

Conceptual Restoration Plan Active Floodplain of the Rio Grande San Acacia to San Marcial, NM

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Overall Project Summary

The goal of this project is to develop a comprehensive restoration plan for the Rio Grande reach from San Acacia to San Marcial. The plan will include a vision statement of the evolution of the river environment with implementation of the restoration plan.

The plan is divided into five phases:

- I. Data collection and Analysis
- II. Specific River Issues
- III. Development of the Restoration Concepts and Strategies
- IV. Development of the Restoration Plan for the Riparian Corridor
- V. Preparation of Monitoring Program

Phase I has been completed. Specific tasks accomplished in this phase included:

- ✓ Project Coordination
 - Contract signed with Consultant (Tetra Tech, ISG) for Phases I & II – April 2002
- ✓ Establishment and Initial Contact with Oversight Committee
 - Project Kickoff meeting held at Sevilleta NWR June 2002
- ✓ Reach Reconnaissance and Photographic Compilation
 - Site visits, including videography, May/June/July 2002
- ✓ Prepare Working Base Maps
- ✓ Comprehensive Project Bibliography Completed
- ✓ Delineate Sub reaches
- ✓ Initiate Existing Data Collection and Identify Known Data Gaps

- ✓ Integrate with Federal and State Agencies – Distribute and Discuss Work Plan
- ✓ Identify Potential Access Limitations and Contact Landowners □ Review GIS Data Bases and Identify Project GIS Objectives
- ✓ Prepare Fluvial Geomorphic Scope of Work and Review Existing Analysis
 - Cross Section AGG/Deg Analysis
- ✓ Review Existing Habitat Data Bases, Inventories and Mapping
 - Data gathered from FWS, NMNHP, UNM, USBR, COE
- ✓ Phase I Findings – Oversight Committee Meeting July 2002

Phase II tasks are currently being worked on with a projected completion date of October 30, 2002. Specific tasks underway in this phase include:

- ❖ Identify Sub reaches That Have Narrowed
- ❖ Examine the Performance of Existing Restoration Sites
- ❖ Locate Potential Restoration Sites and Prepare GIS Mapping
- ❖ Create a List and Description of Potential Restoration Techniques and Methods
- ❖ Perform Initial Site Selection and Identify Limiting Issues
- ❖ Identify Required Site Hydraulic and Geomorphic Analyses and Data Gaps
- ❖ Conduct FLO-2D Simulation of Current Conditions and Review Flood Inundation Areas
- ❖ Describe Riparian and Aquatic Habitat Conditions

- ❖ Identify Restoration Goals and Objectives for Habitat Enhancement
- ❖ Review Alternative Restoration Opportunities for Each Site and Create GIS Habitat and Restoration Mapping Tools

At the end of phase I Tetra Tech produced a report on its findings. A summary is included below.

Phase I of the conceptual restoration plan for the Middle Rio Grande reach from San Acacia to San Marcial involved an investigation of the existing data and publishes information on the river and riparian ecosystem. The intent was to compile a database and library of reference material to support future conceptual restoration designs. One of the purposes of the Phase I investigation was to explore river restoration of



the Middle Rio Grande river considering hydrology, morphology and vegetation composition. Understanding channel morphology and the changes that occurred in response to water and related land resource development would serve as a basis for exploring restoration opportunities. Such opportunities may take the form of providing a greater range of flow regimes, returning to a higher level of river dynamic behavior, removing constraints on channel processes such as invasive vegetation, expanding the active floodplain, increasing channel connectivity, physical reformation of the channel geometry, enhancement of the

riparian system and management of the sediment loading.

Historically the Rio Grande had a natural cycle of removal and regeneration of native plant communities with flooding and channel migration. Cottonwood bosques of varying age classes fell victim to channel migration and beaver activity. Woody debris provided coverage and habitat in the river channel. Large flood events filled the valley with ponded water. It is apparent that the wetlands, marshes, open scrublands, alkali flats and meadows were a significant portion of the floodplain community when the Spanish arrived.

With the beginning of agriculture in the Rio Grande valley about 1,500 years ago, the native vegetation composition and distribution were altered. Landscape fragmentation occurred with deliberate fires and cropland clearing. As a result our knowledge of the historic “natural” Rio Grande floodplain is only anecdotal. Increasing populations (both Pueblo and European) and land cultivation were accompanied by expanded irrigation systems that gradually decreased flows in the system. Eventually upstream reservoir storage attenuated flood peaks and the channel morphology was altered. The riparian vegetation regenerative processes were curtailed as flooding became infrequent, mistimed and of shorter duration. Prominently missing in the river’s hydrologic cycles are the destructive flows that initiated channel migration and bank erosion to remove trees. Gone are the spring flood flows that created the wet substrate in large open areas for germination of native riparian plant species. In response to decreased flooding and reduced sediment loads, the channel has narrowed and the floodplain has become dominated by non-native salt cedar.

Based on a final assessment of the historical vegetation composition and an analysis of the existing sediment load and flow regimes, a restoration plan will be formulated that includes improving river-floodplain hydrologic connectivity, increasing the cottonwood/willow bosque and creating wetlands, marshes and salt grass meadows. In terms of the channel

dynamics, a flow regime within existing administrative, legal, and physical constraints will be formulated to sustain a prescribed active channel. The restoration plan will optimize the active channel width-to-depth ratio and channel-floodplain connectivity on a reach-by-reach basis. The plan will consider potential future sediment yield scenarios, the linkage between load and channel form, future aggradation and degradation trends, equilibrium slope, and cross section variability. An adaptive management plan and channel maintenance flows will be proposed.

In phase II, two important channel morphology and hydrology issues will be addressed. The first issue is the long-term decrease in the sediment load at San Acacia. Higher and more frequent discharge without a

corresponding increase in sediment supply would exacerbate channel incision and reduce potential flooding. The second issue in the form of a question is: How much flooding and what frequency of flooding are needed to limit the encroachment of exotic vegetation in the riparian zone? What flow patterns would benefit native plants? Currently we are field checking our databases and updating data files for the restoration modeling effort. This includes recent channel surveys and levee elevations. One of the issues that is being investigated is possible channel morphology constraints on restoration concepts in different reaches of the river related to channel incision, long term aggradation and possible levee breaching schemes.