

1.0 PURPOSE AND NEED FOR ACTION

1.1 INTRODUCTION

The New Mexico Interstate Stream Commission (NMISC) is proposing to implement the *Isleta Reach Riverine Restoration and Habitat Improvements for the Rio Grande Silvery Minnow and Bosque Ecosystem* (project), a river restoration project in sections of the Isleta Reach of the Middle Rio Grande (MRG) from the southern Isleta Pueblo border to the San Acacia Diversion Dam (Figure 1.1). The NMISC is working in collaboration with the Middle Rio Grande Conservancy District (MRGCD) in implementing the *Post-fire Bosque Restoration in the Middle Rio Grande: A Landscape-Scale Approach Towards Revitalization of an Ecosystem*, an ecosystem restoration project funded through a grant proposal submitted to the U.S. Forest Service Collaborative Forest Restoration Program (CFRP). The combined projects will provide benefit for the federally listed Rio Grande silvery minnow (*Hybognathus amarus*; silvery minnow), Southwestern Willow Flycatcher (*Empidonax traillii extimus*; flycatcher), and the Rio Grande ecosystem as a whole. The combined projects, when implemented, will contribute to the Middle Rio Grande Endangered Species Collaborative Program's (Collaborative Program's) goal of meeting the habitat restoration requirements as stated in Element S of the Reasonable and Prudent Alternatives (RPA) in the March 2003 Biological Opinion (2003 BiOp: U.S. Fish and Wildlife Service [USFWS] 2003). This document covers the two separate but collaborative projects between the NMISC and the MRGCD listed above.

The project will build upon the NMISC's previous habitat restoration work in the MRG between 550 Bridge and I-25 Bridge in the Albuquerque Reach. The NMISC's habitat restoration goals for the Isleta Reach include 1) diversifying mesohabitat types, focusing on spawning, egg retention, larval fish, and young-of-year habitat; 2) creating refugial habitat for silvery minnow during prolonged dewatering/no-flow periods in locations that are adjacent to perennial water sources; 3) designing strategic inundation of disconnected bosque habitat to encourage and increase the extent of overbank inundation; and 4) encouraging fluvial processes and river dynamics (SWCA Environmental Consultants [SWCA] 2008a). The project will apply restoration techniques identified in the MRG Habitat Restoration Plan (Tetra Tech 2004) and the Restoration Analysis and Recommendations for the Isleta Reach of the Middle Rio Grande, New Mexico (Parametrix 2008). The project will complement any existing or planned projects in the Isleta Reach to create suitable habitat for the silvery minnow. Lessons learned from the monitoring of previous projects (SWCA 2007a, 2008b, 2008c) were applied to the site selection and the final design of specific habitat restoration projects proposed here.

The CFRP project intends to implement an ecological restoration project in the riparian area adjacent to what was Willie Chavez State Park. A fire in February 2007 burned the approximately 100-acre (40.5-hectare) site and destroyed a large portion of the Rio Grande cottonwood (*Populus deltoides* spp. *wislizeni*) dominated bosque on the west bank of the project area. This area has been identified by the MRGCD as an important restoration area, particularly as it is now subject to invasion by non-native saltcedar (*Tamarix ramosissima*) and Russian olive (*Elaeagnus angustifolia*). The goal of the CFRP project is to restore landscape diversity and ecological integrity of a post-fire riparian forest, provide efficient and effective tools for measuring success of this project and other bosque restoration efforts, demonstrate ecologically sound forest restoration techniques, and communicate those results to a larger public through

educational programs. The CFRP project will enhance work implemented by the NMISC through active vegetation management and ongoing monitoring. Vegetation management will include controlling non-native phreatophytes, restoring native cottonwood riparian gallery forests, and restoring habitat for the benefit of the flycatcher.

This Environmental Assessment (EA), completed in accordance with provisions of the National Environmental Policy Act (NEPA), evaluates potential direct, indirect, and cumulative impacts of the combined NMISC and MRGCD projects to all resources within the project area during project implementation. The project is anticipated to be implemented in early 2009. Further consultation and acquisition of permits would take place, as required, when specific detailed plans for subsequent phases become available.

