Resolution No. 04-98-73

RESOLUTION OF THE WHITE MOUNTAIN APACHE TRIBE OF THE FORT APACHE INDIAN RESERVATION

WHEREAS, the lands and waters of the White Mountain Apache Tribe have been degraded by prior federal land management activities, leading to increased erosion among other problems; and

WHEREAS, the Tribe has developed a range of environmental management programs to protect, maintain, and restore its land and waters, and has adopted a permanent Land Restoration Fund Ordinance to support restoration efforts in perpetuity; and

WHEREAS, the Tribal Watershed Program has compiled a Watershed Restoration Strategic Plan ("the Plan") which identifies priority restoration projects and which outlines a nonpoint source management program, based on watershed assessment activities and identification of areas of special ecological and community concern; and

WHEREAS, adoption of this plan will enable the Tribe to assume program authority for the Nonpoint Source management Program under the Clean Water Act, and therefore to be eligible to receive funding to implement nonpoint source demonstration projects.

BE IT RESOLVED by the Tribal Council of the White Mountain Apache Tribe that it hereby adopts the attached Watershed Restoration Strategic Plan and authorizes the submittal of grant applications for funding through the Nonpoint Source Management Program (Section 319) of the Clean Water Act.

BE IT FURTHER RESOLVED, by the Tribal Council that the Tribal Watershed Program shall prepare a new version of the Plan no less than every four years, and that revisions to the Plan shall occur annually or as otherwise needed to incorporate new Tribal priorities.

BE IT FURTHER RESOLVED, by the Tribal Council that the Land Restoration Board shall consider the priorities outlined in this Plan when selecting projects under the Land Restoration Fund and shall involve local communities in revising the Plan.

BE IT FURTHER RESOLVED, by the Tribal Council that it hereby authorizes the distribution of a redacted version of this Plan as needed to secure funding for its implementation.

Resolution No. 04-98-73

The foregoing resolution was on April 9, 1998 duly adopted by a vote of nine for and zero against by the Tribal Council of the White Mountain Apache Tribe, pursuant to authority vested in it by Article IV, Section 1 (a), (b), (h), (i), (j), (k), (t) and (u) of the Constitution of the Tribe, ratified by the Tribe September 30, 1993, and approved by the Secretary of the Interior on November 12, 1993, pursuant to Section 16 of the Act of June 18, 1934 (48 Stat. 984).

Chairman of the Tribal Council

Virginia M. Dalton
Secretary of the Tribal Council

White Mountain Apache Tribe

Watershed Restoration Strategic Plan

Guidance for the Watershed Restoration Program
to Abate Nonpoint Source Pollution
and Restore Ecological Health
in the Watersheds of the
White Mountain Apache Reservation

3 April 1998

CONTENTS

CONTENTS

CONTENTS

CONTENTS

CONTENTS

OVERVIEW

I. The White Mountain Apache Tribe depends on the 1.6 million acres of its Reservation for economic prosperity and cultural integrity. Tragically, many of the life-giving waters of the Reservation have deteriorated due to past management practices instituted by the Federal Government. To restore its ecosystems, the Tribe has established several codes and programs. To coordinate these efforts, the Tribe is establishing a *Watershed Restoration Program*. This *Strategic Plan* outlines priorities and mechanisms to guide this program.

II. The Watershed Restoration Program will involve several tribal organizations. The Land Restoration and Conservation Board will select priority projects. The Watershed Planning Program will coordinate implementation and conduct monitoring in concert with other tribal organizations, particularly Wildlife and Outdoor Recreation, Land Operations, and Forestry. Because nonpoint source pollution (runoff from the land) is both a major cause and indicator of damage to watershed health, the Watershed Restoration Program will serve as the Tribe's *nonpoint source management program*.

III. Projects will seek to restore ecological functions in degraded systems for the long-term. Projects should involve communities, schools, and cultural advisors where appropriate.

IV. Within each watershed, implementation of the Strategic Plan will generally include a sequence of preliminary assessment, demonstration efforts, school involvement, watershed analysis, watershed plan development, restoration work, and evaluation.

V. The Watershed Restoration Program will involve several tribal programs, including Watershed Planning, Environmental Planning, Wildlife and Outdoor Recreation, Land Operations, Tribal Forestry, and the Tribal Museum and Cultural Education Facility, as well as local schools and federal programs.

VI. The Program will be implemented through project review, code enforcement, demonstration projects, timber sales, range management, and school programs.

VII. Priority projects for implementing this Plan will be spread across the Reservation and will address the major kinds of impacts. Several projects are already underway, additional ones have been proposed, and more are identified for future implementation. The priorities listed in this Plan will be revised as the Tribe identifies new projects.

VIII. The watersheds of the Reservation are diverse in terms of ecological values. Grazing, roads, and channel manipulations are the most common ongoing causes of degradation throughout the Reservation.

IX. Numerous sources of funding and technical assistance will support implementation of this plan. Projects will match non-tribal funds with tribal in-kind contributions and support from the Land Restoration Fund.

X. Several codes authorize the Restoration Program. The Tribe is eligible to receive program authorization and grant funding for nonpoint source control under Section 319 of the Clean Water Act. Projects will be selected by the Land Restoration Board and implemented with tribal environmental review, public involvement, and evaluation.

I. Introduction

White Mountain Apache people and land are one. What affects the land affects the people, and what affects the people affects the land. Pollution and erosion are indicators of damage to the land, water, and people. Elders have taught us, "take care of the earth, and the earth will take care of you." This understanding reveals the importance of restoration. By working to restore our watersheds to health, we ensure that the land will sustain us.

The Tribe depends on the 1.66 million acres of its Reservation for economic prosperity and cultural integrity. Tragically, many of the life-giving waters of the Reservation have deteriorated due to past land use practices. Unsustainable practices, including overgrazing, improper road construction, establishment of invasive plants, and channel manipulations were instituted by the Federal Government, but today their legacy poses challenges to the Tribe as it takes care of its lands. The Tribal Council has expressed its intention to restore these lands to healthy condition, by establishing a Permanent Land Restoration Fund. To succeed in this mission, we must reestablish the balance between the land and the people. The Tribe directs of suite of natural resource programs with growing emphasis on promoting healthy ecosystems, as outlined in the Tribal Ecosystem Code. The Tribe has codified its desires for healthy waters in a Tribal Water Quality Ordinance. The most widespread source of water pollution on the Reservation is the land itself, as soil washes into the streams. To stop this damage, and to restore waters to healthy condition, the Tribe is establishing a Watershed Restoration Program.

This Strategic Plan outlines the priorities and mechanisms to guide this important effort. Activities under this Plan will be implemented on a watershed basis. This program will continue to evolve as new challenges and new opportunities present themselves, so this Plan will require annual updates. This Plan will be officially approved at least every four years.

II. Restoration Program Summary

The key entities for overseeing and coordinating watershed restoration efforts will be the Land Restoration and Conservation Board and the Watershed Planning Program. The Land Restoration and Conservation Board will select projects, exchange information with local communities, and recommend strategies to implement this plan. Watershed Planning will continue to conduct assessments, develop management plans, and coordinate demonstration projects. The Wildlife and Outdoor Recreation Division, Land Operations Program, Forestry Department, and Environmental Planning Office will also play major roles in planning, evaluating and implementing restoration projects. The newly formed Ecosystem Team, representing the Watershed Program, Hydrology Section, Wildlife and Outdoor Recreation, and Pinetop Fishery Resources Office, may become a key forum for designing, coordinating, and seeking funding for integrated projects. Projects should address community concerns and involve communities through education and cooperative implementation.

The overall goals and objectives of this program are outlined in the Tribal Ecosystem Code, Land Restoration Ordinance, and Section III of this Plan. This program will serve as the Tribe's *nonpoint source management program*, because reducing nonpoint source pollution is a major component of ecosystem restoration. Since the most significant nonpoint source pollution consists of turbidity and suspended sediment from surface and streambank erosion, restoring ecosystem functions such as natural water flows and vegetative cover are essential to reducing pollution across the Reservation.

These efforts will be implemented with assistance from Federal agencies, including the Environmental Protection Agency, Fish and Wildlife Service, Forest Service, Natural Resources Conservation Service, Bureau of Indian Affairs, Bureau of Reclamation and Geological Survey. The Tribe is continuing to establish relationships with various external agencies, including offices of the State of Arizona, as described in Section IX.

We will prioritize activities that tackle several problems and garner support from several entities. We will select projects that will serve as valuable demonstrations for other areas.

This Strategic Plan outlines objectives for four years, but it will be updated annually, in coordination with Watershed Planning, the Land Restoration Fund, and other tribal programs.

III. Goals

A. Vision

This plan envisions the restoration of ecosystems to promote sustainable futures for the White Mountain Apache people based on a healthy and productive land. The prosperity of the Tribe, in economic, health, and spiritual terms, depends on maintaining and restoring the health of the land. People must look after the land, because the land looks after people. Reestablishing the balance between people's needs and ecological needs is an essential part of this effort.

The Tribal Ecosystem Code and Land Restoration Code state guiding principles for promoting and restoring the health of tribal ecosystems.

B. Guiding Principles

Efforts under this plan will follow these principles:

1. Harmony between Economy and Ecology

Tribal economic systems should ensure a sustainable harvest from the land. To achieve this goal, we must reinvest in the natural capital that sustains our economy and health. When we take from the land, we must give back to it so that it is in the same or better condition than when we started. We not only sustain ourselves from the bounty of our ecosystems, but we have a central role in maintaining the ecosystems to which we belong.

2. Holistic Thinking and Action

Traditional Apache beliefs have always appreciated that all parts of the universe are intertwined; consequently, we must always consider the effect of our actions on all aspects of the ecosystem. Traditional practices and prohibitions against certain types of activities may serve to avoid unintended consequences.

