Chapter 1

Purpose of and Need for Action

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1. Introduction

The Bureau of Reclamation (Reclamation) and the New Mexico Interstate Stream Commission (NMISC) prepared this Carlsbad Project Water Operations and Water Supply Conservation Environmental Impact Statement (EIS) to assess the potential consequences of proposed changes in Carlsbad Project operations and the implementation of a water acquisition program in the Pecos River basin, New Mexico. (See map 1.1.) This analysis was carried out to meet requirements of the National Environmental Policy Act of 1969 (NEPA) and the Endangered Species Act of 1973, as amended (ESA). This EIS includes a description of alternative means of implementing the proposed Federal action (alternatives) and presents an evaluation of the potential environmental, economic, and social consequences that could result from implementing these alternatives. These proposed changes in water operations are designed to conserve the Pecos bluntnose shiner (*Notropis simus pecosensis*) (shiner) and its designated critical habitat, while conserving the Carlsbad Project water supply.

What is the Carlsbad Project?

Carlsbad Irrigation District (CID) operates the Carlsbad Project to provide water for water users who are members of CID. The Secretary of the Interior authorized the Carlsbad Project for the purpose of irrigation in 1905.

Reclamation owns the Carlsbad Project dams and reservoirs, and CID operates the dams and reservoirs. Carlsbad Project operations include diverting to storage and releasing water to deliver project water to CID water users.

In 1987, the U.S. Fish and Wildlife Service (Service) listed the shiner, a small minnow, as a threatened species under ESA and designated two noncontiguous river reaches, totaling approximately 101 miles of the Pecos River, as critical habitat (*Federal Register* [FR] 52(34):5295-5303). Critical habitat is a geographical area occupied by the species at the time it is listed, on which are found those physical and biological features essential to the conservation of the species and which may require special management considerations or protection. The shiner population is currently restricted to about 225 miles of river between Fort Sumner State Park and Brantley Reservoir. Threats identified in the listing package included “restricted flow from reservoirs, water diversion for irrigation, siltation, and pollution from agricultural activities along the river.” Subsequent to the listing, additional information has been gathered to assess these threats.

Biologists generally agree that the greatest immediate threat to the shiner is intermittent flows between the lower boundary of the upper critical habitat and the U.S. Geological Survey (USGS) Near Acme gage near Roswell (Service, 2003; Kehmeier et al., 2004). Intermittency is an interruption in connected flows or temporary drying of the river. Reclamation believes that its discretionary actions do not cause the intermittency that has occurred since 1998, and that diversion to storage of water or block releases for the Carlsbad Project do not cause the intermittent conditions near the Near Acme gage that have occurred since 1998. In 1998, the Carlsbad Project began bypassing water when the water was available and was needed to provide continuous flow to the river. Intermittency near the Near Acme gage and the upper critical habitat has been caused by diversion of water downstream from Sumner Dam for irrigation and by the ongoing drought. Section 5, "Background," includes a discussion of Pecos River water rights and operations and their influence on intermittency.

Why is an EIS Being Prepared?

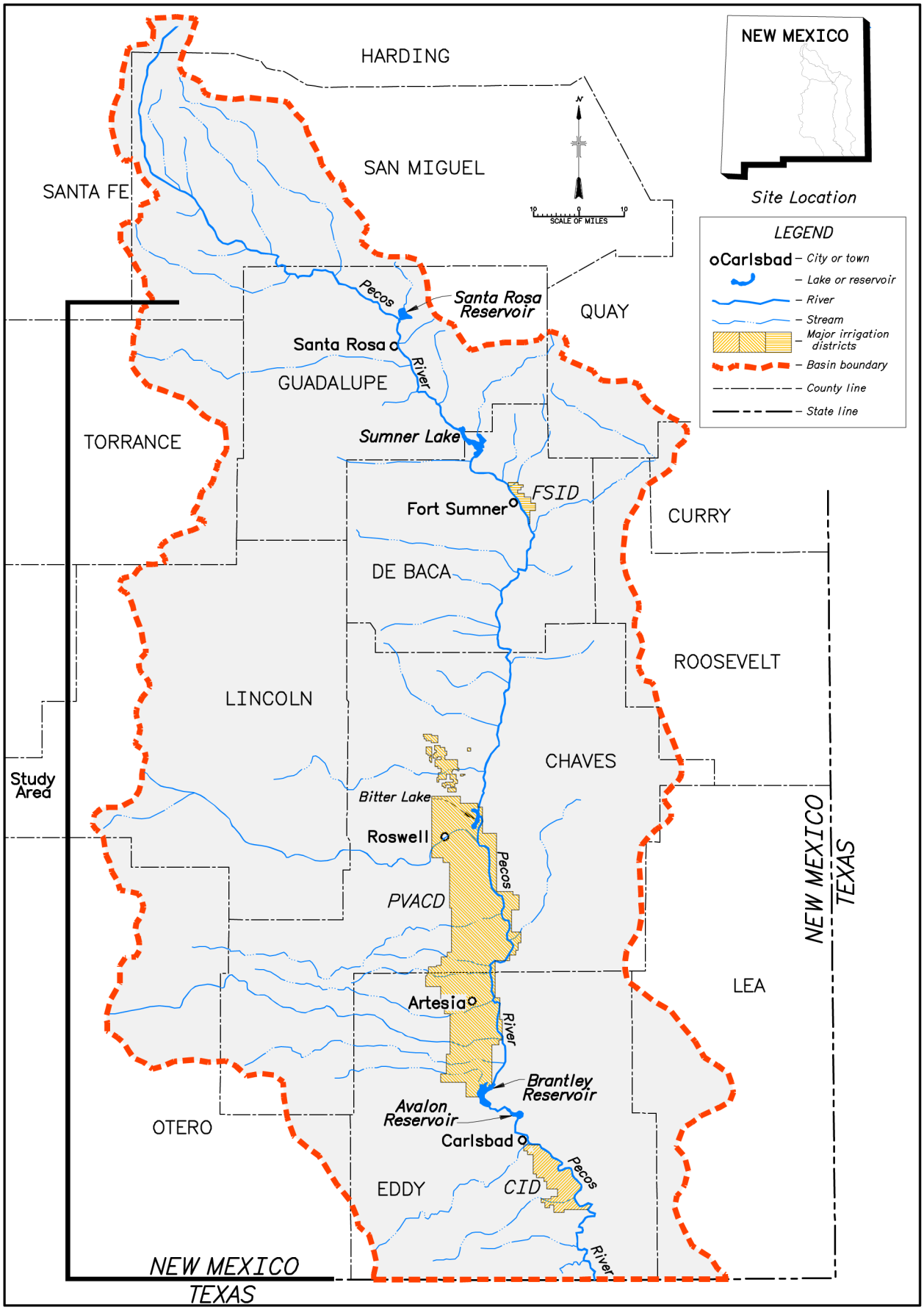
Under NEPA, an environmental impact statement (EIS) must be prepared for a major Federal action. Major Federal actions include new and ongoing activities that have the potential for significant impacts. The proposed action is a major Federal action based on the level of anticipated impacts associated with measures to conserve the Pecos bluntnose shiner and the Carlsbad Project water supply. This EIS documents potential impacts of the proposed action.

