RIO PUERCO MANAGEMENT COMMITTEE
Creating a Healthy Watershed Through Collaboration

Watershed Restoration Action Strategy (WRAS)

for the

Rio Puerco Watershed

Prepared by the
Rio Puerco Management Committee
Albuquerque, New Mexico

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INTRODUCTION

The Federal Clean Water Action Plan (CWAP) of 1998 was developed to help meet the goals of the Clean Water Act through state-led cooperative efforts. These efforts attempt to identify and prioritize watersheds with water quality concerns. Consequently, the New Mexico Unified Watershed Assessment (1998) was conducted by a statewide task force in response to the actions mandated in the CWAP. New Mexico's Unified Watershed Assessment identified 21 out of New Mexico's 83 watersheds as "in need of restoration" (Category I). The Rio Puerco Watershed is included as a New Mexico Category I watershed.

This Watershed Restoration Action Strategy (WRAS) for the Rio Puerco Watershed is a comprehensive planning document with a focus on restoring and protecting the health of water bodies that are impaired in this Category I watershed. The WRAS is a required product of the CWAP process, and has been developed for a variety of planning, reporting, and funding purposes by the Rio Puerco Management Committee.

This WRAS contains the following components:

- A description of the Rio Puerco Watershed and water bodies of concern and a profile of the Rio Puerco Management Committee, the authors of this plan.
- The public outreach structure and methods that have been, and continue to be used to engage and maintain public involvement including local, state, federal, and tribal governments.
- Monitoring and evaluation activities based on water quality and other goals and outcomes needed to refine the problems or assess progress towards achieving these goals.
- The specific water quality problems to be addressed, the sources of pollution, and the relative contribution of sources.
- A blueprint of the actions to be taken and desired water quality, natural resources, socioeconomic and other goals and outcomes, i.e., implementation of pollution control and natural resource restoration measures.
- A schedule for implementation of restoration measures and identification of appropriate lead agencies or cooperators to oversee implementation,

maintenance, monitoring and evaluation.

- Funding needs to support the implementation and maintenance of restoration measures.

Watershed Setting/Water Quality Concern

The Rio Puerco Watershed, in west central New Mexico, is the largest tributary to the middle Rio Grande Basin. The major drainages in the watershed are the Rio Puerco, Arroyo Chico, and the Rio San Jose. The Rio Puerco basin includes nine large physiographically defined subwatersheds, draining portions of seven counties, west of the greater Rio Grande Basin in northwest and west-central New Mexico. Originating along the eastern edge of the Continental Divide, the watershed encompasses approximately 7,350 square miles (4.7 million acres/over 1.9M hectares) that contribute flow to the Rio Grande at Bernardo, NM (see map). The geological setting dominantly involves relatively soft sedimentary strata, intruded and capped by younger volcanic rocks. The watershed has been studied in great detail by a variety of noted investigators including geologists, geomorphologists, habitat and range management specialists, social scientists, and others.

The Rio Puerco has acquired a worldwide renown as a severely impacted and degraded watershed, synonymous with accelerated erosion processes. While the watershed contributes less than 10 percent of the total flow, it is a primary source of sediment to the Rio Grande, contributing a disproportionately large percentage of silt and debris to that system.

Rio Puerco Management Committee

The Rio Puerco Management Committee (RPMC), based in Albuquerque, New Mexico, is a collaborative watershed organization established by Congress through the *Rio Puerco Watershed Act*, Section 401 of the *Omnibus Parks and Land Management Act of 1996.* The RPMC was formed in February 1997, building on an initiative begun by the Rio Puerco Watershed Committee, a locally led stakeholders group based in Cuba, New Mexico. Passage of the Rio Puerco Watershed Act formalized an organization to carry out a broad-based, collaborative effort to restore and manage the watershed. RPMC membership includes state, federal, and tribal agencies, soil and water conservation districts, representatives of county government, residents from the rural communities within the watershed, environmental and conservation groups, and the public-at-large.

conditions/reaches/areas will be identified and monitored to serve as goals for restoration and protection. The success of our projects will depend on the continued implementation of restoration activities and maintenance of completed projects. A long-range monitoring program will assure that project activities are tracked and evaluated beyond the implementation of individual projects. Milestones will keep us on track for restoring the watershed.