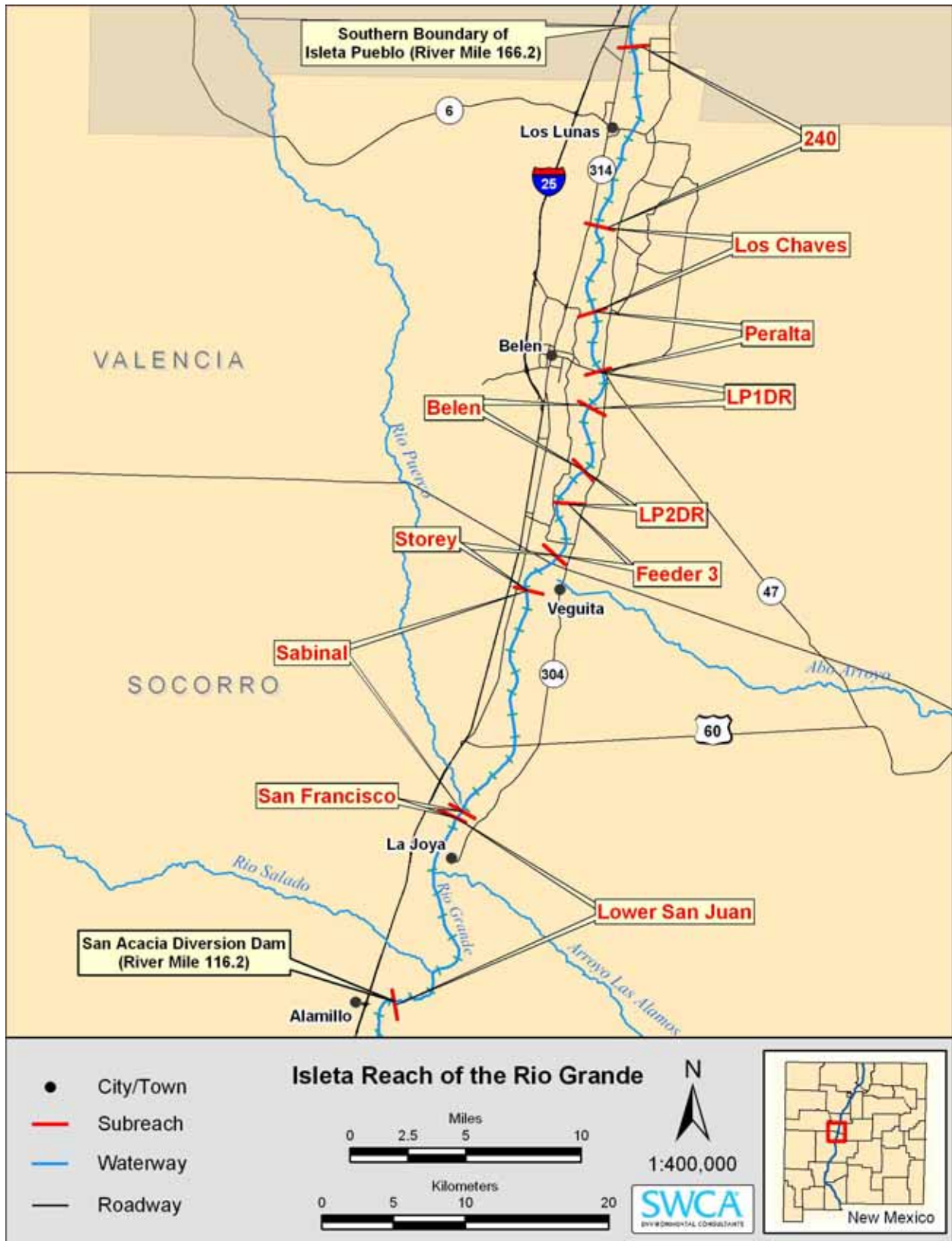


Figure 1.1. Project location map.

1.2 PROPOSED ACTION LOCATIONS

1.2.1 ISLETA REACH

The Isleta Reach of the MRG stretches from the Isleta Diversion Dam south of Albuquerque to the San Acacia Diversion Dam (see Figure 1.1). Here, the Rio Grande is a predominantly sand-bedded channel that has experienced significant channel degradation since the closure of Cochiti Dam. Flood control activities have caused the river to be significantly channelized through the Isleta Reach. The reduced magnitude of peak flows and the presence of non-native phreatophytes have resulted in stabilization of the river planform and disconnection of the channel from its historic floodplain (Mussetter Engineering, Inc. [MEI] 2008). Channel degradation has resulted in a reduced frequency and duration of inundation of bosque lands outside the floodway and the bank-attached and mid-channel bars within the floodway. The resulting changes have caused a loss of habitat required to meet the life stages of the silvery minnow.

