment acceptable may be prohibitive, and the outdoor environment would still be unacceptable (HUD, 1984).

As a general rule of thumb, noise generated by a stationary noise source, or point source, will decrease by approximately 6 dBA over hard surfaces and 9 dBA over soft surfaces for each doubling of the distance. For example, if a noise source produces a noise level of 85 dBA at a reference distance of 50 feet over a hard surface, then the noise level would be 79 dBA at a distance of 100 feet from the noise source, 73 dBA at a distance of 200 feet, and so on (FHWA, 2006).

The anticipated noise levels during construction should be comparable to noise levels from activities that currently take place in the area. The best available technology will be used to maintain noise levels below 85 decibels measured at a distance of 3-feet from the source. No

noise effects to wildlife are expected as a result of the infrastructure construction of the expansion project.

Figures 1 through 3 depict the fence line/property line with respect to predominant geographic features (such as highways, roads, streams, and railroads). There are no schools, religious buildings, commercial businesses, or residences within 3,000 feet of the proposed facility boundary.

7.5 Federally-Protected Species Effects

7.5.1 Federally Listed Species

7.5.1.1 Potential to Occur at Proposed Site and in Action Area

Table 5 lists the likelihood of rare species known from the project vicinity to occur in the project and action areas.

Table 5
Federally Listed Species Potential to Occur at Proposed Site and in Action Area

Species Common Name (Scientific name)	Occurrence Potential within Physical Project Footprint	Occurrence Potential within Area Evaluated for Greenhouse Gases
Wright's Marsh Thistle (<i>Cirsium wrightii</i>)	Absent. Suitable aquatic habitat is absent from the site. The entire site consists of upland habitat with only a few very small depressions that could potentially hold water for short periods of time. Additionally, this species has not been documented in Texas.	Unlikely. There is one documented occurrence within the five counties quarried. A population was found in 2009 at Blue Spring, which is located outside of the area evaluated to the west, northwest.
Sneed Pincushion Cactus (<i>Coryphantha sneedii</i> var. <i>sneedii</i>)	Absent. Suitable habitat is absent from the site. There were no vertical cliffs or ledges on the site's relatively flat terrain.	Unlikely. There are few cliffs in the action area. The ones observed were along the Pecos River and tributaries.
Kuenzler Hedgehog Cactus (<i>Echinocereus fendleri</i> var. <i>kuenzleri</i>)	Absent. Suitable woodland habitat is absent from the site. Additionally, this species has not been documented in Texas.	Unlikely. Specie has not been documented in Texas. The suitable woodland habitat in New Mexico, Pinyon-Juniper, is outside the action area.
Gypsum Wild Buckwheat (<i>Eriogonum gypsophilum</i>)	Absent. Suitable gypsum soils are absent from the site. Additionally, this species has not been documented in Texas.	Unlikely. Specie has not been documented in Texas. The suitable gypsum soils are not typical in the southern portions of Eddy and Lea Counties within the action area.
Guadalupe Mountains Fescue (<i>Festuca ligulata</i>)	Absent. Suitable woodland habitat is absent from the site.	Unlikely. The preferred habitat, pin-oak-juniper woodlands, in the Chisos and Guadalupe Mountains are located outside the action area.
Pecos/Puzzle Sunflower (<i>Helianthus paradoxus</i>)	Absent. Suitable aquatic habitat is absent from the site. The entire site consists of upland habitat with only a few very small depressions that could potentially hold water for short periods of time.	Absent. The preferred habitat around cinegas (i.e. unique type of spring) is located near San Solomon Springs near the towns of Toyahvale and Balmorhea in Reeves County, Texas outside the action area.

Table 5
Federally Listed Species Potential to Occur at Proposed Site and in Action Area

Species Common Name (Scientific name)	Occurrence Potential within Physical Project Footprint	Occurrence Potential within Area Evaluated for Greenhouse Gases
Pecos Assiminea Snail (<i>Assiminea pecos</i>)	Absent. Suitable aquatic habitat is absent from the site. The entire site consists of upland habitat with only a few very small depressions that could potentially hold water for short periods of time.	Unlikely. Historically throughout the Pecos River Valley. Only known population is near Ft. Stockton outside the action area.
Texas Hornshell Mussel (<i>Popenaias popeii</i>)	Absent. Suitable aquatic habitat is absent from the site. The entire site consists of upland habitat with only a few very small depressions that could potentially hold water for short periods of time.	Unlikely. Known from outside the action area in the Rio Grande Basin and several rivers in Mexico.
Comanche Springs Pupfish (<i>Cyprinodon elegans</i>)	Absent. Suitable aquatic habitat is absent from the site. The entire site consists of upland habitat with only a few very small depressions that could potentially hold water for short periods of time.	Absent. Only known to swift water within San Solomon and Phantom Cave that are outside the action area.
Pecos Gambusia (<i>Gambusia nobilis</i>)	Absent. Suitable aquatic habitat is absent from the site. The entire site consists of upland habitat with only a few very small depressions that could potentially hold water for short periods of time.	Likely. Could potentially be present in the shallow margins of clear, vegetated springs in calcium carbonate and sinkhole habitats of the Pecos River and tributaries.
Pecos Bluntnose Shiner (<i>Notropis simus pecosensis</i>)	Absent. Suitable aquatic habitat is absent from the site. The entire site consists of upland habitat with only a few very small depressions that could potentially hold water for short periods of time. Additionally, this species has not been documented in Texas.	Absent. Found outside the action area in main stream channel of Pecos River near Ft. Sumner to Artesia, New Mexico.
Bald Eagle (<i>Haliaeetus leucocephalus</i>)	Unlikely. A rare transient may pass over the site from time to time, but suitable aquatic and nesting habitat is absent.	Unlikely. A transient may pass within the action area from time to time, but suitable nesting habitat is absent.
Golden Eagle (<i>Aquila chrysaetos canadensis</i>)	Unlikely. A rare transient may pass over the site from time to time, but suitable nesting habitat is absent. Very little woody vegetation is present on the site.	Unlikely. A transient may pass within the action area from time to time, but suitable nesting habitat is absent.
Northern Aplomado Falcon (<i>Falco femoralis septentrionalis</i>)	Unlikely. A rare transient may pass over the site from time to time, but suitable nesting habitat is absent. Very little woody vegetation is present on the site.	Likely. Suitable nesting habitat occurs within action area.
Least Tern (<i>Sterna antillarum</i>), interior population (<i>S.a. athalassos</i>)	Unlikely. A rare transient may pass over the site from time to time, but suitable aquatic and nesting habitat is absent.	Unlikely. Not expected as optimal habitat in likely not present. Few locations along the Pecos River are present.

US EPA ARCHIVE DOCUMENT

Table 5
Federally Listed Species Potential to Occur at Proposed Site and in Action Area

Species Common Name (Scientific name)	Occurrence Potential within Physical Project Footprint	Occurrence Potential within Area Evaluated for Greenhouse Gases
Sprague's Pipit (<i>Anthus spragueii</i>)	Unlikely. A rare transient may pass over the site, but suitable habitat is absent.	Unlikely. A transient may pass through the action area. Optimum habitat not present in action area.
Mexican Spotted Owl (<i>Strix occidentalis lucida</i>)	Unlikely. A rare transient may pass over the site from time to time, but suitable nesting habitat is absent. Very little woody vegetation is present on the site.	Unlikely. A transient may pass through the action area. Optimum habitat occurs outside the action area.
Southwestern Willow Flycatcher (<i>Empidonax traillii extimus</i>)	Unlikely. A rare transient may pass over the site from time to time, but suitable aquatic and nesting habitat is absent.	Unlikely. A transient may pass through the action area. Optimum habitat occurs outside the action area.
Black-footed Ferret (<i>Mustela nigripes</i>)	Absent. This species is not believed to presently occur in Loving County. Additionally, a prairie dog town was not observed on the site during the December 3 and 4, 2012 field visit.	Unlikely. Believed to be extirpated.
Gray Wolf (<i>Canis lupus</i>)	Absent. This species is not believed to presently occur in Loving County. Additionally, suitable habitat is absent from the site.	Unlikely. Believed to be extirpated.

Explanation of Status and Occurrence Potential

Present: Species observed on the project site.

Possible: Species not observed on the site, but may be expected to occur on a regular basis.

Unlikely: Species not observed on the site, and is not expected to occur, except possibly as a rare transient.

Absent: Species not observed on the site, and is not ever expected to occur on the site.

7.5.1.2 Potential Effects and Determination of Effect

Table 6 lists the potential effects and determination of effects for the rare species potentially occurring in the project and action areas.

Table 6
Federally Listed Species Potential Effects and Determination of Effects

Federally Listed Species	Recommended Determination of Effect within Physical Project Footprint	Recommended Determination of Effect within Action Area
Wright's Marsh Thistle	No effect	May affect, but is not likely to adversely affect
Sneed Pincushion Cactus	No effect	May affect, but is not likely to adversely affect
Kuenzler Hedgehog Cactus	No effect	May affect, but is not likely to adversely affect
Gypsum Wild Buckwheat	No effect	May affect, but is not likely to adversely affect
Guadalupe Mountains Fescue	No effect	May affect, but is not likely to adversely affect
Pecos/Puzzle Sunflower	No effect	No effect

Table 6
Federally Listed Species Potential Effects and Determination of Effects

Federally Listed Species	<i>Recommended Determination of Effect within Physical Project Footprint</i>	<i>Recommended Determination of Effect within Action Area</i>
Pecos Assiminea Snail	No effect	May affect, but is not likely to adversely affect
Texas Hornshell Mussel	No effect	May affect, but is not likely to adversely affect
Comanche Springs Pupfish	No effect	No effect
Pecos Gambusia	No effect	May affect, but is not likely to adversely affect
Pecos Bluntnose Shiner	No effect	No effect
Bald Eagle	No effect	May affect, but is not likely to adversely affect
Golden Eagle	No effect	May affect, but is not likely to adversely affect
Northern Aplomado Falcon	No effect	May affect, but is not likely to adversely affect
Least Tern, Interior Pop.	No effect	May affect, but is not likely to adversely affect
Sprague's Pipit	No effect	May affect, but is not likely to adversely affect
Mexican Spotted Owl	No effect	May affect, but is not likely to adversely affect
Southwestern Willow Flycatcher	No effect	May affect, but is not likely to adversely affect
Black-footed Ferret	No effect	May affect, but is not likely to adversely affect
Gray Wolf	No effect	May affect, but is not likely to adversely affect

7.5.2 Migratory Birds

Migratory birds are protected under the MBTA (16 U.S. Code 703-711) and bald and golden eagles are additionally protected under the BGEPA (16 U.S. Code 668-668d). The MBTA implements various treaties and conventions between the U.S. and Canada, Japan, Mexico and the former Soviet Union for the protection of migratory birds. Under the Act, taking, killing or possessing migratory birds is unlawful. Unless permitted by regulations, the Act provides that it is unlawful to pursue, hunt, take, capture or kill; attempt to take, capture or kill; possess, offer to or sell, barter, purchase, deliver or cause to be shipped, exported, imported, transported, carried or received any migratory bird, part, nest, egg or product, manufactured or not.

Migratory birds are those species that breed in Canada and the United States during the summer, and then spend the winter in the southern United States, Mexico, Central, or South America, or the Caribbean Islands. Many bird species traverse the project area during migration to and from tropical regions.

7.5.2.1 Potential to Occur at Proposed Site and in Action Area

No migratory birds were observed at the site of the Avalon Mega CGF. Migratory birds have the potential to use habitats in the action area. A variety of species of migratory birds were observed in the action area. According to the TXNDD results, no recorded rookeries are located within the action area (TPWD, 2013).

7.5.2.2 Potential Effects and Determination of Effect

Migratory birds will likely not be directly impacted by construction activities associated with the project or noise. All wastewater associated with construction and operation of the proposed project will be trucked offsite for disposal at an existing approved facility and will not impact migratory birds.

Nitrogen accumulation, acidification, resulting from deposition or leaching, and eutrophication in terrestrial or aquatic habitats are not likely to occur as a result of the proposed project. Therefore, migratory birds will not likely be impacted by indirect effects resulting from the proposed project.

7.6 Cumulative Effects

The project is located within an area that currently includes oil and gas exploration and production facilities. Multiple facilities have historically been and continue to be in operation within the Permian Basin area of West Texas and southeast New Mexico. The area is likely to experience additional oil and gas development over time.

As with the proposed project, any new proposed developments may have the potential to impact federally protected species. However, DBJVG is not aware of any specific projects planned for this area at this time.

7.7 Conservation Measures

The construction of the proposed expansion project will likely have no direct or indirect impact on federally protected species or their habitat.

DBJVG plans to utilize the BACT to control emissions and thus minimize impacts to the surrounding environment to the maximum extent practicable. The proposed emissions of each pollutant subject to PSD review are consistent with both the TCEQ BACT guidance and the most stringent limit in the RBLC; and, are considered to be the top level of control available for the new and modified facilities.

8.0 CONCLUSION AND DETERMINATION OF EFFECTS

DBJVG plans to utilize the BACT to control the project emissions and therefore minimize impacts to the surrounding environment to the maximum extent practicable. The construction of the proposed project is not anticipated to have any direct or indirect impact on federally-

protected species habitat. Process areas will be located in a covered building and process wastewater will be collected in tanks and trucked off of the facility to an appropriate disposal facility. Therefore, there will be no effect from wastewater as a result of the project. Sheet and overland flows of rainwater will continue toward the natural drainage to the east. Storm water drainage will be expected to continue east and then south through unnamed tributaries of the Pecos River, located south then continuing west of the project site. There will likely not be any additional effect from surface water as a result of the project. The anticipated noise levels during construction should be comparable to noise levels from activities that currently take place in the area. The best available technology will be used to maintain noise levels below 85 decibels measured at a distance of 3-feet from the source. No noise effects to wildlife are expected as a result of the infrastructure construction of the expansion project. Additionally, there are no schools, religious buildings, commercial businesses, or residences within 3,000 feet of the facility boundary.

9.0 PREPARERS

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Tre' Wharton – Sr. Environmental Scientist

10.0 REFERENCES

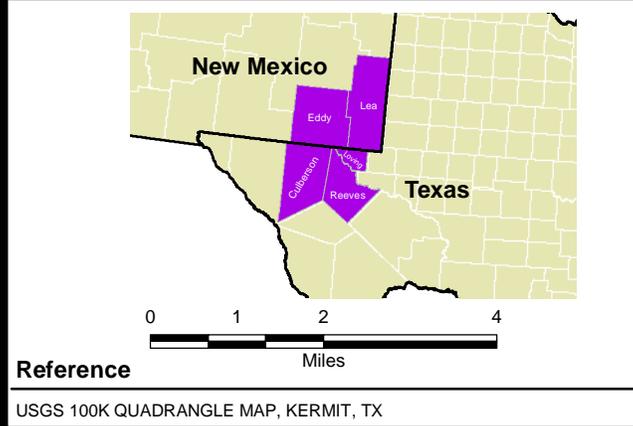
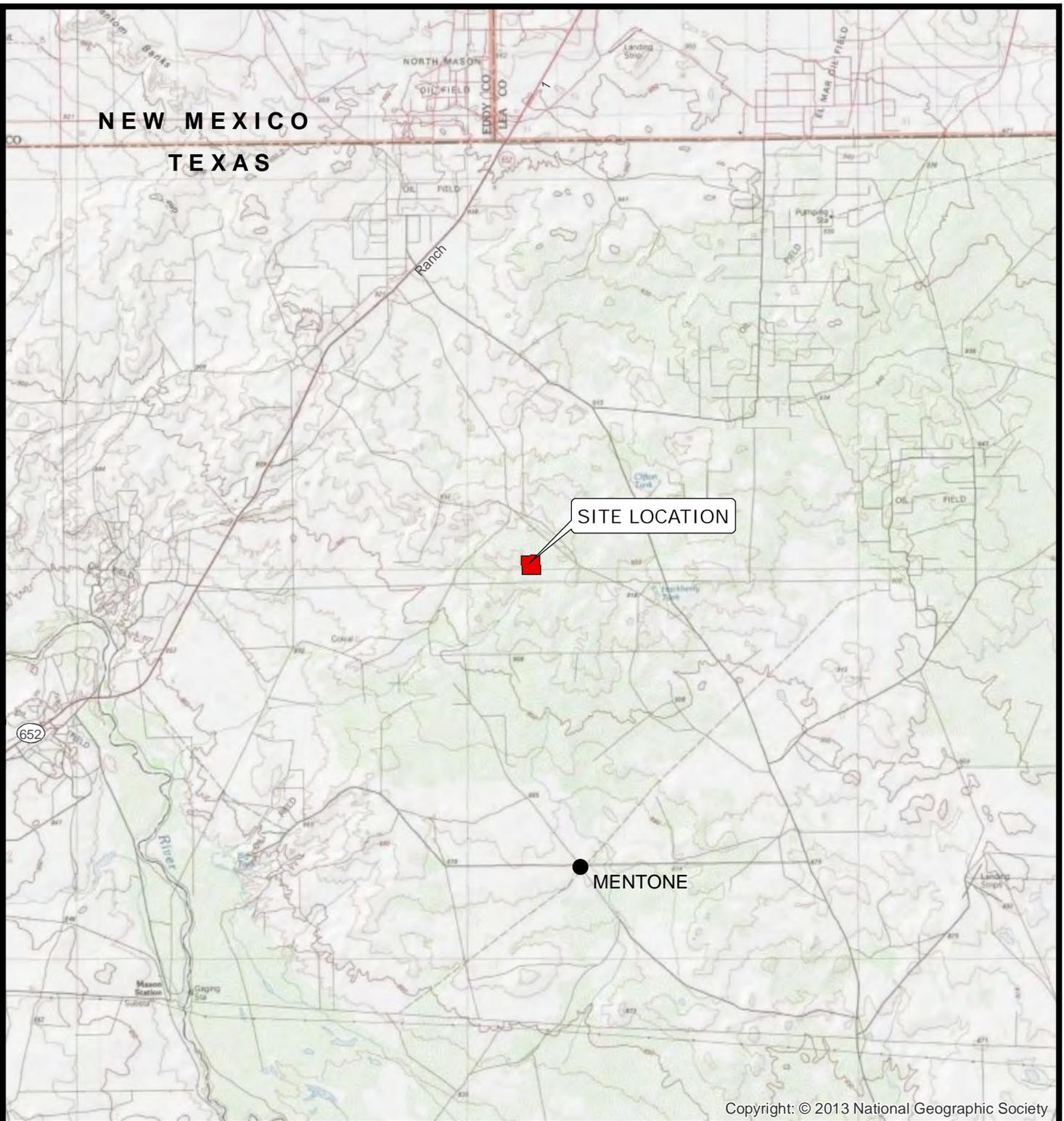
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FIGURES



