

**Rio Costilla Cooperative Livestock Association  
(RCCLA)**

Sanchez Creek  
Watershed Restoration Action Strategy

WRAS

**Clean Water Act  
Section 319 (h) Grant**

**Prepared by  
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for  
Rio Costilla Cooperative Livestock Association**

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## Table of Contents

<b>RCCLA Watershed Ecosystem Restoration Project</b> .....	2
Rio Costilla Creek Tributary:.....	2
Component I.....	2
Component II .....	2
Component III.....	2
<b>Project Benefits:</b> .....	2
<b>Introduction:</b> .....	3
<b>RCCLA Background / History:</b> .....	4
<b>Project Partners:</b> .....	5
<b>Watershed Setting:</b> .....	5
<b>Overall Project Strategy:</b> .....	5
<b>Objective:</b> .....	6
Problem Statement: .....	6
Stems per Acre: (Estimated).....	7
Risk: .....	7
<b>Goals:</b> .....	7
Action Items: (Implementation of Best Management Practices).....	8
Desired Water Quality Outcomes: .....	8
Data Gathering and Monitoring:.....	8
<b>Workplan:</b> .....	8
<b>Permitting and Compliance:</b> .....	8
<b>Project Deliverable:</b> .....	9
<b>Public Outreach Activities:</b> .....	9
<b>E.P.A. Supplemental Guideline – 9 Elements:</b> .....	10
<b>Implementation Schedule:</b> .....	11
<b>Funding Needs:</b> .....	11
<b>Best Management Practices – Definition and Description:</b> .....	11
Tillage: .....	12
Planting Method:.....	12
Replacement Species Mix:.....	12
Prescription: (Lower Elevations) .....	13
Prescription: (Upper Elevations).....	14
<b>Future Rio Costilla Watershed Projects:</b> .....	14
Sagebrush P/J Conversion to Grassbank High-Altitude Prairies .....	14
Watershed Thinning Projects:.....	14
Riparian Area Projects: .....	14
<b>Author’s Contact Information:</b> .....	15
<b>RCCLA Project Map:</b> .....	15

## **RCCLA Watershed Ecosystem Restoration Project**

### **Rio Costilla Creek Tributary:**

#### **Component I**

A project to convert Sagebrush / P.J. Complex to a grassland prairie in the “El Poso” area.

#### **Component II**

A forest-thinning project targeted within the Sanchez Creek Watershed. We will selectively thin high population density small-diameter timber stands to promote surface water quality through soil stabilization efforts, which promotes establishment of a vegetative groundcover.

#### **Component III**

Wetland improvement of marshes will include thinning of dense timber stands, building temporary erosion control structures and rerouting jeep trails to stabilize soils and accelerate the rate of site restoration.

### **Project Benefits:**

Implementation of this project will offer improvement of surface water quality within the target watershed. It also provides temporary economic development opportunities, job training and an opportunity to positively influence the mindset of owners and neighbors of the RCCLA Ranch on natural resource management and implementation practices. Working on the premise of leading by example, we will:

- Demonstrate alternative low-impact re-vegetation methods
- Introduce an alternative grass/shrub species mix to displace the prejudice that “Crested Wheatgrass is Best”.
- Convert targeted Sagebrush ‘wastelands’ to stabilized dryland grassland prairies with mixed species of palatable shrubs.
- Thin overcrowded forests to stabilize soils through the propagation of groundcover growth.

## **Introduction:**

This document is a working document reflecting strategic plans for change whose tactical implementation will strive to improve surface water quality from tributary sources of the Rio Costilla River.

After years and decades of following a national forest management goal of “No Fires” and a regional goal of “No harvesting of green wood” we have inherited an opportunity of somewhat monumental proportion. Our ranch and, specifically a target tributary of the Rio Costilla Creek, the Sanchez Creek watershed has evolved into what is now a diminishing quality watershed within a stagnant forest ecosystem.

Culturally, the reduction in the number of domestic animals grazing has also contributed to shrinking meadows as tree seedlings and sagebrush now encroach into mountain valley meadows. This forces wildlife and domestic animal populations to concentrate and congregate in the more sensitive riparian creek bottoms, competing for fewer and fewer acres of forage. Selective harvesting of prime genetic specimen timber over the last 150 years has somewhat stifled natural ecological succession and a disproportionate population of small-diameter timber of various species now dominates surrounding forests creating several problems.