Private partnerships constructed water storage, canals, and diversion structures along the Pecos River in the late 1880s near Carlsbad, New Mexico. In 1905, the Secretary of the Interior authorized the original Carlsbad Project under the Reclamation Act of 1902. The Federal Government purchased and rehabilitated the existing irrigation system and constructed and maintained new facilities throughout the twentieth century. The Carlsbad Irrigation District (CID) is a political subdivision of the State of New Mexico created to deliver irrigation water to its members. CID has since repaid its obligation, and the Federal Government has transferred title for much of the distribution infrastructure to CID. Reclamation owns the project dams and reservoirs but contracts with CID for their operation. Reclamation holds Carlsbad Project storage rights for the beneficial use of CID members in accordance with various contracts between Reclamation and CID. Carlsbad Project beneficial use is downstream from the designated critical habitat.

2. Proposed Federal Actions

The proposed Federal actions that require NEPA compliance are changes in Carlsbad Project operations and the implementation of a water acquisition program. As required by NEPA, a No Action Alternative is also analyzed, which would continue current Carlsbad Project operations and water acquisition actions.

Carlsbad Project operations include diverting water to storage and releasing water for authorized uses. Sumner Lake is the storage reservoir located immediately



Map 1.1 Pecos River basin location map

Key Terms and Concepts

Beneficial use: Uses of water including agricultural, commercial, industrial, and recreational that do not constitute waste. In New Mexico, continuous beneficial water use is needed to maintain a water right.

Block release: High-volume, high-velocity releases of water from a dam.

Bypassing: Allowing water to flow downstream, rather than diverting it for irrigation or storage.

Critical habitat: Critical habitat is a geographical area occupied by the species at the time it is listed, on which are found those physical and biological features essential to the conservation of the species and which may require special management considerations or protection.

Conservation pool: An amount or allocation of water held in a reservoir.

Discretionary actions: Actions that are within the scope of the agency's legal and statutory authority.

Fish conservation pool: In this case, an allocation of storage in either Santa Rosa Reservoir or Sumner Lake, which is designated specifically for the benefit the shiner by maintaining flows or avoiding intermittency.

Gage: A specific monitoring location on a stream where systematic observations of hydrologic data are obtained.

Intermittency: An interruption in connected flows or temporary drying of reaches of the river.

Pecos bluntnose shiner: A small fish that is native to the Pecos River that has been designated as a threatened species.

Target flows: A specific goal for streamflow as measured at a gage location. Target flows are a goal, and they do not preclude higher flows or the possibility that target flows would not be met 100 percent of the time.

Water right: A property right to put surface or ground water to beneficial use. Water in New Mexico belongs to the public and is subject to appropriation by the New Mexico State Engineer.

upstream of the reach of the river where the shiner is still present. Reclamation has limited opportunities to store and release water in Sumner Lake under its State water rights permit and the Sumner Dam authorization, as described in Section 5, "Background."

Proposed changes in Carlsbad Project operations include bypassing available inflows through Santa Rosa and Sumner Dams to meet target flows or minimum flows as measured at either the Taiban gage (i.e., the Below Taiban Creek Near Fort Sumner gage) or the Near Acme gage. These gages are used to monitor flows in river reaches that have dried in the past. Depending on the alternative, these target flows can be constant or variable by time of year or by hydrologic condition, as defined in chapter 2. Actions contemplated also include guidance for block releases, continued use of a fish conservation pool, and implementation of an adaptive management plan.

Because changes in Carlsbad Project operations to benefit the shiner could result in reduction to the available Carlsbad Project water supply, a variety of options for acquiring water to keep the project whole are under consideration. Additional options have been developed to acquire water to directly augment flows and meet target flows at gage locations in reaches of the river where the shiner is present. Both types of water acquisition options include a

range of actions described in chapter 2 that are not fully developed as site-specific proposals. As part of the Record of Decision (ROD) for this EIS, options that provide Reclamation the tools needed to meet the purpose of and need for the proposed action will be retained and specific proposals will be developed. Implementation of water acquisition options may require additional permitting, consultations, congressional authorization, and NEPA analysis. Additional NEPA analysis is expected to include the preparation of documents tiered from this EIS, such as environmental assessments (EA) and categorical exclusions. For some actions, resource-specific field studies, such as cultural and biological resource studies, may be conducted. Entities other than Reclamation may need to implement some of these options. Reclamation actions must be in accordance with its existing Federal and State legal and statutory authorities and obligations, the Pecos River Compact (Compact), water rights, and contractual obligations.

3. Purpose of and Need for Action

The purpose of Reclamation's proposed Federal action is to conserve the Pecos bluntnose shiner, a federally threatened fish species,[1] and to conserve the Carlsbad Project water supply.[2] The underlying need for Reclamation action is compliance with ESA and Reclamation's responsibility to conserve the Carlsbad Project water supply.

Reclamation needs to comply with ESA for operation of its Pecos River facilities. Reclamation is proposing changes in operations that benefit the shiner under its existing authorities and are consistent with its ESA section 7(a)(1) obligation to conserve and protect listed species. Within the exercise of its discretionary authority, Reclamation must also continue to avoid jeopardizing the continued existence of the shiner or destroying or adversely modifying designated critical habitat [ESA section 7(a)(2)].[3]

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[1] Conserving the shiner means that Reclamation would ensure that any discretionary action it authorizes, funds, or carries out is not likely to jeopardize the continued existence of a listed species or result in the destruction or adverse modification of critical habitat. Reclamation would continue to participate in interagency actions to protect federally listed species and designated critical habitats, within its legal and discretionary authority.

[2] Conserving the Carlsbad Project water supply means delivering the amount of water to the project that would otherwise be available but for changes to operations.

[3] Under section 7(a)(2), a discretionary agency action jeopardizes the continued existence of a species if it "reasonably would be expected, directly or indirectly, to reduce appreciably the survival and recovery of a listed species in the wild by reducing the reproduction, numbers, or distribution of the species."

Reclamation has also elected to keep the Carlsbad Project water supply whole. Without an accompanying program to acquire and provide water, changes to historical operations would cause reductions to the Carlsbad Project water supply.

4. Lead, Cooperating, and Participating Agencies

Reclamation and NMISC are the joint lead agencies for preparing this EIS. The joint lead agencies are responsible for all decisions involving preparation of the EIS and issues arising during the NEPA process. NEPA decision documents, such as the ROD, are the responsibility of the lead Federal agency, and the final decision on alternatives and options is made solely by Reclamation.

The mission of Reclamation is to manage, develop, and protect water and related resources in an environmentally and ecologically sound manner. Reclamation diverts to storage and delivers Carlsbad Project water to CID and owns Sumner, Fort Sumner Irrigation District (FSID) Diversion, Brantley, and Avalon Dams.

NMISC administers interstate stream compacts, oversees interstate litigation, and cooperates in the planning of Federal water projects. The New Mexico Office of the State Engineer (NMOSE) administers water rights in the State, including the apportionment, measurement, and distribution of water. Together, NMISC and NMOSE conduct investigations of water supply, and protect, conserve, and develop the underground and stream systems of the State. NMISC is responsible for ensuring that the State of New Mexico meets its water delivery requirements to Texas, as measured at the State line, in order to ensure compliance with the 1948 Pecos River Compact, the 1988 *Texas* v. *New Mexico* U.S. Supreme Court Amended Decree (Amended Decree), and the 2003 Settlement Agreement.