3. Focus on Ecological Functions

Conventional resource management has often been geared to production of economic or biological resources without paying sufficient regard to the underlying functions that enable the ecosystem to produce; by maintaining functional ecosystems, we can produce sustainable benefits for people and preserve options for the future.

4. Causes of Dysfunction

Often people are dismayed by the *symptoms* of ecological degradation (such as bank erosion), and lose sight of the causes (loss of vegetation); to stem degradation over the long-term, we address the causes.

5. Community and School Involvement

By building relationships between Tribal programs and communities, particularly through schools, we will better accomplish the goals of promoting healthy, sustainable ecosystems. One of the avenues for public outreach is *Nowhik'e Bagową*, the Tribal Museum and Cultural Educational Center.

6. Challenges for Sustainable Development

Programs should target issues that are sacrificing the long-term productivity of ecosystems or will enhance economic development activities such as recreation and tourism.

7. Appropriate Solutions

Solutions should be cost-effective and able to be implemented by our own tribal members. Technologies should require little maintenance unless long-term resources can be set aside. Projects should seek to involve local communities so that residents can understand how to monitor or maintain the projects.

8. Integrated Management

Tribal traditions assert that all parts of the ecosystem are interconnected. For that reason, tribal management must acknowledge this connectedness by promoting integrated planning and coordinating actions that affect the ecosystem. Projects should promote integration by enlisting participation from multiple organizations and ensuring compatibility with existing resource plans.

C. Objectives to Guide Project Selection

The list of priority projects for restoration in Section VIII should address the following objectives over the four years of this Plan:

1. Respond to priorities identified by **communities**
2. Address **critical ecological concerns**, including sensitive species and palustrine (shallow water) wetlands
3. Accomplish **demonstration projects** for each of the major types of impacts (roads, livestock grazing, construction/development, feral horses, gullying, and channel manipulations)
4. Accomplish projects in each of the **four major watershed areas** on the Reservation (Cibecue, Carrizo, White, Black)

IV. Strategy

The main approach to achieve the objectives of this Plan is to continue developing watershed planning, monitoring and restoration activities, and to *integrate* those activities with other tribal and federal land management programs on the Reservation. Implementation of plans will occur through restoration projects, school programs, tribal plan and project review process, and conventional land management activities such as timber sales, range management, and maintenance of irrigation systems. Regulatory enforcement (for water quality standards or other legal codes) will typically be a secondary tool to attain compliance in emergency situations, or to address problems arising off the Reservation where the Tribe lacks other mechanisms. Newspaper articles, radio programs, and videos, will continue to be used to inform the public of problems and ongoing efforts to resolve them.

A. Watershed Plans

Watershed plans will be developed according to the annual schedule of watershed planning. That schedule will be based upon assessment work and direction from tribal members in public meetings, the Tribal Council, the Land Restoration Board, and other tribal departments. Priority watersheds for planning will generally have high ecological and community values, as well as high threats to those values. Each Watershed Plan will address key issues that affect watershed health, including roads, animal impacts, and riparian/channel conditions. Watershed planning will be a continual process of revision, so not all issues need be addressed in the first round of a plan. Each Watershed Plan will chart a strategy for implementation involving tribal programs, a community steering committee and local schools.

Watershed analysis is a more structured and detailed process of assessing watershed conditions and identifying key measures to protect and restore watershed health. This approach was initiated with the Cibecue Watershed Project and will be refined through additional efforts. The two most important aspects of the analysis will be riparian/channel conditions and surface erosion. Both of these are fundamentally tied to the nature and conditions of soils; consequently, careful analysis of soils, especially their potential and limitations for management, is imperative. Analyses of soils and slopes would assist in planning timber sales, roads, and other land-use activities. These analyses should address erosion hazards and delivery potential to downstream resources.

B. Priorities for Restoration Projects

Priority for implementation under this program will be given to projects which meet the guiding principles above, and demonstrate satisfaction of the following criteria:

1. *Involves local community* in identifying and addressing key issues

2. *Promotes education* concerning ecological functions and means to protect them, particularly through school programs and exhibits at the Tribal Museum.
3. Addresses *ecosystem values of unusual significance* (wetlands, sensitive species, fisheries)
4. Adopts solutions that are *sustainable* over long-term with minimal resources from governmental entities
5. Draws *support from outside* entities where appropriate
6. Reduces pollutants or disruptions at their *source*, rather than just treating symptoms
7. Promotes *innovative* techniques and applications
8. Provides for *monitoring and evaluation* of effectiveness

C. Steps for Watershed Planning and Restoration

The following steps provide a guide for conducting watershed planning and restoration activities. Not every projects need to fit into the full cycle, but this approach will help ensure that actions are taken in a holistic, watershed context. Furthermore, the steps need not be followed in a rigid order. For example, educational outreach and demonstration projects may be undertaken before, during, or after development of a watershed plan.

1. Preliminary identification of problems (through routine assessments or community input)
2. Watershed monitoring
3. Educational outreach through schools program
4. Watershed analysis
5. Involvement of community groups (perhaps forming a watershed steering committee)
6. Demonstration projects
7. Development of watershed plan
8. Establishment of implementation structure
9. Implementation of plan
10. Evaluation and revision (return to step 1)

D. Integrated Management

This Strategic Plan serves to integrate nonpoint source pollution control with land restoration activities and ecological assessments. The Ecosystem Code establishes that all activities on the Reservation shall be reviewed to ensure compatibility with environmental standards, cultural concerns, watershed plans, and this Strategic Plan. The Land Restoration Board shall help to ensure that projects are consistent with long-range tribal goals and community concerns.

E. Monitoring and Evaluation

Various programs have responsibilities for ecological monitoring, as described in the next section. The Watershed Program staff will work with the Land Restoration Board to develop monitoring plans for specific restoration projects; general ideas for monitoring proposed projects are described in the Priority Projects section below. The Land Restoration Board will require evaluations of all restoration projects.

V. Program Structure

The Tribal Government has several programs and departments that are responsible for various aspects of ecosystem management.

The Tribal programs coordinate with local offices of federal agencies, including the Fort Apache Agency (Bureau of Indian Affairs), the Pinetop Arizona Fishery Resources Office (US Fish and Wildlife Service), and the Flagstaff Rocky Mountain Station (US Forest Service). The Tribe is currently establishing relationships with the US Geological Survey, Bureau of Reclamation, and Natural Resources Conservation Service. The Tribe has a very positive relationship with the US Environmental Protection Agency, Region IX in San Francisco.

Key programs are briefly discussed below, and an organizational chart is attached as Appendix A.

A. Ecosystem Team

This newly formed working group involves representatives from Wildlife and Outdoor Recreation, Watershed Program, Hydrology Section, and the Pinetop Fishery Resources Office. This group of technical experts will serve to coordinate existing projects and plan new integrated efforts to conserve and restore the ecosystems of the Reservation.

B. Watershed Planning

Watershed Planning has primary responsibility for assessment, design, coordination, and pursuit of funds for watershed projects. The Watershed Planning Program has lead responsibility for water quality assessments, watershed analysis, and design and oversight of watershed restoration projects.

1. Nonpoint Source Pollution Control

Watershed Planning is the designated entity for coordinating nonpoint source pollution control, as such it will incorporate nonpoint source assessments into its watershed assessment report, which is updated annually and also addresses water quality conditions.

2. Watershed Monitoring

Watershed Planning will conduct monitoring for restoration projects to evaluate their success in reducing nonpoint source pollution and restoring watershed conditions. Monitoring should target the parameters that are more sensitive or critical to the restoration activities. In many cases, monitoring will emphasize vegetation, as it may be the first parameter to respond to restoration. The Program will also monitor areas in preparation for conducting watershed analyses. The Program will continue to conduct occasional assessments at previous sites or establish new ones.

Types of monitoring include:

1. Riparian Vegetation Transects
2. Upland Vegetation Transects
3. Channel Morphology (cross-sections, longitudinal profiles)
4. Pebble counts
5. Basic water quality parameters (temperature, pH, Dissolved Oxygen, conductivity, turbidity)
6. *E. coli* bacteria sampling
7. Nutrient sampling (Phosphorous and Nitrogen)
8. Suspended sediment measurements

Watershed Planning follows a Water Resources Monitoring Plan in conducting assessments and monitoring. The Monitoring Plan includes guidelines for ensuring quality control and for evaluating impairments of waterbodies. The annual Watershed Assessment Report provides more information on how specific evaluations were made.

3. Wetlands Projects

The Wetlands Conservation Plan outlines the process for assessing wetland health and functional condition. The Wetlands Project Manager is overseeing wetlands restoration projects in Gooseberry Watershed, Lofer Cienega, and the ID Restoration Area.

4. Cibecue Project

The Cibecue Project Manager is coordinating watershed analysis and education activities in the Cibecue watershed, in concert with the Cibecue High School.

C. Land Restoration Board

The Land Restoration Board will represent the different watershed communities across the Reservation. The Board will guide program implementation. The Board will select projects for funding from the Land Restoration Fund. The Watershed Planning Program will staff the Land Restoration Board to advise them on project selection, coordination, and evaluation.

D. Watershed Steering Committees

Communities will be encouraged to form steering communities to mediate interactions between residents and the tribal government regarding watershed restoration efforts. Each Committee should include a member of the Land Restoration Board, a Chair of the Community Council, and a representative of the local livestock association(s). The committee may be charged with additional

responsibilities by the Tribal Council, including coordination and enforcement of approved restoration policies.

E. Environmental Planning

1. Tribal Plan and Project Review

The Environmental Planning Office oversees the Plan and Project Review Process, which ensures compliance with tribal policies, plans, and codes. The EPO also acts as the Tribal Water Quality Control Officer. These functions are described in detail in the Implementation Section below.

2. "Challenge to Change" Summer Youth Program

Environmental Planning coordinates a summer youth environmental program which supplies labor for restoration projects through the tribal JTPA office.

