

**MODIFIED SAN FRANCISCO WATERSHED RESTORATION PROPOSAL TIER-2
CRITERIA FOR A NM UNIT OR A WATER UTILIZATION ALTERNATIVE [1010 total
points possible]**

~~ORIGINAL BRIEF PROJECT DESCRIPTION: Restoring the complete overgrown watershed on three adjacent tributaries to the San Francisco River: Devils, Deep, & Mineral Creeks.~~

MODIFIED BRIEF PROJECT DESCRIPTION: To sustain the current level of water use in the San Francisco River Watershed, and capture the increased water yield, resulting from the catastrophic wildfires, to meet current and future San Francisco River Watershed water right obligations, and improve ecosystem health in Catron

1. [570] If the proposal would extend the water supply through conservation, or increase the supply through development of new water

- a. Describe the location and verify the ownership of and legal access to lands related to the proposal. [0 to 30 points]

~~Project location is the San Francisco River Watershed (HUC 1504004); 100% of the project is on US Forest Service managed lands within the Gila National Forest Glenwood District. The project area encompasses 144,301 acres ranging from 4,620 to 10,880 feet in elevation and composed of desert grasslands to subalpine forest. Private property within the project area (7,844 acres; approximately 5% of the total project area) is currently excluded from the analysis and proposed treatments. All watersheds to be treated are within the red line of the attached maps (Appendix Maps A, B, C), as follows in order of treatment priority:~~

~~Deep Creek Watershed (HUC: 150400040405)~~

~~Devils Creek Watershed (HUC: 150400040404 and portion of 150400040406)~~

~~Mineral Creek Watershed (HUC: 150400040605 and portion of 150400040606)~~

~~Whitewater Creek Watershed* (HUC: 150400040607 and portion of 150400040608)~~

~~*Since much of the Whitewater Creek watershed is either designated wilderness or inventoried roadless area, this watershed will be used as a control, receiving no restoration treatments in a paired watershed experimental design.~~

~~All activities for this project occur on National Forest System lands. Glenwood Ranger District supports the project (see support letter) and will provide necessary access to projects consistent with other laws and regulations.~~

~~No construction or reconstruction of roads or timber harvest in Inventoried Roadless Areas will occur without approval of the Secretary of Agriculture.~~

The Whitewater Baldy Complex catastrophic wildfire in the watersheds identified in the first proposal, and adjacent watersheds, are now exposed to destructive flooding. Due to this devastating change and the flood emergency/disasters declared by the Governor of New Mexico and Catron County Commission, regarding the associated flood damage potential to the lower watershed irrigation systems, the Catron County Commission has modified its original proposal. The *Areas Affected*, as listed in the original Tier 2 SAN FRANCISCO WATERSHED RESTORATION PROPOSAL still pertains, that is "Catron County, town of Glenwood, all users on the streams and all downstream water users. Increased infiltration and live

water will be available for domestic use, wildlife, agriculture, recreation, towns & industry. Reduce flooding downstream.”

The modified project area is within the San Francisco River Watersheds (HUC 15040004) in Catron County, New Mexico. (See Appendix C) The original Catron County AWSA proposal project area was comprised of 144,301 acres that were contained in all or portions of seven 6th code watersheds where it was planned to treat vegetation to increase water yield and to monitor the effects of the treatment. The project area of the modified Catron County AWSA proposal has been expanded to include the San Francisco River Basin within Catron County, including private and federal land, due to the expected increase in stream flows that will result from the recent catastrophic wildfires and planned treatments. The original seven 6th code watershed project areas will remain the focus for upland treatments. They are the most sensitive areas that suffered severe damage from the Whitewater Baldy Complex Fire, and are the most critical to watershed function for all downstream uses. The vegetation treatment and burned area restoration work will occur on lands administered by the Gila National Forest. No mitigation work will occur on National Forest system lands without the appropriate permits and approval of the appropriate Forest Service line officer.

The significant change to the proposal is the addition of downstream irrigation projects. They will be conducted on the private land with those participants who hold water rights (and/or successor in interest) identified in THE DISTRICT COURT OF GRANT COUNTY, STATE OF NEW MEXICO; ORDER FOR DEFAULT JUDGEMENT, pages 1-5, No. 16610, Dated April 16, 1968. The projects are along the San Francisco River and key tributaries, from Reserve to south of Pleasanton, where the terrain and other conditions will allow revamping of the current irrigation systems to make them capable of dealing with elevated flows and increases in sediment. In the event any system does not meet the engineering criteria, or any project selection criteria, or upon withdrawal of request for assistance, by the system manager, the County, in accord with the above cited judgment, will provide assistance, as justified, on other active ditches, which have been evaluated and prioritized, for example, Jackson, and Thompson Flat ditches, among others, which are capable of utilizing the identified assistance.

If a need arises to carry out any mitigation work on National Forest system lands and/or the lands of non-holders of water rights, approval from the affected landowner, legal access, and release from liability for any harm or damage that results from the work will be obtained prior to any work being completed. In the future, each flood event will be monitored. If additional land owners become affected by deleterious downstream events and seek mitigation work on their lands the work will be considered based on the availability of funding. All future private land mitigation work will be coordinated through the Catron County Commission in consultation with Catron County Acequias Commission and the San Francisco Soil and Water Conservation District.

Both project components in this proposal are intended to sustain and meet water demands.

b. Identify the source of the water to be put to use. [0 to 10 points]

~~The source of water is water that falls as precipitation on the above targeted watersheds, as well as natural springs. Approximately 144,301 acres of project area multiplied by 21 inches average precipitation equals 252,527 acre feet of source water. While some source water is lost to evapotranspiration through the hydrologic cycle, even altering a small fraction of the total water source to more beneficial forms represents thousands of acre feet. Conservation of water will~~

~~thus effectively increase availability of water from the watershed.~~

The source of water that is of interest in this proposal is the water that falls as precipitation within the headwaters of the San Francisco River, and its tributaries, in both Arizona and New Mexico. Although there is concern about adverse effects from precipitation within the watersheds of the West Fork and Middle Fork of the Gila River for downstream users, that portion of the Whitewater/Baldy wildfire, and the resulting run-off within Catron County, are located within the Gila Wilderness and will have very little impact on Catron County citizens.

The specific water supply that pertains to the modified proposal is the additional volume of water that will now flow in the San Francisco River Basin due to recent wildfires that burnt large areas within the San Francisco Watershed. The two largest and most intense wildfires occurred in 2011 (Wallow Fire) and 2012 (Whitewater/Baldy Fire). The increase in water runoff from these two wildfires is directly related to the number of acres burnt and to the severity of the burns. The Whitewater/Baldy Complex- Burned Area Emergency Response (BAER) Team Executive Summary indicates there are 70,885 acres of high and moderate severity burn areas which will affect the Gila/San Francisco River flows within Catron County. The Wallow Fire- BAER Team Watershed Report indicates that there are 9,484 acres of high and moderate severity burn areas which will affect San Francisco River flows in Catron County. The high and moderate severity burn area of the combined fires is 80,369 acres.

The actual amount of increased stream flow, due to these fires, can only be estimated based upon past research conducted near the high severity burnt areas. This proposal does not try to accurately estimate the actual amount of water that will be lost to evaporation, percolation, evapotranspiration or run-off in the future. Past experience indicates that the high and moderate intensity burned areas of the Whitewater/Baldy and Wallow wildfires will continue to dramatically alter the hydrologic cycle within the Gila/San Francisco Watershed far into the future.

Information from *Monitoring the Effects of Timber Harvest on Annual Water Yield*, (Stednick, John D, Journal of Hydrology, 179 (1996) 79-9) at the Workman Creek, Arizona research area, which is located on the Apache/Sitgreaves National Forest,) indicates that an 83 % reduction in the forest canopy in a mixed conifer forest stand produced a 4.2 inch increase in stream flow water yield. The Workman Creek data most closely represents the elevation, average yearly precipitation, geological conditions and vegetative communities for the areas burned in the Wallow and Whitewater/Baldy Fires.

Using the 4.2 inch increase in stream flow water yield, recorded at Workman Creek, it can be calculated that the 80,369 acres of high and moderate burn area, which has reduced the forest canopy by at least 83%, could yield an increase of approximately 28,129 acre- feet of water per year (80,369 acres X 4.2 inches of water / 12 inches per foot). The increase in water yield remained stable after 21 years. This study indicates that thousands of acre-feet of additional water will now runoff of the recently burnt areas due to the absence of vegetation, reduction of ground cover and alteration of soil properties that has occurred. This increase in water yield and sediment coming off the uplands will make it nearly impossible to continue to divert and use surface water for irrigation in the future unless measures can be taken to allow for diversion and capture of water, during elevated flow levels, and storage in ponds to allow the sediments to settle out. The combination of watershed restoration in the uplands, and water capture and storage, downstream, for agricultural uses, will make more water available for beneficial use. Without these measures, much of the additional run-off will be experienced as torrential floods and will not be available for beneficial use until it is captured and it gives up its sediment load in the San Carlos Reservoir, which is well into Arizona.

There are about 4,000 acre-feet of established consumptive use water rights from the San Francisco River and its tributaries, in Catron County. Approximately 50% of those established water rights are currently not being put to beneficial use due to lack of availability of downstream water and the age and capacity of many of the existing irrigation systems. Most of the irrigation infrastructure, in place today, originated from early Hispanic settlement, with the establishment of acequias, and, later, on lands settled under the Homestead Act. In order to cultivate the land, as required by the Homestead Act, ditches, diversions and wooden dams were built using horse teams, plows, and fresnos. As over-growth of woody vegetation increased upland, less water was available for downstream uses. Cycles of drying and subsequent flooding became more acute and these primitive systems were not capable of withstanding them without significant investment of materials and labor. Eventually there were fewer acres under cultivation. In the current situation, any increase in water yield, resulting from the planned treatments and the recent wildfires, will not necessarily be put to beneficial without improvements to the existing irrigation systems. Upgrades in collection and delivery systems will improve the ability to meet water demands efficiently and stop this downward spiral hastened by the impacts of the Whitewater- Baldy and Wallow fires. As more usable water becomes available, meeting the water use needs of the current holders of water rights will be the first priority. If it becomes apparent that sufficient water is available to capture a portion of the 14,000 acre-feet of additional water promised in the AWSA, then the process and efforts to start using this additional un-obligated water will be considered.

c. Describe and quantify whether and how the proposal would extend the water supply through conservation, or increase the supply through development of new water in the Southwest Planning Region. [4 points for each 10 AF up to 500 points]

~~Over a large portion of the project watershed area, tree canopy is increasing with more than 1,000 trees per acre in many areas. Because of competition for light and water, woody vegetation has proliferated at the expense of herbaceous ground cover. It is the herbaceous plants that slow water flowing over the soil surface, reduce sheet erosion, and provide a mechanism for water to infiltrate the soil, to reach deeper roots and eventually the water table. Due to the proliferation of the woody species that has occurred within the last 100 years, sheet erosion has occurred in the uplands causing much sedimentation and turbidity in downstream water bodies. Main stream channels and tributaries that were formerly highly productive bottom lands today are deeply incised channels and the valley bottoms are dry with limited productivity and water storage or capture functionality. Livestock grazing has been greatly reduced for many years, yet the vegetative communities within these watersheds have not returned to their historical composition of woody and herbaceous species.~~