A detailed understanding of the specific responses of the river to these changes at each of the identified sites is necessary for successful implementation of habitat restoration measures. Site-specific information on river conditions is developed from a number of investigations of the Rio Grande performed over the past several years, including:

- NMISC's study of MRG bar morphology and dynamics (MEI 2005a).
- Geomorphic and Sedimentologic Investigation of the Middle Rio Grande (MEI 2002).
- Sediment continuity analysis of the MRG funded by the NMISC and the Upper Rio Grande Basin Water Operations Review (MEI 2004).
- U.S. Army Corps of Engineers (USACE) Spring 2005 Inundation Mapping of the Middle Rio Grande (USACE 2007a).
- USACE FLO-2D Modeling (calibrated to the 2005 peak flows) of the Middle Rio Grande (MEI 2005b).
- NMISC Riparian Groundwater Modeling of the Middle Rio Grande Corridor (S.S. Papadopulos and Associates [SSPA] 2003).
- NMISC river flow monitoring in support of fish rescue and biological flow requirements (River Eyes) (SSPA 2005).
- Characterization of silvery minnow egg and larval drift and retention study (SWCA 2007b).
- U.S. Bureau of Reclamation (Reclamation) experimental activities on the MRG (SWCA 2008d)
- Technical Memorandum: Isleta Reach Riverine Restoration Hydrological Analysis and Hydraulic Modeling (MEI 2008).

Designs based on updated hydrological analysis and hydraulic modeling (MEI 2008) were developed for each site restoration treatment. Hydrological analysis included mean daily flow analysis using gage records from the Rio Grande Floodway near Bernardo (U.S. Geological Survey [USGS] Gage No. 08330010) and flood-frequency analysis using flood-frequency values developed by the USACE (2007a). HEC-RAS modeling was used to determine the water-surface

profiles over a range of steady state discharges to determine inundation discharge for islands and bank-attached bars. FLO-2D modeling was conducted using the 250-foot grid to assess the channel capacity, overbank flows, and overbank flow paths at discharges greater than channel capacity. Both models used topographic data, a digital elevation model (DEM), and contour shapefiles obtained from Light Detection and Ranging (LiDAR) topographic data acquired in March 2008. Modeling outputs show a topographical representation of the site before restoration and cross sections of the river channel. These engineering designs take into account potential increased sediment retention in the modified sections of the river as well as potential flow-through velocities and depths.

As shown in Figure 1.2 and Figure 1.3, the two subreaches of the Isleta Reach proposed for restoration/rehabilitation techniques in Isleta Reach Habitat Restoration Phase 1 are the Peralta and Lower Peralta #1 Riverside Drain (LP1DR) subreaches. These subreaches lie within the Los Lunas Subreach and the Belen Subreach, respectively, as defined in the Restoration Analysis and Recommendations for the Isleta Reach (Parametrix 2008). Figure 1.4 shows the burn area MRGCD proposes to remediate. Brief descriptions of the existing conditions in the Peralta and LP1DR subreaches are contained in Sections 1.2.2 and 1.2.3.

1.2.2 PERALTA SUBREACH

The Peralta Subreach (Figure 1.2) is demarcated by the Peralta wasteway outfall at River Mile 152.5 (River Kilometer 245.4) to the north and the LP1DR wasteway outfall at River Mile 149.6 (River Kilometer 240.8) to the south. The approximate subreach length is 2.9 miles (4.7 km). Overbank inundation occurs at approximately 5,000 cubic feet per second (cfs). Level-1 (low-relief bars formed during recessional flows) and Level-2 bank-attached bars (bars formed by additional deposition onto Level-1 bars) give the appearance of a meandering, single-thread channel within a well-defined channel. Islands appear to be primarily Level-1 (formed from linguoid bars during recessional flows) and Level-2 braid bars (formed from vertical accretion of sand onto Level-1 braid bars) with a few stabilized mid-channel bars. The river channel throughout this subreach has a nominal 600-foot (183-m) channel width as designed under Reclamation's Middle Rio Grande Project. This subreach has intermittent flow during irrigation season due to influx from the Peralta wasteway (SSPA 2005). The bosque through this subreach has been affected recently by fire and has also had forest clearing activities to minimize future fire potential. This subreach also includes a small wetland area on the west side of the river called "Boys Pond," which is managed by the MRGCD. Within this subreach, the following modifications are being proposed:

- Increase mesohabitat diversity, focusing on egg retention, larval fish, and young-of-year (e.g., backwater, embayments, and bankline terrace creation).
- Create low-flow refugia by creating in-channel pools (created and maintained with large woody debris [LWD] or other physical structures) to provide dewatering/no-flow habitat.