3. Hydrology Section

This office includes the Hydrology Section, which is also involved in assessing watershed conditions and recommending best management practices. The Hydrology Section of the Environmental Planning Office is establishing a Reservation-wide water monitoring program at fixed gauging stations. This effort will monitor water quantity and basic water quality parameters (temperature, pH, and conductivity) on a regular basis. A summary of the stream gage network is included in Appendix B.

F. Land Operations

The Land Operations Program is responsible for much of the physical implementation of restoration efforts, including the use of heavy equipment. Land Operations includes the Range Conservation Program, which works with Tribal Livestock Associations in range planning and livestock management.

G. Wildlife and Outdoor Recreation

The Wildlife Program includes a sensitive species component as well as game and fish management. The Program is responsible for monitoring of indicator species and for management of wildlife populations. It may supplement this work with habitat assessments. Additional priorities for biological monitoring will be developed through the sensitive species analysis. Outdoor Recreation may develop eco-tourism efforts that interact with restoration projects.

H. Forestry

The Tribal Forestry Department helps coordinate forest and woodland planning, as well as conducting some assessment, monitoring, and demonstration projects for

forest and woodland health. Watershed restoration may include erosion treatments in woodland areas that involves special management overseen by the Forestry Department.

I. Schools

Through the community-based Watershed Schools Program coordinated by Watershed Planning, local schools are involved in collection of field data. Classes are encouraged to assist in design and implementation of restoration activities. A major partnership has been established with the Cibecue High School, where students have been collecting data and preparing reports and articles about the local watershed project. Work has also begun with the JFK School in Cedar Creek. Schools in the Whiteriver area are interested and cooperative efforts will probably begin shortly. A Watershed Education Guide is being prepared by the Watershed Program in concert with the Cibecue High School.

J. Tribal Museum and Education Center (*Nowhik'e Bagowa*)

The Tribal Museum and Cultural Education Center offers a unique facility for displaying the results of restoration activities and their relationship with tribal culture.

K. Outside Agencies

Several Federal and non-Federal agencies assist the Tribe in designing and implementing restoration activities. Support includes funding, technical assistance, and cooperative research. Watershed Planning and other programs channel this assistance into restoration projects. A summary of outside relationships is found in Section IX at the end of this document.

VI. Implementation

A. Oversight / Regulation

All tribal and non-tribal activities on the Reservation that may significantly affect the Reservation environment are supposed to be reviewed through the Tribal Plan and Project Review Process. Several tribal codes impose these requirements and establish procedures for enforcing violations. This oversight system will provide the "defensive" aspects of implementing this Watershed Restoration Strategy, while other projects will provide for active efforts to restore watershed health.

Examples of plans and projects that will be regularly reviewed through these processes include:

1. Timber sales
2. Range management plans
3. Construction projects (HUD Housing, IHS facilities, BIA Roads, Arizona Department of Transportation roads)
4. Prescribed burns
5. Wildlife habitat improvement projects
6. Modifications to irrigation diversions
7. Discharges (also governed under National Pollution Discharge permits which the Tribe reviews)
8. 404 wetland dredge/fill permits

The main entities whose projects will be reviewed through this process include tribal departments, Bureau of Indian Affairs, Indian Health Service, and Arizona Department of Transportation.

1. Codes and Laws

The Tribe is adopting an **Ecosystem Code** to provide overall guidance to management activities, including watershed restoration. Tribal **Water Quality Standards** are in the process of being adopted as a Tribal Ordinance. These standards include provisions for nonpoint source pollution controls. The Tribe already has Certification Authority under Section 401 of the Clean Water Act. Additional provisions of the Clean Water Act support the Tribe's efforts to protect ecosystem health, as detailed in Section X below.

2. Plan and Project Review

The **Tribal Plan and Project Review Panel** reviews activities to ensure compliance with tribal and other applicable policies, plans, and codes. An important concern of this review process is compliance with **water quality standards**. The Tribal Review Panel will be responsible for the review of all

activities on the Reservation to ensure compliance with the tribal nonpoint source program. The Panel will refer to this plan when reviewing projects. Their review will encompass both tribal and non-tribal agencies acting on the Reservation.

Restoration plans and projects will be reviewed through the Tribal Review Process for environmental impacts, including sensitive species, water quality, heritage sites, cultural concerns, and other issues. Involvement of Federal funds (for prescribed burning, for example), may require additional reviews under Federal laws such as the National Environmental Policy Act and Endangered Species Act.

Several types of activities overseen by Tribal and Federal agencies should be reviewed for their effects on water quality or possible inconsistency with the Tribe's nonpoint source management objectives, including the projects and plans described below.

B. Timber Sales

Upcoming timber sales present an opportunity to address significant watershed concerns, particularly road conditions. Recent activities include reseeding with appropriate native species, road closure, and road rehabilitation. Watershed Planning and the Tribal Hydrologist routinely provide input into timber sales to identify and recommend solutions to watershed problems. Efforts will focus on providing recommendations early in the timber sale process to address sources of nonpoint source pollution. A key component of this effort will be a solid analysis of soil types and conditions. Areas that are identified as high sources of sediment due to road construction will be prioritized for rehabilitation or relocation of roads. Watershed analyses will provide guidance for timber sale planning. Road problems should be corrected in conjunction with timber sale entries. Future sales should begin to incorporate gully control measures and accommodate restoration through use of fire where appropriate and feasible.

The schedule for upcoming sales includes the following:

1. Corduroy (CARRIZO)
2. Lame Deer (NORTH FORK OF WHITE)
3. Turkey Creek (BLACK)

C. Range Management

All tribal Livestock Associations have adopted Range Management Plans which outline priorities for resource conservation. Livestock management plans, which roughly conform to watershed boundaries, should be revised to address sensitive riparian areas and erosion hazards. Government support for livestock operations should be contingent upon adequate management of livestock to protect watershed concerns.

Working cooperatively with Watershed Planning and the Range Conservationist, three Associations have revised their plans to address concerns for riparian

conditions in conjunction with restoration projects. Such efforts should continue in the coming years to address concerns in other watersheds. Associations that are already involved with projects are marked with a check below:

- ☑ Cedar Creek: Gooseberry Project, Cedar Creek
- ☑ Carrizo: Horseshoe Project, Carrizo
- ☑ Grasshopper: Salt River / Medicine Ecosystem
- ☑ Turkey Creek: Lofer Cienega Project

Listed below are Associations with the potential to cooperate on projects listed in the Priority Projects section below:

- ☐ North Fork: Paradise Park in Upper North Fork
- ☐ Oak CreeK: Oak Creek, Canyon Creek, Medicine Ecosystem
- ☐ Cibecue: White Springs, Cibecue
- ☐ Canyon Day: Black and White Rivers
- ☐ ID Herd: ID Restoration Area

D. Road Construction and Maintenance

Development of a Transportation Plan for the Reservation will include consideration of watershed impacts. Watershed analyses will help to identify problem areas and recommend road system improvements. The Watershed Program, Hydrologist, and other ecosystem management entities will all provide input to this Plan.

E. Modification to Irrigation Diversions

Irrigation systems, particularly in East Fork, North Fork, and Cibecue, are both a beneficial use of and an impact to stream health. New technologies and designs can help to provide water for farming while reducing negative impacts to the channel. Plans should be developed by Land Operations to rehabilitate these systems, in particular, those systems identified in Section VII. The Watershed Program will continue to assist in the development of alternative designs. In the meantime, the Project Review process ensures that any modifications to these systems will comply with the Watershed Restoration Plan.

F. Fire Management

Prescribed fire and fire suppression activities can affect watershed health positively and negatively. Fire suppression money may become available for prescribed burning, provided that resource plans are developed for such activities. Watershed plans may provide a useful forum for addressing fire issues. The Salt River/Medicine Ecosystem Plan may provide an excellent starting point for promoting careful use of prescribed fire for restoration.

G. Demonstration Projects

Demonstration projects not only serve as educational outreach, but they also help to evaluate the potential of restoration and gauge the most effective means of achieving restoration objectives. Demonstrations to addressing different kinds of impacts in different ecological zones are a priority for the four years of this plan. Techniques used to restore degraded areas are listed in Appendix C, **Restoration Techniques.**

H. Education Efforts

1. Watershed Schools Program

Watershed Planning has enlisted the involvement of several schools across the Reservation in watershed assessment and restoration activities. This cooperation provides an important avenue for communicating to local communities the purpose of restoration efforts and to seek input on the best ways to address community concerns. The Watershed Program is adopting a Watershed Education Guide that will show how watershed planning can be connected to K-12 education in local schools.

2. Tours of Demonstration Areas

Watershed Planning staff lead occasional tours to these areas to show tribal leaders, outside entities, and local residents the value and potential of restoration work.

3. Media Outreach

Regular publications in the local newspaper, the Apache Scout, and occasional broadcasts on the local radio station help tribal staff to reach members of the community who might not normally learn about restoration activities. Video production promises to provide an excellent vehicle for reaching many members of the community; consequently, the Watershed Program will begin to incorporate filming into restoration projects.

4. Museum Exhibits

With assistance from staff at the Museum and Cultural Education Center, special exhibits emphasizing a restoration theme may be developed for public display.

VII. Priority Projects

Projects listed below will have priority as they already have been identified as important concerns and preliminary assessments have been made. The list below is based upon the following types of input:

1. Concerns or suggestions from tribal members, including comments made at the public meetings to review this plan
2. Assessment work identifying water quality impairments or stream/wetland dysfunctions (refer to the Watershed Assessment Report and Wetlands Conservation Plan)
3. Identification of unique ecological areas or priority habitats for sensitive species

Future projects may be added to this list following the principles and criteria listed in the strategy section of this plan, and to address the opportunities identified in the previous section. Future tribal watershed plans will recommend additional priority projects for implementation. The results of the sensitive species analysis and soils analyses will also generate information to prioritize projects.

