

Chapter 3. Affected Environment

The Carlsbad Project area is characterized by Desert Scrub and Desert Grassland vegetation suited for the annual rainfall of approximately 8.15 inches. Brantley and Avalon Reservoir were primarily constructed for irrigation and flood-control purposes; however, fishing, and other recreational activities have become important secondary functions. Storage elevations are influenced by annual inflows and releases for irrigation demands causing significant fluctuations to the reservoir pool and exposed reservoir lands.

Soils

The soils in the Research Project area (see Appendix C) vary from flat, alluvial loams to steep, rocky outcrops, to exposed caliche surfaces. Seven soil associations are found throughout Eddy County, but five of these are found specifically within the Research Project area. These include the following: 1) Arno-Harkey-Anthony Association: loamy, deep soils from recently mixed alluvium; 2) Limestone Rock Land-Ector Association: rockland and very shallow, stony, rocky, loamy soils over limestone; on hills and mountains; 3) Reagan-Upton Association: loamy, deep soils that are shallow to caliche; from old alluvium; 4) Reaves Gypsum Land-Cottonwood Association: loamy soils that are very shallow to moderately deep over gypsum beds and gypsum lands; and 5) Simona-Pajarito Association: sandy, deep soils from wind-worked mixed sand deposits.

Range Conditions

Reclamation land in the Carlsbad Project area consists primarily of upland range sites, with small draws occurring occasionally. Reclamation currently manages Carlsbad project area grazing permits and allotments. These grazing areas are limited to lands surrounding the Pecos River downstream of Brantley Reservoir. The primary influences on the conditions of riparian-wetlands at Avalon Reservoir appear to be water level fluctuations and grazing.

The treatments would be made to saltcedar occupying alluvial soils in the floodplain between Avalon and Brantley Dams (within the dam's floodplain). The plant communities within the defined limits for this action can be described as mixed desert shrubland, juniper shrubland, mesquite shrubland, saltbush shrub land, limestone/gypsum hills shrubland, desert plains grassland, kochia-dominated area, and arroyo shrubland (Brantley and Avalon Reservoirs Resource Management Plan, Environmental Assessment, October 2003).

- Mixed Desert shrubland is dominated by a mixture of desert shrubs, mainly creosotebush and whitethorn acacia (*Acacia constricta*).
- Juniper Shrubland is dominated by primarily juniper or *Juniperus osteosperma* (utah juniper). Indian ricegrass and sand huhly are grasses commonly founding this plant community.
- Mesquite Shrubland is characterized by areas where mesquite occurs as the dominate shrub. This is found in two habitat types within the Research Project area, drainages (arroyos) and areas with deep sandy soils.
- Saltbush Shrubland occurs in scattered pockets over the entire Research Project area. This plant community is dominated by four-wing saltbush and found on deep loamy soils often adjacent to drainages or bodies of water.

- Limestone/Gypsum Hills Shrubland is a sparsely vegetated plant community found on the limestone and gypsum hills along the Pecos River Valley region's northeastern boundary. This plant community is also potential habitat of *Eriogonum gypsophilum* (gypsum wild buckwheat), a federally threatened species. Dominance of any particular shrub is rare; rather, an assemblage of many low-growing, sparsely spaced shrubs is typical. These include feather indigobush, mariola, turpentine bush, horse brush, Gregg's coldenia, wooly coldenia, broom snakeweed-, various prickly pear species, soaptree yucca, and banana yucca.
- Desert Plains Grassland is a plant community dominated by either tobosa or alkali sacaton. Burrograss, blue grama, and bush muhly are codominated in some areas.
- Kochia-Dominated Area is a plant community dominated by a single species, summer cypress. Russian thistle and peppergrass are also found within this vegetation type in some areas.
- Arroyo Shrubland plant community is dominated by a mixture of shrubs, which include wait-a-minute bush, catclaw acacia, mesquite, Apache plume, burro-brush, little leaf sumac, western whitethorn, California bricklebrush, and smooth sumac. This plant community is made up of many species that are not found in other plant communities or are not found as abundantly. This complex structure is especially important as wildlife, especially for birds. Several of the shrub species are also prime forage for deer. For these reasons, this plant community is considered sensitive since it provides biodiversity and wildlife habitat.

The treatments would be made to emergent saltcedar and possibly other invasive plants occupying lands within the Carlsbad Project Area.

For the purposes of this action, efforts would be made to avoid impacts upon desirable native vegetation. Only saltcedar dominant sites would be treated with the appropriate methodology to ensure this goal. Proper site management includes the avoidance of creating bare ground, protecting wetlands, and avoiding adverse impacts to water quality and wildlife; protecting federally listed species is paramount. This action is an essential stopgap measure to control the spread and influence of the exotic saltcedar on our native plant communities and riparian system.