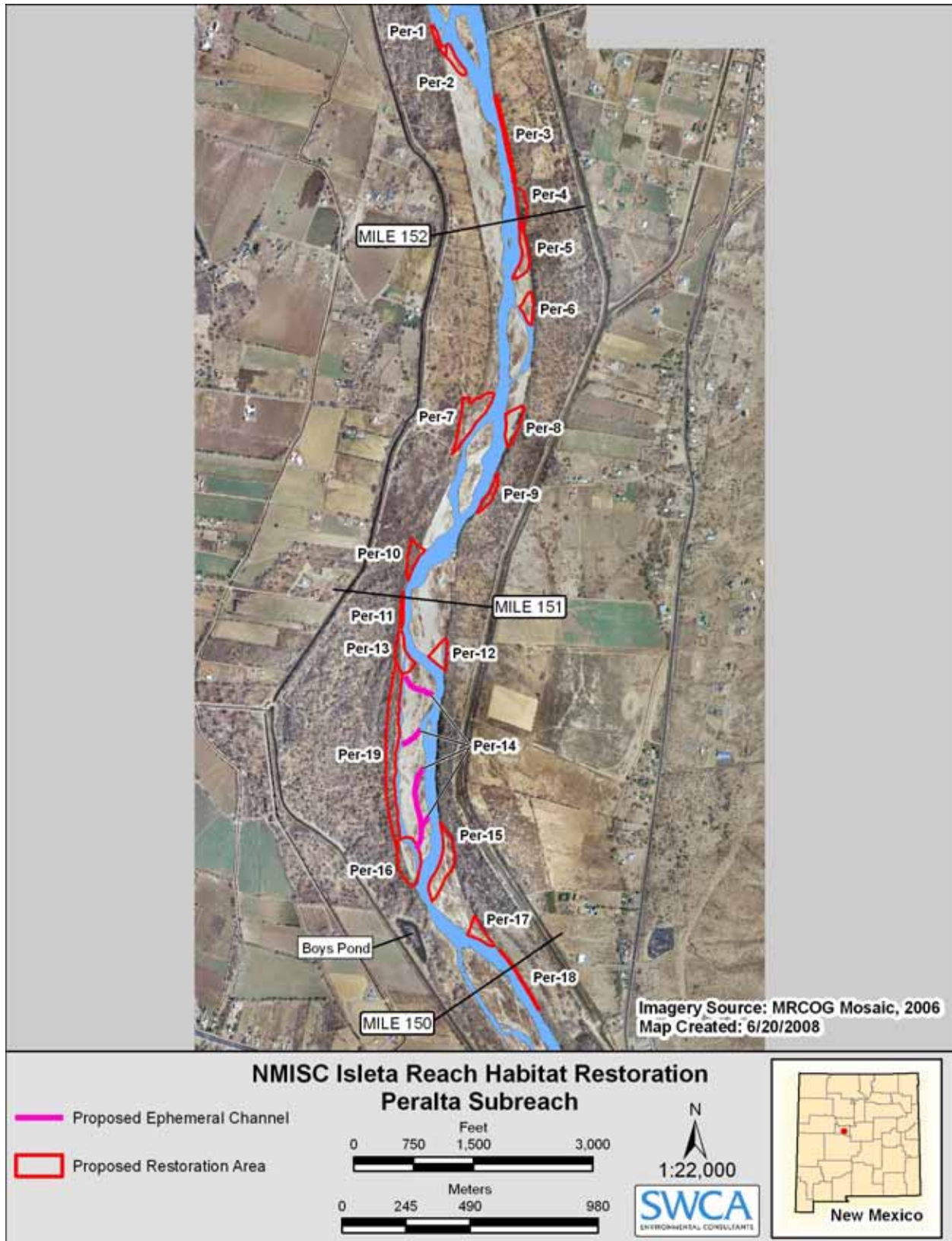


Figure 1.2. Peralta Subreach restoration sites.