In addition to NMISC, other Federal, State, and local agencies were invited to be part of the NEPA process. The role of cooperating agencies is defined in 40 Code of Federal Regulations (CFR) 1508.5 and includes agencies that have special expertise or legal jurisdiction with respect to the environmental impact. By formal agreement, cooperating agencies include the U.S. Army Corps of Engineers (Corps), Service, New Mexico Department of Game and Fish (NMDGF), CID, Pecos Valley Artesian Conservancy District (PVACD), and Eddy County. Other agencies participating in the NEPA process include Chaves County, Chaves County Flood Control District, DeBaca County, FSID, Guadalupe County, and the Pecos Valley Water Users Organization. The involvement of these agencies in the EIS has varied, but all have been given the opportunity to participate in the NEPA interdisciplinary team (ID team), the EIS review committee, and technical workgroups. The ID team meets regularly as a forum to communicate and update representatives of the technical workgroups, authors, and the cooperating and participating agencies on EIS progress and issues. The review committee has no decisionmaking role, but it is a forum for formally reviewing EIS documentation and for coordinating and exchanging

information among the lead agencies, cooperating or participating agencies, and important stakeholders. Technical workgroups provide scientific and task support to the ID team.

5. Background

This section describes the study area, a brief history of Reclamation's involvement on the Pecos River and the Carlsbad Project, changes in Pecos River water operations, authorities and institutional constraints, compliance with ESA, and the current operational decisionmaking process.

5.1 Study Area

Carlsbad Project water operations are located in the Pecos River basin from the "Above Santa Rosa Lake" gage to the "At Red Bluff" gage near the New Mexico-Texas State line (map 1.1). The study area includes the river channels of the Pecos River, major inflow tributaries, water conveyance infrastructure, and the reservoir pools of storage facilities. It includes portions of Guadalupe, De Baca, Chaves, and Eddy Counties. Reclamation facilities include Sumner Dam, FSID Diversion Dam, a portion of the FSID Main Canal, Brantley Dam, and Avalon Dam. The Corps owns Santa Rosa Dam. CID and FSID own a network of laterals, drains, and other distribution infrastructure. Actions considered under the alternatives would occur in the immediate vicinity of these facilities and the river, primarily in the reach from Sumner Dam to Brantley Reservoir.

Water acquisition options are located throughout the entire basin. They include lands where water rights may be leased or purchased, cropping patterns may be changed, or new infrastructure may be constructed. Options currently under consideration extend north to Puerto de Luna and south to the border with Texas. Lands east and west of the river in the FSID, CID, Puerto de Luna, Roswell, Seven Rivers, and Buffalo Valley areas are considered for water acquisition options.

Some of the resource analyses include a broader study area. For example, economic impacts are assessed at the county level, where changes in the amount of irrigated land may affect the local economy.

5.2 Water Development History in the Pecos River Basin

Water development in the Pecos River basin, New Mexico, has a long history. Before the 1880s, there had been acequias and small-scale water diversion projects at several locations, mostly in the upper Pecos River basin. Acequias are the traditional irrigation ditch systems that allow water to be diverted to fields. Coronado observed irrigation agriculture from Pecos Pueblo to Puerto de Luna in 1540. A well-established acequia system was in place at Anton Chico, north of the study area, in the 1840s. In the early 1860s, the U.S. Army built ditches and identified 2,000 acres of land to be farmed by Navajo and Mescalero Apache Indians who had been relocated to Fort Sumner. The relocation was a failure, but

Chronology of Key Events in the Pecos River Basin

- 1800s – Precursors to CID develop dams, canals, and diversion structures
- 1905 – The Secretary of the Interior authorized the Carlsbad Project under the Reclamation Act of 1902
- 1907 – Avalon Dam reconstructed
- 1908 – Renovations made to McMillan Dam
- 1918 – FSID organized
- 1932 – PVACD formed
- 1932 – CID organized
- 1932 – Hope Decree confirmed water rights for Carlsbad Project
- 1935 – Alamogordo Dam (currently called Sumner Dam) authorized under the Flood Control Act of 1935 and completed in 1937
- 1949 – Congress approves Pecos River Compact between New Mexico and Texas
- 1972 – Congress authorized Brantley Project to replace McMillan Dam and Reservoir
  1980 – Corps constructs Santa Rosa Dam
- 1987 – Reclamation completes Brantley Dam and Reservoir
- 1987 – Service lists Pecos bluntnose shiner as a threatened species with critical habitat
- 1988 – U.S. Supreme Court Amended Decree
- 1991 – McMillan Dam breached and reservoir drained
- 1991 – Service issues jeopardy determination for Pecos bluntnose shiner
- 1997 – Reclamation initiates NEPA process in cooperation with other agencies
- 1998 – Reclamation initiates the bypassing inflows through Santa Rosa and Sumner Dams
- 2002 – Forest Guardians complaint submitted in U.S. District Court
- 2002 – Notice of Intent (NOI) to prepare this EIS published in the *Federal Register*
- 2003 – Settlement Agreement among NMISC, CID, Reclamation, and PVACD

portions of the land continued to be farmed after the fort was abandoned in 1868. In the 1880s, several companies and individuals began to explore means to divert larger amounts of water from the Rio Hondo and the Pecos River. The most ambitious of these was the Pecos Valley Irrigation and Improvement Company, which constructed several major water conveyance and dam projects from Roswell to the future CID area, including the Northern Canal, Hondo Reservoir, Avalon Dam and Reservoir, the Southwestern and Southeastern Canals, the Pecos Land and Water Company Canal, and McMillan Dam. After a major economic depression, failure of the Avalon Dam in 1893, and losses of productive land because of problems with salinity and irrigation practices, the company went bankrupt. Avalon Dam was rebuilt, but failed again in 1904. At that time, the Federal Reclamation Service (later named the Bureau of Reclamation) took control of most of these water development projects on the lower Pecos River and Rio Hondo (Bell, 1997; Shomaker, 2003).

In the Fort Sumner area, claims on the water from the old fort system were appropriated by the territorial engineer in 1903 and later developed by the Fort Sumner Land and Development Company. In 1906, the company finished construction of a diversion dam, the first section of the canal, and the head gates. However, the company was plagued by financial trouble, and FSID was organized in 1918 for the purpose of acquiring and operating the irrigation facilities. FSID continued to have problems with system infrastructure and financing and sought help from the State to construct drains and from Reclamation to rehabilitate the diversion works. However, the water users' inability to bear the financial burden of repayment to Reclamation hindered project approval for many years. In 1947, Reclamation developed a plan for rehabilitating the Fort Sumner Irrigation Project, which included building a new

diversion dam, rebuilding the main canals, and improving the drainage system. The Secretary of the Interior approved the plan, and President Harry S. Truman approved a congressional act authorizing the Fort Sumner Project under Public Law (P.L.) 192-483. Most of the project construction was completed within 3 years, although Reclamation has assisted FSID in subsequent maintenance projects. Reclamation has retained ownership of the diversion dam (Bell, 1997).

Ground water from the San Andres Formation of the artesian aquifer was developed early in the twentieth century for homes and farms in the Roswell area. It was recognized by 1906 that this aquifer contributed flow to the Pecos River, and the pressure in the aquifer had declined significantly by 1925 (Shomaker, 2003). In the late 1920s, wells were also being developed in a shallow aquifer in river alluvium, which also affected riverflows. At the urging of local interests, the New Mexico State Engineer undertook administration of the Roswell Underground Water Basin. As a result of this action, PVACD was formed in 1932. PVACD has purchased and retired water rights, closed wells, and promoted improvements to irrigation efficiency. Some of the water for irrigated lands in the PVACD area were, and still are, supplied by the Hagerman Canal (formerly known as the Northern Canal). The Hagerman Canal diverts water from the Rio Hondo east of Roswell and has been owned by the Hagerman Irrigation Company (HIC) since 1907. HIC supplies farmers with a combination of diverted surface water and ground water pumped from the artesian aquifer by HIC-owned supplemental wells (Shomaker, 2003).