Noxious Weed Infestations

Under Federal law, noxious weeds are defined as those plants that are “of foreign origin, are new to or not widely prevalent in the United States, and can directly or indirectly injure crops, other useful plants, livestock, or poultry or other interests of agriculture, including irrigation or navigation, or the fish or wildlife resources of the United States or the public health.” In addition to saltcedar, there are currently known populations of the following plants classified as noxious by State and Federal laws near or occupying sites within the Carlsbad Project areas: African rue (*Peganum harmala*) and Malta starthistle (*Centarea melitensis*).

Reclamation is particularly concerned about noxious weed infestations existing on lands owned by the federal government. Near or within the Carlsbad Project area are known populations of kochia (*Kochia scoparia*), African rue (*Peganum harmala*), Malta starthistle (*Centarea melitensis*) and many other undesirable weed populations. To deal more effectively with these weed issues, a draft Integrated Pest Management (IPM) Plan is currently being written by Reclamation. The IPM plan will include all the proposed work discussed within this EA/BA.

The IPM plan is considered a “living document” and will be revised as needed to ensure that weed infestations are being addressed to the extent possible.

Grazing

Carlsbad Project area grazing management consists primarily of continuous, year-round stocking of cows and calves. Along stream channels and other water bodies within the Carlsbad Project area, no physical separations (fences) exist, and if alternative livestock water sources are not readily available, cattle will congregate on the banks of Avalon Reservoir, in draws, or along the Pecos River. The Pecos River dissects the Carlsbad Project area and is the primary source of water in most allotments. Grazing is permitted on lands along the Pecos River below Brantley Dam and on lands surrounding Avalon Reservoir. These areas are managed cooperatively under BLM permitting and oversight. Reclamation lands constitute 52 percent of the allotments and are supplemental to adjacent BLM grazing lands (Brantley and Avalon Reservoirs RMP Project Final EA, Oct 2003). Reclamation land within these allotments is primarily sub-irrigated bermuda and saltgrass sods and is extremely valuable to livestock producers.

Water Quality

Nutrient levels in Brantley and Avalon Reservoirs are fairly high, in part because of stormwater runoff returns. Brantley Reservoir was classified as meso-eutrophic, also with good phytoplankton diversity and Avalon Reservoir is eutrophic, with good phytoplankton diversity (NMED/SWQB 1991b). In late February of 2004, about a dozen fish were overcome by anoxic conditions from tainted well water when Reclamation restarted an existing well at Seven Rivers, New Mexico. The fish kill was limited to the immediate area at the outflow of the pipe.

Water

The study areas will be located over the Roswell basin: a shallow alluvial aquifer and a deep artesian aquifer. The Major Johnson Springs aquifer, in the southern part of the ground water basin, is part of the shallow aquifer (Daniel B. Stephens & Associates [DBS&A], 1995). As shown in Figure 1, the shallow and carbonate aquifers are separated by a semiconfining layer throughout most of the Roswell Basin. Both aquifers, however, are connected in the northwestern part of the ground water basin where the carbonate aquifer rises structurally to meet the shallow aquifer. The deep artesian aquifer is associated with the San Andres Formation and is confined on the east side and unconfined on the west. The shallow alluvial aquifer is unconfined throughout the basin. Both of the aquifers were developed significantly for irrigation water supplies in the 20th century.

A veneer of alluvial sediments deposited by the Pecos River covers the floodplain and comprises the shallow alluvial aquifer. As described by DBS&A (1995), the alluvial fill in the Roswell to Artesia area was deposited by streams ancestral to the current Pecos River in prehistoric times on an eroded surface of eastward dipping bedrock (Kelley, 1971; Lyford, 1973). The alluvial fill material includes the Plio-Pleistocene Gatuna Formation. The shallow aquifer saturated thickness ranges from 0 at its edge to approximately 300 feet in the north-central portion of the aquifer, and it is generally saturated with water within 50 feet (and frequently less) of the ground surface.