Our monitoring plan includes the development of individual project monitoring plans. Technical assistance for the development of project monitoring plans by project proponents will be in the form of periodic workshops conducted by the RPMC Monitoring and Compliance Sub-committee. The workshops will be open to the public and will focus on how to develop a monitoring plan. We propose to use the Quality Assurance Project Plan for Water Quality Management Programs 2001 produced by the Surface Water Quality Bureau of the New Mexico Environment Department as a basis for our training sessions. Other monitoring procedures will be evaluated and accepted by the sub-committee.

Appropriate monitoring techniques will be chosen to produce valid data that reflects both the successes and shortfalls of the projects. Before project implementation, baseline conditions will be established and monitored. A monitoring schedule will be developed based on the type of project and timing of implementation. Project proponents will report monitoring results in quarterly reports to be submitted to the RPMC Monitoring and Compliance Sub-committee for technical review and tracking. Funding for the monitoring component of individual projects will be included in the grant request.

There are some basic needs that must be met for our monitoring plan to be successful. First, we need continuous database management. This is to ensure that monitoring efforts are coordinated to meet the needs of agencies and stakeholders and to maximize the usefulness of the data obtained. Second, we need to establish a cadre of trained monitoring volunteers to help with projects and to help establish baseline conditions throughout the watershed. Third, we need to create a library of monitoring resources for project proponent's use for developing their monitoring plan. Fourth, we would like to develop an information hotline possibly through the creation of a Rio Puerco web page and through a column in the RPMC newsletter. The hotline would provide a means for stakeholders to access data and provide monitoring updates. Fifth, with the first four needs in place, we would hold regular monitoring task force meetings to sustain the monitoring initiative and to ensure that enough people and resources are available to continue monitoring.

The implementation of this monitoring plan will produce the following results:

- It will help us meet the goals of the Rio Puerco Watershed Act of 1996 and the commitments associated with any funding we obtain for Rio Puerco restoration

activities.

- It is essential for evaluation of the effectiveness of Best Management Practices (BMPs) to produce long-term benefits and to reach project goals.
- We will have hard data to show successes of project implementation.
- Collection of these data will improve our understanding of processes that cause resource degradation, social deterioration and financial losses in the Rio Puerco Watershed.

Compliance and Project Evaluation

The goal of our compliance review plan is to meet project objectives within a scheduled timeframe; to ensure the use of available funding effectively and consistently with the stated project implementation plan; to ensure continued suitability of BMPs to achieve resource restoration and protection during implementation of the project; and to guarantee maintenance of installed BMPs and completed projects.

The Monitoring and Compliance Sub-committee has committed to continuous involvement in compliance review. The compliance plan involves the assignment of a three-person RPMC compliance review team to be assigned to each individual project to monitor compliance to the project proposal and goals. The compliance review team and project proponent will meet initially to review compliance expectations, including completion of any National Environmental Policy Act (NEPA) and State Historic Preservation Act requirements. A site inspection by the compliance review team would occur within the first six months after project initiation. The compliance review team will then set up a schedule of additional field reviews as needed. The project proponent will submit quarterly reports describing actions, finances, and project progress. A final report will be required at project completion.

With the help of the Monitoring and Compliance Sub-committee, the compliance review team would be responsible for recommendations regarding project amendments, additional funding, project termination, or continuing phased and multi-year projects. The recommendations would then be made to the RPMC for consideration and future planning. Project proponents will be expected to include funding needs for compliance reporting as part of each grant.