~~Large amounts of bare ground and limited undergrowth are factors indicative of high runoff, sediment production and loss of soil nutrients. An inverse correlation between basal area or canopy cover and understory herbaceous vegetative cover is well documented, and when intercanopy precipitation falls on bare ground unimpeded it is a primary source of runoff during high intensity thunderstorms. Therefore, treatments that increase ground cover should reduce runoff and sediment production, while increasing infiltration. (Ashcroft, N.K. 2009. The ecological effects of reducing piñon and juniper basal areas in northwestern New Mexico. PhD Dissertation, New Mexico State University, Las Cruces, NM).~~

~~The goal of the project is to extend water supply and quality through improvement of watershed condition over a significant portion of the San Francisco watershed including improved herbaceous ground cover, watershed storage and capture functioning. Water delivered to streams~~

~~and rivers from the water table vs. surface runoff slows and extends downstream delivery while improving water quality.~~

~~Watershed restoration objectives are to:~~

- ~~• Extend ground water and surface water delivery time~~
- ~~• Capture water runoff within watershed and decrease water loss~~
- ~~• Reduce soil loss and delivery to live water courses~~
- ~~• Increase herbaceous ground cover~~
- ~~• Improve water quality in streams~~
- ~~• Increase biological diversity and wildlife habitat~~
- ~~• Decrease the risk of catastrophic wildfire~~
- ~~• Maintain or improve multiple uses~~
- ~~• Establish baseline and post implementation monitoring protocols~~

The overgrown watershed condition, which existed at the time that the original proposal was submitted, has been largely reversed by the catastrophic wildfires. The opportunity to modify the 16 approved proposals (as well as incorporate elements from them) recognizes that the significant impacts from the recent catastrophic wildfires resound throughout the watershed. After the critical headwaters of the San Francisco watershed and its tributaries, were burned in Arizona and New Mexico, those who hold diversion rights in Catron County became particularly at risk to the loss of infrastructure due to destructive flooding and loss of agricultural assets, due to not being able to use poor quality flood waters for irrigation purposes.

As it pertains to the AWSA in this proposal, the Catron County Commission has a vested interest in ensuring that all water users in the county are secured in their water rights and is a willing sponsor of projects that comply with and support *The Catron County Commission Resolution 054-2012 Declaring Emergency/Disaster Declaration from Fire and Flooding Caused by the Whitewater-Baldy Complex Fire*, issued June 8, 2012, wherein it is recognized that:
systematic capital improvements and flood planning is an effective tool for communities and counties to define their development needs, establish priorities, and pursue concrete actions and strategies to achieve necessary project development.

The project goal and objectives from the original proposal, SAN FRANCISCO WATERSHED RESTORATION PROPOSAL, are still crucial. However, reducing the risk of flooding, and erosion, were secondary environmental and economic benefits in the original treatments. Now they are causes in themselves for a reprioritization, given Catron County and the Governor's emergency declarations. Governor Martinez issued an *Emergency Declaration that Allows for Mobilization of Additional State Resources to Assist Local Efforts in Flood Mitigation and Emergency Preparedness* (June 8, 2012), pertaining to the Whitewater Baldy Complex Fire. It is still in effect today. It directed:
...all Cabinet Departments and agencies under gubernatorial control, to provide any assistance that may be required by the Department of Homeland Security and Emergency Management or by the State Emergency Operations Center under the authority of the Governor's Authorized Representative.

In that capacity, as a political subdivision of State government, the Catron County Commission submits that the proposed projects will offer protection, mitigation and restoration from adverse flood affects, where applicable, to at-risk diversion right holders.

The ability to extend water supply and improve water quality through improvement of watershed conditions, as stated in the original proposal, now requires changes to some of the long term treatments, and the addition of shorter term projects with more predictable outcomes. Both components of the modified proposal, i.e., the upland restoration component and the lowland irrigation component, work in conjunction to improve watershed health and sustain water uses, as further described below.

The modified goal is:

- **To sustain the current level of water use in the San Francisco River Watershed, and capture the increased water yield, resulting from the catastrophic wildfires, to meet current and future San Francisco River Watershed water right obligations, and improve ecosystem health in Catron County.**

In order to achieve these goals the following objectives will need to be met:

1. Extend downstream delivery time for surface-water and reduce peak flow levels of flood events
2. Reduce soil loss and adverse alteration of water courses
3. Provide a means where water can be diverted during higher levels of peak flow
4. Provide a means where sediments can be filtered from stream flow prior to the water being put to beneficial use.
5. Improve efficiency of water use rights
6. Protect threatened, endangered and sensitive species' habitat.
7. Monitor flood events so mitigation and restoration projects can be implemented in an efficient and timely manner
8. Monitor the restoration and recovery of the Whitewater Baldy Fire burn scar so the potential effects of future catastrophic wildfires can be better understood and planned for.

OBJECTIVES 1, 2 and 6: The uplands restoration planned in this proposal will help make the potential increase of 28,000 acre-feet, per year, for Gila and San Francisco River flow within Catron County, less flashy, and not as sediment laden. This project will restore the native vegetation which filters and retains sediments, and slows runoff from precipitation, so that it can percolate and resurface as downstream springs and seeps. As shown in Appendix D, and explained elsewhere in the proposal, the most sensitive areas that suffered severe damage from the wildfires will be identified and treated to restore vegetative conditions which will also improve habitat for threatened, endangered or sensitive species.

DISCUSSION: A substantial portion of the Gila/San Francisco Watershed area that was historically characterized by park-like conditions, 100 years ago, became overgrown, supporting a dense forest canopy of more than 1,000 trees per acre. Woody vegetation proliferated at the expense of herbaceous ground cover over large expanses within this watershed. Main stream channels and tributaries that were formerly highly productive bottom lands became deeply incised channels and the valley bottoms became dry with limited productivity and water storage or capture functionality. Sheet erosion has occurred in the uplands causing much sedimentation and turbidity in downstream water bodies. Livestock grazing has been greatly reduced for many years, yet the vegetative communities within these watersheds have not returned to their historical balance of woody and herbaceous species.

The Wallow and Whitewater/Baldy wildfires that occurred during that last two years **have** reversed this successive process towards a climax vegetative community on approximately 111,860 acres of the dense

forest communities within the Gila/San Francisco Watershed. Of the 111,860 acres of high and moderate severity burn, 80,369 acres are located in a position to influence the flows of the Gila and San Francisco Rivers in Catron County. While it is impossible to assess the exact reduction of tree canopy on the 80,369 acres, it is estimated that the overall reduction in tree canopy is at least 80%. Many of the 80,369 high and moderately burnt acres have experienced a 100% reduction in tree canopy and all woody vegetation was consumed due to the extreme intensity of these wildfires. A study by Ashcroft, N.K. 2009, entitled *The Ecological Effects of Reducing Piñon and Juniper Basal Areas in Northwestern New Mexico*. Ph.D. Dissertation, New Mexico State University, Las Cruces, NM, has shown that large amounts of bare ground and limited undergrowth are factors indicative of high runoff, sediment production and loss of soil nutrients. When intercanopy precipitation falls on bare ground unimpeded, it is a primary source of runoff during high intensity rainstorms.

Treatments that increase ground cover and restore the historical balance in the ecosystem can be expected to increase infiltration, reduce runoff and decrease sediment production.

OBJECTIVES 3, 4 and 5:

- Provide a means where water can be diverted during higher levels of peak flow;
- Provide a means where sediments can be filtered from stream flow prior to the water being put to beneficial use;
- Improve efficiency of water use

The improved irrigation systems increase the ability to capture and store runoff during high flow events, improve the quality of water used for irrigation and extend the delivery time in a controlled manner during dry periods. The infiltration galleries filter debris and sediments from the water that enters the irrigation systems. The infiltration galleries and water storage/ sediment ponding systems, together, further improve water quality by trapping sediments and particulates out of poor quality intake-water before it is applied to a field or reenters the stream. The ponding systems store water and extend delivery time during dry periods. They also increase replenishment of ground water and improve herbaceous growth in the surrounds. The piping systems conserve water which would otherwise be lost to evaporation or seepage, and increase water use efficiency through precise delivery of water to targeted areas for irrigation. The entire system- ponds, infiltration galleries, delivery and field pipelines- is low maintenance and imparts minimal impact to the surrounding area.

DISCUSSION: Sustains and provides for future water demands. Improve efficiency of water use.

According to Bureau of Reclamation reports, issued before the recent wildfires, approximately 50% of established water rights are not presently being put to beneficial use. This is attributable to the lack of available water and the nature of the antiquated earthen irrigation systems which can lose 50% of their capacity due to evaporation and seepage. Irrigators at the end of a ditch, often experience a significant reduction in the volume of water available for irrigation purposes, which their water rights entitle them to. The replacement of these older, earthen irrigation ditches, with either steel or PVC pipe, for water conveyance, minimizes water loss along the ditch systems and ensures that the water demands of *all* of the irrigators can be met equally, thus fulfilling and sustaining existing water rights in accord with the AWSA. The example, below, illustrates how efficiently water rights can be made whole and at the same time conserve up to 50% of irrigation water for other uses. Without improved delivery methods, the

present situation, on which older ditch systems do not distribute water equally to all down line users, will not be remedied, so water rights have no chance of being made whole.

Improvement to irrigation infrastructure conserves water for other downstream uses. Data from the only completed irrigation system similar to those proposed, consisting of an infiltration gallery, ponding system, delivery pipelines and a field pipeline system, has shown a savings of 1/3 to 1/2 less water diverted. In Catron County there are approximately 2,269 acres between Luna and Glenwood, along the San Francisco River, and tributaries, which are recognized as suitable for irrigation. At an average irrigation diversion use rate of approximately 2.7 acre-feet per acre, 6,126.3 acre-feet of water (2.7 acre-feet/acre x 2,269 acres=6,126.3 acre-feet) could be put to beneficial use. Through improvements to existing irrigation systems, much more water can be conserved, while still meeting current irrigation water right obligations, along the San Francisco River, and its tributaries, in Catron County.

If the low estimate of 1/3 of this volume is saved, then 2,042.1 acre-feet of water are conserved for in-stream flow.

- **Following ISC AWSA evaluation criteria, if 4 points are received for each 10 acre feet of water conserved this equates to 816.84 points for criteria 1-c.**

If the high estimate of this volume is saved, then, 3063.15 acre-feet of water are conserved for in-stream flow.

- **Following ISC AWSA evaluation criteria, if 4 points are received for each 10 acre feet of water conserved this equates to 1,225.26 points for criteria 1-c.**

A significant quantity of water that would otherwise flow through Catron County and end up in Arizona, where it would be put to beneficial use, will be captured and put to beneficial use in New Mexico as a result of implementing this modified proposal.