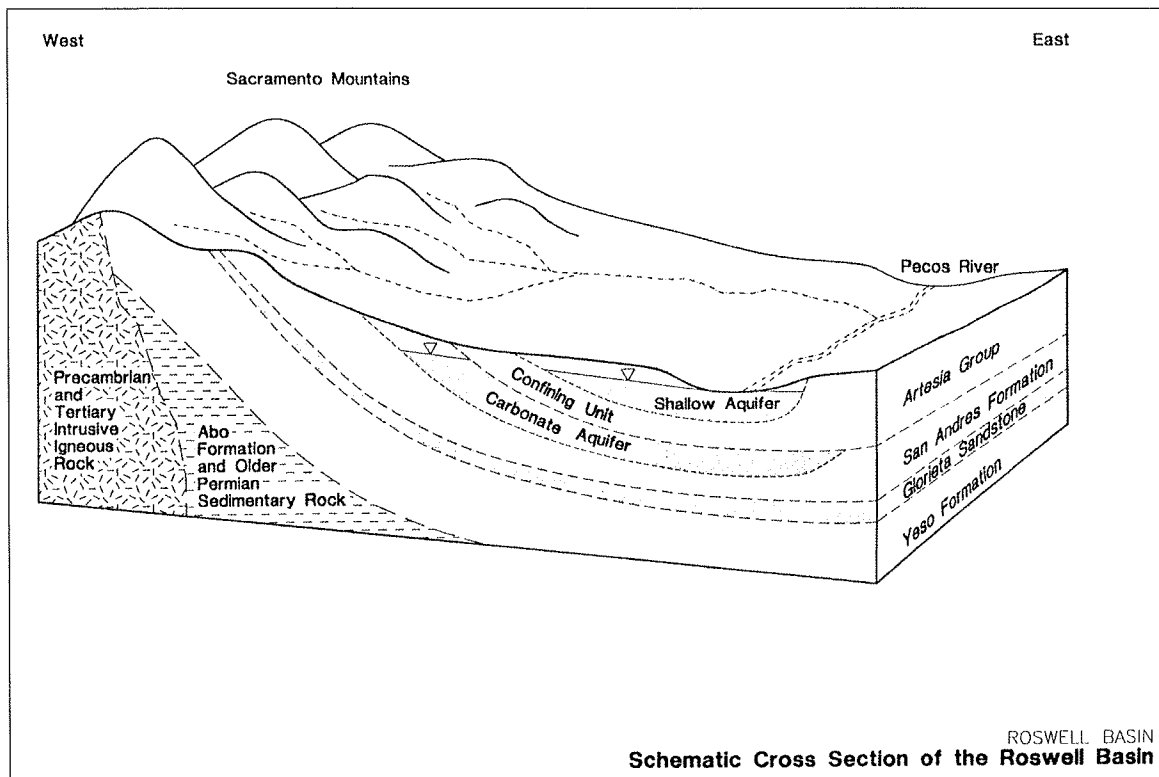


Figure 1. Schematic West-East cross-section illustrating the geologic profile in the Roswell Basin (from DBS&A, 1995).

The reach from Artesia to Brantley Reservoir is generally a losing reach. More specifically, the sub-reach contained within the upstream and downstream limits of the Kaiser Channel is a losing reach. The Kaiser Channel was built from October 1948 to April 1949 and was originally a 4-mile channel that served to bypass flows through the immense delta that had formed on Lake McMillan. The channel was built to reduce transpiration losses from tamarisk (saltcedar) that grew on the delta and presently still proliferates. Due to the construction of Brantley Reservoir and the breach of the old McMillan Dam, the Kaiser channel is now closer to 13 miles long and runs from the start of the old Lake McMillan Delta to the mouth at Brantley Reservoir. Although the channel keeps water confined from most of the delta area, it still has significant losses through this stretch.

The USGS Ground Water Atlas (Atlas) indicates that in 1975, the artesian aquifer in the Roswell Basin had a potentiometric surface that slopes gently to the southeast and ranges in elevation from 3,250 to 3,550 feet above sea level (1995). The *Atlas* also indicates that in 1926, when the first ground water studies of the Roswell Basin were conducted, the potentiometric surface of the carbonate rock aquifer near the river was as much as 100 ft above the land surface (USGS, 1995). By 1950, the water levels had declined 10 ft to 30 ft below ground surface (bgs) in the eastern part of the aquifer, and by 1975, the levels had declined to more than 40 ft bgs over the entire extent of the aquifer and as much as 100 ft bgs near Lake McMillan (USGS, 1995).

The shallow aquifer in the Roswell basin had experienced similar declines in water levels from 1950 to 1975. Some area declines were close to 40 ft for that period, while in the center of the

basin, a cone of depression as large as 80 ft bgs was noted (USGS, 1995). Areas with large declines in the carbonate aquifer do not coincide with areas of decline in the alluvial aquifer (USGS, 1995). By 1975, in some places, the carbonate aquifer's decline was so great that in effect, the gradient, which typically flowed up from the carbonate aquifer, was reversed in some areas (USGS, 1995). The intensive development of the groundwater resources for irrigation supplies has significantly reduced water levels in both the shallow and deep aquifers compared to pre-development levels.

Recent well data shows that water level declines are recovering somewhat. These recoveries are attributed to the New Mexico Interstate Stream Commission's and Pecos Valley Association Carlsbad District's (PVACD) buy-up and retirement of many of the wells in the Roswell Basin.