In parentheses after the project site name are the approximate starting year and the watershed in which the project is located.

- ✓ Project components marked by a check are already underway, although they still require maintenance and monitoring
- ☐ Project components without a check are planned or desired

For 1998, the program will emphasize expanding existing projects and beginning new ones with plans already in place. For future years, the program will seek to implement new projects until most of the ones on this list have been accomplished. Refer to Appendix D for a table of ongoing and potential restoration projects. Because project selection will ultimately be dictated by the Tribal Council and Land Restoration Board, this plan must necessarily be flexible to respond to changing priorities of these bodies, new information, and the interests of the tribal public.

We hope to incorporate education activities into as many of these projects as possible, by recruiting schools and community groups to participate in project implementation and monitoring, and by producing videos of restoration projects for community viewing.

A. Ongoing and Expanding Projects (1997+)

These projects are currently in place, but new components may be added. Projects are expected to continue for several years until the systems can sustain their restored functions; even then, monitoring should continue indefinitely.

1. Lofer Cienega (1996, BIG BONITO IN BLACK)

- ✓ Livestock exclusion through fencing (requires maintenance)
- ✓ Elk exclosure (1 acre)
- ✓ Reseeding

- ☑ Channel restoration with riffle bars
- ☑ Monitoring riparian conditions (vegetation, water quality, and geomorphology)
- ☑ Monitoring vegetation production/utilization
- ☑ Fish population monitoring and habitat assessment (Apache Trout)
- ☐ Elk population monitoring (Lofer has very high elk population that should be targeted for monitoring)

2. Gooseberry Creek (1996, NORTH FORK OF WHITE)

- ☑ Livestock exclusion through fencing (requires maintenance)
- ☑ Reseeding riparian areas
- ☑ Channel restoration with riffle placement
- ☑ Improved road crossing design
- ☑ Monitoring riparian conditions (vegetation, water quality, and geomorphology)
- ☑ Monitoring vegetation production/utilization
- ☑ Fish population monitoring and habitat assessment
- ☐ Elk population monitoring (Gooseberry has very high elk population that should be targeted for monitoring)
- ☐ Amphibian monitoring (Gooseberry has been identified as habitat for Leopard Frogs)
- ☐ Assess potential for reintroduction of native trout

3. Horseshoe Cienega (1996, UPPER NORTH FORK OF WHITE)

- ✓ Livestock exclusion through fencing (requires maintenance)
- ✓ Riffle placement
- ☐ Reseeding
- ☐ Assess fish populations to compare to 1996 data

4. Pacheta Cienega (1997, PACHETA IN BLACK)

- ✓ Livestock exclusion through fencing
- ✓ Evaluation of 1997 restoration efforts
- ☐ Assess fish populations to compare to 1996 data

5. East Cedar Creek (1996, CEDAR)

- ✓ Exclosure above waterfall has made substantial progress in two years.
- ✓ Reseeding conducted this year.
- ☐ Watershed Education with JFK School
- ☐ Gully control work
- ☐ Road improvements
- ☐ Assess fish populations inside exclosure and compare to those downstream (stream has Speckled Dace and possibly Desert-Mountain Sucker?)

6. Limestone Canyon (1996, CARRIZO)

- ☑ Exclosures are beginning to show substantial gains from two years ago.
- ☑ Reseeding conducted this year.
- ☐ Volunteer Projects with Healthy Nations

- ☐ Assess fish populations inside exclosure and compare to those downstream (stream has Roundtail Chub and Speckled Dace)

7. Cibecue Canyon (1996, CIBECUE)

- ☑ Livestock exclusion through fencing (requires maintenance)
- ☐ Reseeding planned for this year
- ☐ Education Projects with Cibecue School
- ☐ Assess amphibian populations

8. Spring Creek (1996, CIBECUE)

- ☐ Reseeding planned for this year
- ☐ Education projects with Cibecue School
- ☐ Assess amphibian populations

9. Smith Cienega (1995, UPPER NORTH FORK OF WHITE)

- ✓ Monitoring of riparian vegetation and channel morphology
- ✓ Water quality monitoring, including macroinvertebrates
- ✓ Apache Trout population monitoring
- ✓ Vegetation production/utilization
- ☐ Elk population monitoring

10. Martinez Ranch (1997, CIBECUE)

- ☐ Exclosures
- ☐ Gully controls

11. ID Restoration Area (1997, BLACK)

- ✓ Monitoring in cienegas
- ☐ Horse trapping
- ✓ Roundup of cattle
- ☐ Fall reseeding of meadows

12. Soldier Spring (1997, BLACK)

- ☐ Fence exclosure
- ☐ Reseeding
- ✓ Monitoring of riparian vegetation
- ☐ Apache Trout monitoring
- ☐ Monitoring of amphibian species

13. Firebox Watershed (1997, EAST FORK OF WHITE)

- ☐ Road closures and reseeding

B. Planned Projects (1998+)

The following projects have been planned for implementation in the next year. Proposals have been written to fund several of these projects, although funds are

not necessarily available. Some of the projects have been reviewed through the Tribal Plan and Project Review Process, but others will need to be reviewed.

1. Bonito Cienega (1998, BIG BONITO IN BLACK)

- ☐ Monitoring of riparian vegetation and channel morphology
- ☐ Water quality monitoring, including macroinvertebrates
- ☐ Apache Trout population monitoring
- ☐ Vegetation production/utilization

2. Cedar Creek in town (1998, CEDAR)

- ☐ Grazing exclusion
- ✓ Reseeding
- ☐ Road crossing rehabilitation
- ☐ Watershed education with JFK School

3. White Springs (1998, CIBECUE)

- ☐ Grazing exclusion
- ✓ Reseeding
- ☐ Road rehabilitation
- ✓ In-channel structures

4. Cibecue Creek above town to 1st Campground (1998, CIBECUE)

- ☐ Reseeding
- ☐ Fencing
- ☐ Channel restoration
- ☐ Bird surveys
- ☐ Redesign of irrigation diversions
- ☐ Watershed education with Cibecue School

5. Carrizo Creek above community (1998, CARRIZO)

- ☐ Reseeding
- ☐ Fencing
- ☐ Assess fish populations (Roundtail Chub, Speckled Dace, Green Sunfish)
- ☐ Assess bird populations (including Willow Flycatcher)
- ☐ Feral horse trapping

6. Salt River / Medicine Ecosystem (1998, SALT)

- ✓ Removal of maverick cattle
- ☐ Reseeding of riparian areas in campgrounds
- ☐ Monitoring of riparian vegetation
- ☐ Monitoring of upland vegetation
- ☐ Watershed education with Healthy Nations groups

C. Future Projects (1999-2000+)

The following are projects highlighted for implementation in the future, although they are not currently planned. We will aim to accomplish projects from each of the different types of impacts (livestock grazing, gullies, channelization, roads, development, feral animals). The timetable for implementation will be determined by the levels of support for the projects, including community interest, school participation, internal resources available for implementation, outside funding, and recommendations of the Land Restoration and Conservation Board.

1. Trout Creek (1999, NORTH FORK)

- ☐ Road rehabilitation in highly erodible soils, in conjunction with Lame Deer Timber Sale

2. Forestdale/Dry Valley (1999, CORDUROY)

- ☐ Road rehabilitation in highly erodible soils, in conjunction with Corduroy Timber Sale

3. Upper Middle Cedar Creek (1999, CEDAR)

- ☐ Fencing
- ☐ Gully plugs
- ☐ Road drainage improvements

4. Oak Creek (2000, CANYON)

- ☐ Gully controls
- ☐ Reseeding

5. Sunrise Resort (2000, UPPER NORTH FORK)

- ☐ Erosion control on roads, slopes, and parking lots
- ☐ Reconstruction of impoundment for sediment control

6. Cibecue in Town (1999, CIBECUE)

- ☐ Removal of waste material from the slope at the sawmill
- ☐ Restoration of the stream channel
- ☐ Redesign of Stockman's irrigation diversion
- ☐ Watershed education with Cibecue School

7. White River at Canyon Day (1999, WHITE)

- ☐ Natural channel and wetlands restoration
- ☐ Watershed education with Alchesay High School

8. East Fork (1999, EAST FORK OF WHITE)

- ☐ Channel restoration
- ☐ Redesign of irrigation diversions

- ☐ Reseeding
- ☐ Watershed education with JFK School

9. North Fork (2000, NORTH FORK OF WHITE)

- ☐ Channel restoration (particularly in reach below Baptist Church)
- ☐ Redesign of irrigation diversions
- ☐ Reseeding

D. Research Projects

Research projects may complement restoration activities to better address critical challenges facing the Tribe. The following are priorities for the next four years.

1. Wildlife Impacts on Riparian Areas

Special opportunities exist in areas where livestock and horses are excluded, as in Smith Cienega, Bonito Cienega and the Black River Restoration Area. Research should help determine the impacts of wildlife on riparian areas, including water quality.

2. Fire Impacts on Watershed Conditions

Both wildfires and prescribed burning should be examined to determine the effects on the watershed, and what steps can be taken to prevent or mitigate the impacts of fire. Key study areas include the recent White Springs burn near Cibecue and the Sombrero Butte burn near Medicine Ranch. Future prescribed burns can be evaluated for their impacts as well. Such a project should also involve research into cultural attitudes toward fire.

3. Recovery Potential of Riparian Areas

One of the key questions facing the Tribe is determining how long a riparian area needs to rest in order to recover ecological functions. The Black River Restoration Area, and riparian exclosures established in recent years, will provide a prime opportunity to answer this question. We need to determine how intensive restoration measures need to be; for example, is fencing necessary, or can rotations and removal of feral animals achieve sufficient results? Furthermore, we need to evaluate the recovery potential of intermittent streams versus perennial ones.

