

## Chapter 2. ALTERNATIVES

### 2.1 Introduction

This chapter describes the two alternatives analyzed in this EA: the No action Alternative and the Preferred Action Alternative. Other alternatives considered are mentioned..

### 2.2 Description of the Alternatives

#### 2.2.1 No Action Alternative

Without the proposed action, the Rio Grande in this reach will maintain high flow velocities, continue channeling, and maintain poor habitat diversity for the RGSM.

Without the removal of non-natives from the Galisteo Creek floodplain the sediment will continue to be sequestered, perpetuating a cobble substrate river bed in this reach, a feature not conducive for RGSM habitat.

#### 2.2.3 Preferred Action Alternative

The proposed action is aimed at enhancing riverine features to accommodate the minnow's needs. Site one will be a low-flow side channel, and site two will be a backwater habitat. Site three is located in the Galisteo Creek floodplain, and is intended to encourage sediment delivery bound by non-native phreatophytes to the Rio Grande.

##### *Site One*

Site one consists of a side channel extending 0.75 miles from its upstream origination to the terminating end. The left bank of the channel is steep, between 2-5 feet high, with minimal undercutting, and is bordered by pasture and bosque. The right bank is characterized by steep to gently sloping banks and is densely vegetated with Russian olive and tamarisk. The substrate of the channel is predominantly sandy with some gravels. The island that has formed between the side channel and the mainstem is approximately 44 acres, 30 of which are dominated by Russian olive and tamarisk. The clearing of the invasive trees on the island will follow a cut stump prescription and Tahoe-4 (Garlon) herbicide application.

The excavation of the channel will be completed with bulldozers and backhoes when the side channel is devoid of flowing water. Upon completion, the channel will be maintained at low (<30cm/s) velocity flows intended to provide RGSM habitat.

Additional habitat enhancements will be made by placing LWD in the channel to maintain slow velocities, and enhance undercutting of the banks, enhancing

desirable mesohabitats. Embayments will be excavated into the banks to create additional nursery habitat. Each individual embayment will be designed to contain a variety of elevations.

The completion of this project will provide quality RGSM in a reach of the river that will continue to remain wet year-round.

#### *Site Two*

Site two is intended to create a 0.25 mile backwater that will serve as year-round habitat for RGSM habitat. The site is an abandoned oxbow that is only inundated at high flows and is approximately 1.1 miles in length. The dominant vegetation in the project area is Russian olive, tamarisk, and coyote willow.

The backwater will be created by excavating the terminating 0.25 miles of the oxbow with heavy equipment. The channel will vary between 10 and 20 feet wide to increase habitat heterogeneity. The mouth of the channel will remain unexcavated until completion. Embayments and scallops will be excavated in to the banks to create nursery habitat and woody debris will be placed in the backwater to enhance habitat features.

A dense thicket of coyote willow has emerged in part of the project area, while excavating the backwater, several hundred coyote willow will need to be removed and replanted adjacent to the channel.

In addition to the transplanting of the willow poles, tamarisk and Russian olive will be cleared forming a 75 foot buffer around the project area. This clearing will total approximately five acres and be completed outside migratory bird season.

#### *Site Three*

Site three is located 1.5 east of the Rio Grande within the floodplain of the Galisteo Creek. Approximately 110 acres of non-native phreatophytes from this area will be extracted. Historically, the Galisteo Creek was a major contributor of sediment to the Rio Grande. Removal of the non-native trees from the floodplain will enable sediment transport to the Rio Grande, vital for RGSM habitat.

Extraction involves removing target trees below the root crown with an excavator equipped with a hydraulic thumb, and piling the extracted trees. Removal of the root system will allow for sediment to be easily moved to the Rio Grande with flows in the Galisteo.

### **2.3 Alternatives Considered but Eliminated from Further Study**

Alternative Project Area: Other abandoned oxbows exist on Santo Domingo Tribal land; however, greater volumes of sediment would need to be removed in order to create the intended habitat conditions of the proposed actions.

There are no other natural occurring side channel habitats that are connected to perennial water flow on Santo Domingo Tribal land, thus, this project has no alternative to consider.

Phreatophyte Removal: Instead of extracting phreatophytes in the Galisteo Creek, a stump-cut prescription could be implemented, however, this method would take several additional weeks to complete, and require the use of large volumes of herbicide one tree were felled. Spraying the trees with an herbicide is an option, however, Tribal Council has deterred the use of aerial application herbicide in such close proximity to the community.

The options analyzed for phreatophyte control allow tree stumps to remain in place, which would continue to restrict sediment transport to the Rio Grande.

## **Chapter 3. AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES**

### **3.1 Introduction**

This section describes the current condition of resources in the project site that may be affected by the Proposed Action. Resources and related topics presented include geology and soils, hydrology, water resources and net depletions, noxious weeds, threatened and endangered species and special status species, cultural resources, Indian trust assets, socio-economic considerations, land use, and environmental justice.

The affected environment is within the Cochiti Reach of the Middle Rio Grande River. The Cochiti Reach extends from Cochiti Dam downstream to the Angostura Dam. This area has been identified by Reclamation and the ISC, as well as the Collaborative Program, as being a reach of the Rio Grande where habitat/ecosystem restoration projects would be highly beneficial to all life stages of the RGSM.

The US Fish and Wildlife Service and the Santo Domingo NRB have evaluated the No Action and the Proposed Action Alternatives. The USFWS was determined that no negative impacts would result from implementation of the Proposed Action.

### **3.2 Description of Relevant Affected Resources**

#### **3.2.1 Geology and soils**

Historically, the shape and pattern of the Rio Grande channel have continuously redefined the spatial distribution of sediments throughout the floodplain.