5.3 Reclamation and the Carlsbad Project

The Reclamation Act of 1902 authorized construction of irrigation projects in arid and semiarid lands in the Western United States. General authority over these projects was assigned to the Secretary of Interior, with project administration oversight by Reclamation. Proceeds from sales of public lands were placed into a fund to provide local irrigation districts with low-interest, or no-interest, loans for financing water storage and distribution systems.

The Secretary of Interior authorized the Carlsbad Project in 1905 for the purpose of irrigation. Reclamation's predecessor agency, the Federal Reclamation Service, acquired and rehabilitated the existing facilities of the Pecos Valley Irrigation and Improvement Company. Avalon Dam was reconstructed in 1907, and major renovations were made to McMillan Dam in 1908. Further improvements were made to the system infrastructure, including reconstructing the Pecos River Flume; lining canals; and installing innovative dam gates, concrete control gates, and spillway structures. Farmers participating in the Carlsbad Project formed the Pecos Water User's Association, which became CID in 1932.

For several decades, Carlsbad Project water users pushed for the construction of a new reservoir to provide additional storage. President Franklin Roosevelt approved Alamogordo (now known as Sumner) Dam in 1935. The Flood Control Act of 1935 specified that Alamogordo Dam and Reservoir were to be used first

for irrigation, followed by flood control, river regulation, and other beneficial uses. New Deal programs provided capital and labor to construct these projects, to improve McMillan Dam, and to raise the height of Avalon Dam by 6 feet.

There were continuing leakage and siltation problems at McMillan Dam. Studies by Reclamation in the 1960s concluded that major floods could exceed the dam's spillway capacity, resulting in floodwaters overtopping the dam's crest. Reclamation concluded that McMillan Dam and Reservoir should be replaced with a new structure. The Congress authorized the Brantley Project (P.L. 92-514) in 1972 "for the purposes of irrigation, flood control, fish and wildlife, and recreation, and for the elimination of the hazards of failure of McMillan and Avalon Dams." Brantley Dam and Reservoir were completed in 1987. McMillan Dam was breached, and the reservoir was drained in 1991 (Bogener, 1993; Shomaker, 2003).

5.4 Pecos River Water Sources and Use

Surface water in the Pecos River is derived from precipitation in the form of snowmelt and monsoon season rainfall and from ground water inflows. The headwaters of the Pecos River are in the Sangre de Cristo Mountains, located in the northern part of the basin. Substantial flows also enter the river from tributaries with their origins in the Sacramento and Guadalupe Mountains. Amounts of snowmelt and runoff from precipitation can vary greatly from year to year. Ground water also enters the system along reaches between the Below Santa Rosa Dam to Near Puerto de Luna gages, between the Near Acme to Near Artesia gages, and directly into Brantley Reservoir from Major Johnson Springs. Ground water inflows are more consistent in annual volume, but some of the inflows are naturally more saline than precipitation sources (Thomas, 1963).

Water that is diverted for agriculture and applied to a crop is not completely used by the plants. Some water is lost to percolation to deep aquifers. The portion of the water that is either used by the plant (transpired) or evaporated is the amount of consumptive use. The unused water or return flow can directly drain back into the river (return flow) or can seep into shallow ground water aquifers. Throughout the study area, the shallow aquifers and rivers are generally well connected; the return flow will eventually make it back to the river, where it becomes available for downstream diversion and use. Consequently, ground water pumping affects base inflows to the river from the shallow aquifers connected to the river system (Fort and McGucken, 2003).

Surface water diversions have the immediate effect of reducing surface flows, but the extracted volume is partially replaced by return flow. Water is commonly diverted several times. Return flows are usually more saline than native river waters because salts are concentrated when water is removed through transpiration. Salts also can accumulate because of fertilizer application and soil leaching. As such, repeated diversions and returns result in increased salinity in the river downstream (Fort and McGucken, 2003; Thomas, 1963).

Agriculture accounts for more than 83 percent of the surface and ground water diversion in the Pecos River basin and more than 80 percent of all anthropogenic consumptive use. Agriculture consumes more than 69 percent of the surface water used in the Pecos River basin, and evaporation consumes another 28 percent. All other sectors combined use less than 3 percent of the consumed surface water in the basin (Wilson et al., 2003).

Carlsbad Project Water Rights

- Reclamation cannot impair senior water rights in operating the Carlsbad Project.
- Water stored in Carlsbad Project reservoirs can only be used for authorized purposes and applied to beneficial use.
- Reclamation is legally obligated to deliver water stored for irrigation to the water users for use on the lands to which the statutes apply in accordance with the water rights and contracts.

5.5 Pecos River Compact

The Compact is an interstate agreement between New Mexico and Texas that was approved by the Congress in the Act of June 9, 1949. The Compact apportions Pecos River water between the two States and defines the required State-line delivery as the senior right on the Pecos River system. In the Compact, New Mexico agreed to maintain the flows to Texas equivalent to the quantity of water Texas received under the river basin's developed conditions in 1947. The Amended Decree reaffirmed the seniority right of State-line delivery, while applying the principle of prior appropriation within New Mexico. New Mexico is prohibited from having a net shortfall condition in its deliveries to Texas and must pay for water with water (no monetary payments are allowed). A net shortfall condition must be remedied within 9 months of its determination.

5.6 Pecos River Water Rights

Federal law provides that Reclamation obtain water rights for its projects through purchase, lease, or contract and administer its projects pursuant to State law relating to the control, appropriation, use, or distribution of water used in irrigation unless the State laws are inconsistent with express or clearly implied congressional directives. Water can only be diverted to storage and delivered by the Carlsbad Project for authorized purposes for which Reclamation has asserted or obtained a water right in accordance with section 8 of the Reclamation Act of 1902 and applicable Federal law. Reclamation must operate the Carlsbad Project in a manner that does not impair senior water rights. Reclamation has an obligation to deliver water to the Carlsbad Project water users in accordance with the water rights and contracts between Reclamation and the water users (which may be through a water district). Water lawfully stored in Carlsbad Project reservoirs can only be used for Carlsbad Project purposes to the extent that the water is applied to beneficial use within the Carlsbad Project.

The beneficial interest in the Carlsbad Project water right is by the water users who put the water to beneficial use. Reclamation and CID have storage and diversion rights. CID has distribution rights, and water users have water rights. In New Mexico, as in most Western States, a water right is obtained through

appropriation, followed by application within a reasonable time to beneficial use. Appropriation is an amount of water legally set apart or assigned to a particular purpose or use. Application is putting the water to use. Under New Mexico law, actual application of the water to the land is required to perfect a water right for agricultural use. Federal law concerning Reclamation projects, which is consistent with New Mexico law, also provides that the use of water acquired under the Reclamation Act of 1902 "shall be appurtenant [connected] to the land irrigated, and beneficial use shall be the basis, measure, and the limit of the right" (43 United States Code [U.S.C.] section 372). Beneficial use is determined in accordance with State law to the extent that it is not inconsistent with congressional directives. The authorities and the contracts with the United States create and define the extent of the water users' rights. Thus, Reclamation is legally obligated to deliver water stored for an irrigation purpose to the water users for use on the lands to which the statutes apply.

In establishing the Carlsbad Project, Reclamation purchased water rights from the existing private irrigation system and filed with the territorial engineer for additional water rights. These filings and rights have been adjusted from time to time to accommodate new facility construction, but, essentially, the Carlsbad Project operates under the same rights that had been obtained by 1906. The Hope Decree, Number 712, Equity, May 8, 1933, adjudicated to the United States water rights to divert and store for the Carlsbad Project based upon irrigation use. Water is stored in Carlsbad Project reservoirs for the purpose of irrigation. The Hope Decree also defined the rights and priority to use surface waters of the Pecos River from the headwaters in the Sangre de Cristos to Avalon Dam. The decree did not address connected ground water, which affects flows to senior surface water right holders.

FSID has a direct flow diversion right with a priority date of March 18, 1903. Reclamation owns FSID Diversion Dam, but FSID operates it according to the diversion procedure of its senior water right. FSID's right to divert up to 100 cubic feet per second (cfs) of the Pecos River's natural flow is senior to Carlsbad Project's right to divert to storage at Santa Rosa Dam or at Sumner Dam. FSID has no storage right. In addition to its right to divert from the river during the irrigation season, FSID also has the right to divert for two 8-day periods during the nonirrigation season. Therefore, Reclamation cannot divert water to storage if it is needed to meet FSID's senior diversion water right. FSID's water right was established prior to Reclamation's involvement with FSID and was never transferred to the Federal Government.

Puerto de Luna and Anton Chico acequias have water rights that are senior to FSID's, and some river pumpers downstream also have senior rights on the Pecos River. HIC has surface rights from the Rio Hondo and South Springs and ground-water rights to pursue those surface water sources. These wells provide most of the water used by HIC, but they continue to divert surface water from the Rio Hondo, a tributary of the Pecos River.

As described previously, surface flows of the Pecos River are interrelated with ground water sources. This is especially true in the Roswell area, where wells were developed in the Roswell artesian and shallow aquifers early in the last century. Water rights that are junior to those held by CID are diverted from ground water sources. Wells tapping those aquifers reduce base inflow and affect downstream users. Because of the time required for ground water to return to the river, the enforcement of priority water rights on the Pecos River would be very difficult because water could not be easily quantified or immediately delivered to downstream users or to Texas for Compact deliveries.

5.7 Carlsbad Project Operations

Pecos River facilities used to divert Carlsbad Project water to storage and to release water for beneficial use are Santa Rosa Dam and Reservoir, Sumner Dam and Lake, Brantley Dam and Reservoir, and Avalon Dam and Reservoir. Santa Rosa Reservoir, Sumner Lake, and Brantley Reservoir are operated for irrigation and flood control storage. The Corps administers flood control operations, and Reclamation manages irrigation operations.

In 1980, Carlsbad Project water storage rights were transferred from Sumner Lake to Santa Rosa Reservoir (owned by the Corps) to allow more flood control capacity at Sumner Lake. The total storage capacity of the reservoirs is approximately 500,000 acre-feet, which includes the allocation for Carlsbad Project water and the flood pool. The Carlsbad Project is limited to 176,500 acre-feet of storage by the Compact. The different reservoirs also are constrained by individual conservation storage limits for Carlsbad Project water. The conservation storage limits in Santa Rosa Reservoir, Sumner Lake, and Avalon Reservoir change each year, based on estimated sediment deposition since the last survey. Sediment is surveyed every 10 years by the Corps for Santa Rosa and by Reclamation for the other facilities. Reclamation transmits all requests from CID for release of Carlsbad Project water from Santa Rosa Reservoir to the Corps.

CID prefers to store most of its water in the upstream reservoirs and to move water in block releases. Generally, upstream storage is thought to reduce losses to evaporation, but evaporative losses at Sumner Lake may be higher than at Brantley Reservoir. Upstream storage also allows CID the flexibility to capture storm water runoff in Brantley Reservoir. In a block release, a large amount of water is released from Santa Rosa or Sumner Dam. Block releases are the most efficient way to move water downstream. If a small amount of water is released or if water is released slowly, a larger percentage of the delivery is lost to evaporation or subject to other losses in transit. If too large of a percentage of the delivery is lost, a release becomes wasteful and violates State law. The timing of water operations is generally determined by agricultural demand, but water is sometimes released for reasons of conservation storage limits, flood control, and dam safety. If pool elevations exceed designated conservation pool volumes, additional inflows into the reservoir cannot be diverted to storage and must be bypassed through the dam. Flood conditions are relatively rare and seldom

Key Concepts in Carlsbad Project Operations

- Water from storms and snowmelt is diverted from the river for direct use or is stored in reservoirs.
- Water rights and priority affect virtually all aspects of the allocation of water to users.
- Reclamation delivers Carlsbad Project water allocations to CID for irrigation use.
- Upon CID request, block releases are made to deliver water efficiently to CID (Brantley Reservoir).
- Operations must be conducted within the structure of existing water rights and Reclamation authorities. Reclamation is limited by Federal and State laws.
- In order to provide flows for the shiner, Reclamation bypasses Carlsbad Project water when available. Because this is a less efficient way to deliver water, Reclamation has obtained replacement water from other sources.
- This EIS analyzes the environmental effects of **changes in Carlsbad Project** operations. These changes include a range of proposed target flows, as well as options for acquiring additional water for the Carlsbad Project deliveries to CID and for use to benefit the shiner upstream.

dictate flow releases. If designated flood pool elevations are exceeded, flood operations are initiated.

Each month during the irrigation season, which extends from March 1 through October 31, CID determines an allotment for its farmers based on current conditions. When Brantley Reservoir does not have enough water in storage and farmers need water for irrigation in areas around Carlsbad, a block release is made from Sumner Dam to move water to Brantley Reservoir for distribution. Early season releases prior to April 1 may be made to improve the water quality at Brantley Reservoir.

Before the Service listed the shiner as a threatened species in 1987, the Carlsbad Project was operated by Reclamation solely as required by irrigation need, flood control, the Pecos River Compact, existing water diversion rights, and other agreements. In 1989, in a one-time event to test the safety of the newly constructed Brantley Dam, water was released in a block release from Santa Rosa Reservoir and Sumner Lake from the period of April 10 to June 6. The Service requested a consultation in 1990 concerning the impact Pecos River dam operations were having on federally listed threatened and endangered species. Reclamation formally submitted a biological assessment in 1991. The consultation resulted in a jeopardy determination.

To comply with ESA and still meet its other obligations, Reclamation has adjusted both irrigation season and nonirrigation season operations. Important among many changes in operations is the bypassing of some Carlsbad Project water through Santa Rosa and Sumner Dams to augment flows for the shiner. Because bypasses are less efficient than block releases, Reclamation has obtained water from other sources and delivered that water into the Pecos River to conserve the Carlsbad Project water supply.

5.8 FSID Water Operations

FSID water operations are relevant to this EIS because FSID's senior diversion right affects the discretionary actions available to Reclamation to conserve the shiner. FSID irrigation usually begins on March 1. However, if FSID chooses to use its winter diversion water rights in conjunction with the beginning of its irrigation season diversion rights, bypasses could start a full 2 weeks earlier. FSID's flexibility in irrigation planning is limited because it has no storage rights. Before the construction of Sumner Dam in 1937, FSID's entitlement was simply the first 100 cfs of the natural riverflow at the diversion dam. After construction of Sumner Dam, FSID was entitled to the natural riverflow up to 100 cfs as measured at the Near Puerto de Luna gage upstream of Sumner Lake. After Santa Rosa Dam was constructed in 1980, FSID's entitlement was set every 2 weeks based on a computation by NMOSE for the average natural riverflow during the previous 2 weeks and capped at 100 cfs. If the 2-week average shows no flows in excess of FSID's water right, Reclamation cannot divert to storage or bypass any inflows. Thus, during the irrigation season when the natural flow of the river may be reduced, FSID can continue to divert up to its entitlement and Reclamation has fewer discretionary actions available to it for providing flows to conserve the shiner. In recent years, FSID's diversion of the natural flow has been a major cause of low flows and river drying during the irrigation season (Reclamation, 2002).

FSID also has a pump-back operation that allows it to reuse its entitlement. In the pump-back operation, FSID pumps flows directly out of return canals before they reach the river and reapplies that water to nearby farmland within the district.

5.9 Compliance with ESA

Section 7 of ESA outlines the procedures for Federal interagency cooperation to conserve federally listed species and designated critical habitats. To comply with ESA, an analysis of the effects of any discretionary Federal action must be conducted in consultation with the Service. Each Federal agency has an obligation to ensure that any discretionary action it authorizes, funds, or carries out is not likely to jeopardize the continued existence of any endangered or threatened species or destroy or adversely modify its critical habitat unless that activity is exempt pursuant to ESA.

Under section 7(a)(2) of ESA, a discretionary agency action jeopardizes the continued existence of a species if it "reasonably would be expected, directly or indirectly, to reduce appreciably the survival and recovery of a listed species in the wild by reducing the reproduction, numbers, or distribution of the species." If a discretionary agency action is jeopardizing a species, the agency must stop the action or adapt it through reasonable and prudent alternatives (RPAs), which must be within the scope of the agency's legal authority.

Under section 7(a)(1) of ESA, Reclamation also has an obligation to conserve and protect listed species. Section 7(a)(1) alone does not give Reclamation additional

authority to undertake any particular action, regardless of its potential benefit for endangered species. Whether undertaken as section 7(a)(1) conservation activities or as RPAs subsequent to section 7(a)(2) compliance, any Reclamation action for endangered species purposes must be within the agency's existing authority.

Reclamation does not possess the authority and discretion to:

- Restrict FSID's right to divert
- Undertake new construction
- Release water from Carlsbad Project storage for the purpose of wildlife and habitat restoration
- Purchase water to maintain habitat for the shiner
- Construct or physically modify habitat for the shiner
- Allocate additional Carlsbad Project storage space for anything other than irrigation and/or flood control
- Restrict CID's right to Carlsbad Project storage space

As described previously, consultations between Reclamation and the Service in 1991 on Pecos River operations resulted in a jeopardy determination. The Service formulated RPAs that governed many aspects of river operations and required an interagency research and monitoring program to determine the hydrologic and biologic needs of the shiner.

From the 1990 through 1998 irrigation seasons, operations at Sumner Dam resumed with the following changes. Flows above FSID's diversion right were diverted to storage, and block releases continued to be used to deliver water stored in upstream reservoirs to Brantley Reservoir. From 1992 through 1997, experimental operations were conducted to collect data for the development of a hydrologic model and studies of shiner habitat. These experimental operations included winter bypasses from Santa Rosa Reservoir and Sumner Lake for analyzing the efficiency of low flows and block releases that included ramp-up and ramp-down periods for evaluating the effect of these transitional flow periods on shiner habitat and conveyance efficiencies.

One of the RPAs from the jeopardy opinion directed Reclamation to develop a computer model of the river. The model was to be developed for analyzing the effect of changes in operations on the various affected resources. The model was developed with the RiverWare software application developed at the Center for Advanced Decision Support for Water and Environmental Systems (CADSWES) at the University of Colorado at Boulder. An application was developed for the Pecos River that represents all the key processes in the basin and simulates operational policy for the system.

After the 1992-97 study period, Reclamation resumed consultations with the Service. In subsequent years, Reclamation has continued to consult with the Service and has implemented recommendations governing the aspects of the operations where there is discretionary Federal involvement or control. In 1998, the Carlsbad Project began bypassing water when the water was available and was needed to provide a continuous river. Intermittency near the Near Acme gage and the upper critical habitat has been caused by diversion of water downstream from Sumner Dam for irrigation and by the ongoing drought.

ESA compliance on current operations is guided by the Final Biological Opinion for the Bureau of Reclamation's Proposed Pecos River Dam Operations, March 1, 2003, through February 28, 2006, dated June 18, 2003 (BO). Conditions of the 2003-2006 BO are described in greater detail in chapter 2 under section 4.1, "No Action Alternative." As detailed in the BO, the Service found that the water operation proposal "is not likely to jeopardize the continued existence of the shiner, and is not likely to destroy or adversely modify the shiner's designated critical habitat." The conclusion was based on the premise that Reclamation's proposed action would, at a minimum, maintain flowing water through critical habitat even during dry years and that in average-to-wet years, additional water would be bypassed for the shiner. The primary focus is to avoid intermittency throughout the river in all years. Reclamation believes that its discretionary actions do not cause the intermittency that has occurred in recent years. The Service anticipated that there would be incidental take of shiner resulting from block releases during the spawning season, but based on the assumption that the river would be kept whole, determined that the level of anticipated take would not likely jeopardize the shiner or destroy or adversely modify critical habitat (Service, 2003).

Consultation with the Service on Reclamation's proposed action was conducted concurrently. Formal consultation began in August 2005 with the submittal of a draft biological assessment to the Service. Reclamation has obtained a 10-year BO (appendix 1). The consultation process is discussed in chapter 6.

The Relationships Among the Biological Assessment, Biological Opinion, and EIS

As required under section 7 of the Endangered Species Act of 1973, as amended, Reclamation is required to consult with the Service regarding project impacts on federally listed species and designated critical habitats. As part of consultation, when there is the potential for project effects on a listed species, the Federal agency prepares a **biological assessment** that evaluates potential effects of the agency action on the listed species. The Service subsequently prepares a **biological opinion** based on information contained in the biological assessment and the Service's knowledge of the project and affected species. Decisions made during consultation process will be incorporated into the final EIS and Record of Decision.

5.10 NEPA Study History

In 1997, Reclamation initiated a NEPA process in cooperation with NMISC, the Service, the Corps, NMDGF, and CID to consider long-term changes in operations to protect the shiner. Progress on an environmental assessment was constrained by the continued development of the RiverWare software, the lack of specific details of water acquisition, and the need to verify biological conclusions regarding the needs of the shiner.

Reclamation determined that an EA would be inadequate to address the complicated issues and potential impacts resulting from changes in Carlsbad Project operations. The proposed level of NEPA analysis was elevated to an EIS to avoid the constraints associated with uncertainty and insufficient data. Reclamation decided to include the water acquisition program within the Federal action being considered, thereby coupling the provision of acquiring water with proposed operational changes that result in a new depletion. Reclamation proceeded with plans to initiate the EIS and informed the cooperating agencies of its intentions in fall 1999. Reclamation formally invited NMISC to serve as a joint lead agency, and both agencies developed a memorandum of agreement for conducting the study. In 2002, the Forest Guardians submitted a complaint in U.S. District Court, citing the failure of Reclamation and the Corps to comply with the requirements of ESA and NEPA (U.S. District Court for the District of New Mexico, 2002). A settlement was reached based on an agreed schedule for completion of the draft environmental impact statement (DEIS) and final EIS.

In 2002, Reclamation and NMISC developed an approach for environmental review of proposed Pecos River basin activities. Reclamation and NMISC decided to prepare an EIS for Reclamation's Carlsbad Project water operations and water acquisition (i.e., the Carlsbad Project Water Operations and Water Supply Conservation EIS), and another for a miscellaneous purposes contract that would allow NMISC to use Carlsbad Project water for purposes other than irrigation (the Long-Term Miscellaneous Purposes Contract EIS [MPEIS]). The purpose of the MPEIS is to allow NMISC to release project water from Avalon Dam to ensure that Pecos River Compact delivery requirements are met. The project water would come from lands within CID boundaries that NMISC owns or leases or through other acquisitions of water rights.

The Notice of Intent (NOI) to prepare the Carlsbad Project Water Operations and Water Supply Conservation EIS was published in the *Federal Register* on October 4, 2002. This study is following a schedule based on settlement of the Forest Guardians' complaint that requires issuance of a DEIS to the public by September 1, 2005, a final EIS by June 1, 2006, and a ROD by August 1, 2006 (U.S. District Court for the District of New Mexico, 2004). The NOI to prepare the MPEIS was published in the *Federal Register* on January 20, 2004. Reclamation and NMISC are conducting both EIS processes concurrently and are coordinating the environmental analyses.

6. Related and Ongoing Actions

This section describes related and ongoing activities relevant to this EIS. It begins with a list of the legislated authorities and responsibilities of Federal agencies managing projects and lands. The next section lists major statutes and regulatory requirements involved with the management of natural and human environment. The third section describes the relationship between the actions contemplated in this EIS and other regional programs, projects, and activities of Reclamation and NMISC.

6.1 Authorities and Agreements

Table 1.1 includes the legislative authorizations for Reclamation activities and major Pecos River agreements that are directly relevant to the EIS.

Table 1.1 Relevant legislative laws, agreements, and authorizations

Law, agreement, or authorization	Description
Reclamation Act of June 17, 1902 (43 U.S.C. section 391)	Authorized construction of irrigation projects in the West. Assigned authority over these projects to the Secretary of Interior, with project administration oversight by Reclamation.
Carlsbad Project Authorization November 28, 1905	The Secretary of the Interior authorized purchase and rehabilitation of Pecos Irrigation and Improvement Company facilities.
Hope Decree of 1933	Defined the rights and priority to use surface waters of the Pecos River from the headwaters to Avalon Dam (CID, FSID, HIC, acequias, and river pumpers). The decree did not address connected ground water, which affects flows to senior surface water right holders.
Alamogordo (Sumner) Dam Authorization, November 6, 1935, Emergency Relief Appropriations Act of 1935 (funding)	Authorized funding and construction of Alamogordo (Sumner) Dam.
Flood Control Act of 1935	Specified that Alamogordo Dam and Reservoir were to be used first for irrigation, followed by flood control, river regulation, and other beneficial uses.
Reclamation Project Act of 1939 (53 Statute [Stat.] 1187)	Allowed authorization of projects for multiple purposes, the costs to be shared among the various beneficiaries so that the projects would be economically viable.
Pecos River Compact of 1948	Apportions the waters of the Pecos River between New Mexico and the downstream neighboring State of Texas and requires that New Mexico not deplete, by man's activities, the flow of the river at the State line below a quantity of water available to Texas under the river basin's developed conditions in 1947, known as the "1947 condition."
Fort Sumner Project Authorization, under P.L. 81-192, 63 Stat. 483, July 29, 1949	Authorized Reclamation to rehabilitate the Sumner Diversion Dam and other facilities.
Brantley Project Authorization, P.L. 92-514, October 20, 1972	Authorized construction of Brantley Dam and Reservoir for multiple purposes as a replacement for McMillan Dam.

Table 1.1 Relevant legislative laws, agreements, and authorizations

Law, agreement, or authorization	Description
Reclamation Reform Act of 1982 (43 U.S.C. sections 390aa to zz-1)	Increased the acre limit that an individual or legal entity can irrigate with water from a Federal project from 160 acres to 960 owned or leased acres.
1988 *Texas* v. *New* Mexico U.S. Supreme Court Amended Decree	Established that a shortfall in deliveries to Texas had occurred and affirmed State-line delivery as the senior right on the Pecos River system, while applying the principle of prior appropriation within New Mexico. New Mexico is prohibited from having a net shortfall condition in its deliveries to Texas and must pay for water with water (no monetary payments are allowed). A net shortfall condition must be remedied within 9 months of its determination.
Reclamation Recreation Management Act of 1992 (P.L. 102-575)	Provided uniform policies regarding recreation developments, fish and wildlife enhancements, cost sharing of Federal multipurpose water resource projects, and other purposes.
Transfers of Certain Carlsbad Project Lands to CID (P.L. 106-220, on June 21, 2000	Transferred title to nearly 6,200 acres of Carlsbad Project lands to CID, including irrigation, drainage features, and a maintenance facility. Does not include Sumner Dam and Lake or Brantley and Avalon Dams and Reservoirs.
Final Biological Opinion for the Bureau of Reclamation's Proposed Pecos River Dam Operations, March 1, 2003 through February 28, 2006	Defined target flows, block release protocols, and other RPAs and conservation recommendations currently in place to avoid jeopardy from Reclamation actions on the Pecos River.

6.2 Regulatory Requirements

In addition to NEPA, several other Federal statutes involve management of resources within the study area. These laws and Executive orders were designed to restore, protect, and preserve the natural resources (for example, air, water, land, fish, and wildlife) and cultural resources (for example, historic and prehistoric sites) of the United States. In addition, several laws protect the rights of Native Americans to express, believe, and exercise religious practices. Federal statutes that guided the NEPA development process include the following:

- American Indian Religious Freedom Act of 1978 (P.L. 95-341; 42 U.S.C. 1996)
- Archaeological and Historic Preservation Act of 1974 (16 U.S.C. sections 1531-1543)
- Archeological Resources Protection Act of 1979 (P.L. 96-95; 16 U.S.C. 470aa-470ll)
- Clean Air Act of 1970 (42 U.S.C. 7401 et seq.; 40 CFR parts 50-87)
- Clean Water Act (33 U.S.C. sections 1251-1387)

- Endangered Species Act of 1973 (P.L. 93-205; 16 U.S.C. 1531 et seq.)
- Farmland Protection Policy Act (P.L. 97-98; 7 U.S.C. 4201)
- Fish and Wildlife Coordination Act of 1958 (P.L. 85-624)
- Historic Sites, Buildings, and Antiquities Act of 1906 (16 U.S.C. sections 431-433)
- Migratory Bird Treaty Act (16 U.S.C. 703-712), as amended
- National Historic Preservation Act of 1966 (P.L. 95-515; P.L. 102-575; 16 U.S.C. 470)
- Executive Order 11593, Protection and Enhancement of the Cultural Environment, May 13, 1971 (36 FR 8921)
- Executive Order 11988, Flood Plain Management, May 24, 1977 (42 FR 26951)
- Executive Order 11990, Protection of Wetlands, May 24, 1977 (42 FR 26961
- Executive Order 11991, Protection and Enhancement of Environmental Quality, March 5, 1970 (35 FR 4247)
- Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, February 11, 1994 (59 FR 7629)
- Executive Order 13007, Indian Sacred Sites, May 24, 1996 (61 FR 26771)
- Executive Order 13112, Invasive Species, February 3, 1999 (64 FR 6183)

6.3 Required Compliance Actions and Permits

Table 1.2 lists required consultations, compliance actions, and permits that are anticipated as part of preparing the EIS or implementing the decisions of the EIS. The acquisition of additional water for the Carlsbad Project water supply or for the shiner may require additional NEPA compliance work and additional permitting and consultation as these actions become better defined.