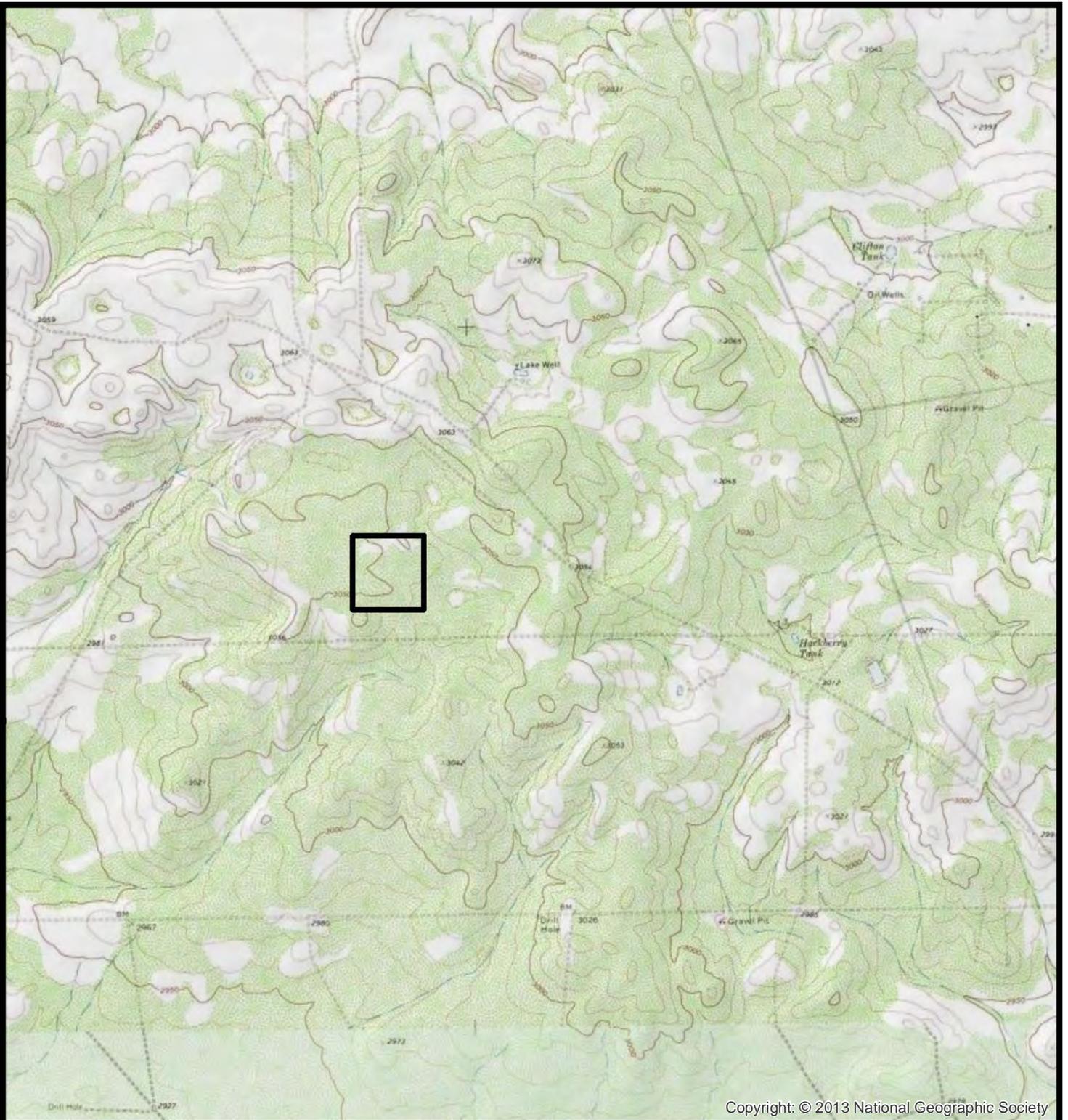
DELAWARE BASIN JV GATHERING LLC
THE WOODLANDS, TEXAS
AVALON MEGA CGF BIOLOGICAL ASSESSMENT

SITE LOCATION MAP



Drawn:	CAL/AM10.1
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Approved:	TW
Date:	3/26/14
Dwg. No.:	A8509-01

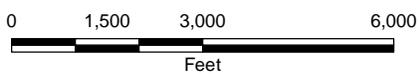
FIGURE 1



Copyright: © 2013 National Geographic Society

Legend

 Site Boundary



Reference

USGS 24K SERIES QUADRANGLE MAP, KYLE RANCH, TX.



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THE WOODLANDS, TEXAS

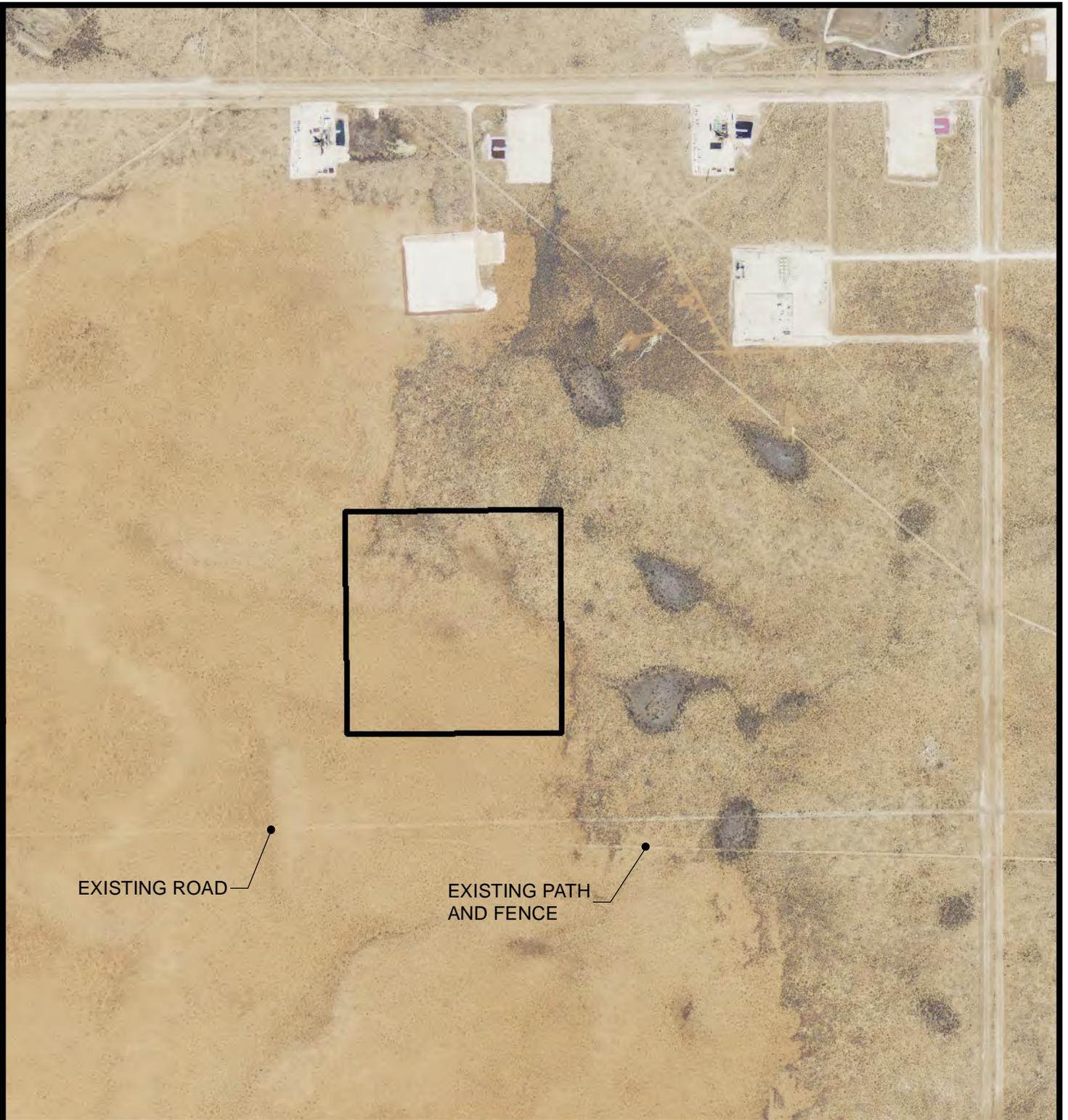
AVALON MEGA CGF BIOLOGICAL ASSESSMENT

TOPOGRAPHIC MAP



Drawn:	CAL/AM10.1
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Approved:	TW
Date:	3/21/14
Dwg. No.:	A8509-03

FIGURE 2



EXISTING ROAD

EXISTING PATH AND FENCE

Legend

 Site Boundary



Reference

IMAGERY: NAIP 2012, LOVING COUNTY, TX.



DELAWARE BASIN JV GATHERING LLC
THE WOODLANDS, TEXAS

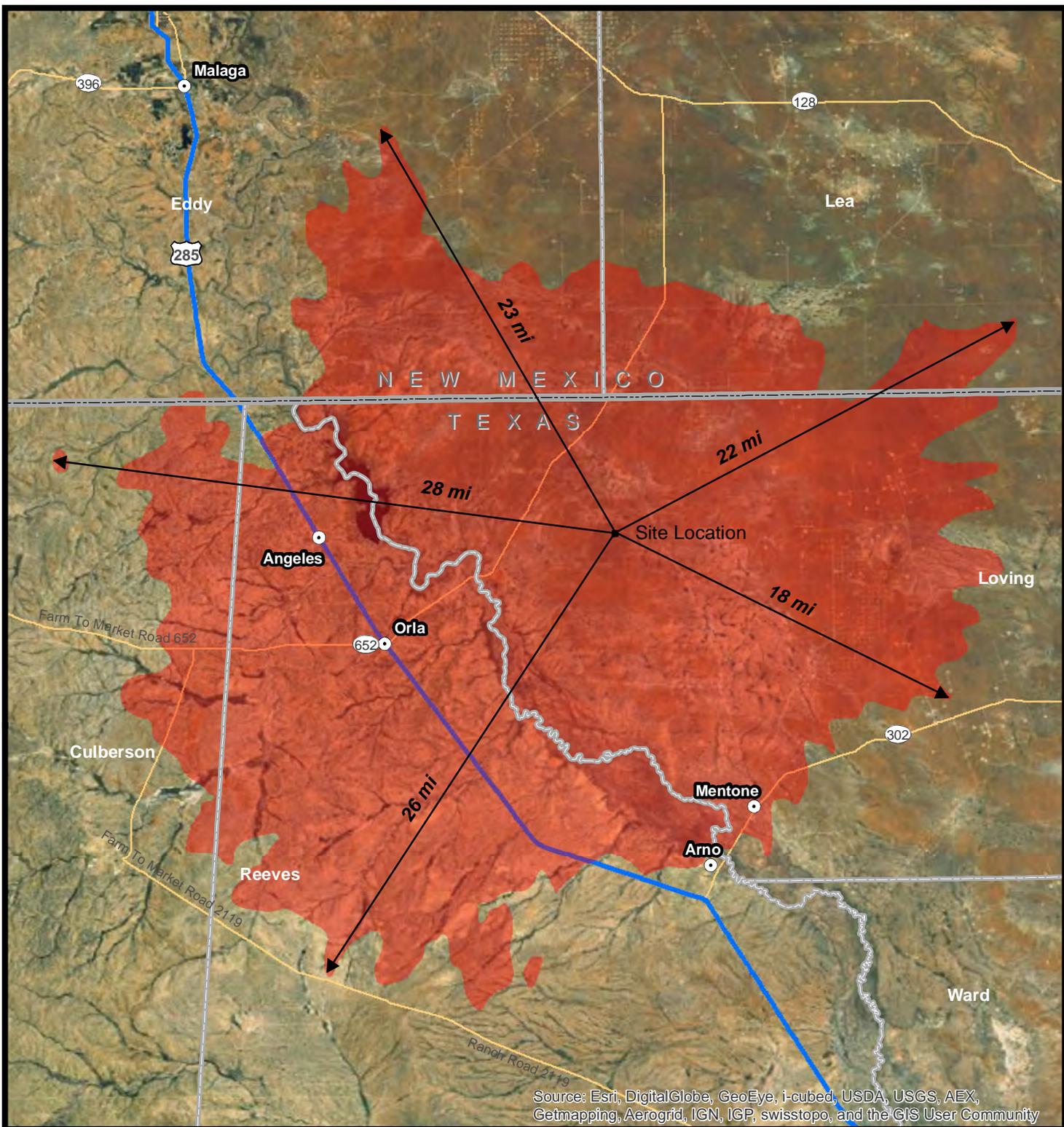
AVALON MEGA CGF BIOLOGICAL ASSESSMENT

AERIAL PHOTOGRAPH



Drawn:	CAL/AM10.1
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Approved:	TW
Date:	3/21/14
Dwg. No.:	A8509-02

FIGURE 3



Source: Esri, DigitalGlobe, GeoEye, i-cubed, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

Legend

- City
- State Boundary
- County Boundary
- Action Area

0 2.5 5 10 15
Miles

Reference

IMAGERY: ESRI WORLD IMAGERY, ARCGIS ONLINE.

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THE WOODLANDS, TEXAS

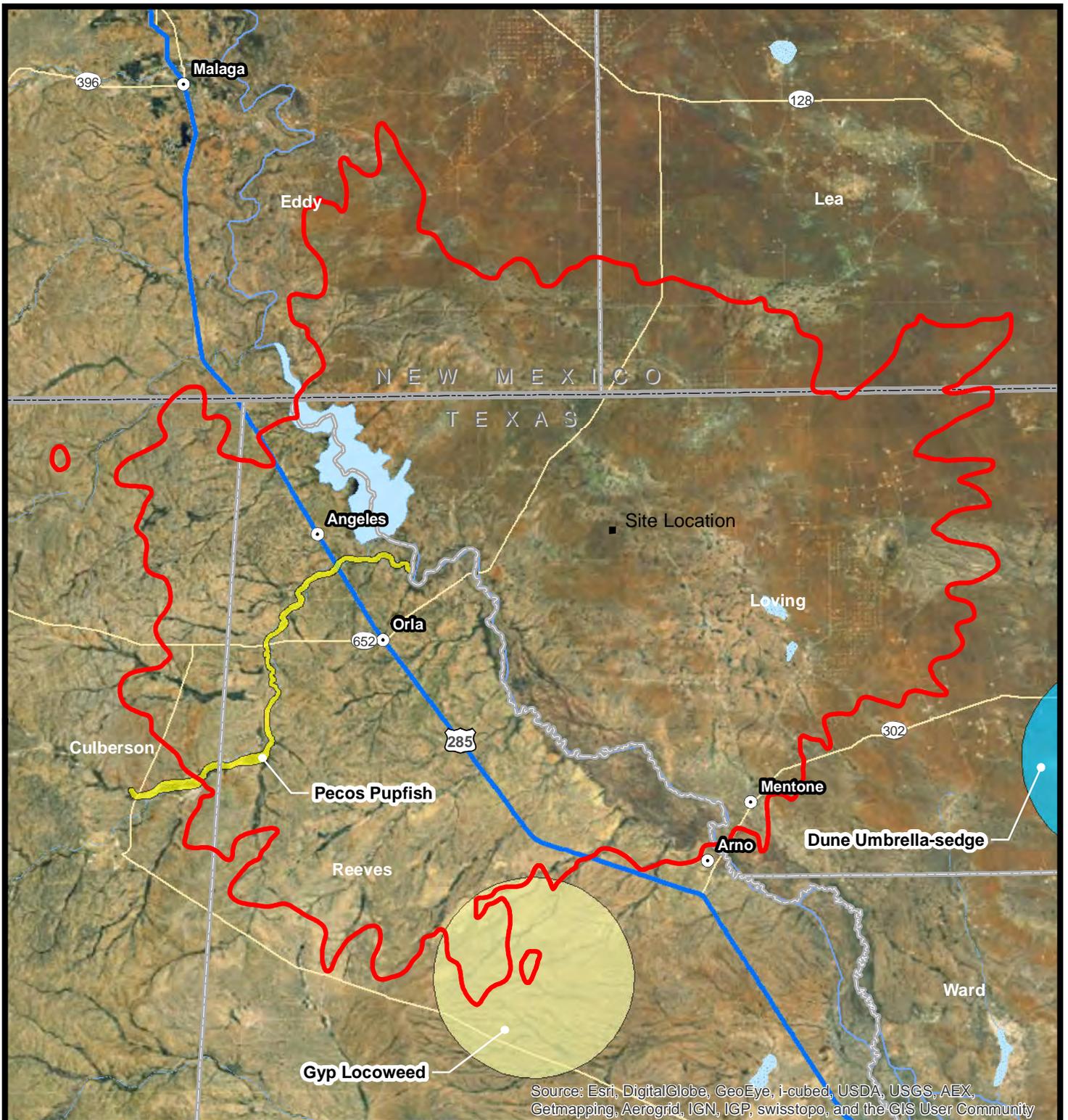
AVALON MEGA CGF BIOLOGICAL ASSESSMENT

ACTION AREA

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Date:	3/21/14
Dwg. No.:	A8509-05

FIGURE 4

CK ASSOCIATES
ENVIRONMENTAL CONSULTANTS



Source: Esri, DigitalGlobe, GeoEye, i-cubed, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

Legend

-  City
-  State Boundary
-  County Boundary
-  Action Area



Reference

Data from: TEXAS NATURAL DIVERSITY DATABASE (TXNDD)



DELAWARE BASIN JV GATHERING LLC
 THE WOODLANDS, TEXAS
 AVALON MEGA CGF BIOLOGICAL ASSESSMENT
TEXAS NATURAL DIVERSITY DATABASE (TXNDD)
DOCUMENTED OCCURRENCES



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Dwg. No.:	A8509-06

FIGURE 5

APPENDIX A
FEDERALLY LISTED SPECIES

CULBERSON COUNTY

ARACHNIDS

Federal Status

State Status

Guadalupe Cave pseudoscorpion

Archeolarca guadalupensis

live in leaf mold or decaying vegetation, in soils, beneath bark and stones, and in some mammals' nests; oviparous and may produce more than one brood per year

BIRDS

Federal Status

State Status

American Peregrine Falcon

Falco peregrinus anatum

DL

T

year-round resident and local breeder in west Texas, nests in tall cliff eyries; also, migrant across state from more northern breeding areas in US and Canada, winters along coast and farther south; occupies wide range of habitats during migration, including urban, concentrations along coast and barrier islands; low-altitude migrant, stopovers at leading landscape edges such as lake shores, coastlines, and barrier islands.