Numerous studies demonstrate that Salt cedar evapotranspirates from 30 inches to 90 inches of water per year (Hays 2003). The average size saltcedar consumes 300 gallons of water per day (Reclamation, 2003). The actual water use is site specific.

Fisheries

Brantley and Avalon Reservoirs are important warmwater fisheries in southeastern New Mexico. Since Brantley and Avalon Reservoirs, as well as parts of the Pecos River, support essentially the same fish species, this discussion combines all three water resources into "Research Project area fisheries." Conditions unique to a particular water body are noted where they occur.

The primary sport fishes are largemouth bass and walleye. The NMDGF stocks largemouth bass (northern and Florida strains) and walleye periodically. Other important game species include channel catfish, *Micropterus punctulatus* (spotted bass), white bass, and *Pomoxis annularis* (white crappie). The primary forage fish in the reservoirs are *Dorosoma cepedianum* (gizzard shad), with various other fishes from "bait-bucket" introductions making up a small part of the forage base.

Habitat for primary sport fish species appears to be good, at least for adult fishes. Shallow littoral areas with inundated vegetation are seasonally available, as are gravel, rip-rap, and rocky shorelines. Gravel and rocky areas are preferred by littoral species (*centrarchid* spp. [sunfishes], including black bass) for spawning and nursery areas. Walleye are believed to spawn over the rip-rap along the dam; however, reproduction and recruitment is not successful because of water level fluctuations during the period of spawning and egg incubation.

The reservoirs and river within the Research Project area support 26 species of fish representing 11 families (See Appendix H). All of the species listed are found in both reservoirs and the river within the Research Project area, except for the *Moxostoma congestum* (gray redhorse), which is thought to occur only in Avalon Reservoir.

Live vegetation in and along the riparian zone, next to the stream bank, serves as vital cover and nutrient input for fish and wildlife. Moreover, it serves as a barrier to prevent sediments, debris, and pollution from entering the river. Dead and dying vegetation contributes to long-term point source pollution (nutrient and organic debris loading) at these sites.

At the reservoir, treatment may occur anywhere except within 50 feet of the wetted perimeter.

Wildlife

Other information used in the assessment included the *Final Environmental Statement for the Brantley Project* and *Final Supplement* (Bureau of Reclamation 1972, 1982) and the results of a 1998 study of the effects on wildlife from efforts to control saltcedar along the Pecos River (Andersen et al. 2000).

Approximately 80 percent of the wildlife habitat in the Research Project area is composed of upland vegetation types (i.e., Mixed Desert Shrubland Arroyo Shrubland, Desert Plains Grassland, Juniper Shrubland, Kochia-Dominated Area, Limestone/Gypsum Hills Shrubland, Mesquite Shrubland, and Saltbush Shrubland). The majority of the upland vegetation types are located away from the waterways and contain relatively little understory because of natural conditions and grazing. Nevertheless, upland vegetation is important to a wide range of wildlife including rodents, big game, lizards, snakes, turtles, upland game birds, raptors, and songbirds.

Riparian-wetland vegetation types (i.e., Marsh, Tamarisk Shrubland, and Riparian Grassland) comprise about 20 percent of the wildlife habitat in the Research Project area. Of this 20 percent, 98 percent of the habitat is Tamarisk Shrubland. Riparian-wetland vegetation types are primarily located along the Pecos River and shorelines of Brantley and Avalon Reservoirs. Despite the limited amount of riparian-wetland vegetation types, these habitats substantially add to the biological diversity of the Research Project area by attracting a diverse assemblage of wildlife species that otherwise would not occur in the general area. Riparian-wetland habitats are considered a limited resource in the surrounding arid environment, yet are used by a number of waterfowl, shorebirds, passerines, and amphibians.

The Brantley Wildlife Management Area, designated as part of the mitigation for the development of Brantley Dam and Reservoir, lies within the Research Project area boundary. It is managed by the NMDGF and consists primarily of Tamarisk Shrublands of varying densities and open field areas. The NMDGF manages this area for upland species with techniques such as mowing strips, planting small grains, and controlled burning. Within the Brantley Wildlife Management Area, the Seven Rivers Waterfowl Management Area is used to grow corn and alfalfa primarily for waterfowl. Milo, wheat, and millet are also grown to a lesser extent.

The fluctuating water levels in Brantley and Avalon Reservoirs and the Pecos River affect wildlife in a number of ways. For instance, when water levels are low, species that prefer mudflats and shallow water, such as shorebirds, benefit by having an increase in available habitat and prey. However, lowered water levels increase the distance from riparian-wetland habitats to the water, and thereby result in reduced-value habitats. When water levels are raised during the breeding season, nesting and roosting sites may become flooded. Fish spawning areas also vary with the changing water levels. The greatest adverse effect to wildlife from fluctuating water levels is related to the scouring of the shores which prevents vegetation from establishing, thereby limiting bank-side vegetation in some areas.