For one, the forest fire ladder is now quite well established. Historic overgrazing by cattle and now by elk has caused the influx of early seral stage, invader and opportunistic plant species to predominate the plant community. This species mix and density is out-competing both forage and prime timber species leaving a barren and dry soil beneath the tree canopy, which accelerates the rate of various forces of soil erosion.

Direct impacts of these historic management practices on the watershed within and around the ranch is affecting and contributing to the degradation of many natural resources that increasingly will affect the quality of water entering the Rio Costilla watercourse. Erosion, risk of wildfire and wildlife populations are the largest imminent issues that need to be addressed in our attempt to improve the natural resources that make up the watershed and the quality of surface water within this watershed.

Our need, to begin to manage this issue, is to substantially increase understory groundcover between a proposed and planned sparser tree overstory. To do that, we need to reduce the small-diameter timber populations and deadwood debris that currently predominates the current species composition. Along with the thinning process we need to increase the amount of grass, forbs and shrubs growing in the now tree-shaded barren and highly erodible soil surface. By doing that we strive to increase the amount of sunlight hitting the ground and release a significant volume of water currently being consumed by the now stagnant trees. This can alternatively be used to encourage a

‘natural groundcover infiltration system’ in and around these tributaries and riparian areas of the watershed.

Eroding seasonal drainages (arroyos) need to be stabilized to control the sediment being released from damage caused during periods of high runoff. Creek sections that have been allowed or forced to straighten their flow need to be slowed down by introducing meandering curves back into the stream watercourses to decrease the water velocity as well as improve the filtration capability along the stream and spring banks.

### **RCCLA Background / History:**

The RCCLA, re-organized in 1942, is an 80,000-acre remnant of the Carlos and Narciso Beaubian Land-grant in the Sangre de Cristo mountain range of the Rocky Mountains in Northern Taos County, New Mexico. A responsibility of the existing owners, 182-direct descendants of the original settlers, is to preserve the size of the asset while improving the quality of the ranch’s natural resources including the development and diversification of it’s income stream.

Our business components by size are:

- Big Game Hunting
- Recreational Camping and Fishing
- Livestock grazing
- Commercial Timber Harvesting
- Dowel Mill: Small-diameter timber processing
- Other

As a business model, it is obviously disproportionate. The current business structure also alludes to the point that focus has been on extraction of resources. Focus should now be placed on the regeneration of renewable resources and development of more productive, diverse and low-impact business units that can help fund the natural resource base.

Our target scenario for the future is a more open forest species complex, which will provide opportunities for Eco-tourism, photography, nature trails and other related soft-industry and agricultural businesses. Targeting this objective will help our development initiatives to be self-funding allowing the ongoing self-sustaining improvement opportunities for our natural resource base into the future. Incorporation of ‘Best Management Practices’, driven by this project’s goals, will help us achieve this scenario objective and make this a standard forest management practice in our future watershed projects.

In the past we have exported our natural resources. We should now hope to provide economic development opportunities that will focus on the enhancement of the ecosystem through planned development and improvement of the targeted watersheds.

These ecosystem improvements of today will then be a sound foundation for all of our businesses but more importantly for the watersheds and surface water quality that will be the core element of our future success and ongoing environmental improvement efforts. Integrating the processing of value-added wood products from harvested small-diameter timber from this thinning project will improve profitability. The environmental benefit from this is that we will not need to harvest high volumes of quality genetics found in larger-diameter timber.

**Project Partners:**

- State of New Mexico: Surface Water Quality Bureau of the Environment Department
- State of New Mexico: State Forestry Division of the Energy, Minerals and Natural Resources Department
- State of New Mexico: Department of Game and Fish – Cut Throat Trout Restoration Project on the Rio Costilla
- U.S.D.A. Forest Service – Kit Carson National Forest
- Rio Costilla Cooperative Livestock Association
- 

**Watershed Setting:**

Sanchez Creek is located within the Rio Costilla Cooperative Livestock Association Ranch. The watershed is south of the old school in Amalia, NM. Water from this creek, when it flows, drains into the Rio Costilla. See MAP at end of WRAS document.

**Overall Project Strategy:**

Given the project scope and associated planning needed we can only expect to incrementally improve the surface water quality along the targeted Sanchez Creek watershed of the Rio Costilla Creek with both the timeframe and budget available. However, one significant advantage of this project is that this prototype project will allow us to learn and lead by example toward a better-balanced future as we continue our efforts in surface water quality improvement throughout all our watershed tributaries draining into the Rio Costilla Creek.