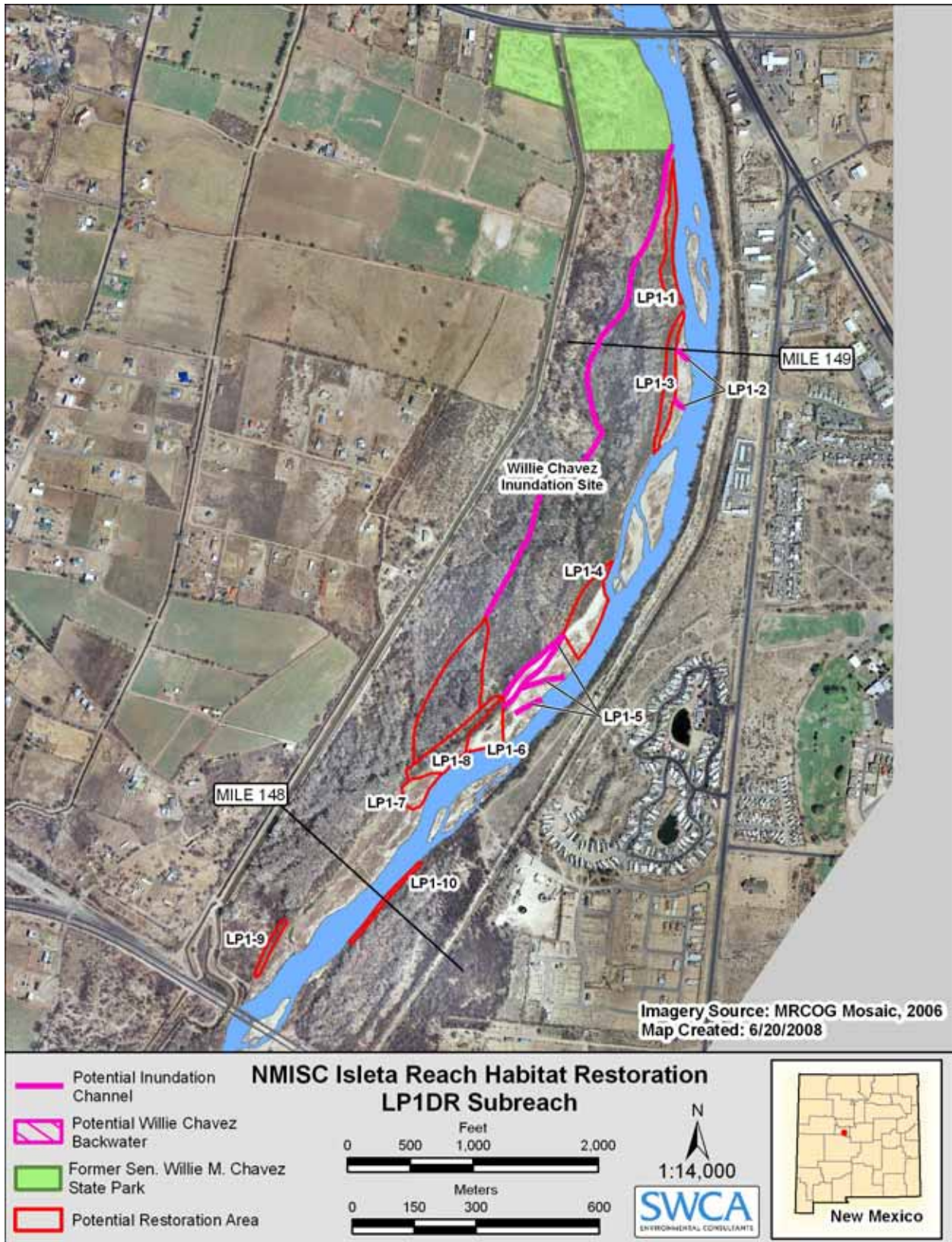


Figure 1.3. LP1DR Subreach restoration sites.