Arctic Peregrine Falcon

Falco peregrinus tundrius

DL

migrant throughout state from subspecies' far northern breeding range, winters along coast and farther south; occupies wide range of habitats during migration, including urban, concentrations along coast and barrier islands; low-altitude migrant, stopovers at leading landscape edges such as lake shores, coastlines, and barrier islands.

Baird's Sparrow

Ammodramus bairdii

shortgrass prairie with scattered low bushes and matted vegetation; mostly migratory in western half of State, though winters in Mexico and just across Rio Grande into Texas from Brewster through Hudspeth counties

Common Black-Hawk

Buteogallus anthracinus

T

cottonwood-lined rivers and streams; willow tree groves on the lower Rio Grande floodplain; formerly bred in south Texas

Ferruginous Hawk

Buteo regalis

open country, primarily prairies, plains, and badlands; nests in tall trees along streams or on steep slopes, cliff ledges, river-cut banks, hillsides, power line towers; year-round resident in northwestern high plains, wintering elsewhere throughout western 2/3 of Texas

Mexican Spotted Owl

Strix occidentalis lucida

LT

T

remote, shaded canyons of coniferous mountain woodlands (pine and fir); nocturnal predator of mostly small rodents and insects; day roosts in densely vegetated trees, rocky areas, or caves

Montezuma Quail

Cyrtonyx montezumae

open pine-oak or juniper-oak with ground cover of bunch grass on flats and slopes of semi-desert mountains and hills; travels in pairs or small groups; eats succulents, acorns, nuts, and weed seeds, as well as various invertebrates

CULBERSON COUNTY

BIRDS

Federal Status

State Status

Mountain Plover

Charadrius montanus

breeding: nests on high plains or shortgrass prairie, on ground in shallow depression; nonbreeding: shortgrass plains and bare, dirt (plowed) fields; primarily insectivorous

Northern Aplomado Falcon

Falco femoralis septentrionalis

LE

E

open country, especially savanna and open woodland, and sometimes in very barren areas; grassy plains and valleys with scattered mesquite, yucca, and cactus; nests in old stick nests of other bird species

Peregrine Falcon

Falco peregrinus

DL

T

both subspecies migrate across the state from more northern breeding areas in US and Canada to winter along coast and farther south; subspecies (F. p. anatum) is also a resident breeder in west Texas; the two subspecies' listing statuses differ, F.p. tundrius is no longer listed in Texas; but because the subspecies are not easily distinguishable at a distance, reference is generally made only to the species level; see subspecies for habitat.

Prairie Falcon

Falco mexicanus

open, mountainous areas, plains and prairie; nests on cliffs

Snowy Plover

Charadrius alexandrinus

formerly an uncommon breeder in the Panhandle; potential migrant; winter along coast

Southwestern Willow

Empidonax traillii extimus

LE

E

Flycatcher

thickets of willow, cottonwood, mesquite, and other species along desert streams

Sprague's Pipit

Anthus spragueii

C

only in Texas during migration and winter, mid September to early April; short to medium distance, diurnal migrant; strongly tied to native upland prairie, can be locally common in coastal grasslands, uncommon to rare further west; sensitive to patch size and avoids edges.

Western Burrowing Owl

Athene cunicularia hypugaea

open grasslands, especially prairie, plains, and savanna, sometimes in open areas such as vacant lots near human habitation or airports; nests and roosts in abandoned burrows

Western Snowy Plover

Charadrius alexandrinus nivosus

uncommon breeder in the Panhandle; potential migrant; winter along coast

Western Yellow-billed Cuckoo

Coccyzus americanus occidentalis

C;NL

status applies only to western population beyond the Pecos River Drainage; breeds in riparian habitat and associated drainages; springs, developed wells, and earthen ponds supporting mesic vegetation; deciduous woodlands with cottonwoods and willows; dense understory foliage is important for nest site selection; nests in willow, mesquite, cottonwood, and hackberry; forages in similar riparian woodlands; breeding season mid-May-late Sept

CULBERSON COUNTY

BIRDS

Federal Status

State Status

Zone-tailed Hawk

Buteo albonotatus

T

arid open country, including open deciduous or pine-oak woodland, mesa or mountain county, often near watercourses, and wooded canyons and tree-lined rivers along middle-slopes of desert mountains; nests in various habitats and sites, ranging from small trees in lower desert, giant cottonwoods in riparian areas, to mature conifers in high mountain regions

FISHES

Federal Status

State Status

Pecos pupfish

Cyprinodon pecosensis

T

originally Pecos River basin, presently restricted to upper basin only; shallow margins of clear, vegetated spring waters high in calcium carbonate, as well as in sinkhole habitats

INSECTS

Federal Status

State Status

A mayfly

Neochoroterpes kossi

AZ, NM, west TX small streams; mayflies distinguished by aquatic larval stage; adult stage generally found in shoreline vegetation

A Royal moth

Sphingicampa raspa

woodland - hardwood; with oaks, junipers, legumes and other woody trees and shrubs; good density of legume caterpillar foodplants must be present; Prairie acacia (*Acacia augustissima*) is the documented caterpillar foodplant, but there could be a few other woody legumes used

A tiger beetle

Cicindela hornii

grassland/herbaceous; burrowing in or using soil; dry areas on hillside or mesas where soil is rocky or loamy and covered with grasses, invertivore; diurnal, hibernates/aestivates, active mostly for several days after heavy rains. the life cycle probably takes two years so larvae would always be present in burrows in the soil

A tiger beetle

Amblycheila picolomini

bare rock/talus/scree, desert, grassland/herbaceous; burrowing in or using soil; invertivore; crepuscular, nocturnal, hibernates/aestivates; larva always present in burrows in soil

Barbara Ann's tiger beetle

Cicindela politula barbarannae

limestone outcrops in arid treeless environments or in openings within less arid pine-juniper-oak communities; open limestone substrate itself is almost certainly an essential feature; roads and trails

Guadalupe Mountains tiger beetle

Cicindela politula petrophila

open, sunny areas; predaceous and feeds on a variety of small insects; larva lives in vertical burrows in soil of dry paths, fields, or sandy beaches

Poling's hairstreak

Fixsenia polingi

oak woodland with *Quercus grisea* as substantial component, probably also uses *Q. emoryi*; larvae feed on new growth of *Q. grisea*, adults utilize nectar from a variety of flowers including milkweed and catslaw acacia; adults fly mid May - Jun, again mid Aug - early Sept

CULBERSON COUNTY

INSECTS

Federal Status

State Status

Texas minute moss beetle *Limnebius texanus*

adult moss beetles of this genus are aquatic and herbivorous; larvae are semiaquatic and carnivorous; found in vegetation along margins of streams

MAMMALS

Federal Status

State Status

Big free-tailed bat *Nyctinomops macrotis*

habitat data sparse but records indicate that species prefers to roost in crevices and cracks in high canyon walls, but will use buildings, as well; reproduction data sparse, gives birth to single offspring late June-early July; females gather in nursery colonies; winter habits undetermined, but may hibernate in the Trans-Pecos; opportunistic insectivore

Black bear *Ursus americanus* T/SA;NL T

bottomland hardwoods and large tracts of inaccessible forested areas; due to field characteristics similar to Louisiana Black Bear (LT, T), treat all east Texas black bears as federal and state listed Threatened

Black-footed ferret *Mustela nigripes* LE

extirpated; inhabited prairie dog towns in the general area

Black-tailed prairie dog *Cynomys ludovicianus*

dry, flat, short grasslands with low, relatively sparse vegetation, including areas overgrazed by cattle; live in large family groups

Cave myotis bat *Myotis velifer*

colonial and cave-dwelling; also roosts in rock crevices, old buildings, carports, under bridges, and even in abandoned Cliff Swallow (*Hirundo pyrrhonota*) nests; roosts in clusters of up to thousands of individuals; hibernates in limestone caves of Edwards Plateau and gypsum cave of Panhandle during winter; opportunistic insectivore

Davis Mountains cottontail *Sylvilagus floridanus robustus*

brushy pastures, brushy edges of cultivated fields, and well-drained streamsides; active mostly at twilight and at night, where they may forage in a variety of habitats, including open pastures, meadows, or even lawns; rest during daytime in thickets or in underground burrows and small culverts; feed on grasses, forbs, twigs and bark; not sociable and seldom seen feeding together

Desert bighorn sheep *Ovis canadensis mexicana*

rough, rocky mountainous terrain; bluffs and steep slopes with sparse vegetation

Fringed bat *Myotis thysanodes*

habitat variable, ranging from mountainous pine, oak, and pinyon-juniper to desert-scrub, but prefers grasslands at intermediate elevations; highly migratory species that arrives in Trans-Pecos by May to form nursery colonies; single offspring born June-July; roosts colonially in caves, mine tunnels, rock crevices, and old buildings

Ghost-faced bat *Mormoops megalophylla*

colonially roosts in caves, crevices, abandoned mines, and buildings; insectivorous; breeds late winter-early spring; single offspring born per year

CULBERSON COUNTY

MAMMALS

Federal Status

State Status

Gray wolf

Canis lupus

LE

E

extirpated; formerly known throughout the western two-thirds of the state in forests, brushlands, or grasslands

Gray-footed chipmunk

Tamias canipes

forest-dwelling; occur in Texas only in the Sierra Diablo and Guadalupe Mountains in the Trans-Pecos; favorite habitat is downed logs near edges of clearings; also occur in dense stands of mixed timber (oaks, pines, firs) and on brushy hillsides, especially with rock crevices

Guadalupe southern pocket gopher

Thomomys bottae guadalupensis

known from Guadalupe Mountains; habitat variable, ranging from loose sands and silts to tight clays; dry deserts to montane meadows; active year round, mostly underground; diet variable, but mostly roots and tubers; breeds continuously, but main season in spring

Limpia Creek pocket gopher

Thomomys bottae texensis

throughout Davis Mountains; habitat variable, ranging from lower canyons to higher coniferous woodlands; loose sands and silts to tight clays; dry deserts to montane meadows; active year round, mostly underground; diet variable, but mostly roots and tubers; breeds continuously, but main season in spring

Limpia southern pocket gopher

Thomomys bottae limpiae

Limpia Canyon area of Davis Mountains; habitat variable, ranging from loose sands and silts to tight clays; active year round, mostly underground; diet variable, but mostly roots and tubers; breeds continuously, but main season in spring

Long-legged bat

Myotis volans

in Texas, Trans-Pecos region; high, open woods and mountainous terrain; nursery colonies (which may contain several hundred individuals) form in summer in buildings, crevices, and hollow trees; apparently do not use caves as day roosts, but may use such sites at night; single offspring born June-July

Pale Townsend's big-eared bat

Corynorhinus townsendii pallescens

roosts in caves, abandoned mine tunnels, and occasionally old buildings; hibernates in groups during winter; in summer months, males and females separate into solitary roosts and maternity colonies, respectively; single offspring born May-June; opportunistic insectivore

Western red bat

Lasiurus blossevillii

roosts in tree foliage in riparian areas, also inhabits xeric thorn scrub and pine-oak forests; likely winter migrant to Mexico; multiple pups born mid-May - late Jun

Western small-footed bat

Myotis ciliolabrum

mountainous regions of the Trans-Pecos, usually in wooded areas, also found in grassland and desert scrub habitats; roosts beneath slabs of rock, behind loose tree bark, and in buildings; maternity colonies often small and located in abandoned houses, barns, and other similar structures; apparently occurs in Texas only during spring and summer months; insectivorous

CULBERSON COUNTY

MAMMALS

Federal Status State Status

Yellow-nosed cotton rat *Sigmodon ochrognathus*

higher elevations in the Chisos Mountains, Davis Mountains, and Sierra Vieja; rocky slopes with scattered bunches of grass; underground dens and aboveground nests in various locations, including at base of agaves or roots of junipers; active in daytime; several litters possible during breeding season of March-October

Yuma myotis bat *Myotis yumanensis*

desert regions; most commonly found in lowland habitats near open water, where forages; roosts in caves, abandoned mine tunnels, and buildings; season of partus is May to early July; usually only one young born to each female

MOLLUSKS

Federal Status State Status

Northern threeband *Humboldtiana ultima*

leaf litter in mesic canyons of limestone mountains; in soil, under rocks

REPTILES

Federal Status State Status

Chihuahuan Desert lyre snake *Trimorphodon vilkinsonii*

T

mostly crevice-dwelling in predominantly limestone-surfaced desert northwest of the Rio Grande from Big Bend to the Franklin Mountains, especially in areas with jumbled boulders and rock faults/fissures; secretive; egg-bearing; eats mostly lizards

Mountain short-horned lizard *Phrynosoma hernandesi*

T

diurnal, usually in open, shrubby, or openly wooded areas with sparse vegetation at ground level; soil may vary from rocky to sandy; burrows into soil or occupies rodent burrow when inactive; eats ants, spiders, snails, sowbugs, and other invertebrates; inactive during cold weather; breeds March-September

Texas horned lizard *Phrynosoma cornutum*

T

open, arid and semi-arid regions with sparse vegetation, including grass, cactus, scattered brush or scrubby trees; soil may vary in texture from sandy to rocky; burrows into soil, enters rodent burrows, or hides under rock when inactive; breeds March-September

PLANTS

Federal Status State Status

Chisos agave *Agave glomeruliflora*

gravelly or rocky soils in oak-juniper woodlands and mesquite-creosote bush-invaded grasslands at elevations of about 600-1800 m (1950-5900 ft); flowering mid-spring to early fall

Chisos coral-root *Hexalectris revoluta*

in the Chisos and Guadalupe mountains, in humus in oak groves along rocky creekbeds at mid- to high elevations; in the Glass Mountains, it has been found 'among lechuguilla and shinnery oak on the sunny slopes and ridges'; purplish or brownish stem color provides a surprisingly effective camouflage from human observers, aerial stems are not reliably sent up every year; usually flowering May-August,

CULBERSON COUNTY

PLANTS

Federal Status

State Status

Foster's rock-daisy

Perityle fosteri

Texas endemic; known only from rock faces on limestone boulders and bluffs in a deep, protected canyon; flowering/fruitletting July, other months not yet known

Guadalupe Mountains columbine

Aquilegia chrysantha var chaplinei

perennially moist to wet limestone canyon walls; moist leaf litter and humus among boulders in wooded mesic canyons; flowering April-November (most reliably June-July)

Guadalupe Mountains fescue *Festuca ligulata*

C

pine-oak-juniper woodlands on mesic slopes and in creek bottoms above 1800 m (5900 ft); Chisos Mountains substrates are gravelly and sandy loams derived from igneous materials; Guadalupe Mountains substrates are unknown but presumed to be loamy soils over limestone; flowering August-September, occasionally in spring after sufficient rainfall

Guadalupe Mountains mescal bean *Sophora gypsophila var guadalupensis*

One-seeded juniper (*Juniperus monosperma*) shrublands on dry slopes above 1,500 m (4,900 ft) elevation in Guadalupe Mountains on slightly gypseous pink sandstone that occurs as lenses within the pervasive limestone of the region; flowering late March-late April or May

Guadalupe Mountains pincushion cactus

Escobaria guadalupensis

on exposed slabs and fractured limestone rock on steep, mostly south-facing slopes in pine-oak-juniper woodlands at (1370-) 1825-2650 m ([4500-] 6000-8700 ft) in the Guadalupe Mountains; flowering April-May; fruiting October-November

Guadalupe Mountains rabbitbrush

Ericameria nauseosa ssp texensis

crevices and solution pits in limestone ledges and boulders, less often in open gravel alluvium of streambeds at elevations between 1490 and 2150 m (4900 and 7050 ft); flowering September-November

Guadalupe Mountains violet *Viola guadalupensis*

Texas endemic, Guadalupe Mountains; 'bullet' hole openings in dolomitized limestone rock faces, in the shade of an open Douglas-fir (*Pseudotsuga menziesii*) woodland at about 2,450 m (8,000 ft) elevation; flowering March-May

Gyp locoweed

Astragalus gypsodes

gypsum or stiff gypseous clay soils on low rolling hills, mostly low elevations in the middle Pecos River valley; many of the known locations are on the Castile Formation (Permian); flowering March-June

Havard's machaeranthera

Xanthisma viscidum

Occurs on calcareous or sandy soils in Chihuahuan Desert shrublands or mesquite grasslands.