4. Efficiency of Restoration Techniques

The Tribe is employing various restoration techniques already, and is considering others. The efficiency of these techniques should be evaluated to determine their effectiveness in restoring ecological functions, net economic benefits, long-term sustainability, and utilization of local resources. Techniques to be examined include gully check-dams, riffle bar placement, road rehabilitation, feral horse removal, natural channel restoration, and reseeding.

VIII. Overview Of Watershed Conditions And Opportunities

Throughout the Reservation, waters have deteriorated due to past and present land uses. Nevertheless, most of the watersheds are in good health overall, supporting native plants, fish, and animals as well as use by people. Watershed Planning has prepared an assessment of watershed health, focusing on water quality and wetland-riparian health, in its Watershed Assessment Report for 1997. This report will be updated annually, with particular watersheds being assessed in greater detail. This report also identifies which waterbodies are not currently meeting tribal water quality standards and/or are suffering from functional impairments. Refer to the Watershed Assessment Report for explanations of these terms and evaluation methods.

A. North Fork

1. Upper North Fork

This watershed contains some of the highest quality streams on the Reservation and it a critical area of biodiversity. It is the home of the Sunrise Park and Resort, as well as several important fishing lakes. This area is critical for maintaining and restoring populations of the Apache Trout. The headwaters are affected by roads and by parking lots at Sunrise.

Water Quality Status: Concerns for sedimentation of Becker Creek, bank erosion at Horseshoe Cienega, and dissolved oxygen levels in lakes

Restoration Goals: protect and promote Apache Trout populations and habitat; reduce sedimentation in Becker Creek; continue effort to restore wetland functions in Horseshoe Cienega; improve water quality in fishing lakes

2. Bog

This watershed contains important fisheries in the Bear Lakes and Bog Tank. It offers potential for high-quality recreational use in a natural setting. The lakes would benefit from having the streams buffered from grazing impacts through drift fencing, riparian exclosures, and/or more intensive livestock rotations.

Water Quality Status: Concern for dissolved oxygen levels

Restoration Goals: Improve riparian conditions along Bog Creek through grazing management

3. Gooseberry

The system has been impacted by high road densities and heavy grazing. Elk populations are especially dense in this area, resulting in heavy use of the meadows and conflicts with livestock. It formerly contained populations of Apache Trout. It also includes a large stand of Bebb Willows.

Efforts to improve conditions in Gooseberry Creek should support the ultimate goal of restoring the native fishery. This plan should complement activities in and around McNary, including a program with the McNary school. Road impacts should continue to be addressed in timber sales.

A major restoration project has proceeded for the past two years with funding from the Arizona Water Protection Fund and support of the Forestdale and Cedar Creek Livestock Associations. The project has resulted in fencing of riparian areas, a redesigned road crossing, and placement of riffle bars.

Water Quality Status: Impairment due to temperature and dissolved oxygen
Restoration Goals: Continue to improve riparian conditions, ultimately restore native trout fishery

4. Diamond

The watershed around Earl Park has been impacted by roads and ungulate grazing. The area should be targeted for watershed analysis and restoration.

Water Quality Status: Probable impairment due to sedimentation from Trout Creek
Restoration Goals: Reduce sedimentation and turbidity by rehabilitating roads

5. Middle and Lower North Fork

The North Fork once provided excellent trout fishing. Now the waters have warmed so much that trout are only seasonal travelers below the Alchesay hatchery. Stream impacts from roads and past gravel mining have undermined the health of this system. The floodplain areas are not in very stable condition, with mostly disturbance plants along the channel. More confined sections, such as the canyon down to the sawmill, are in better health.

Water Quality Status: Full support, with concerns over temperature
Restoration Goals: Restore natural channel conditions and reduce temperatures at areas impacted by gravel mining and diversions

B. East Fork

The East Fork harbors six native fish species. The system has been impacted by a high density of poor roads, irrigation diversions, and flood control projects.

The upper portion of the watershed is the only officially designated wilderness on the Reservation.

East Fork also offers unique potential for native fishery management and involvement of local schools. A grant to support such work was submitted by the Arizona Fishery Resources Office to the Arizona Heritage Fund, but was not funded.

Erosion of corn fields is a major problem in the watershed, which is being compounded by short-term flood control projects. This problem needs to be addressed through a watershed plan and special irrigation plans.

Firebox Watershed, a major tributary to the East Fork, has been identified as a leading cause of sedimentation in the main stem.

Water Quality Status: Possible impairment due to temperature, turbidity

Restoration Goals: Reduce sedimentation from roads in Firebox Watershed, improve channel conditions in gravel mining areas and at irrigation diversions

C. White below confluence

The White River poses concerns for native fish, which have been affected by increasing encroachment of exotic species such as bass and catfish.

One of the impacts in this watershed has been gravel mining at Canyon Day. The abandoned areas may become restoration sites. This area already supports some waterfowl, but a restored system would provide many benefits, including wildlife habitat, recreation and aesthetic values. From these projects, we will have a better understanding of how to restore these systems.

Water Quality Status: Full support, but concerns over temperature and spread of exotic fish species

Restoration Goals: Restore wetlands and channel conditions at Canyon Day

D. Black

The Black Watershed was once proposed as a roadless area for the protection of traditional tribal member activities. Instead, pressure to access the high-quality but remote stands of ponderosa pine led to the creation of the town of Maverick by extending the railroad down from the Sunrise Area. The area was first logged in the 1940s. Now the site is used as a center for guided hunts.

The Black River contains many miles of perennial streams that are important fisheries. The area is extremely valuable for wildlife, including elk, antelope, turkey, waterfowl, and bighorn sheep. With only a few lake facilities, livestock camps, and abandoned settlements at Turkey Creek and Maverick, this large watershed remains largely undeveloped. Therefore, it offers great potential for near-wilderness experiences.

The Black contains many of the perennial streams that are important for Apache Trout. Many of these streams are not impounded currently, and therefore may represent the best opportunities for ensuring long-term native fish populations. Warm temperatures due to sedimentation from roads and loss of stream bank vegetation pose a threat to this objective.

The eastern portion of the Black watershed has the highest density of wetlands on the Reservation. It harbors sizeable populations of antelope, and is beginning to see greater numbers of bighorn sheep.

1. Black River Restoration Area

The cienegas of the Black River watershed are in terrible condition as a result of recent decades of over use. The combination of poorly managed cattle, horses, and elk are simply too great for these systems. Much of the vegetation on these meadows has been converted to bluegrass, sneezeweed, and iris. Some of these areas have been targeted with restoration projects. The Wetlands Conservation Plan has prioritized these areas for restoration.

The Tribal Council designated the east half of the ID Range in this watershed as a restoration area, calling for removal of cattle and feral horses.

Water Quality Status: Full support for water quality in streams; however, lakes may suffer water quality problems, and many wetlands are dysfunctional

Restoration Goals: Improve wetland health within the Restoration Area through reduced grazing pressures

2. Paddy

Paddy Creek is a moderate watershed with unique values, including many springs on the side slopes and populations of Apache Trout (although they are hybridized with rainbows). The conditions in the watershed are terrible due to overgrazing by maverick cattle. Most native riparian plants have been lost. Paddy Creek Cienega still has dense populations of sedges, but it overused.

Water Quality Status: Potential impairment due to temperature (not yet assessed)

Restoration Goals: Improve riparian health through reduction of feral animals

3. Pacheta

Pacheta Creek is one of the highest quality streams in the watershed. It has excellent vegetation in many stretches, including the canyon area below the waterfall. Upper Pacheta Cienega shows signs of overuse, but a restoration project has been implemented this fall to protect the stream channel. Middle reaches of the creek are overgrazed.

Water Quality Status: Impaired wetland functions in Pacheta and Maverick Cienegas

Restoration Goals: Improve wetland-riparian condition through reduction of grazing

4. Big Bonito

The Big Bonito drainage is critical for maintaining populations of Apache Trout and other native fishes. The watershed is highly dissected by perennial streams, including Lofer, Boggy, Flash, Squaw, Little Bonito, Butterfly, Hurricane and Tonto.

The upper portions of the watersheds is impacted by roads, although the lower portion of Big Bonito and Tonto Creeks are relatively roadless.

The area around Lofer Cienega and the Hurricane Timber Sale have been reserved from timber harvest.

A project to restore Lofer Cienega has been underway for the past two years, focusing on reducing grazing pressures.

Water Quality Status: Impairment in Lofer Cienega due to temperature, Big Bonito fully supports uses

Restoration Goals: Reduce road and grazing impacts to upper watershed

E. Carrizo

1. Corduroy

The Corduroy watershed has suffered a wide range of impacts, including juniper eradication in the 1960s, intensive road building, overgrazing, and off-Reservation water diversions. Most of the streams in the watershed now flow intermittently. Sedimentation from roads is especially acute, due to the sandy nature of many of the soils. However, some stream reaches are still in good condition, and there are important resources in the area, such as heritage sites and native fishes.

The Corduroy Watershed should be the focus of a watershed restoration project, in conjunction with plans for sustainable development of the community at Forestdale. There are many opportunities for restoring native vegetation and fisheries in this ecosystem.

Water Quality Status: Possible impairment due to turbidity and dissolved oxygen

Restoration Goals: Reduce turbidity and sedimentation from roads

2. Cedar

Cedar Creek is a highly disturbed system. It suffers from poor water quality and stream health. Native fish, including Speckled Dace, Sucker, and possibly Roundtail Chub, inhabit the system. The entire watershed is marred by the most extensive surface erosion on the Reservation. Cedar Creek flows intermittently below R-14 Ranch.

Historically, Cedar Creek has suffered a variety of injuries, including cottonwood eradication in Big Canyon, roads in sensitive areas, and overgrazing. Native riparian vegetation is kept down by constant pressure from community horses and seasonal use by cattle. Juniper encroachment is a problem in the uplands.