We will affect this strategy through implementation of tactics defined in the project workplan. These include providing informational and educational themes through our Public Outreach components. These will be provided to our owners and also offered to the public.

Implementation of this incremental improvement will focus on marginally modifying the composition of the plant species and age/size mix in ways that will maintain or improve the watershed. We will include project components that remove or minimize noxious invader species such as juniper, rabbit brush and sagebrush as well as thinning of small-diameter timber stands.

Our primary goal is to gain a measurable improvement in water and watershed quality by actively developing the ecosystem through the efforts of the RCCLA and our partners in the natural resource improvement projects proposed in this project.

**Project Components Include:**

- Thinning of dense populations of small-diameter timber in targeted watersheds
- Soil stabilization
- Erosion control
- Improve soil water-holding capacity
- Increase grazing/forage capacity – a byproduct of an improved vegetative groundcover
- Fire hazard mitigation through fuel ladder modification efforts
- Riparian habitat protection with fenced exclusions
- Improve fisheries habitat
- Wetlands improvement within target areas of the ranch
- Removal of invader species of noxious plants in target areas of the watershed

**Objective:**

Improve the watershed and provide a deliverable of an improving watershed to owners of the RCCLA. Strive to change operational practices so results will help keep the Rio Costilla Creek de-listed by reducing the TMDL (Total Maximum Daily Load of sediments) through soil stabilization efforts.

**Problem Statement:**

Over the past twenty years Sanchez Creek has gone from a perennial stream to a seasonal seep, recently drying out shortly after the mid-summer rains. Historically, timber population density on this watershed had been managed by natural fires, harvesting of firewood for community use, removal of timber by local sawmills and by grazing of deer, elk, sheep and cattle. The last twenty years have brought in a significant cultural change

in which virtually no woody material has been removed from this area. In this time period, the population density of indigenous species of trees has increased to the point that sunlight and moisture are increasingly being excluded from the soil surface. Grass has been reduced to riparian areas and alluvial meadows. Invader species such as rabbit brush, sagebrush, juniper and Piñon have encroached into previously open meadows. This is creating a fire ladder connecting the meadow bottoms to the mountaintops with trees up to 60 feet tall making the entire area susceptible to a wildfire that can destroy the stream and the entire watershed.

Because of the problem of a reduction of groundcover by exclusion of sunlight and reduction of soil moisture, spring runoff and seasonal flash flooding are causing surface soil erosion. This eroded topsoil is being transported into Sanchez Creek periodically and temporarily affecting the quality of surface water moving between the Sanchez Creek and the Rio Costilla Creek.

This project area of the park is closed to public access and currently receives minimal vehicle traffic with moderate cattle grazing pressure and increasing elk grazing pressure.

**Stems per Acre:** (Estimated)

**Piñon/Juniper** - areas have stands with 500-700 stems per acre. We would like to thin these areas to less-than 50 stems per acre replacing the open spaces with planted dryland grass.

**Ponderosa Pine** - areas have stands of less-than 500 stems per acre but we will target the removal of only diseased specimens and most of the Piñon/Juniper/Sagebrush complex leaving all the healthy Ponderosa Pine as this ecotype is naturally an open grassland mix.

**Upland Mixed Conifer** - areas have stands of 700-1,000 stems per acre. Our target reduction is an average of 50% of the stems. The range of remaining stems per acre will be anywhere from 300-800 depending on slope, soil moisture, groundcover and soil composition.

**Risk:**

A wildfire in this watershed will affect the quality of the Rio Costilla Creek in Amalia, Costilla and the downstream watershed.

Spring runoff and flash flooding will affect the TMDL at an increasing rate until soil stabilization efforts are implemented.

**Goals:**



### **Action Items: (Implementation of Best Management Practices)**

- Installation of culverts at stream crossings.
- Road Maintenance
- Build exclusions in riparian areas.
- Thinning of forest canopy by removal of selected small-diameter timber.
- Removal of invader species/noxious weeds.
- Reseeding of grasses in thinned and open areas.
- Public Outreach described below.

### **Desired Water Quality Outcomes:**

- Fire hazard mitigation by disrupting fuel ladders.
- Increase grass groundcover to stabilize soil and reduce erosion potential.
- Stream sediment reduction through soil stabilization.
- Stream sediment reduction through vegetation filtration.
- Promote regeneration of target species of grass and timber.
- Reintroduction of Rio Grande Cutthroat Trout once the stream is restored to perennial flow status.