Royal red penstemon

Penstemon cardinalis ssp regalis

pine-oak woodlands in canyons at higher elevations in the Davis and Guadalupe mountains; flowering May-June (-August)

CULBERSON COUNTY

PLANTS

Federal Status

State Status

Sand sacahuista

Nolina arenicola

Texas endemic; mesquite-sage shrublands on windblown Quaternary reddish sand in dune areas; flowering time uncertain May-June, June-September

Smooth-stem skullcap

Scutellaria laevis

Texas endemic; on mountain slopes and in arroyos along dry streambeds of the Sierra Diablo, Beach Mountains, and Guadalupe Mountains; flowering April-September

Sparsely-flowered jewelflower *Streptanthus sparsiflorus*

shaded areas in gravelly limestone canyons and arroyos, often in dry creek beds at elevations ranging 1,200-1,800 m (3,900-5,900 ft); flowering May-June; populations vary widely in size from year to year depending on rainfall

Texas wolf-berry

Lycium texanum

semi-desert grasslands and thorn shrublands on sandy, gravelly, and/or loamy soils, on very gently sloping terrain as well as in rocky areas of canyons, often over limestone at moderate elevations; flowering March-October

Warnock's coral-root

Hexalectris warnockii

in leaf litter and humus in oak-juniper woodlands on shaded slopes and intermittent, rocky creekbeds in canyons; in the Trans Pecos in oak-pinyon-juniper woodlands in higher mesic canyons (to 2000 m [6550 ft]), primarily on igneous substrates; in Terrell County under *Quercus fusiformis* mottes on terraces of spring-fed perennial streams, draining an otherwise rather xeric limestone landscape; on the Callahan Divide (Taylor County), the White Rock Escarpment (Dallas County), and the Edwards Plateau in oak-juniper woodlands on limestone slopes; in Gillespie County on igneous substrates of the Llano Uplift; flowering June-September; individual plants do not usually bloom in successive years

Group	Name	Population	Status	Lead Office	Recovery Plan Name	Recovery Plan Stage
Birds	Yellow-billed Cuckoo (<i>Coccyzus</i>)	Western U.S., DPS	Proposed Threatened	Sacramento Fish And Wildlife		
Birds	northern aplomado falcon (<i>Falco</i>)	Entire, except where listed as	Endangered	New Mexico Ecological Services	Aplomado Falcon (Northern)	Final
Birds	Mexican spotted owl (<i>Strix</i>)	Entire	Threatened	Arizona Ecological Services	Final Recovery Plan for the	Final Revision 1
Birds	Southwestern willow flycatcher	Entire	Endangered	Arizona Ecological Services	Final Recovery Plan for the	Final

Group	Name	Population	Status	Lead Office	Recovery Plan Name	Recovery Plan Stage
Birds	Yellow-billed Cuckoo (<i>Coccyzus</i> Western U.S. DPS	Western U.S. DPS	Proposed Threatened	Sacramento Fish And Wildlife		
Birds	northern aplomado falcon (<i>Falco</i> Entire, except where listed as	Entire, except where listed as	Endangered	New Mexico Ecological Services	Aplomado Falcon (Northern)	Final
Birds	Mexican spotted owl (<i>Strix</i> Entire	Entire	Threatened	Arizona Ecological Services	Final Recovery Plan for the	Final Revision 1
Birds	Southwestern willow flycatcher Entire	Entire	Endangered	Arizona Ecological Services	Final Recovery Plan for the	Final



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Report County + Status Species List for

Eddy + Federal: Endangered

4 species returned.

Taxonomic Group	# Species	Taxonomic Group	# Species
Fish	1	Birds	3

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Species ID	SpeciesLink	Common Name	Scientific Name	Habitat Map	Photo
010225	Pecos Gambusia	Pecos Gambusia	Gambusia nobilis	Yes	no photo
040380	Aplomado Falcon	Aplomado Falcon	Falco femoralis	Yes	
040521	Southwestern Willow Flycatcher	Southwestern Willow Flycatcher	Empidonax traillii extimus	Yes	
042070	Least Tern	Least Tern	Sternula antillarum	Yes	

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Report County + Status Species List for

Bernalillo + Federal: Candidate

1 species returned.

Taxonomic Group # Species

Birds 1

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[Export to Excel](#)

Species ID	SpeciesLink	Common Name	Scientific Name	Habitat Map	Photo
041475	Sprague's Pipit	Sprague's Pipit	Anthus spragueii	Yes	no photo

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U.S. Fish and Wildlife Service

Natural Resources of Concern

This resource list is to be used for planning purposes only — it is not an official species list.

Endangered Species Act species list information for your project is available online and listed below for the following FWS Field Offices:

New Mexico Ecological Services Field Office
2105 OSUNA ROAD NE
ALBUQUERQUE, NM 87113
(505) 346-2525
<http://www.fws.gov/southwest/es/NewMexico/>

Project Name:

Avalon Maga

Project Counties:

Eddy, NM

Project Type:

Oil Or Gas

Endangered Species Act Species List (USFWS Endangered Species Program).

There are a total of 15 threatened, endangered, or candidate species on your species list. Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fishes may appear on the species list because a project could cause downstream effects on the species. Critical habitats listed under the **Has Critical Habitat** column may or may not lie within your project area. See the **Critical habitats within your project area** section below for critical habitat that lies within your project area. Please contact the designated FWS office if you have questions.

Species that should be considered in an effects analysis for your project:

Birds	Status		Has Critical Habitat	Contact
-------	--------	--	----------------------	---------



Natural Resources of Concern

Least tern (<i>Sterna antillarum</i>) Population: interior pop.	Endangered	species info		New Mexico Ecological Services Field Office
Lesser prairie-chicken (<i>Tympanuchus pallidicinctus</i>)	Proposed Threatened	species info		New Mexico Ecological Services Field Office
Mexican Spotted owl (<i>Strix occidentalis lucida</i>) Population: Entire	Threatened	species info	Final designated critical habitat	New Mexico Ecological Services Field Office
northern aplomado falcon (<i>Falco femoralis septentrionalis</i>) Population: U.S.A (AZ, NM)	Experimenta l Population, Non- Essential	species info		New Mexico Ecological Services Field Office
Piping Plover (<i>Charadrius melodus</i>) Population: except Great Lakes watershed	Threatened	species info	Final designated critical habitat Final designated critical habitat	New Mexico Ecological Services Field Office
Southwestern Willow flycatcher (<i>Empidonax traillii extimus</i>) Population: Entire	Endangered	species info	Final designated critical habitat	New Mexico Ecological Services Field Office
Sprague's Pipit (<i>Anthus spragueii</i>)	Candidate	species info		New Mexico Ecological Services Field Office
Clams				
Texas Hornshell (<i>Popenaias popei</i>)	Candidate	species info		New Mexico Ecological Services Field Office
Fishes				



Natural Resources of Concern

Pecos Bluntnose shiner (<i>Notropis simus pecosensis</i>) Population: Entire	Threatened	species info	Final designated critical habitat	New Mexico Ecological Services Field Office
Pecos gambusia (<i>Gambusia nobilis</i>) Population: Entire	Endangered	species info		New Mexico Ecological Services Field Office
Flowering Plants				
Gypsum wild-buckwheat (<i>Eriogonum gypsophilum</i>)	Threatened	species info	Final designated critical habitat	New Mexico Ecological Services Field Office
Kuenzler Hedgehog cactus (<i>Echinocereus fendleri</i> var. <i>kuenzleri</i>)	Endangered	species info		New Mexico Ecological Services Field Office
Lee Pincushion cactus (<i>Coryphantha sneedii</i> var. <i>leei</i>)	Threatened	species info		New Mexico Ecological Services Field Office
Sneed Pincushion cactus (<i>Coryphantha sneedii</i> var. <i>sneedii</i>)	Endangered	species info		New Mexico Ecological Services Field Office
Wright's Marsh thistle (<i>Cirsium wrightii</i>)	Candidate	species info		New Mexico Ecological Services Field Office

Critical habitats within your project area: ([View all critical habitats within your project area on one map](#))

The following critical habitats lie fully or partially within your project area.

Fishes	Critical Habitat Type
--------	-----------------------



U.S. Fish and Wildlife Service

Natural Resources of Concern

Pecos Bluntnose shiner (<i>Notropis simus pecosensis</i>) Population: Entire	<u>Final designated critical habitat</u>
Flowering Plants	
Gypsum wild-buckwheat (<i>Eriogonum gypsophilum</i>)	<u>Final designated critical habitat</u>

FWS National Wildlife Refuges (USFWS National Wildlife Refuges Program)

There are no refuges found within the vicinity of your project.

FWS Migratory Birds (USFWS Migratory Bird Program)

Most species of birds, including eagles and other raptors, are protected under the Migratory Bird Treaty Act (16 U.S.C. 703). Bald eagles and golden eagles receive additional protection under the Bald and Golden Eagle Protection Act (16 U.S.C. 668). The Service's Birds of Conservation Concern (2008) report identifies species, subspecies, and populations of all migratory nongame birds that, without additional conservation actions, are likely to become listed under the Endangered Species Act as amended (16 U.S.C 1531 et seq.).

Migratory bird information is not available for your project location.

NWI Wetlands (USFWS National Wetlands Inventory)

The U.S. Fish and Wildlife Service is the principal Federal agency that provides information on the extent and status of wetlands in the U.S., via the National Wetlands Inventory Program (NWI). In addition to impacts to wetlands within your immediate project area, wetlands outside of your project area may need to be considered in any evaluation of project impacts, due to the hydrologic nature of wetlands (for example, project activities may affect local hydrology within, and outside of, your immediate project area). It may be helpful to refer to the USFWS National Wetland Inventory website. The designated FWS office can also assist you. Impacts to wetlands and other aquatic habitats from your project may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal Statutes. Project Proponents should discuss the relationship of these requirements to their project with the Regulatory Program of the appropriate U.S. Army Corps of Engineers District.

IPaC is unable to display wetland information at this time.



U.S. Fish and Wildlife Service

Natural Resources of Concern

Group	Name	Population	Status	Lead Office	Recovery Plan Name	Recovery Plan Stage
Birds	northern aplomado falcon (Falco	U.S.A (AZ, NM)	Experimental Population, Non-	Office Of The Regional Director		
Birds	Mexican spotted owl (Strix	Entire	Threatened	Arizona Ecological Services	Final Recovery Plan for the	Final Revision 1
Birds	Piping Plover (Charadrius	except Great Lakes watershed	Threatened	Office Of The Regional Director	Great Lakes & Northern Great	Final
Birds	Piping Plover (Charadrius	except Great Lakes watershed	Threatened	Office Of The Regional Director	Piping Plover Atlantic Coast	Final Revision 1
Birds	Least tern (Sterna antillarum)	interior pop.	Endangered	Mississippi Ecological Services	Least Tern (Interior Pop.)	Final
Birds	Southwestern willow flycatcher	Entire	Endangered	Arizona Ecological Services	Final Recovery Plan for the	Final
Birds	Lesser prairie-chicken		Proposed Threatened	Oklahoma Ecological Services		
Birds	Sprague's pipit (Anthus		Candidate	North Dakota Ecological		
Clams	Texas Hornshell (Popenatas		Candidate	Austin Ecological Services Field		
Fishes	Pecos gambusia (Gambusia	Entire	Endangered	Austin Ecological Services Field	Recovery Plan for Pecos	Final
Fishes	Pecos bluntnose shiner	Entire	Threatened	New Mexico Ecological Services	Pecos Bluntnose Shiner	Final
Flowering Plants	Lee pincushion cactus		Threatened	New Mexico Ecological Services	Sneed/Lee Pincushion Cactus	Final
Flowering Plants	Sneed pincushion cactus		Endangered	New Mexico Ecological Services	Sneed/Lee Pincushion Cactus	Final
Flowering Plants	Kuenzler hedgehog cactus		Endangered	New Mexico Ecological Services	Kuenzler Hedgehog Cactus	Final
Flowering Plants	Gypsum wild-buckwheat		Threatened	New Mexico Ecological Services	Gypsum Wild Buckwheat	Final
Flowering Plants	Wright's marsh thistle (Cirsium		Candidate	New Mexico Ecological Services		



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Report County + Status Species List for

Eddy + Federal: Threatened

3 species returned.

Taxonomic Group	# Species	Taxonomic Group	# Species
Fish	1	Birds	2

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Species ID	SpeciesLink	Common Name	Scientific Name	Habitat Map	Photo
010411	Pecos Bluntnose Shiner	Pecos Bluntnose Shiner	Notropis simus pecosensis	Yes	
041375	Mexican Spotted Owl	Mexican Spotted Owl	Strix occidentalis lucida	Yes	
041505	Piping Plover	Piping Plover	Charadrius melodus	Yes	no photo

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Report County + Status Species List for

Lea + Federal: Endangered

2 species returned.

Taxonomic Group # Species

Birds 2

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Species ID	SpeciesLink	Common Name	Scientific Name	Habitat Map	Photo
040380	Aplomado Falcon	Aplomado Falcon	Falco femoralis	Yes	
042070	Least Tern	Least Tern	Sternula antillarum	Yes	

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Report County + Status Species List for

[Print Page](#)

Bernalillo + Federal: Candidate

1 species returned.

Taxonomic Group # Species

Birds 1

[Export to Excel](#)

Species ID	SpeciesLink	Common Name	Scientific Name	Habitat Map	Photo
041475	Sprague's Pipit	Sprague's Pipit	Anthus spraguelli	Yes	no photo

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U.S. Fish and Wildlife Service

Natural Resources of Concern

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Endangered Species Act species list information for your project is available online and listed below for the following FWS Field Offices:

New Mexico Ecological Services Field Office
2105 OSUNA ROAD NE
ALBUQUERQUE, NM 87113
(505) 346-2525
<http://www.fws.gov/southwest/es/NewMexico/>

Project Name:

Avalon Mega Lea

Project Counties:

Lea, NM

Project Type:

Oil Or Gas

Endangered Species Act Species List (USFWS Endangered Species Program).

There are a total of 3 threatened, endangered, or candidate species on your species list. Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fishes may appear on the species list because a project could cause downstream effects on the species. Critical habitats listed under the **Has Critical Habitat** column may or may not lie within your project area. See the **Critical habitats within your project area** section below for critical habitat that lies within your project area. Please contact the designated FWS office if you have questions.

Species that should be considered in an effects analysis for your project:

Birds	Status		Has Critical Habitat	Contact
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Natural Resources of Concern

Lesser prairie-chicken (<i>Tympanuchus pallidicinctus</i>)	Proposed Threatened	species info		New Mexico Ecological Services Field Office
northern aplomado falcon (<i>Falco femoralis septentrionalis</i>) Population: U.S.A (AZ, NM)	Experimental Population, Non-Essential	species info		New Mexico Ecological Services Field Office
Sprague's Pipit (<i>Anthus spragueii</i>)	Candidate	species info		New Mexico Ecological Services Field Office

Critical habitats within your project area:

There are no critical habitats within your project area.

FWS National Wildlife Refuges (USFWS National Wildlife Refuges Program).

There are no refuges found within the vicinity of your project.

FWS Migratory Birds (USFWS Migratory Bird Program).

Most species of birds, including eagles and other raptors, are protected under the Migratory Bird Treaty Act (16 U.S.C. 703). Bald eagles and golden eagles receive additional protection under the Bald and Golden Eagle Protection Act (16 U.S.C. 668). The Service's Birds of Conservation Concern (2008) report identifies species, subspecies, and populations of all migratory nongame birds that, without additional conservation actions, are likely to become listed under the Endangered Species Act as amended (16 U.S.C 1531 et seq.).

Migratory bird information is not available for your project location.



U.S. Fish and Wildlife Service

Natural Resources of Concern

NWI Wetlands (USFWS National Wetlands Inventory).

The U.S. Fish and Wildlife Service is the principal Federal agency that provides information on the extent and status of wetlands in the U.S., via the National Wetlands Inventory Program (NWI). In addition to impacts to wetlands within your immediate project area, wetlands outside of your project area may need to be considered in any evaluation of project impacts, due to the hydrologic nature of wetlands (for example, project activities may affect local hydrology within, and outside of, your immediate project area). It may be helpful to refer to the USFWS National Wetland Inventory website. The designated FWS office can also assist you. Impacts to wetlands and other aquatic habitats from your project may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal Statutes. Project Proponents should discuss the relationship of these requirements to their project with the Regulatory Program of the appropriate U.S. Army Corps of Engineers District.

IPaC is unable to display wetland information at this time.



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Report County + Status Species List for

Lea + Federal: Threatened

0 species returned.

[Print Page](#)

Species ID	SpeciesLink	Common Name	Scientific Name	Habitat Map	Photo
------------	-------------	-------------	-----------------	-------------	-------

[Close Window](#)

Group	Name	Population	Status	Lead Office	Recovery Plan Name	Recovery Plan Stage
Birds	northern aplomado falcon (Falco)	U.S.A (AZ, NM)	Experimental Population, Non-	Office Of The Regional Director		
Birds	Lesser prairie-chicken		Proposed Threatened	Oklahoma Ecological Services		
Birds	Sprague's pipit (Anthus)		Candidate	North Dakota Ecological		

Group	Name	Population	Status	Lead Office	Recovery Plan Name	Recovery Plan Stage
Birds	Bald eagle (<i>Haliaeetus</i>)	lower 48 States	Recovery	Rock Island Ecological Services	Recovery Plan for the Pacific	Final
Birds	Bald eagle (<i>Haliaeetus</i>)	lower 48 States	Recovery	Rock Island Ecological Services	Southeastern States Bald Eagle	Final Revision 1
Birds	Bald eagle (<i>Haliaeetus</i>)	lower 48 States	Recovery	Rock Island Ecological Services	Northern States Bald Eagle	Final
Birds	Bald eagle (<i>Haliaeetus</i>)	lower 48 States	Recovery	Rock Island Ecological Services	Chesapeake Bay Bald Eagle	Final Revision 1
Birds	Bald eagle (<i>Haliaeetus</i>)	lower 48 States	Recovery	Rock Island Ecological Services	Southwestern Bald Eagle	Final
Birds	northern aplomado falcon (<i>Falco</i>)	Entire, except where listed as	Endangered	New Mexico Ecological Services	Aplomado Falcon (Northern)	Final

http://www.fws.gov/southwest/es/ES_ListSpecies.cfm

Loving County

<u>Common Name</u>	<u>Scientific Name</u>	<u>Species Group</u>	<u>Listing Status</u>	<u>Species Image</u>	<u>Distribution Map</u>	<u>Critical Habitat</u>	<u>More Info</u>
northern aplomado falcon	<i>Falco femoralis septentrionalis</i>	Birds	E, EXPN				P

LOVING COUNTY

BIRDS

Federal Status State Status

American Peregrine Falcon *Falco peregrinus anatum*

DL

T

year-round resident and local breeder in west Texas, nests in tall cliff eyries; also, migrant across state from more northern breeding areas in US and Canada, winters along coast and farther south; occupies wide range of habitats during migration, including urban, concentrations along coast and barrier islands; low-altitude migrant, stopovers at leading landscape edges such as lake shores, coastlines, and barrier islands.

Arctic Peregrine Falcon *Falco peregrinus tundrius*

DL

migrant throughout state from subspecies' far northern breeding range, winters along coast and farther south; occupies wide range of habitats during migration, including urban, concentrations along coast and barrier islands; low-altitude migrant, stopovers at leading landscape edges such as lake shores, coastlines, and barrier islands.