OBJECTIVE 6: Protect threatened, endangered and sensitive species habitat.

The upland restoration component and the lowland irrigation component work in conjunction to improve watershed health and ecosystem function. Part of the water that is piped to the storage/ sediment ponds is put to beneficial use and part is returned to the stream as less turbid, improved water for threatened, endangered and sensitive species. The storage ponds provide long term habitat for nesting insectivorous birds (i.e. Southwest Willow Flycatchers) and other wildlife species that need open water sources as part of their habitat. The projects would provide a controlled and continual water flow thereby increasing the water available for diversion right uses and the consumption of water for downstream delivery. Furthermore, the low maintenance requirements of the irrigation systems minimize the necessity to disturb the stream bed or surrounding habitat.

OBJECTIVES 7 and 8:

- Monitor flood events so mitigation and restoration projects can be implemented in an efficient and timely manner
- Monitor the restoration and recovery of the Whitewater Baldy Fire burn scar so the potential effects of future catastrophic wildfires can be better understood and planned for.

The final change to the modified proposal addresses the unique opportunity to monitor and analyze the changes to the upland and lowland components of the watersheds after the catastrophic wildfires. The information acquired would facilitate adaptive management by the Forest Service and provide downstream users with the information needed to use water more efficiently, which, in turn, would result in higher and more secure in-stream flows for all uses. Objective 7 would also provide the ability to monitor potential flood events, advance early warning systems, and possibly prevent or reduce damages to irrigated system infrastructures and associated water rights.

d. Demonstrate how the proposal would meet AWSA and CUFA requirements. [up to 30 points] (See www.AWSAplanning.com for AWSA and CUFA documents)

~~The San Francisco Watershed Restoration Project proposal meets AWSA and Consumptive Use and Forbearance Agreement requirements as well as other applicable federal, state and local laws. It includes treatments to restore or improve watershed function, improve ecological conditions, and to capture, store and conserve water for local consumption.~~

~~Local monitoring instruments will be installed prior to restoration treatments to establish a hydrological baseline (e.g. groundwater levels, soil moisture content in the vadose zone, surface water discharge, runoff ratio, etc.) for the treated watersheds (Deep Creek, Devils Creek, and Mineral Creek). Using this baseline and correcting for precipitation variations will help differentiate the flows from the project from other flow sources. Also, the Whitewater Creek watershed will be left untreated to serve as a control in a paired watershed experimental design.~~

~~Extension of delivery time of water from the watershed will be differentiated from other flow source via stream flow measurements used to monitor this project. The project will use flow measurement of gage station No. USGS 09444000 located on the San Francisco Near Glenwood, New Mexico, and other US Geological Survey or approved designated entity's flow measurement in compliance with CUFA (CUFA 12.1: *For purposes of the measurement of stream flows, real time readings by the U.S. Geological Survey, or such other entity as designated by the technical committee for such purpose, shall be used for purposes of determining compliance with Exhibit 2.47 (Terms of New Mexico Diversions)*). Other hydrology monitoring data will be acquired from rain gauges with data loggers, barologgers, SNOTEL station with project area (Silver Creek Divide <http://www.wcc.nres.usda.gov/nwcc/site?sitenum=757&state=nm>), piezometers with logging pressure transducers, soil moisture content and weirs.~~

~~Furthermore, all work of this proposal will comply with NEPA (AWSA SEC. 212. (h) (1) ENVIRONMENTAL COMPLIANCE. Upon execution of the New Mexico Consumptive Use and Forbearance Agreement and the New Mexico Unit Agreement, the Secretary shall promptly comply with all aspects of the National Environmental Policy Act of 1969 (42 U.S.C. 4321 et seq.), the Endangered Species Act of 1973 (16 U.S.C. 1531 et seq.), and all other applicable environmental Acts and regulations.)~~

The Modified San Francisco Watershed Restoration Project proposal meets requirements of the Arizona Water Settlement Act and Consumptive Use and Forbearance Agreement by, first, providing for the diversion and use of water from the San Francisco River, and its tributaries, to the amount authorized under existing water rights. This will be met by making additional San Francisco River water available through post wildfire upland treatments and capture and storage of this increased water caused by the

recent wildfires. Without taking the measures presented in the modified proposal, thousands of acre feet of water that are needed to meet the current water rights obligations in New Mexico will be allowed to flow into Arizona that will be quickly put to use.

The modified proposal does not immediately establish any new diversions or use of the 14,000 acre feet of water made available under the AWSA. Since a substantial investment of resources and funds are necessary to maintain the current water rights obligation and existing level of water use in Catron County, following the recent large fires, no immediate use of the AWSA 14,000 acre-feet and CUFA authorized water is being planned at this time. In the future, if the water is available and there is a demand for additional water, the appropriate authorities will be asked to allow for the diversion of additional water as authorized under the AWSA and CUFA. If the opportunity to put additional water to beneficial use ever materializes and is approved all of the monitoring and use requirements of the AWSA and CUFA will be followed.

In addition to meeting the other requirement of the AWSA and CUFA, all work planned in this proposal will comply with the requirements of all other Federal laws. (AWSA SEC. 212. (h) (1) ENVIRONMENTAL COMPLIANCE.-Upon execution of the New Mexico Consumptive Use and Forbearance Agreement and the New Mexico Unit Agreement, the Secretary shall promptly comply with all aspects of the National Environmental Policy Act of 1969 (42 U.S.C. 4321 et seq.), the Endangered Species Act of 1973 (16 U.S.C. 1531 et seq.), and all other applicable environmental Acts and regulations).

2. Describe the proposal and its technical viability [up to 40 points].

~~Possible management actions considered in this proposal are commonly utilized methods and techniques in use in the local area. Specifications and guidelines for these management practices can be found in the NRCS technical specification, US Forest Service Best Management Practices, Wildlife and Livestock improvement manuals, and scientific literature on watershed restoration practices.~~

~~Possible management practices include but not limited to:~~

- ~~•Vegetation manipulation (thinning, patch clear cuts, overstory and/or understory removal, prescribed burning, wildfire management, planting, seeding, herbicide treatments, fencing, fuelbreaks, wetland creation)~~

~~Monitoring plan to include but not limited to:~~

- ~~•Water runoff quantity over time (measurement weirs on primary drainages, water level monitoring on impoundments, utilizing data logging crest gauges)~~
- ~~•Ground water level (well monitoring, pizometers, spring discharge)~~
- ~~•Water quality monitoring on primary drainages and San Francisco River for turbidity, temperature, dissolved oxygen, conductivity, pH, metals, and nutrients.~~
- ~~•GIS analysis of forest density, topography, fire risk, erosion prone areas, and accessible and appropriate forest treatment areas.~~
- ~~•Project implementation (ensure that projects are implemented as planned)~~
- ~~•Project effectiveness monitoring (before and after measurements of ground cover, forage, crown cover, tree/brush density, etc.)~~
- ~~•Data will be collected and analyzed for monitoring of hydrological and biological functions and used for adaptive management and documentation of benefits.~~

The hydrological modeling from the BAER team indicates that post-fire runoff may have severe effects downstream. The restoration of the upland burnt areas is needed to reduce sheet, gully and stream bank erosion and to improve water quality prior to run-off water reaching the major stream channels. Also the restoration of the burnt areas will speed up the natural process of re-establishing vegetation on some of the most impacted areas. Riparian vegetation plantings will be necessary to protect and/or restore stream banks scoured by flood waters. The re-establishment of native perennial vegetation on the areas where it was completely destroyed will greatly improve water quality. The initial Burned Area Emergency Response (BAER) Team seed mixture contained a large component of annual grasses in order to quickly re-establish herbaceous ground cover, but the establishment of perennial grass herbaceous ground cover will be needed in order to substantially enhance water quality and make future run-off water much more useable.

The proposed improvements to the existing irrigation systems are necessary to capture irrigation water during elevated flows while simultaneously filtering sediments from the diverted water. The creation of storage ponds will settle fine sediments and excess nutrients before water is turned out onto the fields. Installing pipelines instead of maintaining open ditches will increase the efficient use of water and reduce the maintenance costs of the irrigation system.

Management practices to be implemented in this modified proposal include:

- Implement the appropriate restoration practices in the extreme burned mountain meadows and riparian areas in order to reduce the level of sediments that enter the stream channels at the upper end of the watershed. By stabilizing these key headwater areas many adverse impacts to downstream ecosystem and water users can be prevented. Restoration of healthy watershed condition in the headwaters will reduce peak flows and will reduce the amount of sediment/nutrients carried downstream in both future base flow runoff and flood events.
- Augment and speed up the natural recovery of the upland watershed through introduction of seed source plants in the severely burnt areas. The use of seed source native plant materials to restore severely degraded watersheds is the one of the most cost effective and ecosystem friendly restoration practices that can be implemented in rough and remote areas such as are found on the Whitewater/Baldy Fire.
- Continue with the treatment of the piñon/juniper vegetative community in the Mineral Creek, Deep Creek, and Devils Creek watersheds as was proposed in the original Catron County AWSA Proposal.
- Construct infiltration gallery diversion structures in order to use the increased flow of water in the San Francisco River and tributaries, which will result from the recent catastrophic wildfires. The new infiltration gallery structures will make it possible to divert irrigation water during flood events and during the expected elevated base flow levels. The infiltration gallery structures will prevent large debris and sediments from being diverted, which will keep the water transport systems (ditches or pipes) open and functioning. The infiltration galleries will not require the construction of any additional above ground structures in the active stream channel and will reduce disturbance of the stream channel once they are constructed.
- Conversion of many of the open earthen irrigation ditches to a pipe irrigation water transport system. This will be especially important in areas where the existing irrigation ditches are located near the current stream channels and are prone to being filled with sediment or

washed out during flood events. Also the piping of irrigation water could conserve an estimated 2042 acre-feet of water that will remain in the river as in stream flow.

- Construct water storage/sediment ponds at suitable locations along the irrigation ditches or pipelines. These storage ponds will be designed to fit with the terrain and will vary in size (area occupied) and capacity (volume of water held). One purpose of these ponds is to capture water during high flow events and make it available during low flow periods. The ponds will also serve as a means to allow sediments, fine particulates and elevated nutrients to settle out of the low quality floodwater before it is applied to a field. These upgraded diversion systems will aid in the reduction of the turbidity and improve water quality for all uses, including habitat for threatened and endangered species.