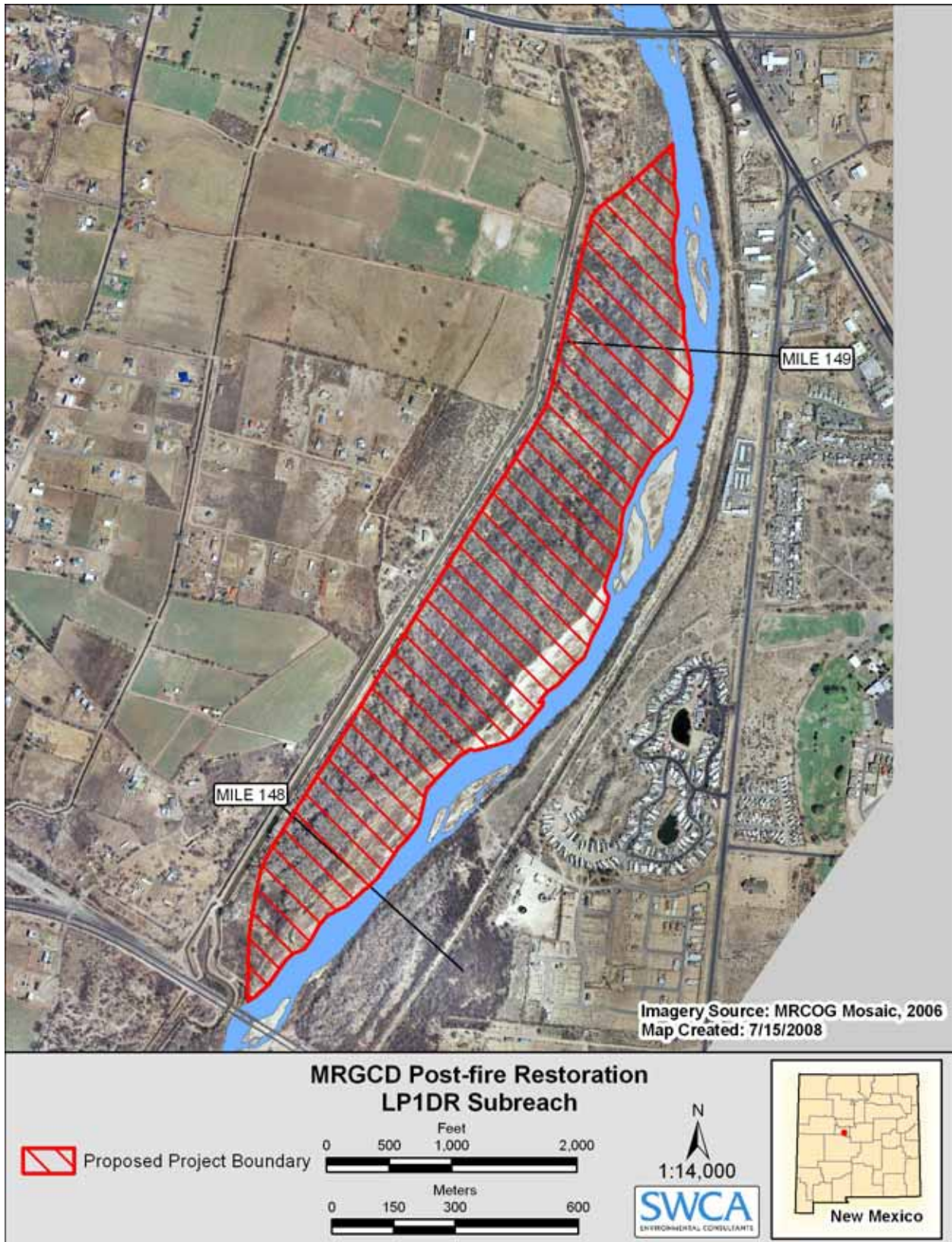


Figure 1.4. Boundary of MRGCD's proposed project and burn area.

1.2.3 LP1DR SUBREACH

The Lower Peralta #1 Riverside Drain Subreach (see Figure 1.3) of the MRG valley is demarcated by the LP1DR outfall at River Mile 149.6 (River Kilometer 240.8) to the north and the Belen Riverside Drain outfall at River Mile 147.7 (River Kilometer 237.7) to the south, a distance of 1.9 miles (3.1 km). This subreach is generally a braided channel at flows less than 400 cfs. Overbank inundation occurs at approximately 5,000 cfs. The active river channel has migrated to the east bank levee as the channel bends from the east to the southwest. There is a significant point bar along the west side river bank for over half of the subreach length (a Burlington Northern Santa Fe railroad bridge demarcates the southern boundary of this subreach). The large west side bosque area, including the aforementioned point bar, experienced a wildfire in 2007 and has undergone subsequent vegetation management by local agencies as a response. Within this subreach, the following modifications are being considered:

- Alleviate stresses on east river bank through the modification of the migrating point bar and associated banklines.
- Increase inundation of floodplain west of the Rio Grande and east of the flood control levee.
- Increase mesohabitat diversity, focusing on egg retention, larval fish, and young-of-year (e.g., backwater, embayments, and bankline terrace creation).
- Create low-flow refugia by creating in-channel pools (created and maintained with LWD or other physical structures) to provide dewatering/no-flow habitat.
- Restore the burned portions of the bosque in the LP1DR Subreach with native tree and shrub plantings, especially willow (*Salix* spp.) and willow baccharis (*Baccharis* spp.) species.
- Restore riparian habitat for the benefit of the flycatcher.