Birds

A total of 179 bird species were documented in the general area during past studies, including 32 known and 25 suspected breeding species (Bureau of Reclamation 1972). More recently, species

observed as part of the development of the 2003 Brantley and Avalon Reservoirs RMP EA is presented in Appendix G.

The Pecos River Valley is noted for its migratory waterfowl and shorebirds and, to a lesser extent, nesting and wintering species. The Research Project area attracts a large number of waterfowl and shorebirds because of its complex of open water, riparian-wetland, and upland habitats. This complex provides resources required by water-dependent birds such as food items (e.g., fish, macroinvertebrates, and emergent vegetation), sites to loaf and rest, protective cover, nest material, and secluded nesting areas. Such resources are directly associated with riparian-wetland vegetation types (Marsh, Riparian Grassland, and Tamarisk Shrubland) that are larger than 0.4 hectare (1.0 acre) in size and are within 30 meters (100 feet) of the Pecos River and reservoir shores. The habitat quality for waterfowl and shorebirds is limited in some parts of the Research Project area by the high degree of disturbance resulting from recreational use, cattle grazing, fluctuating water levels, and the invasion of large, mono-typic stands of Tamarisk Shrublands. Regardless, the Research Project area does contain areas that are particularly suitable for waterfowl and shorebirds. Common waterfowl and shorebird species include mallards, *Anas strepera* (gadwalls), *Anas acuta* (northern pintails), *Anas* spp. (teals), *Aythya americana* (redheads), *Aythya affinis* (lesser scaups), *Branta canadensis* (Canada geese), *Grus canadensis* (sandhill cranes), *Charadrius vociferus* (killdeers), *Recurvirostra americana* (American avocets), and *Himantopus mexicanus* (black-necked stilts) (Bureau of Reclamation 1972).

One notable habitat area, a small Marsh below the Avalon Reservoir dam, supports high densities of waterfowl and shorebirds. This area is comprised of open water with emergent vegetation, several scattered cottonwoods, and stands of *Baccharis* sp. (seepwillow). The Marsh is bordered by Riparian Grassland and Tamarisk Shrubland communities and is likely used by breeding birds (e.g., teals, northern shovelers, and grebes) for nesting, foraging, and brood-rearing. Migrating and wintering birds also likely use this area because of its abundance of food items and isolation. Arroyo outflow areas in the Research Project area may also provide secluded sites for nesting and brood-rearing.

Mudflats along the shores of the reservoirs and the Pecos River provide loafing and foraging areas for many species of waterfowl and shorebirds such as American avocets, black-necked stilts, killdeers, sandpipers, terns, and ducks. Research Project area mudflats are typically inundated during high water periods but remain exposed when water levels drop. Mudflats primarily occur within the footprint of Avalon Reservoir and immediately downstream along the Pecos River in areas where topographic relief is minor. Riparian Grasslands often border the mudflats.

Other areas of importance to waterfowl and shorebirds for feeding are located near fish spawning areas, such as within the shallow littoral zones containing inundated vegetation and shorelines composed of gravel and rock. Some waterfowl, including American coots, *Mergus merganser* (common mergansers), and *Larus argentatus* (herring gulls), forage within the deeper portions of Avalon Reservoir.

Raptors, such as *Buteo jamaicensis* (red-tailed hawks), *Buteo swainsoni* (Swainson's hawks), and *Falco sparverius* (American kestrels), are known to occur throughout the Research Project area.

The upland areas provide an abundance of small mammal prey including *Dipodomys* spp. (kangaroo rats), *Mus musculus* (house mouse), *Peromyscus maniculatus* (deer mouse), and *Thomomys* spp. (gophers). However, few roosting and nesting sites are available for raptors with the exception of 4.3 hectares (10.7 acres) of Juniper Woodland located within the upper draws of the Research Project area. Raptors may also use mature stands of Tamarisk Shrubland for roosting and nesting.

Habitat for most songbirds is associated with the riparian-wetland areas. In particular, Marsh and Tamarisk Shrublands with dense growth and complex vertical structure support nesting, migrating, and wintering populations of songbirds. These habitats provide nesting sites, protective cover from weather and predators, and prey items (e.g., seed, plant material, and insects). The Research Project area contains 1.9 hectares (4.7 acres) of Marsh and 2,497.6 hectares (6,171.7 acres) of Tamarisk Shrubland.