### **Data Gathering and Monitoring:**

- Establish photo points in key locations for use as demonstration components of educational and outreach programs.

### **Workplan:**

See Project Workplan for specifics.

### **Permitting and Compliance:**

- Provide a letter to the U.S. Fish and Wildlife describing the project and asserting that the work, especially soil work, will not negatively impact endangered species.
  - Joy Nicholopoulos  
U.S. Fish & Wildlife Service  
2105 Osuna N.E.  
Albuquerque, NM 87113

- Provide a letter to the State Historical Preservation Division of the Office of Cultural Affairs describing the project and identifying the work areas on a 7-1/2 X 7-1/2 topographic quadrangle map.
  - Elisabeth Oster, Archaeologist  
Office of Cultural Affairs  
Historic Preservation Division  
La Villa Rivera Building  
228 East Palace Avenue  
Santa Fe, NM 87501
  
- Provide a copy of the responses from the two agencies to the State of New Mexico Environment Department.

### **Project Deliverable:**

We will deliver an overall watershed improvement that will positively impact identifiable ecosystem components. In the mid to long-term, these environmental elements, as a group, will help us harvest and deliver a higher volume of substantially higher quality water held in the ground, benefiting vegetation, as well as delivered downstream to the watershed's customers along the Rio Costilla Creek.

### **Public Outreach Activities:**

- Quarterly Newsletters to owner/members throughout the course of the project implementation phase.
- Educational opportunities and field tours to local students sponsored by local teachers and the RCCLA.
- Presentations to owner/members at quarterly and annual membership meetings.
- Provide educational orientation and training sessions to employees involved in the watershed ecosystem restoration projects.
- Generate and distribute periodic Public Service Announcements to local and state media highlighting the RCCLA's natural resource projects with updates on the accomplishments and derived multi-faceted benefits.
- RCCLA Website: [www.RioCostillaPark.com](http://www.RioCostillaPark.com) Provide status of project for both member and public components of the website.

## **E.P.A. Supplemental Guideline – 9 Elements:**

1. Load sources to be controlled
  - a. Soil from roads, road crossings, streambank erosion and alluvium during spring runoff and flashfloods.
2. Estimate load reductions
  - a. Target a 1-5% reduction per year of load based on recovery time necessary for soil stabilization.
3. Describe measures targeted at reducing loads
  - a. See **Component** Definitions in this document
  - b. See **Goals** in this document
  - c. See Project **Workplan**, a separate document submitted to the State of New Mexico Environment for this project.
4. Estimate Assistance (Technical & Financial)
  - a. Approximately 400 acres of this 80,000-acre ranch are being treated with a budget of under \$300,000. (See Project Budget)
  - b. Ron Martinez is providing technical support for the design phase of this project. We will also receive some specialized technical support from our project partners. The RCCLA will also hire contract help of a park ranger and a forester.
  - c. At an average cost of \$750/acre, each 1,000 acres will cost approximately \$750,000 to implement surface water quality improvements in each of the major watersheds of the Rio Costilla within our Ranch.
5. Describe Information / Education Component
  - a. See **Public Outreach Activities** section above.
6. Identify a project timeline
  - a. The project timeline is estimated within the project workplan
  - b. We should be well within the 3-year funding cycle parameter for this project

7. Describe goals, tasks and milestones
  - a. These elements are detailed within the project workplan
8. Establish criteria to measure progress of load reduction measures
  - a. Documentation elements for this component are identified in the workplan and include:
    - i. Photo points
    - ii. GIS Information
    - iii. Fenced Exclusions
    - iv. Project Status Reports
  - b. These are qualitative elements used in favor of quantitative elements so we can focus on implementation and results rather than on empirical research given that this is an “On-the-ground” project.
9. Define the monitoring component of item 8 above
  - a. Photo points will be marked with a permanent marker and identified by a GIS reading. We plan on three readings for the three project components: Before, during and after. Digital Photographs will be taken before work is started. Once the physical work is completed we will take a second reading. The final reading will be taken two-years after the physical work is completed allowing sufficient time for soil stabilization efforts to become evident.

**Implementation Schedule:**

To be determined post-funding.

**Funding Needs:**

Defined in the Project Workplan and associated Budget.

**Best Management Practices – Definition and Description:**

Implementation of tillage practices consistent with optimal environmental ecosystem management. Designed to reduce the destruction of the existing soil profile preserving

indigenous grass species with minimal soil compaction. These practices emphasize conversion techniques of Sagebrush/Rabbit brush near and within a Piñon/Juniper complex.