Monitoring will include:

- Monitoring of changes in stream channel flow rates, sediment loads and ground water levels in the areas directly impacted by the Whitewater/Baldy and Wallow wildfires.
- Monitoring of changes in soil moisture, runoff rates, and rates of erosion within the moderate and high intensity burned areas.
- Monitor for and remove large debris such as logs and large rocks that plug or divert stream channels and cause additional gully and stream bank erosion.
- Detail measuring, recording and analysis of key climatic conditions.
- Long term monitoring of wildfire effects on water quality, quantity, recovery of watershed health, and flooding in Catron County.
- Long term monitoring of wildfire effects on ecosystem health and changes in vegetative communities within the high and moderate burned areas.
- Monitoring of changes in riparian cover, composition and functioning condition, as well as changes in geomorphology due to changes in riparian conditions.
- Monitoring of changes in aquatic and riparian related threaten, endangered and sensitive species and their habitat. This monitoring will be directed towards capturing the impacts of increased water flow and water diversion that are part of this proposal.
- Monitoring of changes brought about by the Whitewater/Baldy and Wallow wildfires on economic returns, especially impacts to water availability and use that are brought about by this proposal.
- The NMSU Water Resources Research Institute (WRRI) will capture, store and manage all of the monitoring data, as well as making all of the data available for use by other agencies and interests entities.
- Data will be collected and analyzed for monitoring of hydrological and biological functions and used for adaptive management and documentation of benefits.

The above actions are frequently utilized practices. The proposed monitoring techniques are commonly used to track the effectiveness of other similar projects and land management practices. The specifications and guidelines for the proposed management/restoration practices can be found in various NRCS Watershed and Vegetation Treatment Technical Manuals and Handbooks, US Forest Service Best Management Practices and Watershed Management Manuals and Handbooks, US Forest Service Burned Area Emergency Response Handbook and numerous other scientific publications on watershed restoration and Monitoring practices.

In order to measure the accomplishments of the modified proposal, past and current data will be located and compiled in order to establish a baseline or description of pre-Wallow and Whitewater/Baldy wildfire conditions. Also monitoring instruments will be installed to establish a hydrological post fire baseline (e.g. groundwater levels, soil moisture content in the vadose zone, surface water discharge, runoff ratio, etc.) for the watersheds most impacted by the Whitewater/Baldy Fire. Using this pre and post wildfire baseline data will help differentiate the water yield and sediment delivery from the fire restoration efforts and will show changes over time as wildfire related degraded watershed conditions are restored. Also pre and post water and sediment yield data will be collected in order to demonstrate the effectiveness of treating piñon/juniper vegetation in the un-burnt upland areas of the treated watersheds. Because a large portion of the Whitewater/Baldy wildfire occurred in the Wilderness, much of this area will be left untreated and will serve as a control.

Measurements of total water yield, peak flow levels and extension of delivery time of water from the recently burnt San Francisco watershed will be compared to pre-fire San Francisco River flow data to display the long term effects on the hydrological curve due to the Wallow and Whitewater/Baldy wildfires. Having 80,369 acres of recent severely/ moderately burnt area within the San Francisco/Gila watershed will most likely have a significant impact to the hydrological curve for this large watershed, but without close monitoring, the post-fire water yield and water- quality impacts, can only be speculative and based upon anecdotal observations. Adverse impacts to aquatic life and agricultural production have already been reported. Some fields have been flooded with black sludge and some crops could not withstand the toxicity of irrigation water which ran off during the monsoons, this summer. This unique opportunity to measure, quantitatively and qualitatively, the restorative watershed treatments, after the fire effects, will expand the scientific and agricultural knowledge-base for future uses.

The monitoring of the proposal will use flow measurement from gage station number: USGS 09444000 located on the San Francisco River near Glenwood, New Mexico, and other US Geological Survey or approved designated entity's flow measurement in compliance with CUFA (CUFA 12.1: For purposes of the measurement of stream flows, real-time readings by the U.S. Geological Survey, or such other entity as designated by the technical committee for such purpose, shall be used for purposes of determining compliance with Exhibit 2.47 (Terms of New Mexico Diversions)). Other hydrology monitoring data will be acquired from rain gauges with data loggers, SNOTEL station within the affected area, piezometers with logging pressure transducers, soil moisture content measurements and weirs. Data from a SNOTEL station within the area can be found at: Silver Creek Divide <http://www.wcc.nrcs.usda.gov/nwcc/site?sitenum=757&state=nm>

- a. Include any (or reference publically available) technical and engineering studies completed and demonstrate how these studies support the proposal. [up to 20 points]

~~As no earth moving, construction or reconstruction involved in this project, technical studies and engineering would not be required that addressed those issues. The Baker study (below, part 2b) supports the vegetation types and techniques that are being considered in this proposal.~~

The technical specifications for restoration of catastrophic wildfires are found in US Forest Service Burned Area Emergency Response Handbook (FSH 2509.13), and US Forest Service Watershed

Protection and Management Manual (FSM 2520, ID 2520-2012-1). This handbook and manual provide the current guidance for the short and long term treatment of burnt areas on National Forest system lands.

The construction of improved irrigation systems as presented in this proposal is based on projects that have been completed within the San Francisco Watershed in the recent past. Technical and engineering considerations are part of the recently constructed projects and are included in the construction component of this proposal. The concept and general design of the proposed improved irrigation systems is found in Section 4 of the NRCS Technical Field Guide and other engineering reference publications. In order to implement the improvements to all of the irrigation systems identified in this proposal funding for some of the advanced engineering and technical support is being planned into the cost of this proposal.

b. Include any (or reference publicly-available) hydrologic, ecologic, or geotechnical studies completed and demonstrate how information included in these studies specifically supports or detracts from the proposal. [up to 20 points]

refers to: Added to modified proposal. Refers to: Removed from modified proposal

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3. [40] Quantify estimated costs.

- a. Quantify the proposal's estimated costs including planning design and/or construction and administration or oversight. [up to 10 points]

~~Total estimated costs for the San Francisco Watershed Restoration Project are \$12,094,404.~~

Total estimated costs for the Modified San Francisco Watershed Restoration Project are \$12,090,967.

The Modified San Francisco Watershed Restoration project is made up of two interrelated components:

- 1.) The uplands restoration and piñon/juniper treatment activities, which are aimed at long term post fire restoration on National Forest system lands and the reduction of piñon/juniper vegetation in order to increase the yield of water from some of the lower elevation upland areas; and
- 2.) The water yield/water quality activities, associated with sustaining and possibly increasing agricultural water-use on private lands through modification of irrigation systems.

An integrated process of monitoring activities is built into both of the above components which tracks and documents changes in water-yield and downstream sediment delivery, and key environmental variables that are associated with the changes in stream flow and sediment yields throughout the process of restoration and recovery.

1.) Uplands activities: The Executive Summary of the Whitewater Baldy fire, produced by the Burned Area Emergency Response Team (BAER), predicts that peak flows of 2-4 times pre-fire flows could occur. The upland restoration activities and piñon/juniper treatments directly relate to the potential for increases of useable water within the San Francisco River and tributaries in the future. The uplands restoration and piñon/juniper treatment estimated costs are described in the following Table 1 (Total AWSA Cost). The costs to survey, design and layout the restoration and piñon/juniper treatment activities are included in the per acre cost for these activities and are not displayed as separate cost items. The work to identify and layout the restoration and piñon/juniper treatment areas will be carried out by the Forest Service using their existing expertise and workforce. Also a more detailed set of cost tables for Vegetative treatments, Wetlands-riparian treatment and Piñon/juniper treatments are located in Appendix D.

2.) Water yield/water quality activities: The Governor's State of Emergency Declarations for the Wallow Fire (EO2011-040) and Whitewater Baldy Complex Fire (EO 2012-014) and enhanced flood potential due to the severe wildfires in listed counties (EO-2012-007) made it was very evident to the irrigators and water users in the San Francisco River Basin in Catron County that stream flow levels and sediment yield will make water less useable. The Catron County Commission, in partnership with the San Francisco Soil and Water Conservation District, Catron County Acequias Commission and the County Extension Agent and ditch owners, have met to assess the potential downstream impacts from the burnt areas. The proposed projects directly address the concerns of the local water users and comply with the Governor's State of Emergency, as well as the Catron County's Emergency Declaration 054-2012. The irrigation projects are intended to make any increase in stream flow that results from the recent wildfires, and treatments, accessible for use by the holders of water rights in Catron County, in order to sustain the current level of water use and make water rights whole.

The costs of these projects are described in the following **Table 1 (Total AWSA Cost)**. A detailed set of estimated costs for the activities planned in this proposal, are found in the various cost tables.

Engineering, layout and surveying cost tables, for upgrading the irrigation systems, are located in 5 b. The integrated monitoring activities included in this proposal are necessary to quantify any increase in useable water, in Catron County, which results from implementing the proposed activities following the recent wildfires. The monitoring will also ensure that the planned restoration and piñon/juniper treatment

activities accomplish their desired results. Also, monitoring will determine if the upgrade to existing irrigation systems sustains the current level of water use and will quantify levels of additional useable water in the future. The knowledge gained from implementing a cooperative monitoring program with the NMSU WRRRI will greatly increase the knowledge base concerning impacts and rate of recovery following large catastrophic wildfire in the Southwest. This increased knowledge concerning impacts to water quantity, water quality, watershed recovery and other environmental factors will make planning for catastrophic wildfire impacts much more meaningful in the future.

The monitoring estimated costs are described below in **Table 1 (Total AWSA Cost)**. A more detailed monitoring cost table is in Appendix D.

Arizona Water Settlement Act Revised San Francisco Watershed Proposal	
Total AWSA Costs	
Activity	Total Costs
Develop budgets, track and report completed work for AWSA Projects (Catron County)	\$156,000
Develop and administer irrigation system upgrade contracts (Catron County)	\$150,000
Travel, per diem, equipment, GIS, computer, etc. cost (Catron County)	\$50,000
Payment processing/tracking and audit cost (Catron County & SFSWCD)	\$50,000
TOTAL ADMINISTRATION COST	\$406,000
% of Total Project Cost	3.36%
FS Survey/NEPA Cost (Gila NF)	\$766,429
Irrigation System Survey/NEPA Cost (NMSU WRRRI)	\$601,000
TOTAL OVERHEAD COST (Required)	\$1,367,429
% of Total Project Cost	11.31%
Water/Sediment Yield Monitoring Cost (NMSU WRRRI)	\$1,981,200
TOTAL RECOVERY MONITORING COST (Project Work)	\$1,981,200
% of Total Project Cost	16.39%
PP-MC Vegetation Treatments Cost (Gila NF)	\$1,429,499
Riparian/Wetland Restoration Treatments Cost (Gila NF)	\$943,750
Pinyon/Juniper Treatment Cost (Gila NF)	\$1,312,480
TOTAL Vegetation Restoration Cost (Project Work)	\$3,685,729
% of Total Project Cost	30.48%
Upgraded Irrigation Systems Construction Cost (Catron County)	\$4,650,609
TOTAL Irrigation System Reconstruction Cost (Project Work)	\$4,650,609
% of Total Project Cost	38.46%
Grand Total AWSA Cost	\$12,090,967

TABLE 1.

The engineering and layout/survey cost for the upgrade of the irrigation systems is shown in the following **Table 2 Enhanced Irrigation Systems Cost**. The engineering and layout/survey for the upgrade of the irrigation systems will be carried out by the private landowners along with contractors.

**Arizona Water Settlement Act Revised San Francisco Watershed Proposal
Enhanced Irrigation System Cost**

Item	TOTAL COSTS
Irrigation System Pipe Cost	\$769,765
Valves & Misc Hardware	\$390,904
3 Phase Service & Pump Sysytem	\$35,000
Irrigation System Pipe Instalation Cost	\$2,837,740
Storage/Settlement Pond Construction	\$170,000
Engineering Cost	\$322,200
Air Compressor for System Cleaning Cost	\$125,000
Total	\$4,650,609

CONSTRUCTION TOTAL	\$4,650,609
CONTRACT ADMINISTRATION TOTAL	\$150,000
NEPA ANALYSIS TOTAL	\$601,000
IN-KIND TOTAL	\$265,000
Total	\$5,666,609

TABLE 2.

- b. If applicable, quantify the proposed project's on-going administrative, operational, and maintenance costs. [up to 10 points]

The administrative, operational and maintenance costs are estimates for the activities planned in this proposal and are found in the various cost tables. The reoccurring operation and maintenance of the upgraded irrigation systems should be minimal and will be the responsibility of the private owner. Low maintenance is one of the benefits of investing in underground irrigation systems. Future operation and maintenance costs for restoration and piñon/juniper treatment will be the responsibility of the Gila National Forest and the livestock grazing permittee who will benefit from the enhanced vegetative conditions.

The administrative costs are shown in the following **Table 3 (Administrative Costs)**.

**Arizona Water Settlement Act Revised San Francisco Watershed Proposal
Administrative Costs**

Tasks	Units	Cost/Unit	Total
CC expenses to develop budgets, track and report work completed and expenditures to facilitate payment of AWSA project cost (estimated 1040 hrs of labor/year @\$30/hr) for 5 years	5200	\$30	\$156,000
Fund contract development/administration for irrigation system enhancement construction projects (@ \$50,000/year for 3 years)	3	\$50,000	\$150,000
Travel, per diem, meeting support cost, computer and GIS equipment and software, office supplies and phone services (@ \$10,000/year for 5 years)	5	\$10,000	\$50,000
Provide funding to CC and fiscal agent for processing payments and financial audits (@\$10,000/year for 5 years)	5	\$10,000	\$50,000
Total			\$406,000

TABLE 3.

c. Describe environmental compliance activities, and quantify the costs for environmental mitigation and restoration related to the proposal. [up to 10 points]

The threatened/endangered/sensitive species and cultural resource surveys and NEPA process for the restoration and piñon/juniper treatment will be completed by the Forest Service since these projects will occur on National Forest system lands.

Any threatened/endangered/sensitive species and cultural resource survey cost and cost to complete the NEPA process need for the upgrade of the irrigation systems will be carried out in conjunction with the federal permitting agency and most likely will be done by a contractor.

The threatened/endangered/sensitive species and cultural resource survey cost and cost to complete the NEPA process are shown in the following **Table 4 (Survey/NEPA Cost)**.

Arizona Water Settlement Act Revised San Francisco Watershed Proposal			
Survey/ NEPA Costs			
Activity	Cost/Unit	Survey Units	Total
Cultural clearance on FS vegetative treatment areas. (100% mechanical)	\$21/ac	14,734	\$309,414
Cultural clearance on FS vegetative treatment areas. (20% prescribed fire)	\$21/ac	1,915	\$40,215
Cultural clearance on Irrigation System Enhancement Project Areas (10 Systems @100 AC/System)	\$21/ac	1,000	\$21,000
Mexican Spotted Owl Survey (100% coverage of treated areas outside roadless and wilderness areas)	\$20/ac	12,340	\$246,800
Southwest Willow Flycatcher Species and CH Survey (100% of potential suitable habitat, estimated 3000 acres) (\$20/ac/year for 5 years = \$100/ac)	\$100/ac	3,000	\$300,000
Loach Minnow/Spikedace Species and CH Survey (100% of potential suitable habitat, estimated to be 80 miles of stream)(\$100/mile/year for 5 years = \$500/mile)	\$500/mile of stream	80	\$40,000
Chiricahua Leopard Frog Species and CH Survey (100% of potential suitable habitat, estimated to be 80 miles of stream)(\$100/mile/year for 5 years = \$500/mile)	\$500/mile of stream	80	\$40,000
Conduct FS EA Process (Vegetation Treatment)	\$170,000/Project	1 project	\$170,000
Conduct Army Corp Of Engineers EA Process (Irrigation Ssystem Enhancement)	\$200,000/Project	1 project	\$200,000
Total			\$1,367,429
	FS Survey and NEPA Cost		\$766,429
	Irrigation System Survey and NEPA Cost		\$601,000

TABLE 4.

d. Quantify the AWSA funding sought for the proposal and for the pendency (time) of the proposed activity's or project's duration. [up to 10 points]

AWSA funding sought is \$12,090,967 (See Table 1, Total AWSA Cost) Also refer to the uplands restoration detailed cost tables in Appendix D.

Project sequence/timeframe	
Complete the process of defining desired conditions	Complete
Evaluate the Watershed	On-going
Define Scope of Watershed Planning Effort	Complete
Gather Existing Data and Create an Inventory	On-going
Identify data gaps and collect additional data if needed	On-going
Analyze data to characterize the watershed condition	On-going
Estimate thresholds for watershed restoration and resource improvement	Complete
Set goals and identify solutions	Complete
Identify possible management strategies	Complete
Evaluate options and select final management strategies	Currently on-going
Establish baseline monitoring	Will initiate upon receiving funding
Conduct appropriate environmental analysis and decision process	Will initiate upon receiving funding
Design implementation program and assemble watershed plan	Will initiate upon receiving funding
Conduct implementation	Will initiate once planning/ designs and NEPA are complete
Adapt treatment management accordingly	Will initiate once project work starts
Perform post-implementation monitoring	Will initiate once the first project work is completed

4. [40] If proposal impacts, beneficially or adversely, the environment of the Southwest Planning Region, the Gila River, its tributaries or associated riparian corridors, use the best available science to:

- a. Describe and quantify how the proposal might impact the project site and environment, particularly state and federally-listed species. [up to 10 points]

~~Disturbance of areas undergoing restoration may occur for weeks at a time in discrete areas while the project work is occurring, however such disturbance will be a one-time occurrence for each area. Soil surfaces may be temporarily disturbed; noise levels will be higher during project work; and the presence of vehicles and humans will be higher during restoration implementation.~~

~~Mexican spotted owl (*Strix occidentalis lucida*) Protected Activity Centers (PACs) will be identified during the biological assessment portion of the NEPA process and avoided during project implementation as per US Fish & Wildlife Mexican spotted owl management recommendations. All proposed work occurs on federal public land, and therefore is subject to thorough assessment under the NEPA process.~~

~~In summary, there will be some short term impacts, but long term habitat benefits.~~

~~Minimum impact on listed species is anticipated, as the project will follow all recommended practices for each species, as referenced below.~~

An additional adverse impact to the burnt areas and to the piñon/juniper treatment areas will occur for short periods of time while work is being completed; however this disturbance will be a one-time occurrence for each area. Soil surfaces will be temporarily disturbed, noise levels will be higher and the presence of vehicles and humans will be higher while the restoration project work and piñon/juniper treatment is being completed.

The implementation of the burnt area restoration will have no long term negative impacts on the environment and state/federally-listed species above what has already occurred due to the severe impacts caused by the wildfires. The proposed wildfire restoration practices will provide long term environmental benefit to the areas that were adversely impacted by the wildfire.

The piñon/juniper treatment will have short term adverse impacts to water quality due to the use of heavy equipment and/or prescribed fire, which will remove ground cover and disturb the soils. There is also a potential for disturbance of cultural resources buried below the ground surface as the trees are plowed out of the ground by the equipment or from the effects of extreme heat generated by the prescribed fires. The piñon/juniper treatment should have little impact on state/federally-listed species since few if any listed species depend upon piñon/juniper woodlands for their habitat.

During construction of the upgraded irrigation systems, the installation of the infiltration devices could result in some short term impacts within the stream channels, which possibly could harm listed fish species and their habitat. Also the presence of machinery in the stream channel may stir up embedded sediments, which will temporarily impact water quality.

The installation of pipe and water control devices such as valves will require excavation within or adjacent to existing ditches which will be a onetime, short term endeavor. Impacts due to the presence of machinery and workers at the project location are expected to be minimal. The use of pipe and buried water control devices will reduce the maintenance needs along the existing ditches. Consequently, long term operational impacts will be reduced because there will be less need to use equipment to clean and repair the open ditch system. The installation of infiltration diversion systems will eliminate the need to continually maintain above ground head gates and flow- regulating structures that are common features of irrigation ditch systems. Also there will no longer be a need to construct temporary dams and channels in

the active, base-flow channel to force water to enter existing ditch systems. This will considerably reduce, the duration that heavy equipment is operated within the active channel. Overall the short term impacts to the environment are greatly offset by the installation of more efficient, durable systems which require minimal maintenance.

The construction of the storage ponds will again require the use of equipment and will cause onetime, short- term impacts for excavation of the ponds and pond banks. These storage ponds will provide long term beneficial effects and potential habitat for nesting insectivorous birds (i.e. Southwest Willow Flycatchers) and the Chiricahua Leopard Frog that need open water sources as part of their habitat. Although all storage ponds will be constructed on private land there will be a need to ensure that state and federally-listed species are not adversely impacted. The benefits that the upgraded irrigation systems will provide for listed species should more than off-set the short term negative impacts that will occur during the construction phase of the project.

All of the activities being proposed will involve some short term environmental impacts, but will result in many long term habitat benefits. Minimum impacts on listed species is anticipated since the FWS will be involved and provide guidance for avoiding or mitigating adverse effects long before any on-the-ground activities are started. Project activities will follow all recommended procedures and practices for each species, as referenced below.