Several Pecos River studies confirmed the high use of dense stands of Tamarisk Shrublands by birds, especially songbirds (Hildebrandt and Ohmart 1982, Hunter et al. 1985, Hunter et al. 1988, Andersen et al. 2000). This is in contrast to the findings of studies on other perennial western river systems (e.g., Colorado River, Rio Grande) that found a lower density and diversity of birds in Tamarisk Shrublands than in native vegetation (Anderson et al. 1977, Cohan et al. 1978, Anderson and Ohmart 1984). The difference may be related to past vegetative conditions in the riparian corridors. For instance, the Pecos River historically contained few stands of tall, mature vegetation, whereas the Colorado River and Rio Grande supported extensive willow and cottonwood forests prior to human manipulation. Thus, saltcedar may be providing habitat on the Pecos River where none previously existed.

Mammals

Twenty-six mammal species were documented in the general Research Project area (Bureau of Bureau of Reclamation 1972). More recently, species observed as part of the development of the 2003 Brantley and Avalon Reservoirs RMP EA is presented in Appendix G. An additional 40 species occur in the Pecos River Valley and may be present within the Research Project area. Common mammals include *Lepus californicus* (blacktail jackrabbits), *Sylvilagus auduboni* (desert cottontails), *Peromyscus leucopus* (white-footed mouse), deer mouse, *Canis latrans* (coyotes), *Mephitis mephitis* (striped skunks), and *Procyon lotor* (raccoons). Mammals inhabit all vegetation types in the Research Project area.

Furbearers known to occur in the Research Project area include coyotes, *Bassariscus astutus* (ringtails), *Vulpes* (foxes), *Ondatra zibethica* (muskrats), *Taxidea taxus* (badgers), *Lynx rufus* (bobcats), striped skunks, and raccoons. Raccoons and skunks are becoming more of a presence in developed areas of Brantley Lake State Park (Fiala 1998, pers. comm.), although they likely occur throughout the Research Project area. Other furbearers are found in all upland and riparian-wetland habitats, with the exception of muskrats and ringtails which are more specialized in their habitat needs. Muskrats are more commonly associated with wet areas, such as the reservoirs, Pecos River, canals, small ponds, and adjacent vegetation. Ringtails inhabit the rockier sites, such as those along Brantley Dam.

Big game species within the Research Project area include *Odocoileus hemionus* (mule deer) and *Antilocapra americana* (pronghorn antelope). The Research Project area is on the eastern edge

of the mule deer range in New Mexico (Bureau of Reclamation 1972). These species use all upland habitats and Riparian Grasslands for foraging. Areas of particular importance include 284.1 hectares (702.1 acres) of desert plains grasslands and 582.4 hectares (1,439.2 acres) of Arroyo Shrublands that provide protective cover and forage. The arroyos leading to the reservoirs are also used as movement corridors. However, species movement may be limited by the presence of five-strand barbed wire fencing in some Research Project area locations. The reservoirs, Pecos River, canals, and small ponds provide important water sources.

The Research Project area likely supports a high number of bat species because of the availability of roosting and nursery sites associated with several caves (Coffee Cave, Clark's Caverns, and Homogenized White Cave) and abandoned buildings in the Research Project area. The aquatic resources (reservoirs, Pecos River, canals, and small ponds) and Marsh and Riparian Grassland habitats within the Research Project area provide a source of insect prey for bats.

Herpetofauna

Fourteen species of amphibians and 57 species of reptiles are known to exist in the Pecos River Valley (Bureau of Reclamation 1972), with the *Cnemidophorus inornatus* (little striped whiptail) being the most-common reptile. More recently, species observed as part of the development of the 2003 Brantley and Avalon Reservoirs RMP EA is presented in Appendix G. Other common herpetofauna are ornate *Terrapene ornata* (box turtles), *Phrynosoma cornutum* (Texas horned lizards), *Heterodon nasicus* (western hognose snakes), *Pituophis melanoleucus* (gopher snakes), *Crotalus viridis* (prairie rattlesnakes), *Cnemidophorus tesselatus* (checkered whiptails), *Bufo woodhousei* (Woodhouse toads), and *Acris crepitans* (cricket frogs). Reptiles can be found throughout the Research Project area in all upland habitats. *Thamnophis* spp. (garter snakes), several turtle species (*Kinosternon flavescens* [yellow mud turtle] and *Trionyx spiniferus* [Texas spiny softshell turtle]), and amphibians are more typically associated with aquatic sites such as the 1.9 hectares (4.7 acres) of Marsh and 58.2 hectares (143.7 acres) of Riparian Grassland habitats, Pecos River, canals, and scattered small ponds. Toads may also occur in the sandy areas of upland habitats.