Several small demonstration projects have been constructed at R-14 Ranch, Middle Cedar Creek, and Big Canyon. These exclosures are designed to demonstrate the potential recovery of these systems through revegetation.

Cedar Creek should be the focus of a watershed restoration project. The roads in the upper portions of all of the Cedar Creek tributaries should be evaluated for possible closure. They generally travel up the stream bottom, inhibiting revegetation and channel stability. Overgrazing by cattle and horses remain a serious threat to watershed health and promote continued gully erosion. The watershed will continue to suffer high peak flows and serious erosion unless these impacts are addressed.

Water Quality Status: Dysfunctional stream condition in the main stem of Cedar Creek, possible impairment due to sedimentation, violation of narrative standards due to odor and algal growth

Restoration Goals: Reduce sedimentation from gullies and roads and restore riparian health in Middle and East Forks by excluding livestock from riparian areas and reseeding with native wetland plants

3. Upper Carrizo

The Upper Carrizo Watershed has been severely impacted by catastrophic fires, road building, gravel mining, and overgrazing. Due to the widespread impacts, it is doubtful that this watershed will recover anytime soon. However, revegetation could significantly advance recovery by stabilizing streambanks and providing fish habitat. Horses consume much of the streambank vegetation that remains after spring floods.

Efforts should be geared to protecting the existing resources, including the native fishery, and conducting smaller restoration projects on tributary canyons.

One of these efforts is being conducted in Limestone Canyon, where livestock exclosures have been constructed. Farmland in the valley bottoms could be improved by restoring natural stream processes. Restoration of fields for agriculture should be incorporated into long-term restoration plans. Control of horses in the community area and reduction of feral horses are essential tasks. Reseeding with native wetland plants may be needed to restore proper function.

Water Quality Status: Full support in Limestone Canyon, but concerns over turbidity throughout watershed and especially in severely erodible areas below the Mogollon Rim

Restoration Goals: Reduce sedimentation from gullies and roads, improve riparian condition in the main stem and tributaries by removing horses, managing livestock and reseeding with native species

4. Lower Carrizo

The lower portion of Carrizo is dominated by hot springs that alter the chemistry of the stream. Certain places are culturally sensitive. The area has been heavily invaded by salt cedar. The spread of this exotic plant needs to be monitored. Native species may need to be reintroduced to restore stream function.

Water Quality Status: Undetermined

Restoration Goals: Improve riparian vegetation through grazing controls and reseeding

F. Cibecue

Cibecue is the focus of a watershed analysis project, which will help to develop a management and restoration plan. This plan will be a priority for implementation.

Grazing impacts, especially by roaming horses, need to be addressed to improve the condition of sensitive riparian areas and eroding uplands.

1. Upper Cibecue

Upper Cibecue has been heavily impacted by forest roads. A better designed road system is imperative.

Farmland in the riparian area could be improved by restoring natural stream processes. Consideration of agricultural use should be incorporated into long-term restoration plans.

Water Quality Status: Possible impairment due to turbidity
Restoration Goals: Reduce sedimentation from gullies and roads

2. Middle and Lower Cibecue

Middle portions of Cibecue are heavily impacted by grazing, resulting in a loss of streambank stability.

Lower Cibecue offers tremendous potential for restoring and maintaining a high quality, low-elevation stream system on the Reservation, due to its inaccessibility. This area will be addressed through the Medicine Ecosystem Project, which should compile information on the extent of native fishes in the system.

Water Quality Status: Possible impairment due to *E. coli* bacteria
Restoration Goals: Improve riparian conditions through improved grazing management and reseeding

G. Canyon

This watershed is the most remote on the Reservation. Canyon Creek maintains populations of native fish, including roundtail chub and suckers, and has rainbow trout in the upper reaches. The primary activities in the area are livestock grazing and recreation. The Oak Creek Livestock Association is interested in doing water development work in the area. These projects could be tied into range management efforts to protect and enhance the riparian areas in this system. Road crossings in the upper portion of the watershed are another problem, particularly in highly erodible soils. Canyon Creek offers near-wilderness recreation opportunities. Habitat improvements in the upper reaches (and off the Reservation) could improve the trout fishing in the system.

The lower portion of the watershed should be addressed through the Medicine Ecosystem Project.

The roads in the upper portion of the watershed should be evaluated and redesigned to improve stream health. Riparian conditions in the middle portion of Canyon Creek should be examined, with a goal of improving conditions through cooperative projects with the Oak Creek Livestock Association.

Water Quality Status: Possible impairment due to turbidity
Restoration Goals: Reduce sedimentation from gullies and roads in upper watershed and at Oak Creek, reduce grazing pressures on riparian areas throughout the watershed

H. Salt

1. Salt River Draw

This system supports a small native fishery for the short reach that flows perennially. The watershed has been impacted by livestock grazing, but the rugged nature of the lower canyon affords natural protection for the stream. It is an important wildlife area and contains significant archaeological sites.

Parts of the watershed will be addressed through the Medicine Project. Range management should be improved in the watershed. Guided tours are a possibility for providing economic returns while limiting access to this sensitive area.

Water Quality Status: Undetermined

Restoration Goals: Improve herbaceous vegetation in the woodland and rangelands, to reduce runoff and surface erosion.

2. Salt River

This system once supported by diverse native fishery, but now it has been invaded by exotic catfish and bass, as well as by salt cedar. The entire area is extremely sensitive from a traditional cultural perspective.

Salt River has great potential for ecotourism activities, expanding upon the existing recreation base of whitewater rafting.

The Salt and lower west end tributaries should be evaluated through the Medicine Project to determine the potential for recovering native fishes, as well as achieving other tribal goals and learning more about this special area. A management plan for this area is under development. Recommendations from this plan geared to improving watershed health should be a priority for implementation.

Water Quality Status: Undetermined

Restoration Goals: Improve riparian health and habitat for native fishes through reducing maverick cattle populations.

IX. Sources Of Assistance And Funding

In addition to the tribal Land Restoration Fund and various programs involved in ecosystem management, several outside agencies and programs are available to support restoration projects. Other sources may become available according to the desires of the Tribal Council. The Ecosystem Code includes a section that will guide tribal assumption of Federal program authority.

A. Federal Programs

1. Natural Resources Conservation Service

Several programs under the Farm Bill (Environmental Quality Incentives Program, Wildlife Habitat Improvement Program, and others) are administered by the NRCS and could support restoration and nonpoint source control projects. The Land Restoration and Conservation Board will oversee the conservation district by coordinating and recommending projects.

2. Forest Service Rocky Mountain Station

The Tribe is adopting a Memorandum of Agreement with the Station that will facilitate the transfer of technology for watershed and riparian assessment and restoration. The Station will be a key partner in helping to design and evaluate restoration projects. The Station offers valuable assistance in researching answers to challenges facing the Tribe.

3. Environmental Protection Agency

The EPA offers several grant sources, including Nonpoint Source Control, Clean Lakes, Wetlands Demonstration, Sustainable Development and Environmental Education, which could complement watershed restoration efforts.

4. Fish and Wildlife Service

Several programs are also available from the FWS to support habitat restoration and protection. The Tribe has implemented riparian demonstration projects with a Challenge Cost-Share grant. The Service is assisting the Tribe in conducting a sensitive species analysis which will help identify additional restoration priorities. Species-specific funding may be adapted for watershed restoration projects as appropriate.

5. Bureau of Indian Affairs

The Bureau of Indian Affairs may provide staff time and heavy equipment, in addition to direct funding of projects. Many projects may be coordinated with timber sales or road reconstruction that directly involve the BIA. BIA Forestry

and Environmental Quality Staff can assist with long-range planning, analysis, and demonstration projects.

6. Bureau of Reclamation

The Tribe has entered into a cooperative agreement with the Bureau of Reclamation which provides for funding and technical assistance. The Tribe has used this assistance for community mapping. Future projects may include sensitive species assessments, hydrologic studies, and improved irrigation diversions.

B. Other Assistance

1. Arizona Department of Environmental Quality

ADEQ provides funding for nonpoint source projects for the entire State of Arizona. The Tribe may submit projects for consideration from this source after it establishes a Memorandum of Agreement with this agency.

2. Arizona Water Protection Fund

The Tribe has already received two grant awards from this fund for projects that focused on nonpoint source pollution controls through watershed and wetland restoration.

X. Authority And Process

A. Legal Authority

The Tribal Ecosystem Code directs the development of the Watershed Restoration Strategy. The Land Restoration Code authorizes the use of this document for prioritizing restoration projects. The Water Quality Ordinance sets goals for water quality and authorizes the establishment of a nonpoint source management program. These Ordinances will be adopted after public review and comment. Refer to the attached notice of Legal Certification (Appendix E) by the Tribe's General Counsel for the Tribe's authority to implement a non-point source control program.

The Federal Clean Water Act includes several provisions that support the Tribe's efforts to control nonpoint source pollution, including Section 303 (Water Quality Standards), Section 305 (Reporting), Section 319 (Nonpoint Source Control), Section 401 (Water Quality Certification), and Section 404 (Discharge and Fill of Materials). The Tribe will receive authority under Section 319 with EPA approval of the management program detailed in this Plan. The Tribe currently has authority under Section 401, Section 303 authority is pending tribal adoption of standards, and Section 404 permits receive tribal review through the water quality certification process.

B. Public Outreach and Input

The Tribe will provide for public comment on this Plan in special meetings on tribal efforts to protect and restore its lands and waters. Meetings were held in Cibecue and Whiteriver prior to completion of this Plan, and comments were incorporated into the Plan. Such meetings will be held at least every four years when the Tribe adopts a new version of the strategic plan. Additional meetings will be arranged when the Land Restoration Board begins operation. Board members will serve as liaisons to the community and arrange special community meetings to discuss the Restoration Program.