Baird's Sparrow *Ammodramus bairdii*

shortgrass prairie with scattered low bushes and matted vegetation; mostly migratory in western half of State, though winters in Mexico and just across Rio Grande into Texas from Brewster through Hudspeth counties

Bald Eagle *Haliaeetus leucocephalus*

DL

T

found primarily near rivers and large lakes; nests in tall trees or on cliffs near water; communally roosts, especially in winter; hunts live prey, scavenges, and pirates food from other birds

Ferruginous Hawk *Buteo regalis*

open country, primarily prairies, plains, and badlands; nests in tall trees along streams or on steep slopes, cliff ledges, river-cut banks, hillsides, power line towers; year-round resident in northwestern high plains, wintering elsewhere throughout western 2/3 of Texas

Interior Least Tern *Sterna antillarum athalassos*

LE

E

subspecies is listed only when inland (more than 50 miles from a coastline); nests along sand and gravel bars within braided streams, rivers; also know to nest on man-made structures (inland beaches, wastewater treatment plants, gravel mines, etc); eats small fish and crustaceans, when breeding forages within a few hundred feet of colony

Mountain Plover *Charadrius montanus*

breeding: nests on high plains or shortgrass prairie, on ground in shallow depression; nonbreeding: shortgrass plains and bare, dirt (plowed) fields; primarily insectivorous

Peregrine Falcon *Falco peregrinus*

DL

T

both subspecies migrate across the state from more northern breeding areas in US and Canada to winter along coast and farther south; subspecies (F. p. anatum) is also a resident breeder in west Texas; the two subspecies' listing statuses differ, F.p. tundrius is no longer listed in Texas; but because the subspecies are not easily distinguishable at a distance, reference is generally made only to the species level; see subspecies for habitat.

Prairie Falcon *Falco mexicanus*

open, mountainous areas, plains and prairie; nests on cliffs

LOVING COUNTY

BIRDS

Federal Status State Status

Snowy Plover *Charadrius alexandrinus*

formerly an uncommon breeder in the Panhandle; potential migrant; winter along coast

Sprague's Pipit *Anthus spragueii* C

only in Texas during migration and winter, mid September to early April; short to medium distance, diurnal migrant; strongly tied to native upland prairie, can be locally common in coastal grasslands, uncommon to rare further west; sensitive to patch size and avoids edges.

Western Burrowing Owl *Athene cunicularia hypugaea*

open grasslands, especially prairie, plains, and savanna, sometimes in open areas such as vacant lots near human habitation or airports; nests and roosts in abandoned burrows

Western Snowy Plover *Charadrius alexandrinus nivosus*

uncommon breeder in the Panhandle; potential migrant; winter along coast

FISHES

Federal Status State Status

Pecos pupfish *Cyprinodon pecosensis* T

originally Pecos River basin, presently restricted to upper basin only; shallow margins of clear, vegetated spring waters high in calcium carbonate, as well as in sinkhole habitats

MAMMALS

Federal Status State Status

Big free-tailed bat *Nyctinomops macrotis*

habitat data sparse but records indicate that species prefers to roost in crevices and cracks in high canyon walls, but will use buildings, as well; reproduction data sparse, gives birth to single offspring late June-early July; females gather in nursery colonies; winter habits undetermined, but may hibernate in the Trans-Pecos; opportunistic insectivore

Black bear *Ursus americanus* T/SA;NL T

bottomland hardwoods and large tracts of inaccessible forested areas; due to field characteristics similar to Louisiana Black Bear (LT, T), treat all east Texas black bears as federal and state listed Threatened

Black-footed ferret *Mustela nigripes* LE

extirpated; inhabited prairie dog towns in the general area

Black-tailed prairie dog *Cynomys ludovicianus*

dry, flat, short grasslands with low, relatively sparse vegetation, including areas overgrazed by cattle; live in large family groups

Gray wolf *Canis lupus* LE E

extirpated; formerly known throughout the western two-thirds of the state in forests, brushlands, or grasslands

LOVING COUNTY

MAMMALS

Federal Status State Status

Jones' pocket gopher *Geomys knoxjonesi*

southwestern plains of Texas; deep sandy soils of aeolian origin; small isolated population vulnerable to land use changes

Pale Townsend's big-eared bat *Corynorhinus townsendii pallescens*

roosts in caves, abandoned mine tunnels, and occasionally old buildings; hibernates in groups during winter; in summer months, males and females separate into solitary roosts and maternity colonies, respectively; single offspring born May-June; opportunistic insectivore

Pecos River muskrat *Ondatra zibethicus ripensis*

creeks, rivers, lakes, drainage ditches, and canals; prefer shallow, fresh water with clumps of marshy vegetation, such as cattails, bulrushes, and sedges; live in dome-shaped lodges constructed of vegetation; diet is mainly vegetation; breed year round

MOLLUSKS

Federal Status State Status

False spike mussel *Quadrula mitchelli*

T

possibly extirpated in Texas; probably medium to large rivers; substrates varying from mud through mixtures of sand, gravel and cobble; one study indicated water lilies were present at the site; Rio Grande, Brazos, Colorado, and Guadalupe (historic) river basins

Texas hornshell *Popenaias popeii*

C

T

both ends of narrow shallow runs over bedrock, in areas where small-grained materials collect in crevices, along river banks, and at the base of boulders; not known from impoundments; Rio Grande Basin and several rivers in Mexico

REPTILES

Federal Status State Status

Spot-tailed earless lizard *Holbrookia lacerata*

central and southern Texas and adjacent Mexico; moderately open prairie-brushland; fairly flat areas free of vegetation or other obstructions, including disturbed areas; eats small invertebrates; eggs laid underground

Texas horned lizard *Phrynosoma cornutum*

T

open, arid and semi-arid regions with sparse vegetation, including grass, cactus, scattered brush or scrubby trees; soil may vary in texture from sandy to rocky; burrows into soil, enters rodent burrows, or hides under rock when inactive; breeds March-September

Group	Name	Population	Status	Lead Office	Recovery Plan Name	Recovery Plan Stage
Birds	northern aplomado falcon (Falco)	Entire, except where listed as	Endangered	New Mexico Ecological Services	Aplomado Falcon (Northern)	Final
Birds	Mexican spotted owl (Strix)	Entire	Threatened	Arizona Ecological Services	Final Recovery Plan for the	Final Revision 1
Crustaceans	Diminutive Amphipod		Endangered	Austin Ecological Services Field		
Fishes	Comanche Springs pupfish	Entire	Endangered	Austin Ecological Services Field	Recovery Plan for the	Final
Fishes	Pecos gambusia (Gambusia)	Entire	Endangered	Austin Ecological Services Field	Recovery Plan for Pecos	Final
Flowering Plants	Pecos (=puzzle, =paradox)		Threatened	New Mexico Ecological Services	Final Pecos Sunflower	Final
Snails	Phantom Springsnail		Endangered	Austin Ecological Services Field		
Snails	Phantom Tryonia (Tryonia)		Endangered	Austin Ecological Services Field		
Snails	Pecos assimineea snail		Endangered	New Mexico Ecological Services	Recovery Outline for the Noel's	Outline

Reeves County

		<u>Species</u>						
<u>Common Name</u>	<u>Scientific Name</u>	<u>Species Group</u>	<u>Listing Status</u>	<u>Species Image</u>	<u>Distribution Map</u>	<u>Critical Habitat</u>	<u>More Info</u>	
Comanche Springs pupfish	<i>Cyprinodon elegans</i>	Fishes	E				<u>P</u>	
Diminutive amphipod	<i>Gammarus hyalleloides</i>	Crustaceans	C				<u>P</u>	
Mexican spotted owl	<i>Strix occidentalis lucida</i>	Birds	T				<u>P</u>	
northern aplomado falcon	<i>Falco femoralis septentrionalis</i>	Birds	E, EXPN				<u>P</u>	
Pecos (=puzzle, =paradox) sunflower	<i>Helianthus paradoxus</i>	Flowering Plants	T				<u>P</u>	
Pecos assiminea snail	<i>Assiminea pecos</i>	Snails	E			<u>Final</u>	<u>P</u>	
Pecos gambusia	<i>Gambusia nobilis</i>	Fishes	E				<u>P</u>	
Phantom Lake cave Snail	<i>Cochliopa texana</i>	Snails	C	No Image			<u>P</u>	
Phantom Springsnail (=Tryonia)	<i>Tryonia cheatumi</i>	Snails	C	No Image			<u>P</u>	

REEVES COUNTY

BIRDS

Federal Status State Status

American Peregrine Falcon *Falco peregrinus anatum*

DL

T

year-round resident and local breeder in west Texas, nests in tall cliff eyries; also, migrant across state from more northern breeding areas in US and Canada, winters along coast and farther south; occupies wide range of habitats during migration, including urban, concentrations along coast and barrier islands; low-altitude migrant, stopovers at leading landscape edges such as lake shores, coastlines, and barrier islands.

Arctic Peregrine Falcon *Falco peregrinus tundrius*

DL

migrant throughout state from subspecies' far northern breeding range, winters along coast and farther south; occupies wide range of habitats during migration, including urban, concentrations along coast and barrier islands; low-altitude migrant, stopovers at leading landscape edges such as lake shores, coastlines, and barrier islands.

Baird's Sparrow *Ammodramus bairdii*

shortgrass prairie with scattered low bushes and matted vegetation; mostly migratory in western half of State, though winters in Mexico and just across Rio Grande into Texas from Brewster through Hudspeth counties

Ferruginous Hawk *Buteo regalis*

open country, primarily prairies, plains, and badlands; nests in tall trees along streams or on steep slopes, cliff ledges, river-cut banks, hillsides, power line towers; year-round resident in northwestern high plains, wintering elsewhere throughout western 2/3 of Texas

Interior Least Tern *Sterna antillarum athalassos*

LE

E

subspecies is listed only when inland (more than 50 miles from a coastline); nests along sand and gravel bars within braided streams, rivers; also know to nest on man-made structures (inland beaches, wastewater treatment plants, gravel mines, etc); eats small fish and crustaceans, when breeding forages within a few hundred feet of colony

Montezuma Quail *Cyrtonyx montezumae*

open pine-oak or juniper-oak with ground cover of bunch grass on flats and slopes of semi-desert mountains and hills; travels in pairs or small groups; eats succulents, acorns, nuts, and weed seeds, as well as various invertebrates

Mountain Plover *Charadrius montanus*

breeding: nests on high plains or shortgrass prairie, on ground in shallow depression; nonbreeding: shortgrass plains and bare, dirt (plowed) fields; primarily insectivorous

Northern Aplomado Falcon *Falco femoralis septentrionalis*

LE

E

open country, especially savanna and open woodland, and sometimes in very barren areas; grassy plains and valleys with scattered mesquite, yucca, and cactus; nests in old stick nests of other bird species

REEVES COUNTY

BIRDS

Federal Status State Status

- | | | | |
|-------------------------|-------------------------|----|---|
| Peregrine Falcon | <i>Falco peregrinus</i> | DL | T |
|-------------------------|-------------------------|----|---|
- both subspecies migrate across the state from more northern breeding areas in US and Canada to winter along coast and farther south; subspecies (F. p. anatum) is also a resident breeder in west Texas; the two subspecies' listing statuses differ, F.p. tundrius is no longer listed in Texas; but because the subspecies are not easily distinguishable at a distance, reference is generally made only to the species level; see subspecies for habitat.
- | | | | |
|-----------------------|------------------------|--|--|
| Prairie Falcon | <i>Falco mexicanus</i> | | |
|-----------------------|------------------------|--|--|
- open, mountainous areas, plains and prairie; nests on cliffs
- | | | | |
|----------------------|--------------------------|--|---|
| Reddish Egret | <i>Egretta rufescens</i> | | T |
|----------------------|--------------------------|--|---|
- resident of the Texas Gulf Coast; brackish marshes and shallow salt ponds and tidal flats; nests on ground or in trees or bushes, on dry coastal islands in brushy thickets of yucca and prickly pear
- | | | | |
|---------------------|--------------------------------|--|--|
| Snowy Plover | <i>Charadrius alexandrinus</i> | | |
|---------------------|--------------------------------|--|--|
- formerly an uncommon breeder in the Panhandle; potential migrant; winter along coast
- | | | | |
|------------------------|-------------------------|---|--|
| Sprague's Pipit | <i>Anthus spragueii</i> | C | |
|------------------------|-------------------------|---|--|
- only in Texas during migration and winter, mid September to early April; short to medium distance, diurnal migrant; strongly tied to native upland prairie, can be locally common in coastal grasslands, uncommon to rare further west; sensitive to patch size and avoids edges.
- | | | | |
|------------------------------|------------------------------------|--|--|
| Western Burrowing Owl | <i>Athene cunicularia hypugaea</i> | | |
|------------------------------|------------------------------------|--|--|
- open grasslands, especially prairie, plains, and savanna, sometimes in open areas such as vacant lots near human habitation or airports; nests and roosts in abandoned burrows
- | | | | |
|-----------------------------|--|--|--|
| Western Snowy Plover | <i>Charadrius alexandrinus nivosus</i> | | |
|-----------------------------|--|--|--|
- uncommon breeder in the Panhandle; potential migrant; winter along coast
- | | | | |
|-------------------------------------|---|------|--|
| Western Yellow-billed Cuckoo | <i>Coccyzus americanus occidentalis</i> | C;NL | |
|-------------------------------------|---|------|--|
- status applies only to western population beyond the Pecos River Drainage; breeds in riparian habitat and associated drainages; springs, developed wells, and earthen ponds supporting mesic vegetation; deciduous woodlands with cottonwoods and willows; dense understory foliage is important for nest site selection; nests in willow, mesquite, cottonwood, and hackberry; forages in similar riparian woodlands; breeding season mid-May-late Sept
- | | | | |
|-------------------------|--------------------------|--|---|
| Zone-tailed Hawk | <i>Buteo albonotatus</i> | | T |
|-------------------------|--------------------------|--|---|
- arid open country, including open deciduous or pine-oak woodland, mesa or mountain country, often near watercourses, and wooded canyons and tree-lined rivers along middle-slopes of desert mountains; nests in various habitats and sites, ranging from small trees in lower desert, giant cottonwoods in riparian areas, to mature conifers in high mountain regions

REEVES COUNTY CRUSTACEANS

Federal Status State Status

Pecos amphipod *Gammarus pecos*

E

endemic aquatic amphipod; omnivorous; amphipods are active mostly at night and spend daylight hours hiding under vegetation and other cover; vulnerable to reduction of springflow resulting from declining levels of groundwater

FISHES

Federal Status State Status

Comanche Springs pupfish *Cyprinodon elegans*

LE

E

originally in Comanche Springs, San Solomon, and Phantom Cave, presently restricted to San Solomon and Phantom Cave and associated springs, and downstream irrigation canals; found in constantly discharging springs and in swift-flowing water of canals and earthen ditches, vulnerable to hybridization with *C. variegatus*

Headwater catfish *Ictalurus lupus*

originally throughout streams of the Edwards Plateau and the Rio Grande basin, currently limited to Rio Grande drainage, including Pecos River basin; springs, and sandy and rocky riffles, runs, and pools of clear creeks and small rivers

Pecos gambusia *Gambusia nobilis*

LE

E

Pecos River and tributaries; shallow margins of clear, vegetated spring waters high in calcium carbonate, as well as in sinkhole habitats

Pecos pupfish *Cyprinodon pecosensis*

T

originally Pecos River basin, presently restricted to upper basin only; shallow margins of clear, vegetated spring waters high in calcium carbonate, as well as in sinkhole habitats

INSECTS

Federal Status State Status

A tiger beetle *Cicindela hornii*

grassland/herbaceous; burrowing in or using soil; dry areas on hillside or mesas where soil is rocky or loamy and covered with grasses, invertivore; diurnal, hibernates/aestivates, active mostly for several days after heavy rains. the life cycle probably takes two years so larvae would always be present in burrows in the soil

Arroyo darner *Aeshna dugesi*

creek, high - moderate gradient; eggs laid in aquatic plants, larvae cling to bottom of pools of streams, adults forage widely in pools in streams, from desert up to pine-oak zone; invertivore, diurnal; larvae overwinter, flight season late June to early September

Balmorhea saddle-case caddisfly *Protophila balmorhea*

oviparous; larvae make turtle-shaped cases of small pebbles attached to the underside of stones in swift-flowing streams and rivers

Leonora's dancer damselfly *Argia leonorae*

REEVES COUNTY

INSECTS

Federal Status

State Status

south central and western Texas; small streams and seepages

MAMMALS

Federal Status

State Status

Big free-tailed bat

Nyctinomops macrotis

habitat data sparse but records indicate that species prefers to roost in crevices and cracks in high canyon walls, but will use buildings, as well; reproduction data sparse, gives birth to single offspring late June-early July; females gather in nursery colonies; winter habits undetermined, but may hibernate in the Trans-Pecos; opportunistic insectivore

Black bear

Ursus americanus

T/SA;NL

T

bottomland hardwoods and large tracts of inaccessible forested areas; due to field characteristics similar to Louisiana Black Bear (LT, T), treat all east Texas black bears as federal and state listed Threatened

Black-footed ferret

Mustela nigripes

LE

extirpated; inhabited prairie dog towns in the general area

Black-tailed prairie dog

Cynomys ludovicianus

dry, flat, short grasslands with low, relatively sparse vegetation, including areas overgrazed by cattle; live in large family groups

Cave myotis bat

Myotis velifer

colonial and cave-dwelling; also roosts in rock crevices, old buildings, carports, under bridges, and even in abandoned Cliff Swallow (*Hirundo pyrrhonota*) nests; roosts in clusters of up to thousands of individuals; hibernates in limestone caves of Edwards Plateau and gypsum cave of Panhandle during winter; opportunistic insectivore

Davis Mountains cottontail

Sylvilagus floridanus robustus

brushy pastures, brushy edges of cultivated fields, and well-drained streamsides; active mostly at twilight and at night, where they may forage in a variety of habitats, including open pastures, meadows, or even lawns; rest during daytime in thickets or in underground burrows and small culverts; feed on grasses, forbs, twigs and bark; not sociable and seldom seen feeding together

Gray wolf

Canis lupus

LE

E

extirpated; formerly known throughout the western two-thirds of the state in forests, brushlands, or grasslands

Pale Townsend's big-eared bat

Corynorhinus townsendii pallescens

roosts in caves, abandoned mine tunnels, and occasionally old buildings; hibernates in groups during winter; in summer months, males and females separate into solitary roosts and maternity colonies, respectively; single offspring born May-June; opportunistic insectivore

Pecos River muskrat

Ondatra zibethicus ripensis

creeks, rivers, lakes, drainage ditches, and canals; prefer shallow, fresh water with clumps of marshy vegetation, such as cattails, bulrushes, and sedges; live in dome-shaped lodges constructed of vegetation; diet is mainly vegetation; breed year round