**Tillage:**

Use a steel drag and/or brush shredder to breakdown the existing shrubs and small trees. Tillage practices will exclude the use of plowing and use of a disc, in most or all situations.

**Planting Method:**

Spread the seed with cone spreaders. These can either be small electrically operated units operated from ATV's or larger PTO driven units used on a farm tractor. Once the shrubs have been broken down, the seed mix will be broadcast and surface drag will again be passed over the seed mix to lightly cover the seed with soil to wait sufficient moisture for germination and growth. Optimal planting seasons includes:

- Prior to the summer monsoon season
- Late fall, allowing for natural stratification processes over the winter to enhance seed viability as well as for surface compaction by snow to improve the seed/soil surface contact for better moisture percolation.

**Replacement Species Mix:**

Plant species mix recommendations include a combination of grasses and shrubs. Shrub species prescribed by this mix will fill the niche currently being occupied by the Sagebrush and Rabbit brush. Without providing replacement species for this shrub niche, it will soon be reclaimed by the noxious shrubs currently inhabiting it. The recommended shrubs are palatable by sheep, deer and elk, which will supplement their forage ration while relieving the forage pressure of grass species and defending against the reintroduction of previous noxious shrubs.

**Prescription: (Lower Elevations)**

<b><u>Shrub Species</u></b>	<b><u>Grass Species</u></b>	<b><u>Indigenous Species (rem)</u></b>
Winterfat 1.0# per acre	Arizona Fescue 1.0# per acre	Bluegrass – protect
Fourwing saltbush 1.0# per acre	Intermediate wheatgrass 1.0# per acre (Var. Tegwar)	Sagebrush – remove or reduce populations from 95-99%
	Green needlegrass 0.5# per acre	Rabbit brush – remove or reduce populations from 95-99%
	Galleta 1.0# per acre	Piñon – Thin to less than 20 +/- trees per acre leaving quality genetics and removing low-growing weedy shrub specimens
	Thickspike wheatgrass 1.0# per acre (Var. Critana)	Juniper – remove all specimens in target area
		Broom snakeweed – not a common noxious weed in the area.

- Dave Clark, employed by the of the State New Mexico, Energy, Minerals and Natural Resources Department, Mining and Minerals Division as a personal favor recommended this species mix to the RCCLA. His expertise is mine land reclamation. His experience is primarily from the geographies of Montana, Wyoming and New Mexico representing geomorphologies similar to those found on the RCCLA. The prescription is based on a request to satisfy the following criteria:
  - Drought tolerance
  - Annual rainfall range from 8”- 12”
  - Elevations between 7,500 ft to 9,000 ft above sea level
  - Mix of cool and warm season grasses
  - Include shrubs to replace sagebrush and rabbit brush
  - Species should be palatable when green or dry to wildlife and domestic animal species
  - Provide an alternative to Crested Wheatgrass

**Prescription: (Upper Elevations)**

<b><u>Shrub Species</u></b>	<b><u>Grass Species</u></b>	<b><u>Indigenous Species (rem)</u></b>
N/A	Orchard	N/A
	Timothy	
	Fescue	
	Broam	

**Future Rio Costilla Watershed Projects:**

Driven by the success of this pilot project and availability of future funding we will pursue several additional projects including those in the following two categories.

**Sagebrush P/J Conversion to Grassbank High-Altitude Prairies**

- Ventero Mesa
  - Tengg Tract – 1,000 acres
  - Sawmill Triangle South – 250 acres
  - Sawmill North Grassbank – 500 acres
  - Ute Creek Gate Sagebrush bottom – 250 acres
- Jaroso Sagebrush Section – 640 acres
- Costilla Crested Wheat replant – 2,500 acres

**Watershed Thinning Projects:**

- Ute Creek – 5,000 acres
- Cordova Creek – 5,000 acres
- Latir Creek – 5,000 acres
- Cañada Bonita – 2,000 acres

**Riparian Area Projects:**

- Box Canyon – 500 acres
- Midnight Creek – 5,000 acres

### Author’s Contact Information:

Ronald E. Martínez prepared this document.

I am an owner/member of the RCCLA as well as a descendant of the organization’s founders. Personal interests include Information Technology, Natural Resource Planning and Management, Rangeland Improvement and international travel to name a few items.

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### RCCLA Project Map:

