2.5. Comparison of Alternatives their Predict Effects and Project Objectives

Reasonable Alternatives	Affected Resources	Predicted Achievement of objectives in section 1.4 to fulfill the need.	Predicted Impacts of Alternatives (See Issues section 1.6)
No Action A	Vegetation	None	None
	Wetlands	None	None
	Water Resources	None	Potential avulsion of the river channel into the LFCC
	Wildlife including Threatened and Endangered Species	None	None
	Noxious Weeds	None	None
	Socioeconomic	None	None
	Environmental Justice	None	None
	Indian Trust Assets	None	None
	Cultural Resources	None	None
	Air Quality and Noise	None	None
Proposed Alternative For River Mile 111	**Affected Resources**	**Predicted Achievement of objectives in section 1.4 to fulfill the need.**	**Predicted Impacts of Alternatives (See Issues section 1.6)**
	Vegetation	Yes	Removal of native vegetation including Cottonwood trees and willows
	Wetlands	Yes	Wetlands in existing LFCC would be destroyed. New wetlands would be created to compensate.
	Water Resources	Yes	Potential impact to the LFCC Delivery of water
	Wildlife including Threatened and Endangered Species	Yes	Positive impact to create nursery habitat for the silvery minnow and habitat for other wildlife species.
	Noxious Weeds	Yes	Need to be controlled
	Environmental Justice	N/A	None
	Indian Trust Assets	N/A	None
	Cultural Resources	N/A	None
	Air Quality and Noise	Yes	During construction only

Chapter 3 AFFFECTED ENVIRONMENT

3.1 Introduction

The relevant resources described in this chapter are those that would be affected by the alternatives if they were implemented. Only resources that may be affected or impacted are described and only to the extent necessary to understand anticipated impacts. The effects (impacts or issues) to these resources created by the alternatives if implemented are discussed in Chapter 4.

3.2 Description of Relevant Issues and Resources (See Issues in Section 1.6)

3.2.1 Vegetation

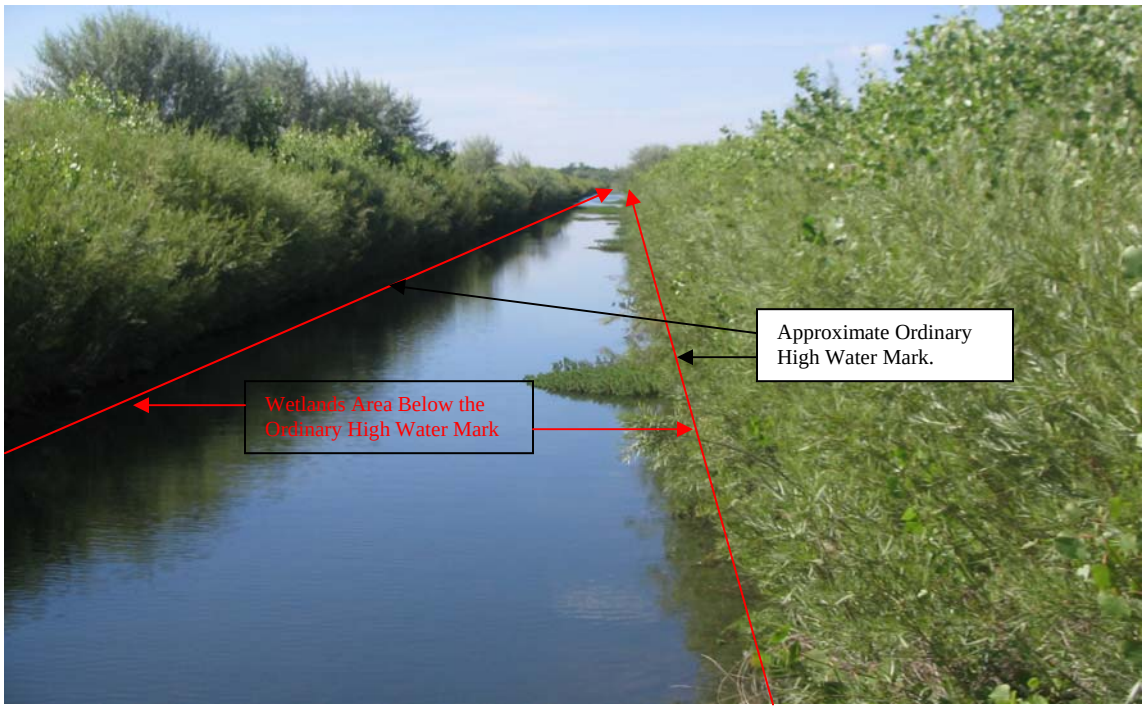
Vegetation at the project area is dominated by non-native species including saltcedar (*Tamarix* spp.) and Russian olive (*Elaeagnus angustifolia*), and other ground-layer weedy species. Other existing vegetation alliances that are found within the project area include the Cottonwood / Coyote Willow Alliance, the Cottonwood-Gooding Willow Alliance, the Cottonwood / New Mexico Olive Alliance, and the Cottonwood-Russian Olive / Saltcedar Alliance.

3.2.2 Wetlands

The area below the ordinary high water mark in LFCC is considered waters of the United States including riparian wetlands along the bank at the ordinary high water mark (see Figure 7). For a site to be considered a wetland, wet conditions (wetland hydrology), wet soils (hydric soils), and wet-loving plants must be present (Watercourse, 1995; and New Mexico Environment Department, 1997).

The LFCC has riparian wetlands. Notice in Figure 7, up the slope of the LFCC from the water's edge Coyote Willow, Cottonwood saplings, Russian Olive, Salt Cedar, and various forbs and grasses are riparian species and some are wet-loving plants near the ordinary high water mark.

Figure 7. Riparian wetlands along the bank at the ordinary high water mark.



3.2.3 Water Resources

The LFCC was created by Reclamation as part of a plan to increase deliveries of water to Elephant Butte. As a result, New Mexico was able to meet delivery requirements for the Rio Grande Compact in the 1960s and 1970s. Due to complications from channel aggradation, LFCC operations were suspended in 1985. However, the purpose of the LFCC remains to deliver water to Elephant Butte.

The LFCC is also used for pumping water at various location downstream of Socorro into the Rio Grande. This action presently provides water at critical times of the year for the RGSM critical habitat. In addition, the Southwestern Willow Flycatcher core population is associated with habitat that receives water from the LFCC in the upper end of Elephant Butte reservoir.

3.2.4 Wildlife including Threatened and Endangered Species

Wildlife species:

Coyote (*Canis latrans*), raccoon (*Procyon lotor*), bobcat (*Lynx rufus*), skunk (*Mephitis mephitis*), beaver (*Castor canadensis*), and various species of mice, rats, bats, rabbits, and other small mammals are common to the area. Birds that can be found in the region at different times of the year include: herons, ducks, turkey vultures, hawks, doves, hummingbirds, crows, and numerous other species.

Threatened and Endangered Species:

The following describes relevant T&E species that may be found at the locations of the proposed alternative.

Rio Grande Silvery Minnow

The Rio Grande silvery minnow (*Hybognathus amarus*) (minnow) was listed as a federally-endangered species by the U.S. Fish and Wildlife Service (Service) in July 1994 (U.S. Fish and Wildlife Service 1994a). Critical habitat was designated as the reach of the Rio Grande from Cochiti Dam to the upper pool for Elephant Butte Reservoir, a distance of approximately 163 miles (U.S. Fish and Wildlife Service 2003a). Surveys in October 2007 found 10 and 46 RGSM at sites on the Rio Grande bracketing the project area (Dudley & Plantania, 2007). No RGSM have been found in the LFCC (Porter etal. 2007).

Dudley and Platania (1997) documented habitat preferences of the minnow. They found that individuals were most commonly collected in shallow water (<40 cm) with low water velocities (<10 cm/second) and small substrate size, primarily silt and sand. Low-velocity habitats, such as backwaters and embayments, provide nursery areas for larvae (Dudley and Platania 1997, Massong et al. 2004), which grow rapidly in these areas. Restoration efforts that increase the availability of these habitat conditions would benefit the minnow. In addition to the quantity of preferred habitat, food availability may be influenced directly by river restoration activities. Minnows are herbivores that eat primarily diatoms, cyanobacteria, and green algae associated with sand or silt substrates in shallow areas of the river channel (Shirey 2004). Habitat created by

the Project would benefit silvery minnow populations and facilitate future re-introduction in the reach.