The expected results of the compliance plan are the following:

- Compliance with the National Environmental Policy Act and other pre-project requirements.
- Completion of approved projects as proposed.
- Continued maintenance of installed projects and other long-range commitments.

- Financial accountability of project proponent.
- Documentation of what works.

SECTION 3 -- DEFINING SPECIFIC WATER QUALITY PROBLEMS

The Rio Puerco Watershed, defined under the United States Geological Survey Hydrologic Unit Codes 130204-130207, is divided into two primary stream segments by the current version of the New Mexico Water Quality Control Commission's (WQCC's) *"State of New Mexico Standards for Interstate and Intrastate Streams"* (October 2000). Segment #2-107, the perennial reach and tributaries to the Upper Main Stem (UMS) of the Rio Puerco gather headwaters from the western edge of the Nacimiento Mountains (see attached maps). Segment #2-107 also includes the Rio San Jose, on the western side of the watershed, with tributaries emanating from the San Mateo and Zuni Mountains. In addition, the state-listed area includes segment #2-105, the intermittent or ephemeral flow (generally the central and southern areas of the watershed) below the perennial reaches of the Rio Puerco, which enters the main stem of the Rio Grande.

Several reaches of the Rio Puerco and its tributaries are listed as impaired, that is, they fail to fully meet the stream's designated uses. These are defined in *Water Quality and Water Pollution Control in New Mexico*, Appendix B - the State's 305(b) Report (2000), and in the 2000-2002 *State of New Mexico CWA Section 303-D List for Assessed Stream and River Reaches*. These documents list non-attained uses for individual perennial to intermittent reaches including the Rio Puerco, Nacimiento Creek, Rio San Jose, La Jara Creek, San Pablo Creek, Rito Leche, Rito de Los Piños, Bluewater Creek, Rio Paguate, and Rio Moquino. Current designated uses for coldwater fishery, and a select reach designated as a high quality coldwater fishery, are listed under categories ranging from "impacts observed" to "partially supporting" to "nonsupport." The Rio San Jose's listed reach has a drinking water source (DWS) designation, and tributaries to the Rio Puerco UMS are known to provide water for irrigation purposes. The monitored or evaluated impairments of concern include temperature exceedances, stream bottom deposits, plant nutrients, metals, turbidity, dissolved oxygen, and pH. These effects are largely due to a lack of vegetative density and diversity in a region of high erosion potential and impacts resulting from habitat alteration, agriculture, rangeland impacts, resource extraction, reduction of riparian vegetation, streambank destabilization, and road maintenance activities. The total effected stream reach is listed at 223.1 miles (359 kilometers) in state documents, but the UWA prioritization listing is currently focused on a total of 119 stream miles (191.5 km).

The region has historically been used for agriculture, grazing, logging, mining, and a wide range of recreational purposes, and though relatively sparsely populated, the encroachment of urban development is increasing. Presently, agriculture is the dominant watershed-wide activity. The specific causes of watershed decline result from

the combination of these land uses and their impact on a relatively vulnerable landscape. The listed causes are reflected in the RPMC's stated watershed restoration priorities, and they essentially define the general targets for improvement that this WRAS is pursuing. Specific sites for project implementation (within certain prioritized subwatersheds, as described below) are still being identified.

Subwatershed Prioritization

The RPMC, presently the region's most active and influential watershed organization, is conducting a thorough analysis of the condition of the lands in this watershed as part of their ongoing restoration initiative. A direct effort has been put into characterizing the truly influential ambient, environmental, or land management factors affecting this watershed. This is expected to lead to a recognition and prioritization of locations, natural setting, and management practices contributing to the watershed's present impacted condition. The prioritization effort was organized by a technical subcommittee composed of staff from the USGS, NMED, BLM, NRCS, the Navajo Nation, and interested residents. A comprehensive approach was taken to define the watershed's physical condition by delineating its geologic, geomorphic, and vegetative settings, and the microclimatic subdivisions in the watershed for the purpose of comparing distinct subwatersheds. Land management, social, and cultural factors are being evaluated, as well.