1.3 PURPOSE AND NEED

The Proposed Action is needed to satisfy federal requirements under the 2003 BiOp. The 2003 BiOp requires the funding and collaborative execution of habitat restoration projects on the MRG that will improve survival of all life stages of the endangered silvery minnow, as specified in RPA Element S:

In consultation with the [U.S. Fish and Wildlife] Service and appropriate Pueblos and in coordination with parties to the consultation, action agencies shall conduct habitat/ecosystem restoration projects in the Middle Rio Grande to increase backwaters and oxbows, widen the river channel, and/or lower river banks to produce shallow water habitats, overbank flooding, and regeneration stands of willows and cottonwood to benefit the silvery minnow, the flycatcher, or their habitats. Projects should be examined for depletions. It is the Service's understanding that the objective of the action agencies and parties to the consultation is to develop projects that are depletion neutral. By 2013, additional restoration totaling 1,600 acres (648 hectares) will be completed in the action area. In the short term (5 years or less), the emphasis for silvery minnow habitat restoration projects shall be placed on river reaches north of the San Acacia

Diversion Dam. Projects should result in the restoration/creation of blocks of habitat 24 hectares (60 acres) or larger. (USFWS 2003:95–96)

The project consists of the application of several alternative restoration/rehabilitation techniques designed to create aquatic habitat in the two subreaches: Peralta Subreach and LP1DR Subreach (see Figure 1.1). The goal of the project is to enhance the availability and condition of spawning and egg retention, larval rearing, young-of-year, and over-wintering habitat for silvery minnow in support of RPA Element S. The objective of the restoration process is to increase measurable habitat complexity in support of various life stages of silvery minnow by providing slackwater habitat and facilitating lateral migration of the river across bars and riverbanks during various mid-level and high-flow stages. The project would be implemented with construction starting in late fall 2008 and continuing through spring 2009. Specific restoration treatments would be implemented, monitored, and evaluated to inform the restoration plans of future phases. Phase 1 of the Isleta Reach Habitat Restoration Project will be implemented in the Peralta and LP1DR subreaches (see Figure 1.2–Figure 1.4). Additional phases would be implemented in downstream subreaches.

Evidence derived from habitat remediation work conducted by the NMISC in the Albuquerque Reach of the MRG suggests that silvery minnow habitat goals can be met by 25 days of inundation based on conservative estimates for egg and larval maturation (MEI 2006). Accomplishing these goals will require: 1) the creation of backwaters and embayments to create slackwater areas; 2) the reduction in height of banklines, bank-attached bars, and islands; and 3) the creation of ephemeral high-flow channels to carry water into hydrologically disconnected overbank areas and bank-attached bars and islands. These actions will result in redistribution of river sediments into geomorphic units (mesohabitats). Further, the jetty jack lines that are so predominant throughout the project area have contributed to the disconnection of overbank areas from the active channel. Natural levees have built up around the jetty jack lines as the river drops sediment during the receding limb of the hydrograph. Natural levees result from overbank flood sedimentation and develop where there is an abrupt reduction in flow velocity, such as around jetty jacks, resulting in immediate deposition of coarser sand and silt (Hudson 2005). These natural levees reduce the connectivity between the river channel and the floodplain. The deposition of nutrient-rich sediments around the jetty jacks, as well as the accretion of similar sediments on the river banks adjacent to the jetty jacks, provide ideal conditions for the colonization of these areas by non-native vegetation, particularly Russian olive. The colonization of these areas by dense vegetation causes additional decreases in flow velocities, further increasing the deposition of sediment along the channel margins. This positive feedback loop relationship further decreases the connectivity between the channel and adjacent floodplain through increasing the bank elevation. Therefore, it is unlikely that flows under the current hydrological conditions will provide the shear stress required to remove vegetation and permit lateral reworking of the existing in-channel and channel-margin bars and islands. Mechanical intervention is required to initially form and maintain desirable silvery minnow spawning and refugia habitat supporting the life cycle of the species.