Threatened and Endangered Species

Federally listed threatened and endangered species that are known from or are suspected to occur within the Research Project Area include: Bald Eagle (*Haliaeetus leucocephalus*), Interior Least Tern (*Sterna antillarum athalassos*), Pecos Bluntnose Shiner (*Notropis simus pecoensis*), Pecos Gambusia (*Gambusia nobilis*), and Gypsum Wild Buckwheat (*Eriogonum gypsophilum*). Other Federally listed species found in Eddy County, New Mexico, but not associated with the Research Project Area are listed in Appendix I.

Bald Eagle

Bald Eagles select large trees near an abundant prey source for nesting, roosting, and perching. Fish and waterfowl are their primary prey, with rabbits and carrion consumed to a lesser extent. Foraging habitat consists of large, unobstructed open areas, such as openings in river corridors or lakes. Open water is a critical habitat component because it allows access to fish and attracts waterfowl, especially during the winter months (Reel et al. 1989, Paige et al. 1990).

Bald Eagles are known to frequent the Pecos River Valley during the winter. The species potentially forages on the reservoirs and Pecos River during this time, although roosting and

perching sites are limited along the waterways. Based on the few available roosting and perching sites, the wintering population in the area is expected to be low. Foraging habitat is associated with the reservoirs, Pecos River, small ponds, and 1.9 hectares (4.7 acres) of Marsh. Few nesting pairs of Bald Eagles have been documented in New Mexico, none of which occur near the Research Project Area.

Interior Least Tern

Interior least terns favor bare or sparsely vegetated sand beaches or sand bars for nesting, such as those found along scoured river shorelines. However, the species will also use rockier substrate and even areas such as parking lots. Interior Least Terns are colonial nesters. Common prey includes small fish, crustaceans, and insects. Thus, shallow water areas in lakes, ponds, and river backwater areas with abundant prey near nesting areas are required. During migration, Interior Least Terns move in small groups, feed in shallow water near land, and loaf along the exposed shorelines (Spendelov and Patton 1988, Whitman 1988, Thompson et al. 1997).

Suitable habitat for the species occurs primarily along the shorelines of the reservoirs and Pecos River and exposed mudflats. The fish community of the reservoirs and the Pecos River contains many species that Interior Least Terns feed upon (NMDGF 1998, Thompson et al. 1997).

Prior to 2004 the only known breeding colony of Interior Least Terns in New Mexico occurred at Bitter Lake National Wildlife Refuge near Roswell, approximately 60 miles north of the Research Project Area. In June 2004 a small breeding colony of Interior Least Terns was discovered at Brantley Reservoir in an area of the reservoir shoreline that was cleared of saltcedar in 2003. This colony contained at least 14 adults and a minimum of 7 nests were located. The tern's nests were situated at varying distances to the edge of the lake, mostly between 150 – 250 yards, and 2 – 3 feet in elevation above the water's surface. Water levels in Brantley Reservoir were monitored during summer 2004 to ensure that the tern colony was not inundated. Observations of the Interior Least Tern colony during the ensuing summer revealed that at least a portion of the nests were successful as evidenced by the presence of juvenile terns. The extent of success for all nests was not determined due to the inability to access the entire colony with a minimum of disturbance.

Gypsum Wild Buckwheat

Currently, only one designated plant, the threatened Gypsum Wild Buckwheat, is known to occur in the Research Project Area. Only three populations are known to exist in the world, all occurring in Eddy County, New Mexico. One of these populations is found on both Reclamation and BLM lands in the lower Seven Rivers Hills area, immediately west of US 285 on the west side of the Research Project Area. On Reclamation lands, the species occurs within the Mixed Desert Shrub habitat on the Seven Rivers Hills escarpment where approximately 50 individuals were observed. An adjacent 219-hectare (540-acre) parcel of BLM land is designated as a Special Management Area (SMA) to protect the species and its habitat. The plant is found on gypsum soils, most frequently on material that has eroded from nearby gypsum outcrops. In the Seven Rivers Hills SMA, the terrain is mostly a complex of bare, steep slopes and deep, eroded arroyos (BLM 1986). In 1998, a through search was also conducted on Reclamation land in similar habitat and east of US Highway 285, and no plants were found (Bureau of Reclamation, 2003).

Pecos Bluntnose Shiner

The Pecos Bluntnose Shiner is federally listed as threatened (USFWS 1987) and listed as endangered (Group 2) by the State of New Mexico. It historically inhabited the Pecos River from Santa Rosa downstream to Carlsbad, New Mexico. Critical habitat for the Pecos Bluntnose Shiner has been designated, but it does not extend into the Research Project Area. However, Pecos Bluntnose Shiner reportedly occurs seasonally in the headwaters of Brantley Reservoir (USFWS 1992), when young fish are displaced from upstream habitats by flood events.