- b. Describe and quantify the proposal's efforts to mitigate possible adverse impacts on the environment, particularly riparian areas and state and federally-listed species in the Gila Basin and at the specific location of the proposal. [up to 10 points]

~~The watershed restoration practices will mitigate possible adverse impacts through following the US Fish & Wildlife Service and other species' management recommendations described in various agency directives, technical manuals and scientific literature. Appropriate environmental analysis processes will be conducted for project implementation.~~

~~Wounding of bark on trees that will remain in the forest will be avoided. Use of low impact logging techniques will minimize erosion, disruption of surface runoff, re-establishment of understory plants, and other detrimental ecosystem effects.~~

~~Per prescription, higher density of native trees along streamsides may be left as a buffer to protect soil and water resources. Vegetation left along waterways can provide habitat for wildlife and a corridor that allows wildlife to travel through the landscape, and acts as a filter for sediment and other nonpoint pollutants to protect water quality. Much of the restoration implementation will occur in terrestrial uplands.~~

~~Timing of treatments will reduce potential for high surface water flow which contributes to erosion and sediment load in San Francisco River. Timing of treatments will also mitigate impact on Mexican spotted owls and other species.~~

~~Note that in order to resolve conflicts with other resources within the project area, chiefly threatened and endangered species, archeological sites, and some soil erosion concerns, post-NEPA analysis indicates that this project will treat fewer acres than initially estimated (80,801 acres) as areas of concern are identified and excluded from implementation during the environmental compliance process. Acreage and costs are based on post-NEPA data (Table 3).~~

The adverse environmental impacts that may be caused by the proposed burned area restoration practices, piñon/juniper treatment and improvements to irrigation systems will be mitigated by following the US Forest Service, US Fish & Wildlife Service, NMED Surface Water Quality, and Army Corp of Engineers recommendations. These agencies have developed procedures and requirements to deal with environmental impacts that are described in various agency directives, technical manuals and scientific literature. Appropriate environmental analysis processes will be conducted prior to project implementation and the mitigation measure and practices recommended by the controlling agencies will be incorporated into the project plans and designs and will be implemented.

As noted above one of the primary objectives in project design will be to mitigate any adverse impacts on state and federal listed species and the related aquatic or riparian habitat located along the river, while meeting other related laws and regulations. Any costs associated with mitigation are included in the budget cost for compliance and mitigation, shown in 3 of this proposal. It is anticipated that the activities planned in this proposal will provide significant benefits to the environment as well as providing a clean and dependable source of water for use in the future.

- c. Describe and quantify how the proposal may benefit the environment, particularly riparian areas and state and federally-listed species in the Gila Basin and at the specific location of the proposal. [up to 10 pts.]

~~Where no listed species actually exist at this time, treatments will maintain potential habitat through following species guidelines, per paragraph 4.b. above. The objective of the proposal, to improve watershed conditions to create additional availability and reliability of water in the local area, may concurrently improve wildlife habitat through creating favorable conditions for water runoff, water quality and water storage capacity, improving herbaceous ground cover, and reducing the risk of catastrophic wildfire. Additionally, watershed restoration will attenuate peak flows leading to more infiltration and recharge in the upper watersheds, which will reduce flood impacts and improve riparian, fish, and wildlife habitat. For more detailed information, see Table 10.~~

First, the proposed projects benefit the environment by implementing treatments that restore historical watershed conditions and native vegetative communities in areas heavily impacted by the recent wildfires. These actions, which are intended to restore herbaceous ground cover and protect or restore riparian vegetation, augment the water-capture capability of the impacted watersheds, attenuate peak flows and leads to increased infiltration and recharge of ground water, which, in turn, provides for a more reliable supply of water in Catron County. Second, the projects also improve water delivery systems and water quality. They conserve water for other uses such as habitat for fish, and other wildlife.

The actions planned in this modified proposal have been proven to benefit the environment, particularly riparian areas. There may be some temporary negative effects on riparian vegetation and state and federally-listed species. Nevertheless, these proven techniques are successfully and commonly used by land management agencies to enhance and restore degraded riparian ecosystems and listed species' habitat. The proposed comprehensive monitoring plan will document benefits to the environment and make available for future consideration the results from the implementation of this modified proposal.

d. List any environmental statutes, rules, or regulations that may apply to the proposal, and demonstrate how the proposal implementation will comply with such laws, rules or regulations. [up to 10 points]

Environmental statutes, rules and regulations that may apply: **No Change**

- U.S. Clean Water Act - Any in stream disturbance below the ordinary high water mark will require a CWA 404 permit and CWA 401 certification. These requirements will be met.
- New Mexico State Water Quality Standards available at: <http://oaspub.epa.gov>
- National Environmental Policy Act statues and regulations. These requirements will be met for activities on federal land or permitted by a federal agency.
- Endangered Species Act regulations for management of specific federally listed species (see species list below)
- USFS statutes and regulations
- Catron County Natural Resource ordinances and policies

~~Agencies involved with this project include:~~

- ~~• US Forest Service~~
- ~~NM Environment Department~~

Agencies and governmental entities involved with this project include

- Catron County Commission
- San Francisco Soil Water Conservation District
- Catron County Acequias Commission
- US Forest Service
- NM Environmental Department, Surface Water Quality Bureau
- NM Department of Agriculture
- NM State University Water Resources Research Institute
- NM State University Range Improvement Task Force
- NM State Forestry
- NM Department of Game and Fish
- NM Office of the State Engineer
- Army Corp of Engineers
- US Fish and Wildlife Service
- US Geological Survey
- Natural Resource Conservation Service

Known federal and state listed species include the following: **no change**

- Yellow-billed Cuckoo (known to occur in SF River)
- SW Willow Flycatcher (2 known nest sites near Glenwood)
- Mexican Gray Wolf (within recovery area, history of denning at one location)
- Chiricahua Leopard Frog (historical and possibly occupied habitat)
- Mexican Spotted Owl (critical habitat, occupied habitat)
- Loach Minnow and Spike Dace Minnow

Other species of concern include: **no change**

- Various neotropical migratory birds
- Baird's Sparrow
- Peregrine Falcon
- Common Blackhawk
- Northern Goshawk
- Suckers (one or more)
- Bats (possibly)
- Gila Groundsel
- Gooding's Onion
- Narrow Headed Garter Snake

Through cooperation with the agencies and governmental entities involved with this project and by recognizing the known federal and state listed species, and the other species of concern, this proposal will comply with the environmental statutes, rules and regulations that may apply.

5. [70] Describe any economic or cost analysis information and data for the proposal:

- a. Quantify estimated economic benefits including environmental, recreation, and value of water itself value of the water to the regional economy, increased economic growth, protection against loss of jobs, agriculture, ranching, local economic sustainability or growth, or other. [up to 10 points]

Economic viability: (no significant wording change from original)

~~It is the vision of this proposal that watershed management and treatments provide proper functioning ecosystems and biodiversity; and, indirectly achieve sustainable economic, ecological and social benefits to current and future generations of New Mexico. This will result in the utilization and management of renewable resources that will provide economic, social and ecological benefits, directly and indirectly through products harvested, increasing water quality and quantity, and the numerous ecological services that benefit the general public. The project will also provide security or reduced economic expenditure by reducing risks of flooding and wildfires that could be expensive or damaging human settlements and the ecosystem. Finally, the watershed restoration proposal provides criteria and indicators for monitoring and assessing the economic, social and ecological sustainability of rangelands that are quantifiable and recognizes the intangible ecosystem service that cannot be measured.~~

This proposal seeks to produce proper functioning ecosystems, reduce health and safety threats from wildfires and flooding, improve water resources for private use and environmental needs, and impart sustainable economic, ecological and social benefits to current and future generations of New Mexico. The improved irrigation systems will sustain, and potentially increase, economic returns to Catron County by supporting existing agricultural businesses.

Successful implementation of this proposal will result in the utilization and management of renewable resources that will provide economic, social and ecological benefits, directly and indirectly through forest and agriculture products harvested. Also by increasing water quantity and quality the general public will realize benefits. The security and reduced economic expenditure brought about by lessening the risks of

flooding and ensuing damage to human settlements and the ecosystem are indirect economic benefits. Finally, the proposed watershed treatments provide ecologically sustainable forest and rangelands that will return quantifiable benefits and recognizable ecosystem improvements that cannot be measured. The proposed comprehensive monitoring carried out by the NMSU WRRRI will include a detailed economic and cost analysis dealing with the effects and restoration of the Whitewater/Baldy fire which will be made available for use in the future.

Recreation:

~~Data collected by the USFS indicate that over one million people visited the Gila NF from October 2000 to September 2001; while the economic situation in the United States has declined considerably since then, given that most of the use of the Gila National Forest is free, we can assume that use has not lessened, and in fact may have increased. (National Visitor Use Monitoring Results, http://www.fs.fed.us/recreation/programs/nvum/reports/year2/R3_F6_gila_report.htm#_Toc18390772 Accessed December 2011).~~

~~With improvement of watershed conditions, wildlife and big game habitat is improved. This could improve the hunter experience, particularly if improved habitat increases game numbers. Additionally, with improved watershed conditions, hiking, photography, wildlife viewing, horseback riding, camping and other recreational opportunities are enhanced.~~

Data collected by the USFS indicate that over one million people visited the Gila NF from October 2000 to September 2001. Recreation Visitor Days (RVD) brings in \$12/day locally and about \$80/day in the state's economy. Hunting is the dominant recreational activity. Any improvement in wildlife habitat and diversity increases hunting opportunities. Maintaining high levels of visual quality in the National Forest and surrounding areas improves all facets of the tourism industry. Upland restoration measures, particularly those affecting local main attractions such as the Catwalk National Recreation Trail, which is second only to the Gila Cliff Dwellings as a popular site to visit in this region, will benefit the local, county and state economies. This restorative action is of paramount importance to the economy of western New Mexico. Because of the possibility of upland flooding, this historic and popular attraction is closed to the public and the catwalk dismantled. Successful upland restoration will increase the likelihood of reopening this recreational area which will greatly enhance the economic health of the local economy. This proposal will help recover the ecosystem health and visual quality of the areas burnt in the recent Whitewater/Baldy Fire, which are substantial factors in a quality recreational experience, and help restore the Catron County economy.

Value of water itself: ~~Open market sales of water rights on the real estate market currently value 1 acre foot between \$10,000 and \$15,000. If water demands increase due to continuing drought conditions, population increase, new agricultural uses, or simply inflation, then water value will necessarily increase.~~

All of life is dependent on water. The entire economy is dependent upon water: livestock, timber production, outdoor recreation, and tourism and family households. The highest economic value is bottled water. One ac. ft. can be up to 2 million dollars. Open market sales of water rights on the real estate market currently value 1 acre foot between \$10,000 and \$15,000. If water demands increase due to continuing drought conditions, population increase, new agricultural uses, or simply inflation, then water value will necessarily increase.

The beneficial use of water rights will be made more secure through the more efficient irrigation systems proposed, herein. By improving the efficiency, it will provide more opportunities for agricultural production, and, thus making their water rights whole.

Value of water to regional economy: (New text is underlined) According to the National Priorities Project <http://data.nationalpriorities.org> (accessed 10/11/11) New Mexico had the second highest percentage of poverty in the nation (20.4% in 2010). According to US Census figures (2009), Catron County is even worse with 22% of its population below poverty level (average annual per capita income under \$21,000). The tax base in Catron County relies predominately on agricultural production with close to 50% of its tax base derived from agriculture production. Climate forecasts predict the continuation of drought which has already impacted the county through loss of forage for livestock and loss of wildlife habitat and loss of forest resources through increased forest disease, insect infestation and wildfire. Given these facts and figures, and given that the San Francisco watershed area of Catron County is an adjudicated water basin with no additional water rights and severe restrictions on water use, without additional AWSA waters, agricultural, commercial, industrial and recreational economic development in Catron County is basically relegated to today's levels, with no chance of future improvement. In other words, the value of water to the economy of Catron County is greater than the simple cost of purchasing a water right (the difference in value of real estate for deeded land in the San Francisco watershed area can be well over \$100,000 more for property with less than a full acre foot of water right compared to property without water rights).