Initially, a watershed hierarchy was defined for the region. This incorporates the graphic subdivision of the watershed as presented in Attachment 3. The example shown below describes the hierarchy for the Rio Puerco Watershed, specifically at the site of the Highway 44/ Rio Puerco Stream Restoration Project:

Watershed Hierarchy

Region:	American Southwest
Provinces:	Southeastern Colorado Plateau (along transition zone to E. Basin and Range)
River Basin:	Rio Grande Basin
Subbasin:	Middle Rio Grande
Watershed:	Rio Puerco
Subwatersheds:	Upper Main Stem
Drainage:	Rio Puerco-La Ventana Reach
Site:	Rio Puerco at La Guzpa Canyon / "Two Bridges Riparian Enclosure"
Surveyed Location:	Sections 17-20, Township 19 North, Range 1 West (New Mexico Principal Meridian); Sandoval County, New Mexico

As a primary step, the RPMC researched how and where the land's natural components, past or present management practices, and current land use or development is directly contributing to the degraded watershed's condition. Data and graphic information was gathered from a wide variety of existing sources (geologic, soil, erosion and vegetation maps, professional papers, agency files, precipitation data, previous Rio Puerco studies); and new surface geology and vegetation information was generated via USGS satellite photo studies. The prioritization progressed by focusing

on some or all of the following factors (with *Preferred Conditions* underlined):

- Dense versus sparse **vegetative cover**, taking into consideration the dominant type of vegetation, its appropriateness for altitude and slope aspects, high vs. low species composition, and diverse vs. limited age-class distribution;
- Presence or absence, and health of **riparian habitat**;
- High versus low percentage of **bare ground**;
- **Geologic surface units** (soil, residuum or bedrock) that are either susceptible to or resistant to erosion;
- High or low density, and proper or poor condition of **roads**;
- Favorable or degraded condition of **woodlands**;
- Good or poor **water quality** (and the types of conditions impacting streams and spring sources).

The RPMC's prioritization effort incorporated consideration of additional social, political, and cultural conditions recognized by the region's residents. The process also put an emphasis on analysis of the listed impairments and causes of pollution identified in state and federal water quality documents. The greatest opportunities to protect water quality obviously occur in the headwaters regions where perennial to intermittent streams are developed.

Locations rising to the top of the prioritization list were found to be at a relative disadvantage when compared to regions displaying some or all of the preferred conditions. As an additional intangible consideration, our prioritization was tempered by the advice and opinion of knowledgeable local residents regarding areas that are deemed likely to provide valid restoration opportunities. They suggested locations that might have an increased likelihood of gaining local consent and participation and contributed their knowledge of a landowner's current management practices and willingness to alter management styles in order to seek improvements. This information was combined with the technical determinations of where ground conditions appear to be conducive to restoration (not too far impacted to expect improvement) and areas with a seasonal precipitation regime supporting revegetation and restoration efforts. In other words, the RPMC does not believe it can support developing projects in areas where a combination of factors make it unlikely that our efforts could succeed.

After beginning with an effort to generate individual restoration projects across the entire 4.7M acre watershed, the RPMC was advised to concentrate efforts on a smaller, better defined, and more manageable region. This prioritization has led us to focus on an area of approximately 595,000 acres comprising the Upper Main Stem and Torreon Wash subwatersheds. Taking additional steps, these two subwatersheds are being further evaluated to identify the most important sites for restoration project work in individual targeted drainage systems (see maps 2 and 3).

In light of the area's natural conditions, the project efforts we intend to implement are expected to result in improvements to the physical setting and the management of these lands. Project efforts will focus upon improvement of water quality, vegetative diversity and soil stability. These are perceived to be vital elements to achieving measurable watershed restoration and improvement.