REEVES COUNTY

MAMMALS

Federal Status State Status

Pocketed free-tailed bat *Nyctinomops femorosaccus*

semiarid desert grasslands; roosts in caves cliff crevices under building roof tiles; feed on insects; females bear one pup per season Jul - Aug

Yuma myotis bat *Myotis yumanensis*

desert regions; most commonly found in lowland habitats near open water, where forages; roosts in caves, abandoned mine tunnels, and buildings; season of partus is May to early July; usually only one young born to each female

MOLLUSKS

Federal Status State Status

Brune's tryonia *Tryonia brunei*

endemic freshwater snail; benthic; currently only found in modified waters Phantom Lake Spring; abundant on firm substratum and in soft mud before modification; vulnerable to declining groundwater resulting in reduction of springflow

False spike mussel *Quadrula mitchelli* T

possibly extirpated in Texas; probably medium to large rivers; substrates varying from mud through mixtures of sand, gravel and cobble; one study indicated water lilies were present at the site; Rio Grande, Brazos, Colorado, and Guadalupe (historic) river basins

Pecos assiminea snail *Assiminea pecos* E E

a member of the marine snail family, but represents the most inland snail of the genus; semiaquatic, usually found on moist ground or beneath emergent plants within a few centimeters of flowing water; only known remaining Texas population at near Fort Stockton, Pecos County; historical to the Pecos River Valley of New Mexico and Texas

Phantom springsnail *Pyrgulopsis texana* E

endemic aquatic snail; known only from three spring systems and associated outflows in Jeff Davis and Reeves counties; vulnerable to reduction of springflow resulting from declining levels of groundwater

Phantom tryonia *Tryonia cheatumi* E

endemic aquatic snail; known only from three spring systems and associated outflows in Jeff Davis and Reeves counties; vulnerable to reduction of springflow resulting from declining levels of groundwater

Texas hornshell *Popenaias popeii* C T

both ends of narrow shallow runs over bedrock, in areas where small-grained materials collect in crevices, along river banks, and at the base of boulders; not known from impoundments; Rio Grande Basin and several rivers in Mexico

REPTILES

Federal Status State Status

Texas horned lizard *Phrynosoma cornutum* T

REEVES COUNTY

REPTILES

Federal Status State Status

open, arid and semi-arid regions with sparse vegetation, including grass, cactus, scattered brush or scrubby trees; soil may vary in texture from sandy to rocky; burrows into soil, enters rodent burrows, or hides under rock when inactive; breeds March-September

PLANTS

Federal Status State Status

Desert night-blooming cereus *Peniocereus greggii var greggii*

Chihuahuan Desert shrublands or shrub invaded grasslands in alluvial or gravelly soils at lower elevations, 1200-1500 m (3900-4900 ft), on slopes, benches, arroyos, flats, and washes; flowering synchronized over a few nights in early May to late June when almost all mature plants bloom, flowers last only one day and open just after dark, may flower as early as April

Grayleaf rock-daisy *Perityle cinerea*

Texas endemic; crevices in dry limestone caprock of mesas; flowering spring-fall

Gyp locoweed *Astragalus gypsodes*

gypsum or stiff gypseous clay soils on low rolling hills, mostly low elevations in the middle Pecos River valley; many of the known locations are on the Castile Formation (Permian); flowering March-June

Pecos/Puzzle sunflower *Helianthus paradoxus*

LT T

restricted to saline, calcareous, heavy-textured soils around cienegas; usually most abundant on perennially wet soils of subirrigated terraces just above the wettest sites; flowering August-November

Wright's trumpets *Acleisanthes wrightii*

open semi-desert grasslands and shrublands on shallow stony soils over limestone on low hills and flats; flowering spring-fall, probably also in response to rains

APPENDIX B
TXNDD DOCUMENTED OCCURRENCES

Element Occurrence Record

Scientific Name: Bat Roost

Occurrence #: 1 **Eo Id:** 7094

Common Name:

Track Status: Track all extant and selected historical EOs

TX Protection Status:

Global Rank: GNR

State Rank: SNR

Federal Status:

Location Information:

Directions:

FROM DOG CANYON RANGER STATION, 0.5 MILE SOUTH OF NM/TX LINE, GO SOUTHWEST 2.0 MILES ON TRAIL, MINES NORTHWEST OF TRAIL

Survey Information:

First Observation:

Survey Date:

Last Observation:

Eo Type:

Eo Rank:

Eo Rank Date:

Observed Area:

Comments:

General

Description:

Comments:

Protection

Comments:

Management

Comments:

Data:

EO Data: TWO ROOSTS IN TWO DIFFERENT MINES

Reference:

Citation:

National Park Service. 1996. Environmental assessment. Closure of abandoned mine openings; Calumet and Texas copper mines. Dog Canyon, Guadalupe Mountains National Park, Culberson County, Texas. January 1996.

Specimen:

Element Occurrence Record

Scientific Name: Bat Roost

Occurrence #: 2 **Eo Id:** 6083

Common Name:

Track Status: Track all extant and selected historical EOs

TX Protection Status:

Global Rank: GNR

State Rank: SNR

Federal Status:

Location Information:

Directions:

From Dog Canyon Ranger Station, 0.5 mile S of New Mexico/Texas line, go SW 1.8 miles on trail, mine S of trail.

Survey Information:

First Observation:

Survey Date:

Last Observation:

Eo Type:

Eo Rank:

Eo Rank Date:

Observed Area:

Comments:

General

Description:

Comments:

Protection

Comments:

Management

Comments:

Data:

EO Data: ONE BAT ROOST

Reference:

Citation:

National Park Service. 1996. Environmental assessment. Closure of abandoned mine openings; Calumet and Texas copper mines. Dog Canyon, Guadalupe Mountains National Park, Culberson County, Texas. January 1996.

Specimen:

Element Occurrence Record

Scientific Name: Bat Roost

Occurrence #: 3 **Eo Id:** 3451

Common Name:

Track Status: Track all extant and selected historical EOs

TX Protection Status:

Global Rank: GNR

State Rank: SNR

Federal Status:

Location Information:

Directions:

FROM DOG CANYON RANGER STATION, 0.5 MILE SOUTH OF NM/TX LINE, GO SOUTHWEST 2.0 MILES ON TRAIL, MINES 0.3 AIR MILE SOUTH OF TRAIL

Survey Information:

First Observation:

Survey Date:

Last Observation:

Eo Type:

Eo Rank:

Eo Rank Date:

Observed Area:

Comments:

General

Description:

Comments:

Protection

Comments:

Management

Comments:

Data:

EO Data: TWO BAT ROOSTS AT TWO DIFFERENT MINES

Reference:

Citation:

National Park Service. 1996. Environmental assessment. Closure of abandoned mine openings; Calumet and Texas copper mines. Dog Canyon, Guadalupe Mountains National Park, Culberson County, Texas. January 1996.

Specimen:

Element Occurrence Record

Scientific Name: Bat Roost

Occurrence #: 37 **Eo Id:** 8834

Common Name:

Track Status: Track all extant and selected historical EOs

Global Rank: GNR

State Rank: SNR

TX Protection Status:

Federal Status:

Location Information:

Directions:

FROM DOG CANYON RANGER STATION, 0.5 MILE SOUTH OF NM/TX LINE, GO SOUTHWEST 2.0 MILES ON TRAIL, MINES NORTHWEST OF TRAIL

Survey Information:

First Observation:

Survey Date:

Last Observation:

Eo Type:

Eo Rank:

Eo Rank Date:

Observed Area:

Comments:

General

Description:

Comments:

Protection

Comments:

Management

Comments:

Data:

EO Data: TWO ROOSTS IN TWO DIFFERENT MINES

Reference:

Citation:

National Park Service. 1996. Environmental assessment. Closure of abandoned mine openings; Calumet and Texas copper mines. Dog Canyon, Guadalupe Mountains National Park, Culberson County, Texas. January 1996.

Specimen:

Element Occurrence Record

Scientific Name: Bat Roost

Occurrence #: 38 **Eo Id:** 8835

Common Name:

Track Status: Track all extant and selected historical EOs

TX Protection Status:

Global Rank: GNR

State Rank: SNR

Federal Status:

Location Information:

Directions:

FROM DOG CANYON RANGER STATION, 0.5 MILE SOUTH OF NM/TX LINE, GO SOUTHWEST 2.0 MILES ON TRAIL, MINES 0.3 AIR MILE SOUTH OF TRAIL

Survey Information:

First Observation:

Survey Date:

Last Observation:

Eo Type:

Eo Rank:

Eo Rank Date:

Observed Area:

Comments:

General

Description:

Comments:

Protection

Comments:

Management

Comments:

Data:

EO Data: TWO BAT ROOSTS AT TWO DIFFERENT MINES

Reference:

Citation:

National Park Service. 1996. Environmental assessment. Closure of abandoned mine openings; Calumet and Texas copper mines. Dog Canyon, Guadalupe Mountains National Park, Culberson County, Texas. January 1996.

Specimen:

Element Occurrence Record

Scientific Name: *Cyprinodon pecosensis* **Occurrence #:** 9 **Eo Id:** 2967
Common Name: Pecos Pupfish **Track Status:** Track all extant and selected historical EOs
Global Rank: G1 **State Rank:** S1 **TX Protection Status:** T
Federal Status:

Location Information:

Directions:

PECOS RIVER, 8.3 KILOMETERS EAST NORTHEAST OF ORLA, REEVES COUNTY

Survey Information:

First Observation: 1972 **Survey Date:** **Last Observation:** 1980
Eo Type: **Eo Rank:** X **Eo Rank Date:**

Observed Area:

Comments:

General Description: A SMALL, SALINE DESERT RIVER; SEVERAL IMPOUNDMENTS; SUBSTRATE GRAVEL, BEDROCK; SPRINGFED TRIBUTARIES

Comments: THREATS INCLUDE HYBRIDIZATION WITH *C. VARIEGATUS* AND TOXIC ALGAL BLOOMS IN PECOS RIVER

Protection

Comments:

Management

Comments:

Data:

EO Data: 91 FISH COLLECTED AT THIS LOCALITY (TNHC 4854); RECENT CHANGES TO RIVER AND HYBRIDIZATION ENDANGER POPULATION; TAXONOMIC IDENTITY OF FISH NEEDS RESEARCHING; ONLY HYBRIDS COLLECTED RECENTLY

Reference:

Citation:

EHELLE, A. A. AND A. F. EHELLE. 1978. THE PECOS RIVER PUFFISH, *CYPRINODON PECOSENSIS*, N. SP. (*CYPRINODONTIDAE*), WITH COMMENTS ON ITS EVOLUTIONARY ORIGIN. *COPEIA* 1978(4):569-582.

EHELLE, ANTHONY A. 1986. PERSONAL COMMUNICATION OF APRIL 18, 1986. RE: *CYPRINODON PECOSENSIS* HYBRIDS.

Specimen:

Element Occurrence Record

Scientific Name: Cyprinodon pecosensis

Occurrence #: 12 **Eo Id:** 937

Common Name: Pecos Pupfish

Track Status: Track all extant and selected historical EOs

TX Protection Status: T

Global Rank: G1 **State Rank:** S1

Federal Status:

Location Information:

Directions:

PECOS RIVER, 1.7 KILOMETERS NORTHEAST OF PECOS, REEVES COUNTY

Survey Information:

First Observation: 1972

Survey Date:

Last Observation: 1980

Eo Type:

Eo Rank: X

Eo Rank Date:

Observed Area:

Comments:

General Description: A SMALL TO MEDIUM DESERT STREAM, SALINE IN UPPER REACHES, GRAVEL, SAND, AND BEDROCK SUBSTRATE, EXTREMELY VARIABLE FLOW REGIME

Comments: THREATS INCLUDE HYBRIDIZATION WITH C. VARIEGATUS AND TOXIC ALGAL BLOOMS IN PECOS RIVER

Protection

Comments:

Management

Comments:

Data:

EO Data: 43 FISH COLLECTED AT THIS LOCALITY (TNHC 4805); EXTENT OF HYBRIDIZATION NEEDS TO BE DETERMINED; ONLY HYBRIDS COLLECTED RECENTLY

Reference:

Citation:

EHELLE, A. A. AND A. F. EHELLE. 1978. THE PECOS RIVER PUFFISH, CYPRINODON PECOSENSIS, N. SP (CYPRINODONTIDAE), WITH COMMENTS ON ITS EVOLUTIONARY ORIGIN. COPEIA 1978(4):569-582.

EHELLE, ANTHONY A. 1986. PERSONAL COMMUNICATION OF APRIL 18, 1986. RE: CYPRINODON PECOSENSIS HYBRIDS.

Specimen:

Element Occurrence Record

Scientific Name: *Cyprinodon pecosensis* **Occurrence #:** 18 **Eo Id:** 5784
Common Name: Pecos Pupfish **Track Status:** Track all extant and selected historical EOs
Global Rank: G1 **State Rank:** S1 **TX Protection Status:** T
Federal Status:

Location Information:

Directions:

SALT CREEK AND CIENEGAS; SALT SPRING TO PECOS RIVER; TAKE U.S. HIGHWAY 285 NORTH TO ORLA, TAKE TX HIGHWAY 652 WEST AND JUST OUTSIDE OF TOWN AS 652 BENDS TO THE RIGHT, TAKE THE FIRST COUNTY ROAD SOUTH, FOLLOW THIS DIRT ROAD APPROXIMATELY 5 MILES TO WHERE IT CROSSES OVER A CULVERT THROUGH WHICH AN OUTFLOW FROM THE FIRST CIENEGA PASSES

Survey Information:

First Observation: **Survey Date:** 1989-08-30 **Last Observation:** 1989-08-31

Eo Type: **Eo Rank:** A **Eo Rank Date:** 1989-08-30

Observed Area:

Comments:

General Description: A SPRING-FED CREEK FLOWING THROUGH ARID COUNTRY TO THE PECOS RIVER; HIGHLY SALINE, UP TO 16 PPM, FORMS SEVERAL CIENEGAS ALONG ITS COURSE

Comments: A NATURAL BARRIER CURRENTLY EXISTS JUST DOWNSTREAM OF THE SITE, ON SALT CREEK; THERE IS NO BARRIER BETWEEN SALT CREEK AND THE PECOS RIVER; THE LATTER SUPPORTS ONLY HYBRIDS, THE OTHER CIENEGAS AND THE SPRINGS UPSTREAM REMAIN TO BE SURVEYED, BUT HAVE BEEN KNOWN TO OR SHOULD SUPPORT CYPRINODON PECOSENSIS

Protection

Comments:

Management

Comments:

Data:

EO Data: 250 PUPFISH WERE TAKEN TO FORM A REFUGE POPULATION AT THE NATIONAL FISH HATCHERY IN UVALDE; THERE WERE THOUSANDS OF FISH IN THE CIENEGA AND ITS OUTFLOW HERE

Reference:

Citation:

PRICE, A.H. AND G.P. GARRETT. 1989. FIELD SURVEY TO SALT CREEK, CULBERSON AND REEVES COUNTIES, TEXAS, 29-31 AUGUST 1989.

DAVIS, JACK R. 1981. DIET OF THE PECOS RIVER PUPFISH, CYPRINODON PECOSENSIS (CYPRINODONTIDAE), SOUTHWESTERN NAT. 25(4):535-540.

EHELLE, A. A. AND A. F. EHELLE. 1978. THE PECOS RIVER PUPFISH, CYPRINODON PECOSENSIS, N. SP. (CYPRINODONTIDAE), WITH COMMENTS ON ITS EVOLUTIONARY ORIGIN. COPEIA 1978(4):569-582.

EHELLE, ANTHONY; PERSONAL COMMUNICATION OF SEPT. 4, 1986 (PHONE)

Specimen:

Element Occurrence Record

Scientific Name: Festuca ligulata **Occurrence #:** 2 **Eo Id:** 1755
Common Name: Guadalupe Mountains fescue **Track Status:** Track all extant and selected historical EOs
Global Rank: G1 **State Rank:** S1 **TX Protection Status:**
Federal Status: C

Location Information:

Directions:

1931 specimen was collected in upper McKittrick Canyon, Guadalupe Mountains, Culberson County, altitude of 1,980 meters.
1952 specimen was collected in McKittrick Canyon, Guadalupe Mountains, altitude of 4,700 ft.

Survey Information:

First Observation: 1931-07-22 **Survey Date:** 2002-09-11 **Last Observation:** 1952-08-10
Eo Type: **Eo Rank:** E **Eo Rank Date:** 1952-08-10

Observed Area:

Comments:

General Description: 22 July 1931: Specimen was collected on moist shaded slopes along creek. 10 Aug 1952: Site had limestone soil.

Comments: The 1931 and 1952 specimens were collected prior to the establishment of Guadalupe Mountains National Park. June 1987 - June 1989: Plant surveys were conducted and no *F. ligulata* plants were observed. The areas surveyed were not provided in the reference. 20-23 Aug, 30 Sep 1985; 21 May, 19-21 Aug, 28 Sep, 6 Oct 1986; 12-13 Aug 1987, 9-11 Sep 2002: All or portions of the following canyons/trails in Guadalupe Mountains NP were surveyed but no *F. ligulata* plants were observed: South McKittrick Canyon, North McKittrick Canyon, McKittrick Canyon, McKittrick Ridge Trail, Bear Canyon Trail, Hunter Peak Trail, Pine Spring Trail, Southeast Rim, Pine Spring Canyon, The Bowl, Bush Mountain. 9-11 Sep 2002: The decision was made by the surveyors to disregard the 4700' elevation of the 1952 Nixon specimen for the time being and to search the interior of McKittrick Canyon (North and South). No evidence of *Festuca ligulata* was found, either flowering plants or even a questionable vegetative example.

Protection

Comments:

Management

Comments:

Data:

EO Data: 22 July 1931: At least three specimens were collected. 10 Aug 1952: At least one specimen was collected; described as a sparse perennial.

Reference:

Element Occurrence Record

Scientific Name: *Lepidospartum burgessii*

Occurrence #: 2 **Eo Id:** 5139

Common Name: gypsum scalebroom

Track Status: Track all extant and selected historical EOs

TX Protection Status:

Global Rank: G2 **State Rank:** S1

Federal Status:

Location Information:

Directions:

WEST OF ALBES [MAPPED 3 MILES NORTHWEST OF INTERSECTION OF HWY 62 AND HUDSPETH-CULBERSON COUNTY LINE]

Survey Information:

First Observation: 1927

Survey Date:

Last Observation: 1927-07-29

Eo Type:

Eo Rank: H

Eo Rank Date: 2006-12-07

Observed Area:

Comments:

General

Description:

Comments:

Protection

Comments:

Management

Comments:

Data:

EO Data:

Reference:

Citation:

TURNER, B.L. 1977. LEPIDOSPARTUM BURGESSII (ASTERACEAE, SENECONIAEAE), A REMARKABLE NEW GYPSOPHILIC SPECIES FROM TRANS-PECOS, TEXAS. WRIGHTIA 5:354-355.