C. Project Selection and Implementation

Guidelines for selecting and implementing restoration and conservation projects are included in the Land Restoration Ordinance. Watershed Planning will generally serve to coordinate and evaluate these projects; however, active participation of other Tribal and non-Tribal programs will be necessary to implement many of the projects.

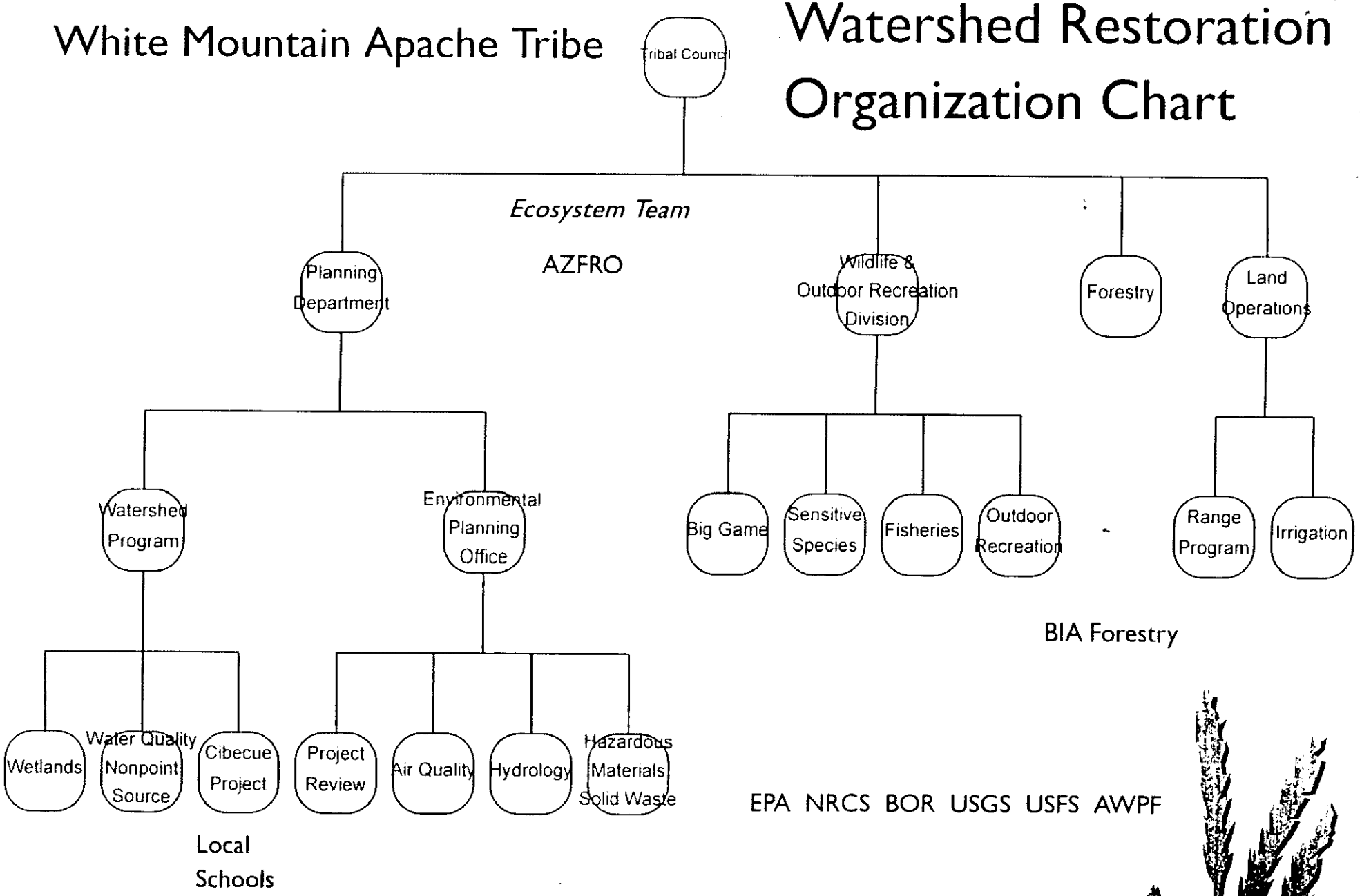
D. Evaluation of Projects and Revisions to this Plan

Watershed Planning staff will evaluate restoration projects to determine their effectiveness and efficiency in meeting objectives. The staff will revise this Plan

annually to reflect progress in implementing projects, new assessment information, new priorities, new techniques for restoration, and feedback from communities. Regular meetings will be held in communities through actions of the Land Restoration Board. Revisions to this plan will be presented to the Tribal Council for its approval.

White Mountain Apache Tribe

Watershed Restoration Organization Chart



Appendix B Stream Gage Network

A. Routine Measurement Locations (WATERSHEDS in parentheses)

Water quantity and basic water quality measurements are taken on a regular basis (approximately monthly, depending on changes in flows) at these sites.

1. Continuously recording streamgaging stations

1. North Fork White River near McNary: ~ .75 mi. downstream of McCoy's Bridge on Highway 473 (NORTH FORK OF WHITE)
2. North Fork White River at Lower Log Road (NORTH FORK OF WHITE)
3. Bonito Creek at Y-40 Road (BLACK)

2. Manual streamgaging stations

1. White Spring (CIBECUE)
2. Cibecue Creek below Big Spring [staff gauge] (CIBECUE)
3. Canyon Creek at O16 crossing, below Oak Creek Ranch [staff gauge] (CANYON)
4. Canyon Creek at Salt River (CANYON)
5. Corduroy Creek above Forestdale Cr. [staff gauge, soon to have continuous recorder] (CARRIZO)
6. Cedar Creek Waterfall (CEDAR)
7. Tonto Creek at Y-47 crossing [staff gauge] (BLACK)

3. USGS streamgaging stations

1. White River near Fort Apache, above Black River Crossing* (WHITE)
2. Black River near Fort Apache, at Black River Crossing (BLACK)
3. Carrizo Creek near Show Low, at Highway 77 bridge* (CARRIZO)
4. East Fork White River near Fort Apache, above Rock Creek (EAST FORK)
5. Salt River near Chrysotile, above Highway 77 bridge* (SALT)
6. Cibecue Creek near Chrysotile, above Salt River* (CIBECUE)

* = tipping bucket rain gauge

B. Other Stream Measurements

1. Spring at Williams Creek Fish Hatchery: daily discharge measured with Eddy Weir (NORTH FORK OF WHITE)

2. North Fork White River at Alchesay Fish Hatchery: continuous stage recorder at hatchery intake; intake flow measured with flume or weir (NORTH FORK OF WHITE)

1. Snow Courses

1. McNary, 1.5 miles W. of McNary (NORTH FORK OF WHITE)
2. Hawley Lake (NORTH FORK OF WHITE)
3. Sunrise Peak (NORTH FORK OF WHITE)

2. Manual Rain Gauges

1. ID Ranch (BLACK)
2. Oak Creek Ranch (CANYON)
3. Salt River Trading Post (SALT)
4. Cibecue School (CIBECUE)
5. Cedar Creek School (CEDAR)

3. Other Rain Gauges (operated by BIA Fire Management)

1. Cibecue Fire Station (CIBECUE)
2. Limestone Ridge, fire season only (CARRIZO)
3. Chediski Peak (?), fire season only (CANYON)
4. Whiteriver Airport (WHITE)

Appendix C Restoration Techniques

The following list summarizes methods for restoring watershed conditions and reducing nonpoint source pollution. This list is based upon previous demonstration projects, research and guidance from the Rocky Mountain Station, and restoration techniques recommended by outside experts. This list will be expanded through new research and demonstrations. Many of these techniques are Best Management Practices (BMPs) that will be incorporated into project plans. All BMPs included in this program will either have no effect or a beneficial effect on groundwater quality. BMPs to protect groundwater quality directly will be adopted through the development of the Tribe's Groundwater Protection Plan (expected in 1998).

A. Range Management

1. Open range grazing

Responsibility for implementing the following BMPs lies primarily with the Range Conservation Program, Tribal Livestock Associations, and the Agriculture Enterprise. Special restoration or conservation projects to build fences or otherwise control livestock use will help to ensure that these BMPs are followed.

12.1.1.1 Conserve Riparian Areas

Maintenance of dense vegetative cover and stable streambanks helps to filter sediment, protect stream banks, and absorb flood flows.

12.1.1.2 Control Livestock Pasturing on Streams and Wetlands

Animals should not be pastured for extended periods (more than a few days) unless there are sufficient barriers (such as dense shrub growth) to protect a wetland, particularly during the early part of growing season (April and May) and wet periods (July and August monsoon rains). Livestock managers should construct fences to protect sensitive areas where other options are not feasible.

12.1.1.3 Rotate Livestock

Livestock should be moved around open rangeland to evenly distribute forage utilization and to protect sensitive areas such as streams and wetlands.

12.1.1.4 Monitor Forage Utilization

Monitoring of utilization by livestock and wildlife is important to determine if grazing use is sustainable. Results from monitoring should be used to guide livestock rotation practices and to manage wildlife populations.

2. Wildlife Management

The Wildlife and Outdoor Recreation Division is responsible for monitoring populations and setting hunting and fishing regulations.

12.1.2.1 Increase hunting to reduce grazing pressures on sensitive riparian areas

3. Feral Animal Management

Feral animals (horses and cattle) that graze throughout the growing season cause overuse of rangelands and sensitive wetlands. Many herds stay near a cienega or move from one wetland to the next. The Range Conservation Program (working with Livestock Associations and their members) and Wildlife and Wildlife and Outdoor Recreation Division should establish a trapping program.