Table 1.2 Required consultations, compliance actions, and permits applicable to EIS preparation and implementation

Consultation/ permit	Agency/ organization	Description
ESA (section 7 consultation)	U.S. Fish and Wildlife Service	Consultation under section 7 of ESA is required to determine if the project will adversely affect threatened or endangered species or designated critical habitat. Effects on the shiner and other listed species are addressed in a BO. Reclamation has prepared a biological assessment for the preferred alternative and for related actions that could affect listed species. The 10-year BO is included in this document as appendix 1.
Permits pursuant to sections 402, 404 of the Clean Water Act	U.S. Army Corps of Engineers (also reviewed by the Service and the New Mexico Environment Department)	Section 404 permitting may be required for options that involve construction or discharge of material into wetlands and other waters of the U.S. National Pollutant Discharge Elimination System (section 402) permitting may be required for options that require discharge.
Environmental Protection Agency (EPA) EIS review	U.S. Environmental Protection Agency	The EIS will be filed with EPA, which will review the environmental impacts and rate the adequacy of the EIS. EPA provides review comments to the Corps on any section 404 permit applications during the public scoping period and assesses compliance with section 309 of the Clean Air Act.
Section 106, National Historic Preservation Act Compliance	New Mexico Historic Preservation Division (State Historic Preservation Office)	Reclamation is required to consult with the State Historic Preservation Office regarding the effects of the project on historic properties (sites eligible for listing on the *National Register of Historic Places*) and to mitigate any adverse effects on these sites. The section 106 process also requires the agency to allow the Advisory Council on Historic Preservation the opportunity to comment on any adverse effects on historic properties.
Permits for water storage, place of use, or point of diversion	New Mexico Office of the State Engineer	Project actions, such as the fish conservation pool and water acquisition options, may require permits to change water storage, type of use, or points of diversion.

6.4 Relationship to Other Reclamation and NMISC Regional Activities

Reclamation and NMISC are currently conducting other projects and NEPA actions in the Pecos River basin. Selected relevant projects and actions are briefly described. Cumulative impacts of these activities and related projects and other relevant past, present, and reasonably foreseeable projects in the region are described in Chapter 5, “Cumulative Impacts.”

6.4.1 Settlement Agreement

The Pecos River Carlsbad Project Settlement Agreement (Settlement Agreement) was executed by NMISC, CID, Reclamation, and PVACD on March 25, 2003, to settle ongoing litigation in the Pecos River basin and to provide a mechanism to ensure long-term compliance with the Pecos River Compact and the Amended Decree. The Settlement Agreement includes an acquisition program that

authorizes NMISC to purchase up to 6,000 acres of land and water rights in CID and up to 12,000 acres of land and water rights upstream of Brantley Dam, which includes PVACD and FSID. Additionally, per the Settlement Agreement, the State will construct or purchase a well field(s) capable of producing 15,750 acre-feet of water per year.

6.4.2 MPEIS

As discussed under Section 5.10, "NEPA Study History," pursuant to the Settlement Agreement, Reclamation and NMISC are conducting an EIS on the execution of a long-term contract with CID to allow NMISC to use water up to 50,000 acre-feet per year for miscellaneous purposes and the subsequent conversion and delivery of the water for purposes other than irrigation. The MPEIS is being conducted concurrently with this EIS.

6.4.3 Carlsbad Project Vegetation Management Program

An environmental assessment/biological assessment was prepared for the Carlsbad Project Vegetation Management Program; a Finding of No Significant Impact was signed in September 2004. This program consists of research and treatment components, both targeting salt cedar and other invasive plants. The research component includes studies of biological agents, herbicides, mechanical methods, revegetation, and herbicide residue.

6.4.4 Water Resources Conservation Program

This program, established in 1991 by section 72-1-2.2, New Mexico Statutes Annotated (NMSA) 1978, called for NMISC to purchase, retire, and place in a State water conservation program adequate water rights over a period of years to increase the flow of water in the Pecos River and to diminish the impact of depletions of the streamflow from human activity and, therefore, meet the State's future obligations under the Pecos River Compact and the Amended Decree.

6.4.5 Active Water Resource Management Program

In response to legislation (section 72-2-9.1, NMSA 1978), NMOSE adopted Rules and Regulations for Active Water Resources Management on December 30, 2004. The regulations are designed to establish a framework for NMOSE to supervise the physical distribution of water and to administer the available water supply by priority date or alternative administration, as appropriate. These State-wide rules and regulations provide that, when necessary, junior water rights that would otherwise be curtailed will be able to temporarily acquire senior water rights from owners participating in the water rights marketplace in an expedited manner. Ultimately, rules and regulations specific to the Pecos River basin will be drafted and promulgated.

7. Issues Summary

Scoping is a public process designed to determine the alternatives and issues to be addressed in a NEPA document. The scoping process for this EIS began on

October 4, 2002, with the publication of the NOI in the *Federal Register*. To inform parties interested in the EIS about the location of scoping meetings and the opportunity to comment, Reclamation developed a distribution list and mailed a newsletter to more than 200 contacts. Newspaper advertisements and a press release were also issued to notify the public of the project, to announce the four public scoping meetings, to request public comments, and to provide contact information. A display advertisement and legal notice also were published in several newspapers, and a legal notice was placed in the *Albuquerque Journal*.

Reclamation held public scoping meetings in Santa Rosa, Fort Sumner, Carlsbad, and Roswell, New Mexico. These meetings provided an opportunity for the public to receive information, ask questions, and provide input. Factsheets about the project were distributed. Comments from the public and agencies focused on the ecology of the shiner, streamflow requirements, impacts on property owners, impacts on farmers, impacts on industries dependent on the river, water rights, watershed management, accuracy of data, and dam operations. More detailed information on the results of scoping is included in Chapter 6, "Consultation and Coordination."

The framework for describing the affected environment and for assessing impacts is based on Reclamation guidance, input from stakeholders and technical specialists, scoping, and the potential for study area resources to be affected by proposed changes in Carlsbad Project operations and water acquisition options. The affected environment for the study area described in chapter 3 includes the following resources:

- Water resources
- Water quality
- Agricultural soil and land resources
- Biological resources
- Regional economy
- Recreation
- Cultural resources
- Indian trust and treaty assets
- Environmental justice

Technical specialists and workgroups prepared work plans for each resource to identify resource issues and impact indicators and to guide the impact analysis process. Resource issues relate to potential effects, risks, or hazards on the resource within the affected environment. Resource indicators are a measurement or qualitative assessment of the degree of change resulting from the alternative or option.

8. Document Organization

This EIS consists of six chapters, described as follows.

Chapter 1 describes the purpose of and need for the proposed Federal action, cooperating agencies, project background, related and ongoing activities, and a summary of issues.

Chapter 2 describes the process used to formulate alternatives, the alternatives considered in detail, the alternatives considered but eliminated from detailed study, and Reclamation's preferred alternative. It also includes a description of the options for acquiring water for the Carlsbad Project water supply, options for providing additional water upstream to conserve the shiner, and a summary comparison of alternatives and impacts.

Chapter 3 describes the current condition of resources within the study area that would be affected by the alternatives and water acquisition options if they were implemented.

Chapter 4 describes and analyzes the environmental impacts of the alternatives and water acquisition options on study area resources. It also describes the relationship between short-term uses of the environment and long-term productivity and provides an assessment of irreversible and irretrievable commitment of resources. Chapter 4 also lists the environmental commitments that may be implemented with the selection of any of the alternatives.

Chapter 5 describes relevant past, present, and reasonably foreseeable projects and their cumulative impacts on study area resources.

Chapter 6 describes the scoping and public participation process that was conducted during the preparation of this EIS. It also describes coordination with Federal, State, and local agencies; Native American groups; and private organizations.

The document also includes a distribution list, list of preparers, references cited, and a glossary, as well as several attachments and appendices with relevant supporting information. Public comments on the DEIS are provided in attachment 1.