Specimen:

Element Occurrence Record

Scientific Name: Sigmodon ochrognathus **Occurrence #:** 5 **Eo Id:** 2137
Common Name: Yellow-nosed Cotton Rat **Track Status:** Track all extant and selected historical EOs
Global Rank: G4G5 **State Rank:** S3 **TX Protection Status:**
Federal Status:

Location Information:

Directions:

COLLECTED ON LIGON RANCH, 3 MILES NORTHEAST OF GUADALUPE MOUNTAINS NATIONAL PARK HEADQUARTERS, CULBERSON COUNTY

Survey Information:

First Observation: 1986-06-19 **Survey Date:** **Last Observation:** 1986-06-19
Eo Type: **Eo Rank:** **Eo Rank Date:**

Observed Area:

Comments:

General Description:

Comments:

Protection

Comments:

Management

Comments:

Data:

EO Data: ADULT MALE

Reference:

Citation:

HOLLANDER, R.R., B.N. HICKS, AND J.F. SCUDDAY. 1990. DISTRIBUTIONAL RECORDS OF THE YELLOW-NOSED COTTON RAT, SIGMODON OCHROGNATHUS BAILEY, IN TEXAS. TX J. SCI. 42(1):101-102.

Specimen:

Sul Ross State University Museum, Alpine. 1986. Unknown Collector, Catalog # 2404 SRSU, 19 June 1986.

APPENDIX C
PHOTOGRAPHS



Facing east along existing road near southern portion of site, taken 12/3/2012.



Facing south from existing road near southern portion of site, taken 12/3/2012.



Facing west along existing road near southern portion of site, taken 12/3/2012.



Facing north toward site from existing road near southern portion of site, taken 12/3/2012.



Facing northeast from southwest corner of the site, note existing oil and gas facility in background, taken 12/3/2012.



Facing west across site from southeast corner, taken 12/3/2012.



Facing east across site from center of west side, note existing oil and gas facilities in background, taken 12/3/2012.



Facing west-southwest from northeast corner across site, taken 12/3/2012.



Facing north from center of site, taken 12/3/2012.



Facing east from center of site, taken 12/3/2012.



Facing south from center of site, taken 12/3/2012.



Facing west from center of site, taken 12/3/2012.



Facing west along north boundary of site from northeast corner, taken 12/3/2012.



Facing south along east boundary of site from northeast corner, taken 12/3/2012.



Facing northeast from northeast corner at surrounding area, existing oil and gas facility in background, taken 12/3/2012.



Facing east from northeast corner at surrounding area, taken 12/3/2012.



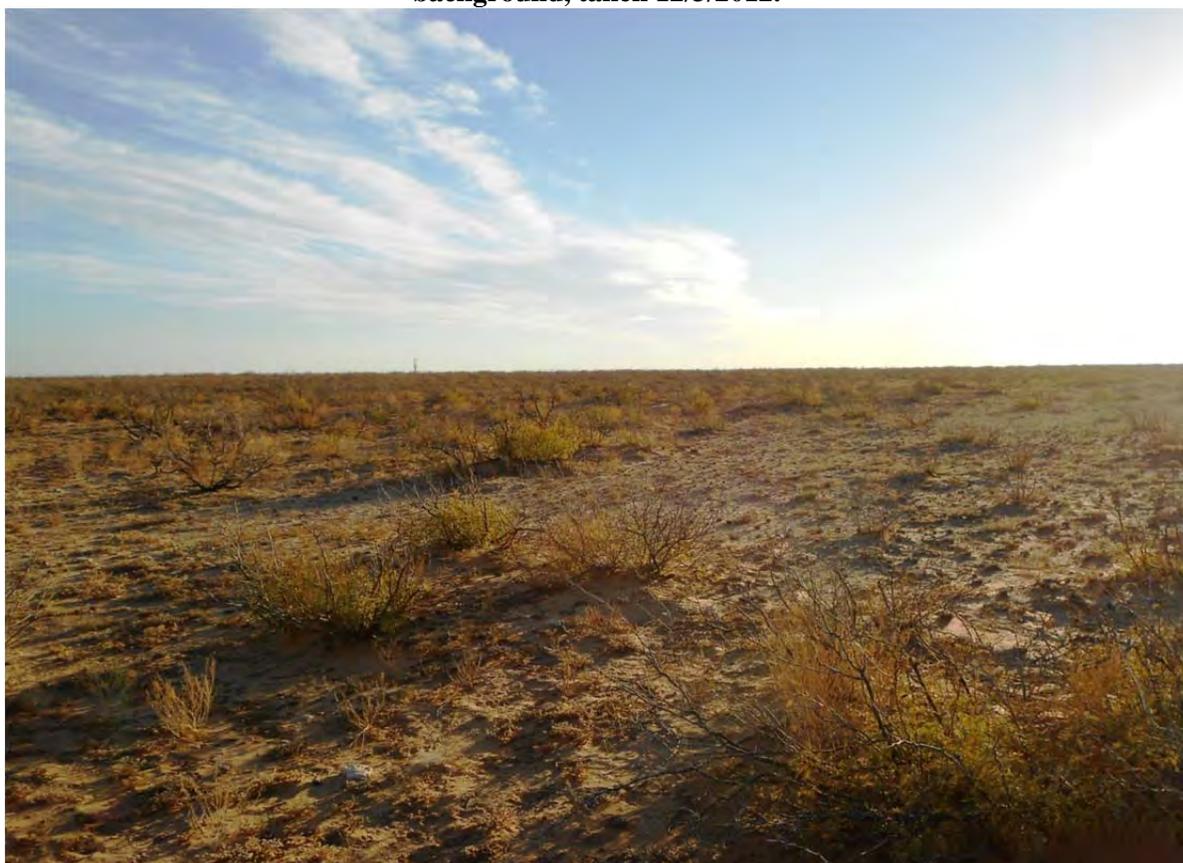
Facing east from northwest corner along north property boundary, existing oil and gas facility in background, taken 12/3/2012.



Facing north from northwest corner at surrounding area, taken 12/3/2012.



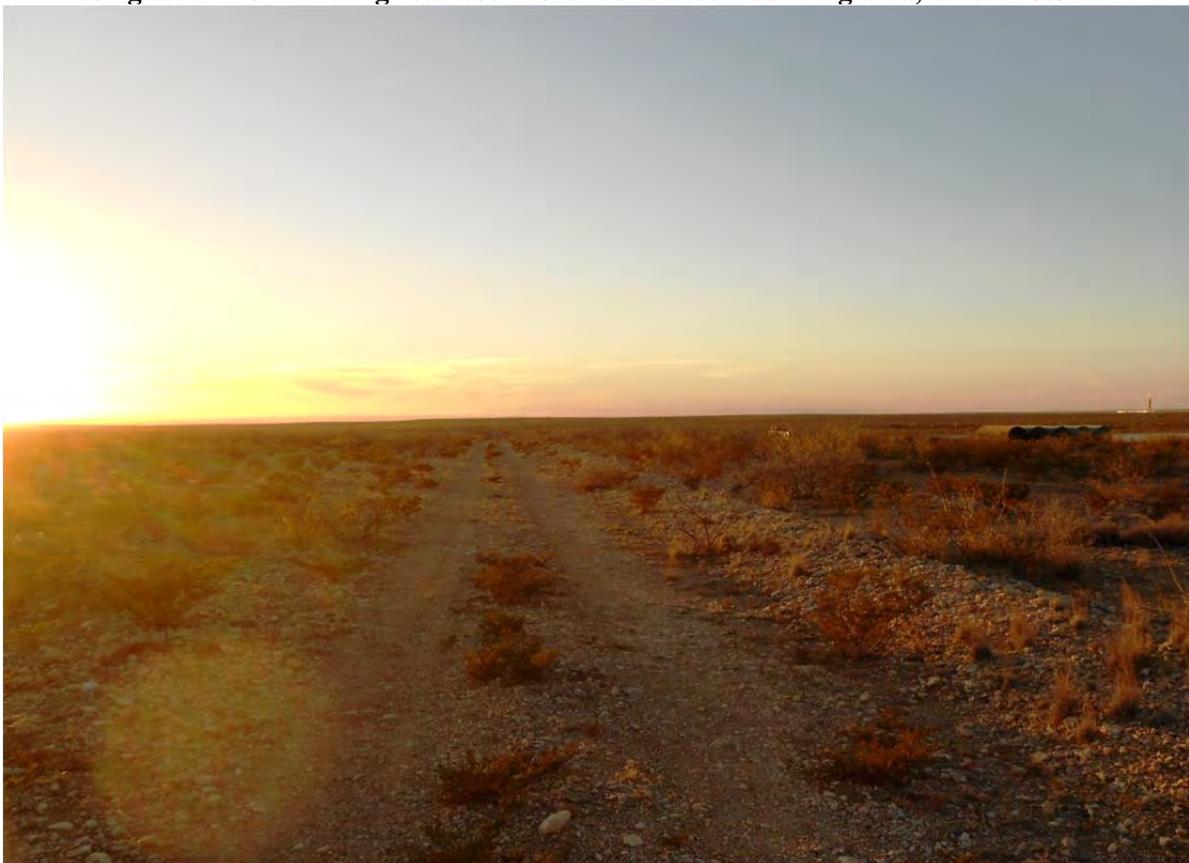
Facing northwest from northwest corner along north property boundary, existing oil and gas facility in background, taken 12/3/2012.



Facing south from northwest corner along west property boundary, taken 12/3/2012.



Facing south from existing road south of the site at surrounding area, taken 12/3/2012.



Facing west from existing road south of the site at surrounding area, taken 12/3/2012.



Facing north from existing road south of the site at surrounding area, oil and gas facility in background, taken 12/3/2012.



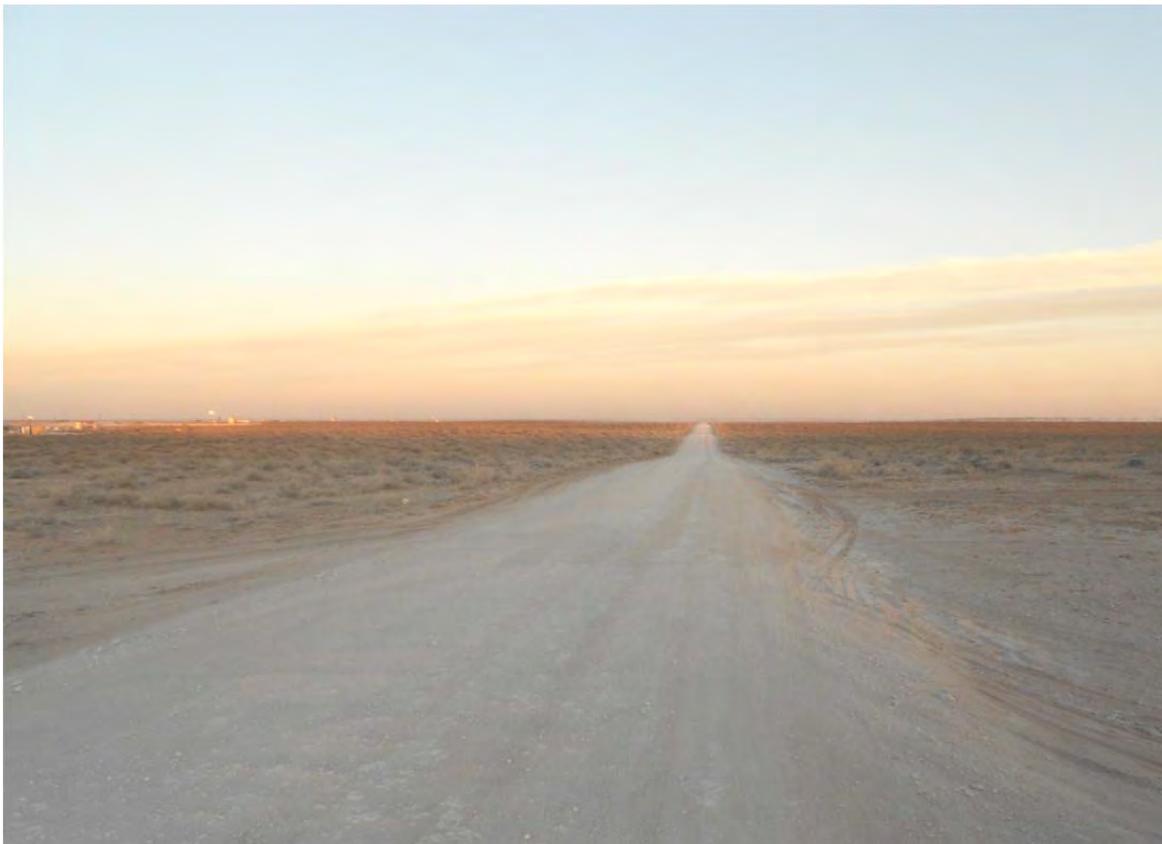
Facing west from existing road south of the site at surrounding area, taken 12/3/2012.



Facing south from existing roads east, northeast, and north of the site, oil and gas facility in background, taken 12/3/2012.



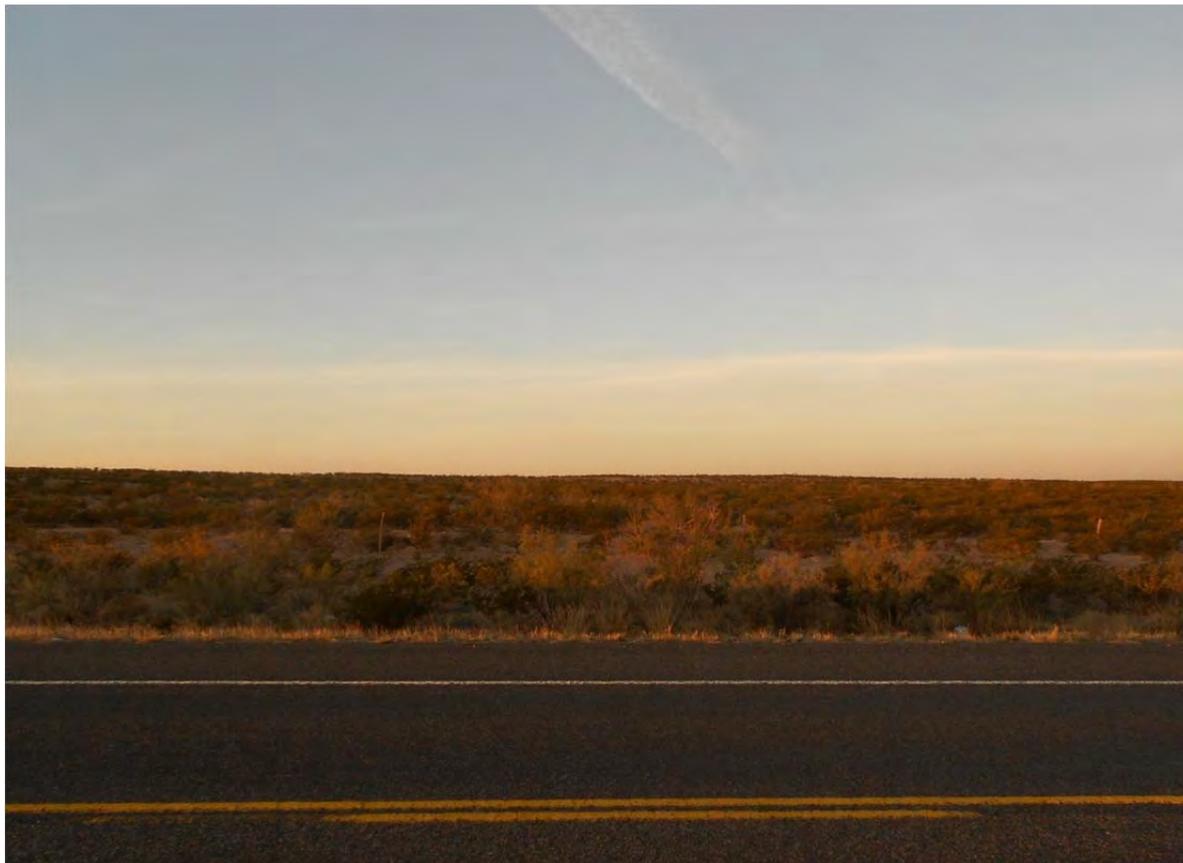
Facing south from existing roads east, northeast, and north of the site, oil and gas facility in background, taken 12/3/2012.