Southwestern Willow Flycatcher

A final rule was published in the February 27, 1995 Federal Register to list the southwestern U.S. population of the Willow Flycatcher (*Empidonax traillii extimus*) as an endangered species under the ESA with proposed critical habitat. However, the final rule designating critical habitat for the species range-wide did not include the Rio Grande (USFWS 1995) at that time. A proposal to list critical habitat was published October 12, 2004 (USFWS 2004), with a final designation published October 19, 2005 (USFWS 2005). The species occurs in southern California, Arizona, New Mexico, southern portions of Nevada and Utah, western Texas, and possibly southwestern Colorado (USFWS 1995). Arizona, New Mexico, and California account for the greatest number of known Southwestern Willow Flycatcher sites (93%) in this region and 88% of the total known territories located in 2001. Within these states, the largest known population of Willow Flycatcher territories is found along the Gila River drainage while the Rio Grande in Colorado and New Mexico contribute the second largest number of territories to the overall population (Sogge et al. 2002).

Since the initial surveys of the Rio Grande Valley in the 1990s, breeding pairs have been found within the Middle Rio Grande Project area from Elephant Butte Reservoir upstream to the vicinity of Española. Several locations along the Rio Grande have consistently held breeding flycatchers. These areas have one or more Willow Flycatcher pairs that have established a territory in an attempt to breed, with most birds returning annually. In some locations, these local populations appear to be expanding with increased number of territories being detected. Some local populations have remained small (10-15 territories, or fewer) but stable; other sites have become extirpated and no longer contain territorial flycatchers.

In the Middle Rio Grande, surveys for Willow Flycatchers in selected areas occurred because of environmental compliance activities for various projects. Although a systematic survey effort throughout the riparian corridor of the Middle Rio Grande has not occurred, reaches of the river with the most suitable habitat for flycatchers have been surveyed fairly thoroughly. Presence/absence surveys and nest monitoring along selected areas of the Rio Grande have been conducted from 1993 to 2007. With expanded or increased survey efforts during this 15-year period, several sites have been located where flycatcher territories have consistently been established. Once located, most of these core breeding areas have been monitored annually. The most recent surveys in the proposed project area were conducted during the 2007 breeding season.

3.2.5 Noxious Weeds

Populations of State-listed noxious weeds have been observed in the project area during site visits. Most of the species observed are considered Class B and Class C noxious weeds, according to the current State list of noxious weeds as shown in Appendix B. Some control efforts were recently implemented at the project area following a fire in 2003. Saltcedar, Russian olive, and Siberian elm were the species targeted during the control efforts.

3.2.6 Environmental Justice

Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, requires that the effects on minority and low-income populations within a project area be given special consideration to determine if the proposed action would result in disproportionate adverse effects to their communities.

According to the most recent data from the U.S. Bureau of Economic Accounts (2005), the annual per capita income for the State of New Mexico in 2003 was $24,995. The 2002 annual per capita income for Socorro County was $18,577. According to the most recent data from the U.S. Census Bureau (2004), approximately 48 percent of the residents of Socorro County were Hispanix or Latino in 2000.

3.2.7 Indian Trust Assets

Indian Trust Assets (ITAs) or resources are defined as legal interests in assets held in trust by the U.S. Government for Native American Indian tribes or individual tribal members. Examples of ITAs are lands, minerals, water rights, other natural resources, money, or claims. An ITA cannot be sold, leased, or otherwise alienated without approval of the Federal government. There are no native American ITAs in the vicinity of the proposed project site.

3.2.8 Cultural Resources

Sections of the LFCC and associated levee would be affected by the proposed action. These structures are eligible for the National Register of Historic Places. In addition, no sacred sites or traditional cultural properties are in the project area.

3.2.9 Air Quality and Noise

The Clean Air Act of 1970, as amended, established National Ambient Air Quality Standards (NAAQS) (40 CFR 1 § 81.332) to protect the public from exposure to dangerous levels of several air pollutants. Socorro County is in Air Quality Control Region (AQCR) 152 – Albuquerque – Mid Rio Grande. The AQCR 152 has been classified as an attainment area for all air pollutants identified in the NAAQS (eCFR 2005). Because of this classification for Socorro County, the proposed project located at RM 111 is not subject to EPA requirements for ambient air monitoring.

Chapter 4 ENVIRONMENTAL CONSEQUENCES

4.1. Introduction

This chapter discusses the predicted achievement of the objectives, effects, and cumulative effects for each alternative in section 2.2 of Chapter 2. Included is a discussion of each alternative's effect on relevant issues summarized in section 1.6 (issues) and resources described in section 3.2.