1.4 ISSUES

1.4.1 ECOLOGICAL VALUES

The Rio Grande floodplain, including the riparian corridor (bosque) and river channel, is highly valued by the residents of Belen and all of New Mexico for its natural beauty, recreational opportunities, importance as a refuge for birds and other wildlife, and the presence of rare and protected species. The floodplain provides numerous ecosystem services to all citizens of New Mexico (Costanza et al. 1997). The project areas are located within the boundaries of the MRGCD.

1.4.2 ECONOMIC COMMITMENTS FOR ENDANGERED SPECIES RECOVERY

The 2003 BiOp requires the funding and collaborative execution of habitat restoration projects to improve survival of all life stages of the silvery minnow and the flycatcher to aid in their recovery. Reclamation has been the primary source of federal funding for the Collaborative Program, which has approved federal funding for this project through its proposal process. The State of New Mexico is managing the project and is contributing funding as part of a non-federal cost share for the Collaborative Program. Additionally, the MRGCD and their project partners are contributing non-federal funds. A summary of funding is presented in Table 1.1.

Table 1.1. Funding Allocation Table

Funding Source	Non-Federal	Federal
NMISC	\$350,000	–
Collaborative Program	–	\$550,000
MRGCD	\$174,100	–
CFRP	–	\$360,000
Total	\$524,100	\$910,000

1.4.3 NET WATER DEPLETIONS

The 2003 BiOp, the Collaborative Program, and/or the New Mexico Office of the State Engineer (NMOSE) require that proposed projects demonstrate that they will not result in any increases in net water depletions or that any increases are offset by releases of stored water or purchased or leased water rights, and that the Collaborative Program comply with state water laws (see NMOSE Restoration Offset Policy presented in Appendix A). In-stream formations within the nominal 600-foot (183-m) channel width (the original river channel design width for this reach to maintain flow delivery efficiency and reduce flood risk) are considered by the NMOSE to be dynamic aspects of the channel. Therefore, no depletion offsets are required for riverine restoration work within the nominal channel width. Restoration work in the floodplain that is outside the nominal channel width would be subject to the depletions offset requirement.

1.4.4 BURNED AREA RESTORATION

A large bosque wildfire in 2007 burned a 700-acre (283-hectare) area of the bosque south of the Belen Bridge (Figure 1.5). Approximately 100 acres (40.5 hectares) of the project area controlled by the MRGCD were severely affected. This fire removed large areas of the overstory and understory vegetation, with some of the most severely burned areas now characterized by standing dead Rio Grande cottonwood and limited herbaceous understory. This poses an extreme erosion risk for the bosque area and reduces native biodiversity of plants and animals. The substrate has also been exposed to invasion by non-native species. Rapid colonization by saltcedar and Russian olive has already begun throughout the site, most particularly in the areas that are adjacent to unburned portions. The MRGCD and New Mexico State Forestry are implementing reduction of hazardous snags and fuels in the area that pose a risk to the public; such fuels reduction efforts will also lower potential fire risk. The MRGCD is also engaging in forest restoration in this area funded through a U.S. Forest Service CFRP grant. MRGCD plans to reduce hazardous fuels, including non-native trees and dead wood, and restore key natural processes on the site, such as seasonal flooding and soil wetting, to increase biodiversity with a goal of making the site a self-sustaining native ecosystem. The projected outcome will be a reduction in the intensity of future fires by creating a diverse mosaic of vegetation patches across the site, which will result in 80% native species plant cover and increased habitat diversity. The project area has also been the focus of four Bosque Ecosystem Monitoring Program monitoring sites.



Figure 1.5. Impact of the fire in the bosque just south of the former Willie Chavez State Park.

1.5 RELEVANT STATUTES, REGULATIONS, AND OTHER PLANS

The Proposed Action does not conflict with any known state or local planning or zoning ordinances. The Proposed Action would also be required to conform to the provisions of Section 7 of the Endangered Species Act (ESA) and the Migratory Bird Treaty Act (MBTA) as administered by the USFWS, and Section 106 of the National Historic Preservation Act (NHPA) as administered by the New Mexico State Historic Preservation Office (SHPO). Compliance with Sections 401, 402 and 404 of the Clean Water Act (CWA) will also be required.