The recent wildfires have placed additional burdens upon Catron County agricultural production, which resonates through the local economy. Anything that reduces water quality and/or the ability to divert and use water has a significant negative effect on the economy of Catron County. Businesses will not invest without a dependable, high quality water supply. The stability and security obtained by stopping the trends toward further degradation of the watershed and increasing ground water retention will strengthen economic investment.

Increased economic growth and protection against loss of jobs, agriculture, ranching, local economic sustainability or growth:

~~Simply put, there can be little economic growth in the southern part of Catron County without an increase in availability of water. It is not only possible that much, if not all, of the 14,000 acre feet of AWSA may be awarded to projects outside this county, but additionally, even with project water available, there is no guarantee to access to it if no water flows in the streams. Thus economic growth is to a certain extent tied to increase of supply from a project such as that of the San Francisco Watershed Restoration.~~

NEW TEXT: Simply put, there can be little economic growth in Catron County without sustaining the current water use obligations that exist under adjudicated water rights. Increased water yields, in the form of torrential floods, cannot be captured and put to beneficial use unless the existing diversion/irrigation systems are improved and measures to improve water quality are taken. The implementation of the agricultural construction projects alone would infuse revenue into the local economies to a significant degree. All commercial endeavors within the San Francisco watershed would benefit. The unemployment rate would drop and even social conditions would improve.

Livestock production: (NEW TEXT) Livestock production yields the largest cash receipts of any crop in southwestern New Mexico except for Luna County. (Source: 2010 Statistical Abstract, Southwest New Mexico Council of Governments). Livestock production receipts make up close to 50% of the Catron County government's tax base (source Catron County Commissioner Chairman, Ed Wehrheim).

Improving the various vegetative communities in the upland areas will increase food production for wildlife as well as for livestock. Livestock production will increase; if not in actual numbers, at least in increased cattle weights. The proposal will also help the farmers, who grow hay, to continue to produce hay for their own use and for local markets. Given the spiraling price of hay and the demand for hay by area livestock producers this will be a significant economic benefit.

Increased hay production will, in turn, help area livestock producers through reduced transportation costs. In addition, as with the farmers, livestock producers will also benefit from more affordable pumping costs for delivering water to their livestock. Hence any assistance and support to livestock production and associated farming can contribute significantly to the four county economies.

Logging and timber industry: ~~Logging and wood product processing are traditional and critical components of the natural resource based economy of Catron County. In an effort to recover from the setbacks of the 1990s when large diameter logging was brought to a halt, the area's timber industry has focused on retooling for smaller diameter logs. A project of the size of the San Francisco Watershed Restoration Recover will support the investment in infrastructure by focusing on watershed treatments where merchantable timber harvesting can benefit watershed health.~~

~~Additionally, this project will support development of industries for woody byproducts of logging and milling, such as: biomass energy or fuel, chips, pressed wood, firewood, laminated lumber, etc. Ensured delivery of raw materials is critical for these industries.~~

NEW TEXT: Logging and wood product processing are traditional and critical components of the natural resource based economy of Catron County. In an effort to recover from the setbacks of the 1990s, when large diameter logging was brought to a halt, the area's timber industry has focused on retooling for smaller diameter logs. Any action to provide more timber will stabilize the base industry. The Catron County government owned saw mill in Reserve depends upon a viable, constant supply of timber, which currently can't be sustained. The proposed long term wildfire treatment will benefit the timber industry by speeding up the recovery of ecosystem health and by providing resources to treat areas that are selected for salvage timber sales. Salvage timber sales, implemented in conjunction with restoration seeding and planting of native shrubs and trees, will accelerate the return of healthy ecosystems and provide forest products which will generate and sustain significant income for the county's economy and provide revenues to county programs and local schools. The multiplier effect from a base industry, such as this, has been proven in the past to have the highest multiplier effect in dollars and job creation and salaries to Catron County.

Environmental benefits: ~~Healthy forested watersheds are healthy forests, and healthy forests are more resistant to disease and drought, and therefore wildfire. Local, state and federal expenditure on catastrophic wildfire will be reduced for the treated watershed. The estimated cost of the 2011 Wallow Fire in Arizona and New Mexico was nearly \$109 million, or \$208 per acre. The approximate cost of wildfires in the Gila National Forest in the last five years appears to range between \$165 and over \$400 per acre. Catastrophic wildfires can cause extreme~~

~~damage to the ecology and physical structure of watersheds and the streams and rivers they feed through loss of habitat, soil sterilization, erosion, and flooding. Fire suppression funds could better be spent on forest restoration and habitat protection.~~

Ecosystem health has been severely impacted on thousands of acres by the recent wildfires. The return of healthy ecosystems on the most severely burned areas may take hundreds of years. Some of the unique species of plants and animals may never return. The watershed and vegetative protection and restoration measures in this proposal will accelerate the return of highly degraded ecosystems to their historical conditions. The watershed and vegetative protection and restoration measures in this proposal will provide a long term investment in ecosystem health.

The proposed project will implement measures to efficiently capture and allow the usage of the increased water yield; aid in the restoration of the wildfire-degraded ecosystems back to their historical norm; improve agricultural production; restore and enhance recreational opportunities and restore the critical wildlife habitat destroyed by the wildfires. These positive measures will provide for future economic sustainability and growth, and new jobs in Catron County. The monitoring data collected while implementing this proposal will be analyzed and made available for use in the future when there is a need to understand the environmental impacts and recovery dynamics of catastrophic wildfire in the Southwest.

b. Quantify estimated costs including planning design and/or construction environmental compliance operation maintenance repair and administrative costs or other. [10]

The irrigation improvement project is estimated to be \$4,650,609, which is necessary to ensure that water right obligations continue to be sustained and fulfilled. The overall irrigation system enhancement costs are broken down in the tables below:

**Arizona Water Settlement Act Revised San Francisco Watershed Proposal
Irrigation System Material/Construction Cost by Ditch**

Ditch Name	Pipe Cost	Pipe Installation Cost	Pond Construction Cost	Valve & Misc. Hardware, Power Service & Pump Cost	Engineering & Surveying	Value of Goods and Services Contributed*
Dry Creek Ditch	\$24,400	\$148,000		\$20,000	\$2,000	
Pleasanton West Side Ditch	\$45,530	\$173,000	\$20,000	\$40,000	\$28,500	\$30,000
Glenwood North Lower Ditch	\$91,500	\$555,000		\$20,000	\$7,500	\$10,000
Mineral Creek Ditch	\$26,228	\$109,600	\$20,000	\$50,000	\$53,800	\$30,000
Lower West Side Ditch	\$58,862	\$212,600	\$10,000	\$50,000	\$39,500	\$15,000
Mid Frisco/Keihne Ditch	\$170,278	\$496,600	\$40,000	\$55,904	\$64,000	\$60,000
Parson Ditch	\$80,890	\$345,880	\$20,000	\$50,000	\$26,600	\$30,000
San Francisco Ditch	\$160,084	\$474,880	\$20,000	\$40,000	\$50,750	\$30,000
Lower Frisco Ditch	\$33,148	\$126,780	\$20,000	\$85,000	\$20,550	\$30,000
Hightower Ditch	\$78,845	\$195,400	\$20,000	\$15,000	\$29,000	\$30,000
	\$769,765	\$2,837,740	\$170,000	\$425,904	\$322,200	\$265,000

Construction Total	\$4,525,609
Compressor Total	\$125,000.00
	\$4,650,609

* Includes value of water rights for ponds. Each participant is prepared to contribute labor and construction equipment, backhoes, blades and dozers. It is not possible to accurately forecast this value at this time, due to uncertainties in fuel and other costs.

Pipe Costs

24" Steel Pipe	4,350	\$61.00	\$265,350.00
20" Steel Pipe	530	\$55.45	\$29,388.50
21" PIP Pipe	3,920	\$22.50	\$88,200.00
16" PIP Pipe	14,920	\$12.00	\$179,040.00
15" PIP Pipe	22,000	\$6.06	\$133,320.00
12" PIP Pipe	7,960	\$6.06	\$48,237.60
8" PIP Pipe	5,280	\$2.69	\$14,203.20
8" Steel Pipe	200	\$20.00	\$4,000.00
6" PIP Pipe	5,280	\$1.52	\$8,025.60
Totals	64,440		\$769,764.90

**Valves & Misc. Hardware
Cost**

Valves & Hardware / System	10	\$39,090.41	\$390,904.10
Totals			\$390,904.10

**3 Phase Power & Pump
System**

3 Phase Power Service	1	\$15,000.00	\$15,000.00
3 Phase Pump System	1	\$20,000.00	\$20,000.00
Totals			\$35,000.00

Air Compressor

Air Compressor, System Cleaning	1	\$125,000.00	\$125,000.00
Totals			\$125,000.00

Pipe Installation Cost

24" Steel Pipe	4,350	\$370.00	\$1,609,500.00
20" Steel Pipe	530	\$240.00	\$127,200.00
21" PIP Pipe	3,920	\$24.00	\$94,080.00
16" PIP Pipe	14,920	\$24.00	\$358,080.00
15" PIP Pipe	22,000	\$18.00	\$396,000.00
12" PIP Pipe	7,960	\$18.00	\$143,280.00
8" PIP Pipe	5,280	\$10.00	\$52,800.00
8" Steel Pipe	200	\$20.00	\$4,000.00
6" PIP Pipe	5,280	\$10.00	\$52,800.00
Totals	64,440		\$2,837,740.00

Pond Construction Cost

Pond Construction Cost	17	\$10,000.00	\$170,000.00
Totals			\$170,000.00

**Engineering & Survey
Cost**

Survey & Engineering/Foot	64,440	\$5.00	\$322,200.00
Totals			\$322,200.00

TOTAL **\$4,650,609.00**

The Catron County Commission, with assistance from San Francisco Soil and Water Conservation District, Catron County Acequias Commission, Catron County Extension Agent, and New Mexico State University Water Resources Research Institute, have analyzed and prioritized the proposed irrigation projects utilizing the following project selection criteria:

- The possible effects on other water right users and water uses are prime considerations.
- The ability to commit available resources by ditch companies and individuals.
- The consent of the State Engineer.
- US Fish & Wildlife Service (FWS) requirements.
- Proposed project design factors developed through assistance from New Mexico State University Water Resources Research Institute, who will also assist in identifying project selection criteria (to include but not limited to design feasibility, commitment of participants and proposal costs).

The acequias, private and community ditches, through Catron County Commission, with the Catron County Acequias Commission, along with the, Catron County Extension Service, WRRI and NRCS, will cost-share and work together on the administration of all aspects of the upgraded irrigation system proposal. At this time it is not possible to accurately quantify the value of outside goods and services contributions for the proposal. The participating irrigators are willing to commit bull dozers, blades and back hoes, and operator time, towards completing the upgrade of their irrigation systems. The future operation, maintenance and repair of the upgraded systems will remain the responsibility of the irrigators who use the upgraded systems.