SECTION 4 -- ACTIONS TO BE TAKEN AND DESIRED WATER QUALITY GOALS AND OUTCOMES

Background

The Rio Puerco Watershed Act grew out of the work begun by the Rio Puerco Watershed Committee, a subcommittee of the Cuba Region Economic Development Board that was established in 1993. Within the first three years, using funding provided by US Department of Agriculture (USDA), the committee sponsored a riparian pole planting, acequia improvements, and over 12,000 acres of aerially applied tebuthiuron treatments to control sagebrush.

During this period, the Bureau of Land Management (BLM) was actively pursuing watershed restoration projects in the Rio Puerco. These included construction of check dams, repair of large detention dams, riparian restoration efforts, reforestation of ponderosa pine sites, encouraging grazing management practices, and sagebrush control. Since 1985, BLM has treated over 49,000 acres of sagebrush and improved over 850 acres of riparian habitat.

In the early 1990's, The U. S. Forest Service Rocky Mountain Forest and Range Experimental Station in Albuquerque released several studies of the vegetation and soils of the upper Rio Puerco.

Also in 1993, the Bureau of Reclamation began a review and a new study of the impact of the Rio Puerco on the Rio Grande and Elephant Butte Reservoir. Besides their own in-house study, they contracted with the New Mexico Bureau of Mines and Mineral Resources to compile an annotated bibliography of previous work done on the Rio Puerco (well over 1,100 references) and a human-resource catalog of people interested in the Rio Puerco. These two compilations were put in separate computerized databases maintained by the Bureau of Reclamation (Davis and Cross 1994). Gorbach and others (1996) summarized the findings of the previous work, discussed the expected impacts of sediments from the Rio Puerco on the Rio Grande between Bernardo and Elephant Butte Dam, and investigated sediment control alternatives.

The United States Geological Survey (USGS) has conducted several studies in the Rio Puerco under the auspices of global climate change research. Pertinent to this discussion is a sediment budget study by Allen Gellis who instrumented two small basins to evaluate erosion within sites that have contrasting land uses. Jonathon

Friedman is trenching various portions of the Rio Puerco channel to date the sediment deposits. Much of the information collected has been made available to the public via the USGS website: http://climchange.cr.usgs.gov/rio_puerco/. This site includes a paper authored by RPMC members in support of the Highway 44 stream restoration project (Coleman, Gellis, Love, and Hadley, 1998).

The NMED-SWQB has completed a number of projects with a variety of approaches to control and prevent nonpoint source pollution impacts, including best management practice (BMP) implementation and working with ranching interests. One project of note is the Quivira Coalition's Senorito Creek Project, a two-year effort to stabilize the slopes of the Nacimiento Mine's overburden pile using intensive cattle use. The project, using Terry Wheeler's Holistic Remediation Process, was funded by NMED through the EPA, BLM, and Teva Corporation.

Current Goals and Actions

The Rio Puerco Management Committee collaboratively established three goals (priorities) to affect beneficial change in the Rio Puerco Watershed. Projects funded by the committee will address:

Goal 1: SEDIMENT REDUCTION
- Sediment Retention
- Erosion Control

Goal 2: VEGETATION AND HABITAT IMPROVEMENT
- Appropriate Vegetative Species and Densities
- Improved Upland, Riparian and Stream Habitats

Goal 3: SUPPORT AND PROMOTION OF OTHER WATERSHED FACTORS
- Interjurisdictional and Interagency Cooperation
- Socio-economic Benefits
- Recognition and Protection of Cultural Resources
- Public Awareness, Education and Participation

To achieve these goals, the Rio Puerco Management Committee will focus on implementing these objectives:

- Work collaboratively using a consensus-based decision making process that includes and encourages broad participation.
- Collect and manage comprehensive data and information relating to the Rio Puerco Watershed.
- Research and develop best management practices that address site-specific

Rio Puerco Basin Major Watersheds