12.1.3.1 Trap and remove feral animals to reduce grazing pressures on riparian and upland areas

4. Vegetation Management

Prescribed wildfire or burning may be used to alter vegetative communities to restore previous watershed condition. These issues will be addressed in a separate plan to be implemented by the BIA Fire Management Program. Disturbed soils should be reseeded with native species if needed to restore appropriate ground cover. Riparian areas may be restored with native species where those plants are no longer present in sufficient quantities.

12.1.4.1 Use prescribed fire as part of comprehensive efforts to restore watershed conditions while addressing wildlife impacts, grazing, and gully erosion

12.1.4.2 Reseed with appropriate native species on uplands and in riparian areas

B. Hydrologic/Habitat Modification

1. Channelization / Streambank modification

Channel restoration may rely on either hand labor or heavy equipment to reshape the bed and banks of a channel to form a more stable configuration based on the natural geomorphology of the system. Techniques will draw upon those developed by David Rosgen, while emphasizing the use of native grass-like plants and woody species where appropriate. These activities need to be designed by Watershed Planning and implemented by Land Operations.

12.2.1.1 Restore natural channel configurations by removing berms, planting vegetation, and reshaping the channel with heavy equipment, but only in accordance with carefully planned designs

2. Surface Erosion (gullying)

Recontouring of gullied areas, checkdams, and reseeding are techniques that can be used to help arrest surface erosion. However, such techniques should be applied only after addressing the causes of the gullying, which in most cases are a combination of overgrazing and road impacts. Watershed Planning will design these projects in coordination with Tribal Forestry (for woodland projects) and Environmental Planning (to involve summer JTPA program).

12.2.2.1 Use checkdams, recontouring, and reseeding to stem gully erosion

3. Channel Downcutting / Bank erosion

Techniques to achieve restoration of natural channel morphology include placing riffle bars, reposing stream banks, excluding grazing, and revegetating banks. These activities need to be designed by Watershed Planning and implemented by Land Operations.

12.2.3.1 Use riffle bar placement and other active restoration measure where necessary to promote channel stability, but only in conjunction with steps to remove the cause of degradation.

C. Road Impacts

1. Road Crossings

Road crossings may be redesigned to promote a more natural geomorphic pattern to accommodate a channel, including low-water crossings, multiple culverts, and bridges. FATCO, Land Operations and BIA Roads are the primary entities for building and improving road crossings. The Hydrologist and Watershed Planning staff will recommend improved designs.

12.3.1.1 Reconstruct improper road crossings to promote a more natural stream morphology

2. Road Drainage

Structures such as rolling dips, waterbars, ditches, and relief culverts will be built to dissipate water flows through vegetation and following natural topography as much as possible. FATCO, Land Operations and BIA Roads are the primary entities for building, maintaining, and rehabilitating roads. The Hydrologist and Watershed Planning staff will recommend priorities for treatment.

12.3.2.1 Use appropriate drainage structures to dissipate water flows and avoid discharge to drainages

D. Construction/Development

Areas where construction have increased pollution should be treated by removing the source. If that is not possible, sediment traps may be established to prevent sediment from entering waterbodies. Similarly, artificial wetlands may be established to filter nutrients or other pollutants before they reach waterbodies. These structures should be designed by the Tribal Engineer.

12.4.0.1 Construct and maintain sediment traps where sources of sediment cannot be practicably eliminated

12.4.0.2 Construct and maintain artificial wetlands where sources of pollutants cannot be practicably eliminated

NPOINT SOURCE / RESTORATION PROJEC APPENDIX D

Project Name	Watershed	Starting Year	Key Entities	Restoration Activities	Monitoring
Lofer Cienega	Big Bonito	1996	Watershed, Turkey Creek Association, Land Operations, Wildlife Division, Rocky Mountain Station	Fencing, reseeding, riffles	Vegetation, Fish, Channel, Water Quality, Pebble Count
Gooseberry Watershed	Gooseberry	1996	Watershed, Forestdale Association, Land Operations, Wildlife Division, Rocky Mountain Station	Fencing, reseeding, riffles	Vegetation, Fish, Channel, Water Quality, Pebble Count
Horseshoe Cienega	Upper North Fork	1996	Watershed, Wildlife Division, Rocky Mountain Station	Fencing, riffles	Vegetation, Fish, Channel, Pebble Count
Pacheta Cienega	Pacheta in Black	1997	Watershed, Land Operations, Rocky Mountain Station	Fencing, riffles	Vegetation, Fish, Channel, Pebble Count
East Cedar Creek	Cedar	1996	Watershed, Land Operations, JFK School	Fencing, reseeding	Vegetation, channel, pebble count
Limestone Canyon	Carrizo	1996	Watershed, Land Operations	Fencing, reseeding	Vegetation, channel, fish
Cibecue Canyon	Cibecue	1996	Watershed	Fencing, reseeding	Vegetation
Spring Creek	Cibecue	1996	Watershed	Fencing, reseeding	Vegetation
Smith Cienega	Upper North Fork	1995	Watershed, Rocky Mountain Station	Elk reductions	Vegetation, channel, water quality
Martinez Ranch	Cibecue	1997	Watershed	Fencing, gully controls	Vegetation, channel
ID Restoration Area	Black	1997	Watershed, Land Operations, Wildlife Division	Cattle and horse roundup	Vegetation, channel
Soldier Spring	Black	1997	Watershed, Land Operations, USFWS	Fencing, reseeding	Vegetation, fish, amphibians
Firebox Watershed	East Fork	1997	Watershed, FATCO	Road closure, reseeding	Pebble Count, water quality
Bonito Cienega	Big Bonito in Black	1998	Watershed, USFWS	Elk reductions	Vegetation, fish, water quality
Cedar Creek in town	Cedar	1998	Watershed, Cedar Creek Association, JFK School	Fencing, reseeding, road crossing rehabilitation	Vegetation, channel

Project Name	Watershed	Starting Year	Key Entities	Restoration Activities	Monitoring
White Springs	Cibecue	1998	Watershed, Cibecue Association, Cibecue School	Fencing, reseeding, channel, gully treatment	Vegetation, channel
Cibecue Creek in town	Cibecue	1998	Watershed, Cibecue School, Cibecue Association, BIA Roads	Fencing, reseeding, channel restoration	Vegetation, channel
Carrizo Creek above community	Carrizo	1998	Watershed, Carrizo Associations, Land Operations	Fencing, reseeding, horse roundups	Vegetation
Salt River / Medicine Ecosystem	Salt	1998	Grasshopper Association, Land Operations, Watershed, Wildlife Division, BIA Fire Management	Cattle roundup, reseeding, Bighorn reintroduction, prescribed fire	Fish; Vegetation, Water Quality, Wildlife
Trout Creek	North Fork	1999	BIA Forestry, FATCO, Hydrology	Road rehabilitation	Water Quality
Dry Valley	Forestdale	1999	BIA Forestry, FATCO, Hydrology, Watershed	Road rehabilitation	Water Quality, Pebble Counts
Upper Middle Cedar Creek	Cedar	1999	Watershed, Cedar Creek, BIA Roads	Fencing, gully plugs, road improvements	Vegetation
Oak Creek	Canyon	2000	Watershed, Oak Creek Association, Land Operations	Gully controls, reseeding	Vegetation
Sunrise Resort	Upper North Fork	2000	Sunrise Park, Hydrology, Watershed, Environmental Planning	Erosion controls	Water Quality, Pebble Counts
Cibecue Sawmill	Cibecue	1999	FATCO, Land Operations, Watershed, Cibecue School, Environmental Planning	Channel restoration	Channel
White River at Canyon Day	White	1999	Watershed, Rocky Mountain Station, Wildlife Division, Environmental Planning	Channel restoration, reseeding	Vegetation, channel, birds, fish
East Fork	East Fork	1999	Watershed, Land Operations, TR School, Wildlife	Channel restoration, redesign of irrigation diversions, reseeding	Vegetation, water quality, channel, fish
North Fork	North Fork	2000	Watershed, Land Operations, Wildlife	Channel restoration, redesign of irrigation diversions, reseeding	Vegetation, water quality, channel, fish

APPENDIX E

LEGAL DEPARTMENT
WHITE MOUNTAIN APACHE TRIBE

Robert C. Brauchli
General Counsel

George R. Hesse
Assistant Tribal Attorney

April 8, 1998

Ms. Maryann Gerber
Non-Point Source Coordinator
U.S. Environmental Protection Agency
345 Courtland Street, N.E.
Atlanta, GA 30365

Dear Ms. Gerber:

In regard to certification of legal authority and program authorization for the Clean Water Act Section 319 program, the White Mountain Apache Tribe is a federally recognized Indian Tribe as published in the Federal Register organized pursuant to the Indian Reorganization Act of 1934, 25 U.S.C. § 476, *et. seq.* The Tribe has a Government to Government relationship with the United States. As a result of this relationship, the Tribal constitution, and the Tribe's inherent sovereign authority as recognized by the United States Government, the Tribe is authorized to receive grant funds and administer programs under the Clean Water Act on the Fort Apache Indian Reservation. The Tribe already has received authority for the Section 106 and 401 program.

The Tribe has taken several steps with reference to the Section 319 Non-Point Source Assessment Report and Management Program and has previously submitted a report on non-point source assessment (included in a Watershed Assessment Report). The Tribe is adopting a Watershed Restoration Strategic Plan, which establishes our non-point source management program and intends to submit an application for financial assistance under Section 319(h) grant funds upon program approval by EPA.

The primary contact for program implementation and administration will be the Tribal Watershed Program located in the Tribal Headquarters Building in Whiteriver, Arizona.

We appreciate your support of the Tribe's efforts to protect and restore its waters. Should you have questions or require additional information, please contact Jonathan Long of our Watershed Program at (520) 338-4346, ext. 284.

Sincerely,

Robert Brauchli

Robert C. Brauchli
General Counsel

Ph. (520) 338-4346 Fax (520) 338-4767 P.O. Box 700 • Whiteriver, Arizona 85941