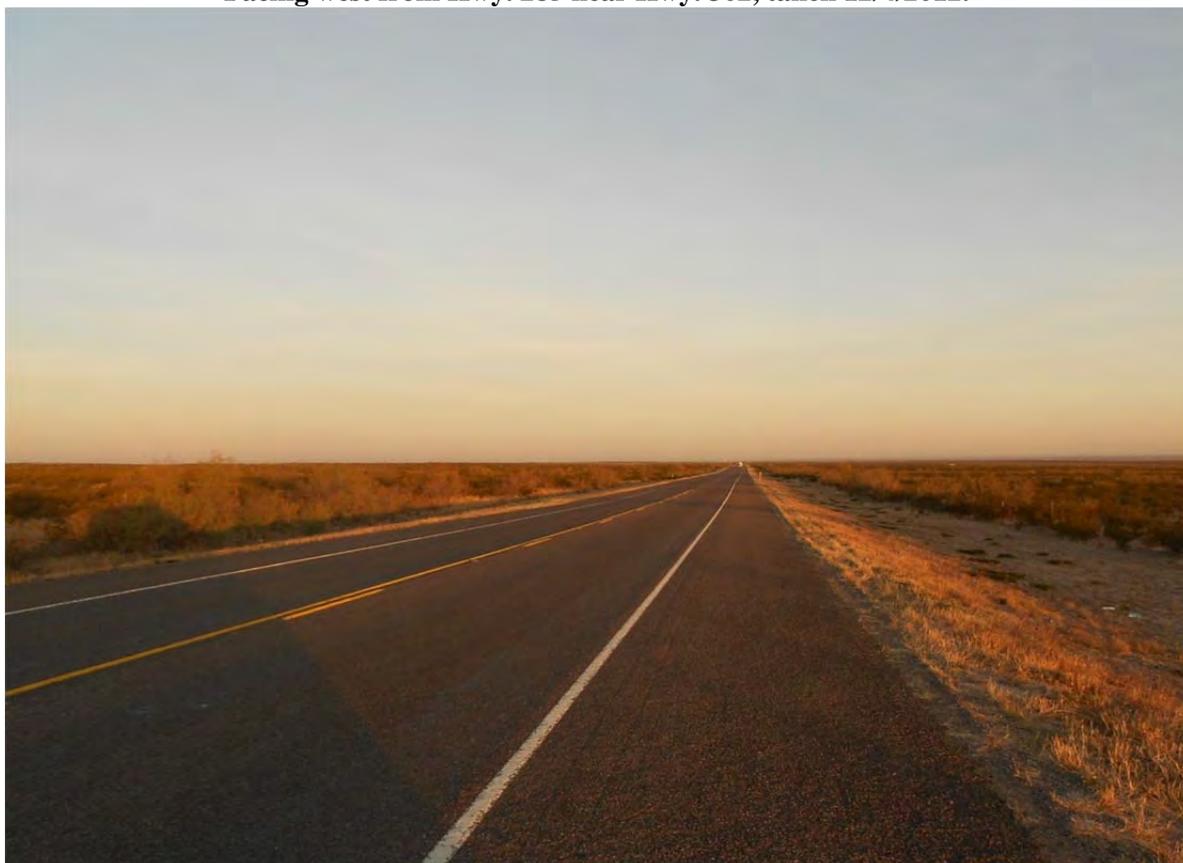
Facing north from existing roads east, northeast, and north of the site, oil and gas facility in background, taken 12/3/2012.



Facing east from existing roads east, northeast, and north of the site, oil and gas facility in background, taken 12/3/2012.



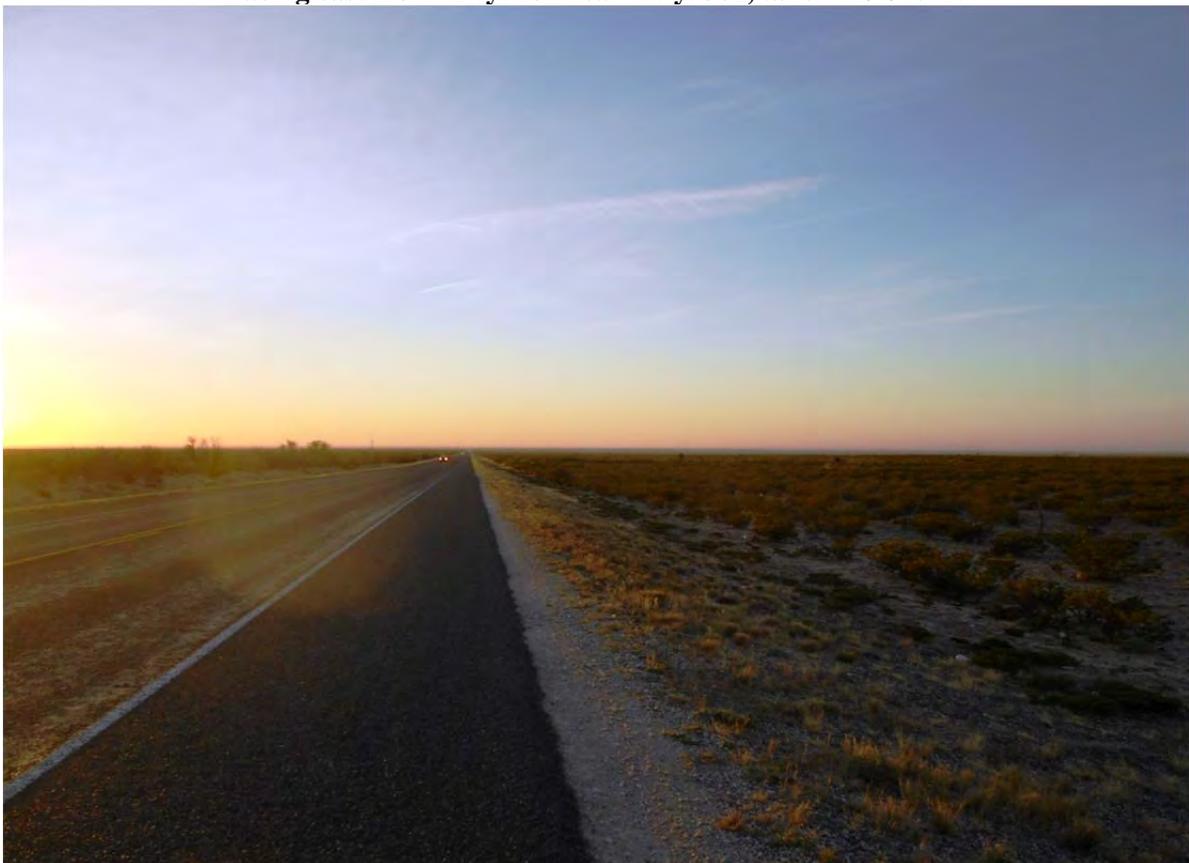
Facing west from Hwy. 285 near Hwy. 302, taken 12/4/2012.



Facing north from Hwy. 285 near Hwy. 302, taken 12/4/2012.



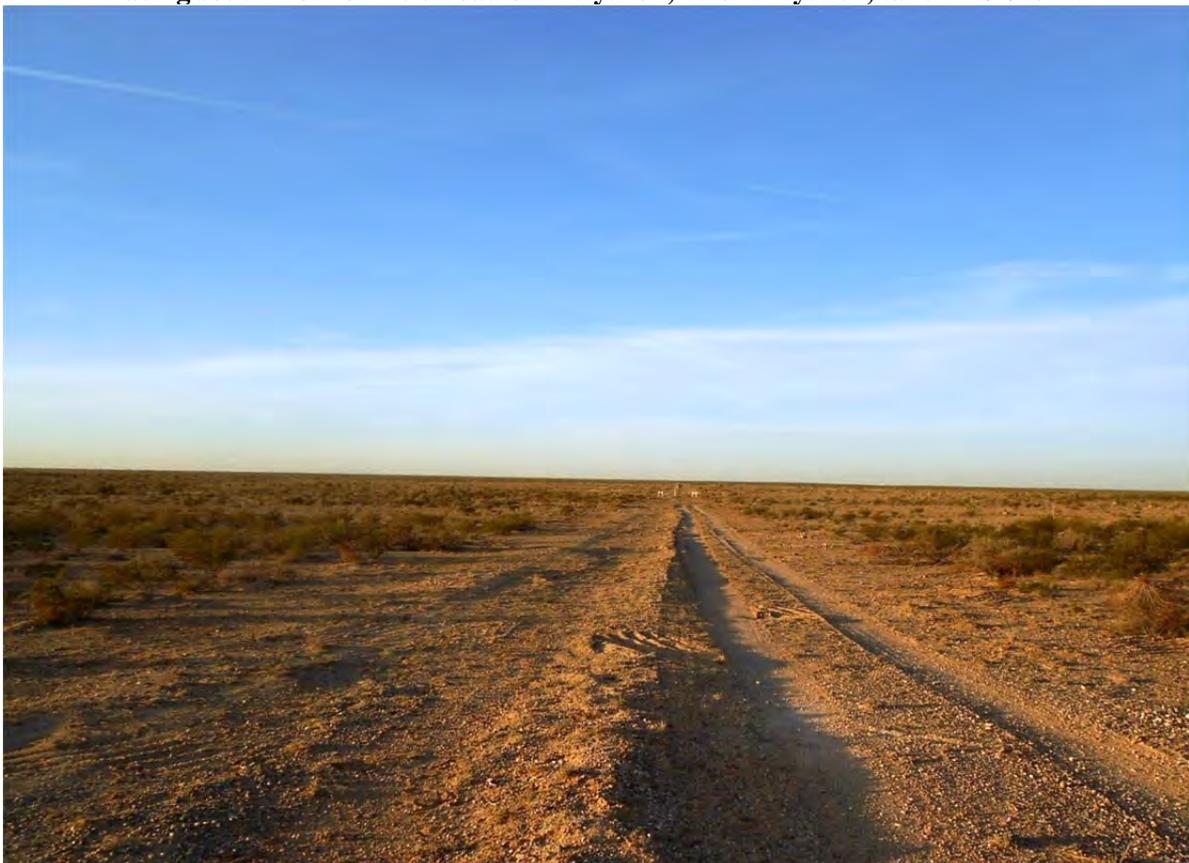
Facing east from Hwy. 285 near Hwy. 302, taken 12/4/2012.



Facing south from Hwy. 285 near Hwy. 302, taken 12/4/2012.



Facing south from oil field road off Hwy. 432, W of Hwy. 285, taken 12/4/2012.



Facing west from oil field road off Hwy. 432, West of Hwy. 285, taken 12/4/2012.



Facing north from oil field road off Hwy. 432, West of Hwy. 285, taken 12/4/2012.



Facing east from oil field road off Hwy. 432, West of Hwy. 285, taken 12/4/2012.



Facing south on Hwy. 285 between Four Mile Draw and Sand Bend Draw, taken 12/4/2012.



Facing west on Hwy. 285 between Four Mile Draw and Sand Bend Draw, taken 12/4/2012.



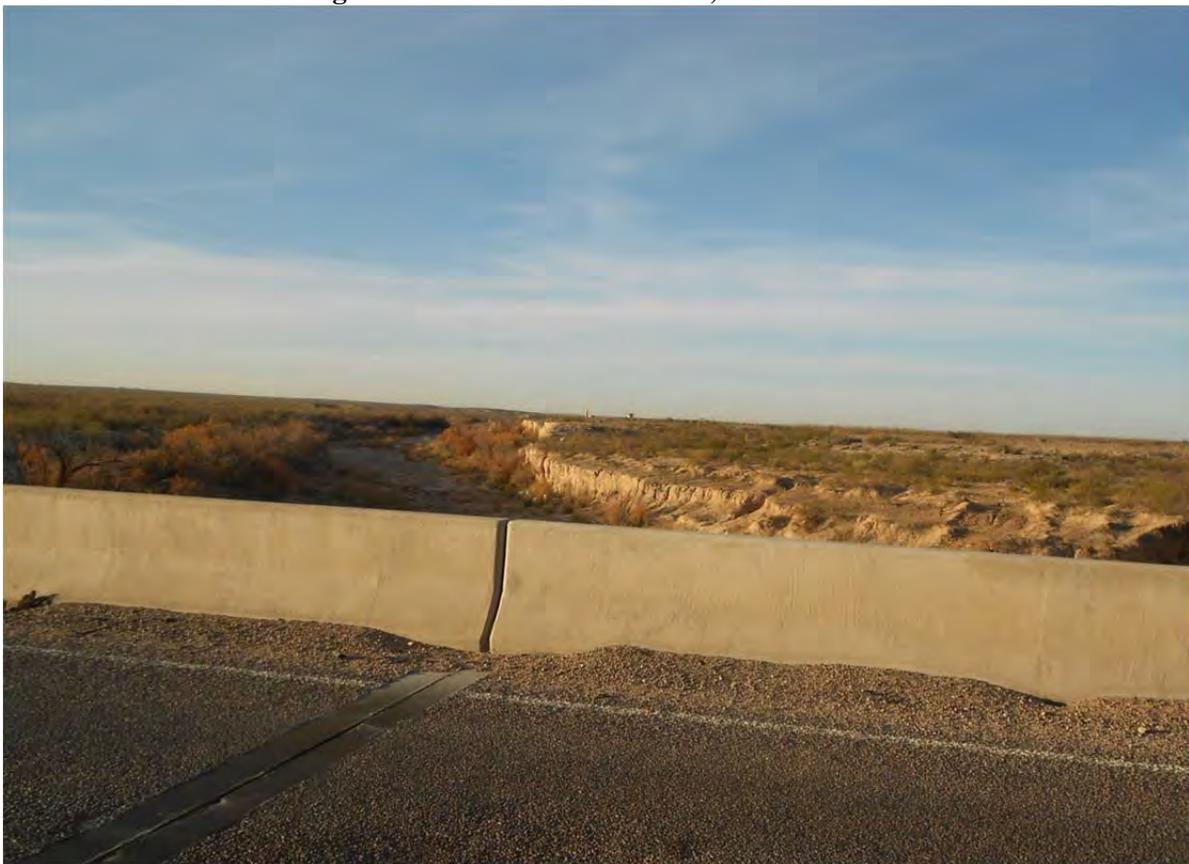
Facing north on Hwy. 285 between Four Mile Draw and Sand Bend Draw, taken 12/4/2012.



Facing east on Hwy. 285 between Four Mile Draw and Sand Bend Draw, taken 12/4/2012.



Facing east toward Four Mile Draw, taken 12/4/2012.



Facing west toward Four Mile Draw, taken 12/4/2012.



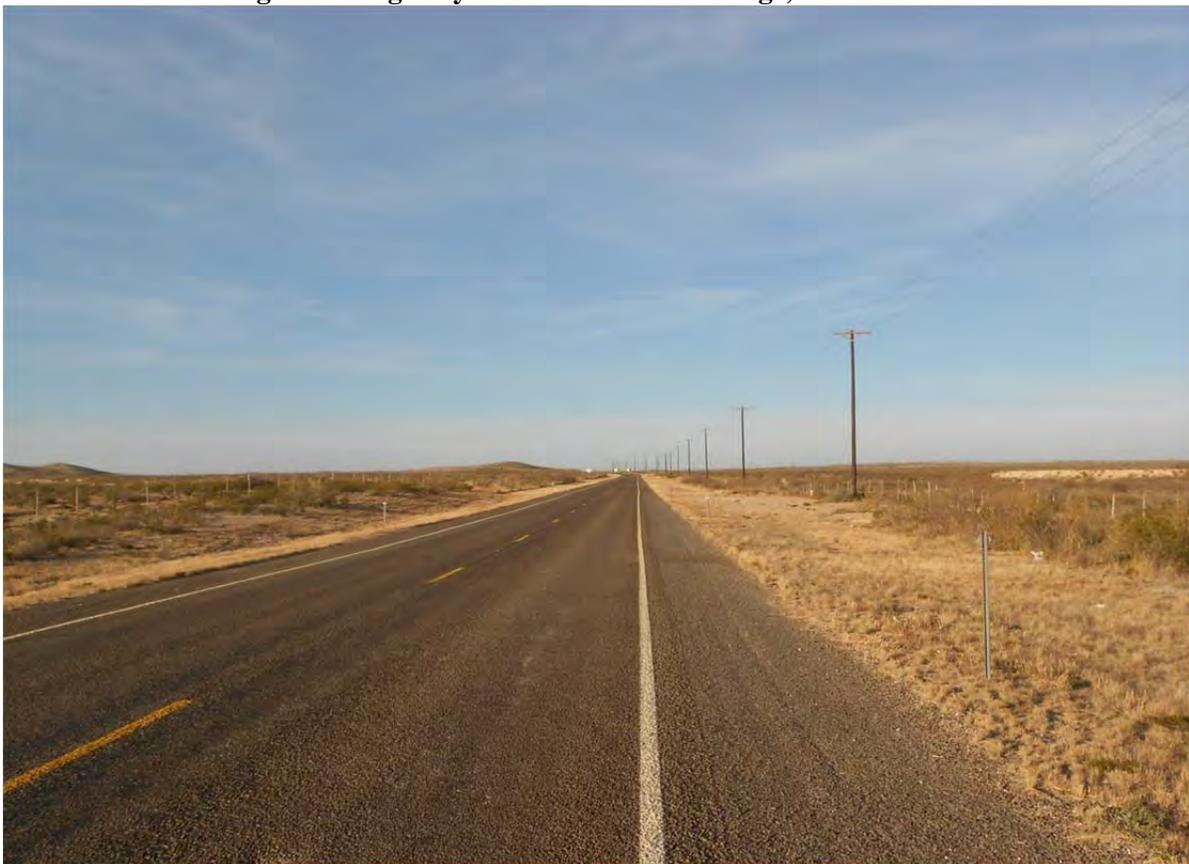
Facing south toward Salt Creek from bridge on Hwy. 652, taken 12/4/2012.



Facing north toward Salt Creek from bridge on Hwy. 652, taken 12/4/2012.



Facing east along Hwy. 652 at Salt Creek bridge, taken 12/4/2012.



Facing west along Hwy. 652 at Salt Creek bridge, taken 12/4/2012.



Facing north along Hwy. 652 near Hwy. 285, taken 12/4/2012.



Facing south along Hwy. 652 near Hwy. 285, taken 12/4/2012.



Facing north along Hwy. 285 at Salt Creek, taken 12/4/2012.



Facing east along Salt Creek at Hwy. 652, taken 12/4/2012.



Facing south along Hwy. 285 at Salt Creek, taken 12/4/2012.



Facing west along Salt Creek at Hwy. 652, taken 12/4/2012.



Facing north along Hwy. 285 just north of TX and NM state line, taken 12/4/2012.



Facing east from Hwy. 285 just north of TX and NM state line, taken 12/4/2012.



Facing south along Hwy. 285 just north of TX and NM state line, taken 12/4/2012.



Facing west from Hwy. 285 just north of TX and NM state line, taken 12/4/2012.



Facing north towards Pecos River along County Line Road in NM, taken 12/4/2012.



Facing east along County Line Road in NM from Pecos River, taken 12/4/2012.



Facing south towards Pecos River along County Line Road in NM, taken 12/4/2012.



Facing west along County Line Road in NM from Pecos River, taken 12/4/2012.



Facing northwest in area northeast of Red Bluff Reservoir, taken 12/4/2012.



Facing north in area between site and Red Bluff Reservoir, taken 12/4/2012.



Facing east in area northeast of site, taken 12/4/2012.



Facing south in area northeast of site, taken 12/4/2012.



Facing west in area northeast of site, taken 12/4/2012.



Facing south at Pecos River south of Red Bluff Reservoir dam, taken 12/4/2012.



Facing north at Pecos River south of Red Bluff Reservoir dam, taken 12/4/2012.



Facing south on Hwy. 302 west of Mentone, taken 12/4/2012.



Facing west along Hwy. 302 west of Mentone, taken 12/4/2012.



Facing north on Hwy. 302 west of Mentone, taken 12/4/2012.



Facing east along Hwy. 302 west of Mentone, taken 12/4/2012.