Pecos Gambusia

The Federally endangered Pecos Gambusia is endemic to the Pecos River Basin in southeastern New Mexico and western Texas. It inhabits the ponded habitats, springs, tributaries, connected or formerly connected backwaters (i.e. sinkholes, isolated permanent pools, and oxbows) usually in association with aquatic vegetation throughout Bitterlake National Wildlife Refuge and the Salt Creek Wilderness Areas (per comm. w/Fish and Wildlife Service, 2004).

Cultural Resources

The human history of the Carlsbad Project area stretches from Paleo-Indian to the Historic period. Within the Carlsbad there are 252 archaeological sites. Only 57 prehistoric sites and one historic site are considered to be in an area of impact. Section 106 will apply to these sites. The rest of the sites identified within the Carlsbad Project area are considered to have their data potential exhausted under a Memorandum of Agreement with the Bureau of Reclamation, New Mexico State Historic Preservation Office and the Advisory Council. If any new sites are located during the integrated controls methods action, Reclamation will follow procedures of Section 106 of the National Historic Preservation Act of 1966. Special Environmental Commitments have been established and will be followed.

Recreation and Accessibility

The dominant opportunities and attractions at Brantley and Avalon Reservoirs are water based activities: fishing, boating and swimming. Camping, picnicking, hiking are also enjoyed in conjunction with water-based activities along the Pecos River.

Socioeconomic

The local economy is linked to the extraction of mineral resources (oil, natural gas, and potash). Ranching and agriculture have also generated much of the local economic activity, however tourism with the Carlsbad Caverns and the Guadalupe Mountains National Parks are major areas of attraction.

Environmental Justice

Environmental justice refers to the protection of human rights, particularly to minority and low income populations, for any government action affecting both the human and natural environment. Environmental justice is included in this EA in compliance with the Executive Order 12898, signed in 1994:

Executive Order 12898, "Federal Actions to address environmental justice in Minority Populations and Low-Income Populations," requires that "each Federal Agency make achieving environmental justice part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health and environmental effects of its programs,

policies and activities on minority populations and low-income populations.”

Eddy County had a population of approximately 51,658 in 2000. This represents 2.8 percent of the total New Mexico population. The 2000 census found that 70.1 percent of the population is considered “urban” or living within an urbanized area. In the case of Eddy County, this reflects the fact that 49.6 of the total county population resided in the City of Carlsbad. There is a large Hispanic population in the county (38.8 percent of the total in 2000) (Bureau of Reclamation 2003).

Chavez County had a population of approximately 61,382 in 2000. This represents 3.4 percent of the total New Mexico population. The 2000 census found that 73.6 percent of the population is considered “urban” or living within an urbanized area, residing primarily in the City of Roswell. There is a Hispanic population in the county (43.8 percent of the total in 2000) (Bureau of Reclamation 2003).

Indian Trusts Assets

Indian Trusts Assets (ITAs) are “legal interests” in assets held in trust by the U.S. Government for individual Indians or tribes. Lands, minerals, water rights, hunting and fishing rights, claims, titles or money are some of the assets held in ITAs. As assets held in trust, ITAs cannot be sold, leased, or alienated without the express approval of the U.S. Government. Secretarial Order 3175 and Reclamation policy require that Reclamation evaluate and assess impacts of a proposed project on ITAs. This requires inventorying all ITAs within the Research Project area. Should any ITAs be impacted, mitigation of impact must be undertaken.

To date, Reclamation has received no tribal claims regarding the sacred nature of any location within the Research Project Area. Correspondence with the Mescalero Apache, the Commanche, and the Kiowa was conducted in conjunction with the initial Traditional Cultural Properties (TCPs). Although all of the groups contacted made statement to the effect that they recognize the importance of the Pecos River to their general cultural heritage, no concern was voiced about the sanctity of any particular property. (Bureau of Reclamation 2003).

Chapter 4. Environmental Consequences

Soils

Soil erosion is not a major concern in the Research Project area, except along certain riverine reaches of the Pecos River. Upstream of the old Lake McMillan Delta and north of the Brantley Reservoir, levees, steep banks and river channelization into a straight narrow space has increased the potential for erosion in these areas. (Brantley and Avalon Reservoirs RMP Project Final EA, Oct 2003).

No Action Alternative is expected to maintain current productivity.

Proposed Action - Vegetation Management Program is expected to increase productivity of soils through improved soil moisture availability and reduced soil disturbance from maintenance equipment. Within this alternative, **Herbicide Treatments, Biological Control, and limited Mechanical Treatments**, would maintain a lower level of productivity of saltcedar growth which would increase productivity of soils through improved soil moisture availability.