The funding for community ditch, private ditches and acequia irrigation projects will be administered by the Catron County Commission. The San /Francisco Soil and Water Conservation District will be the fiscal agent for private irrigation projects.

- c. Identify the source of local contributions and demonstrate the commitment and ability to pay any local cost share for project proposal, including any applicable exchange costs [1 point for every % of project cost to be borne by local sponsor up to 50 points]

~~Due to the depressed economy in New Mexico and particularly Catron County, as well as minimal industrial infrastructure of the county, no local cost share is readily available for this project other than timber and woody byproduct sales.~~

Catron County Commission with the help from USFS has procured funds for vegetative treatments in the research area through County/USFS RAC funds. In addition, the Catron County Commission has used Secure Rural County Payments Act Title Three funds for the formulation and design phases of the San Francisco Watershed Restoration Project. Emergency funding has also been provided. See **Catron County Commission Initiated AWSA Cost Share Table**, below).

Catron County Commission Initiated AWSA Cost Share Table

<u>SOURCE</u>	<u>AMOUNT</u>	<u>ACTIVITY</u>
RAC FUNDS USFS	\$344,000	Cedar Breaks vegetation treatment
RAC FUNDS USFS	\$100,180	Deep Creek vegetation treatment
CATRON COUNTY GENERAL FUNDS	\$75,000	San Fran. watershed, river basin planning, grant writing, and intergovernmental coordination
SECURE RURAL SCHOOLS AND COMMUNITY SELF-DETERMINATION ACT TITLE THREE FUNDS	\$67,000	San Fran. Watershed- treatments, river-basin planning, grant writing, and intergovernmental coordination.
STATE OF NEW MEXICO EXECUTIVE ORDER 2011-040	\$200,000	Wallow Wildfire Emergency Funding
STATE OF NEW MEXICO EXECUTIVE ORDER 2012-014	\$500,000	Whitewater Baldy Wildfire Emergency Funding
TOTAL COST SHARE	\$1,286,180	

The following government agencies are partners, as members of the SFWR Workgroup, contributing agency funds over the last several years as well. The actual amount of their cost share estimate is not available at this time.

U.S. Forest Service, Gila Ranger District
San Francisco Soil and Water Conservation District
New Mexico Environment Department Surface Water Quality Bureau
New Mexico Department of Agriculture
New Mexico State Forestry
Catron County Acequias Commission
New Mexico Department of Game and Fish, Glenwood Fish Hatchery
NM State University Water Resources Research Institute
NM State University Range Improvement Task Force

It is not possible to accurately forecast and quantify the total funding from outside contributions for heavy equipment usage and operation. Rising fuel costs, variable situations and conditions at each location and other factors make an accurate estimate unrealistic. Nevertheless, per hour usage of certain equipment can be over \$90.00 per hour. The contribution of at least 9 pieces of heavy equipment will amount to a significant contribution. Water rights, taken out of irrigation usage, for ponds, are valued at \$15,000 each. The enhancement of the irrigation systems in Catron County will be proposed for NRCS EQIP cost share funding to the maximum extent possible. The amount of EQIP cost share contributions are capped and may only contribute a small portion of the needed funding to upgrade the irrigation systems.

Outside contributions of approximately \$265,000 are detailed, above, in 5b of the proposal. This estimate is most likely well below what will eventually be contributed for the upgrade to the irrigation systems portion of this proposal. For the purposes of this proposal it is estimated that up to 12.83% of the value of this proposal will be made in local-community labor, agency contributions of time, labor and equipment use, and contributions of time, labor and equipment from Catron County.

The Gila National Forest will contribute significantly to the restoration of wildfire damaged areas and to the treatment of the piñon/juniper woodland within the Mineral Creek, Deep Creek, and Devils Creek watersheds since all of this work will be done on National Forest systems lands. An estimate of this contribution could not be obtained at this time since the future budgets of the Forest Service are unknown and are highly variable. Also, it is projected that the Gila National Forest will be making considerable infrastructure investments in damaged roads and trails as well as investment in improving fish and wildlife habitat within the burnt areas. All of these investments will indirectly benefit watershed conditions and water quality, which are the focus of this proposal. RAC funds will also be pursued in the future, along with Clean Water Act Section 319 funds and NRCS EQIP funds specifically earmarked for improving range, livestock and wildlife conditions.

There is the opportunity for forming partnerships and cost sharing with the various agencies who have been participating in this San Francisco watershed restoration project.

Potential Funding Sources for Watershed Treatment

Natural Resources Conservation Service: Agricultural Water Enhancement Program

<http://www.nrcs.usda.gov/programs/awep/>

The Agricultural Water Enhancement Program (AWEP) is a voluntary conservation initiative that provides financial and technical assistance to agricultural producers to implement agricultural water enhancement activities on agricultural land for the purposes of conserving surface and ground water and improving water quality. As part of the Environmental Quality Incentives Program (EQIP), AWEP operates through contracts with producers to plan and implement conservation practices in project areas established through partnership agreements.

Natural Resources Conservation Service: Conservation Innovation Grants

<http://www.nrcs.usda.gov/programs/cig/>

Conservation Innovation Grants (CIG) is a voluntary program intended to stimulate the development and adoption of innovative conservation approaches and technologies while leveraging Federal investment in environmental enhancement and protection, in conjunction with agricultural production. CIG enables NRCS to work with other public and private entities to accelerate technology transfer and adoption of promising technologies and approaches to address some of the Nation's most pressing natural resource concerns.

Natural Resources Conservation Service: Cooperative Conservation Partnership Initiative

<http://www.nrcs.usda.gov/programs/ccpi/index.html>

The Cooperative Conservation Partnership Initiative (CCPI) is a voluntary conservation initiative that enables the use of certain conservation programs with resources of eligible partners to provide financial and technical assistance to owners and operators of agricultural and nonindustrial private forest lands.

Natural Resources Conservation Service: Environmental Quality Incentives Program

<http://www.nrcs.usda.gov/wps/portal/nrcs/main/national/programs/financial/eqip/>

The Environmental Quality Incentives Program (EQIP) provides a voluntary conservation program for farmers and ranchers that promotes agricultural production and environmental quality as compatible national goals. EQIP offers financial and technical help to assist eligible participants install or implement structural and management practices on eligible agricultural land.

EPA Targeted Watersheds Grant Program

<http://www.epa.gov/watershed/initiative/>

The Targeted Watersheds Grant program is designed to encourage successful community-based approaches and management techniques to protect and restore the nation's watersheds. Implementation Grant projects focus on a broad array of methods for addressing watershed concerns including water quality trading, agricultural best management practices, wetland and riparian restoration, nutrient management, fish habitat restoration and public outreach and education.

New Mexico Office of the State Engineer: Water Trust Board Funds

http://www.ose.state.nm.us/more_info_water_trust_board.html

The Water Trust Board was established in 2001 to recommend water projects to the State Legislature for appropriation of funding, in the form of grants or loans, from the Water Project Fund. These water projects must be for: water storage, conveyance, or delivery of water to end users; implementation of federal Endangered Species Act of 1973 collaborative programs; restoration and management of watersheds; flood prevention; or water conservation.

New Mexico Environment Department: Clean Water Act 319 Funds

<http://www.nmenv.state.nm.us/swqb/wps/>

Nonpoint source pollution is the leading cause of water quality degradation in the United States and poses a substantial problem for the health of New Mexico's streams and rivers. Under §319(h) of the Clean Water Act (CWA), funds are made available to federal, state and local agencies, non-profit organizations, and citizen watershed groups to address nonpoint source water pollution through watershed planning and on-the-ground implementation projects.

New Mexico Game and Fish Department: Habitat Stamp Program

http://www.wildlife.state.nm.us/conservation/habitat_stamp_program/index.htm

The New Mexico Habitat Stamp Program is a joint venture between sportspersons and the agencies that manage wildlife and their habitat. Each year, licensed hunters, anglers, and trappers, on Bureau of Land Management or U. S. Forest Service lands, are required to purchase the "stamp" or validation from the New Mexico Department of Game and Fish. These funds are then dedicated to pro-active habitat improvement projects.

US Forest Service: Collaborative Forest Restoration Program

www.fs.usda.gov/goto/r3/cfrp

The Collaborative Forest Restoration Program (CFRP) in New Mexico provides cost-share grants to stakeholders for forest restoration projects on public land designed through a collaborative process.

6. Describe how the proposal addresses the needs of a particular group or groups or interests on the issues of: [up to 120 points possible]

a. Historic uses, traditions, cultures, and customs. [up to 10 points]

~~The County is rich in archaeological sites which indicate Paleo-Indians were probably the first inhabitants of the region, some 10,000 years ago; farming was one of their main subsistence activities. Irrigated agriculture by non-Indians came into widespread use in the mid-1800's. By 1875 a number of ditch systems had been established on the Gila River. By 1890, most land suitable for irrigation with surface water was under cultivation. Most of the diverted water was used to irrigate small farms, although part of the water was appropriated by owners of large ranches for livestock purposes. Ranching spread throughout the remainder of the area away from the main stem of the rivers, and by the late 1800's some of the larger ranches in New Mexico had been established.~~

~~After 1940, irrigation using groundwater began in both New Mexico and Arizona. Farm development in New Mexico picked up substantially in the 1950's, with the realization that soils and climatic conditions enabled successful cash crop production, once water became available. This resulted in the creation of many farming enterprises where only livestock grazing was feasible prior to 1940.~~

~~Due to the proliferation of the woody species that has occurred within the last 100 years, sheet erosion has occurred in the uplands causing much sedimentation and turbidity in downstream water bodies. The main stream channels and tributaries were formerly highly productive bottom lands. Today these channels are deeply incised and the valley bottoms are dry with limited~~

~~productivity and water storage or capture functionality. Livestock grazing has been greatly reduced for many years, yet, the vegetative communities within these watersheds have not returned to their historical composition of woody and herbaceous species.~~

~~The traditional uses of the project area lands, ranching, some farming, and logging will benefit from a healthier forest that results from watershed restoration. Additionally, a healthier forest is more resistant to catastrophic wildfire; Catron County's Community Wildfire Protection Plan (CWPP) and WUI specific CWPPs call for hazardous fuels reduction and watershed restoration. This project will contribute to the protection of human life and property as well as to support continued traditional use of the land and natural resources.~~

Catron County is rich in archaeological sites, which indicate Paleo-Indian inhabitants were probably the first settlers of the region, about 10,000 years ago; farming was one of their main subsistence activities. The first cattle were introduced to the region by the Spanish explorer Onate in 1642. Area ranches initially used natural streams and springs and later developed springs, wells and stock tanks to supply the water needed by their livestock. Acequias/community ditches, established in the 1700's as the first water distribution management systems, are one of the oldest forms of continuous government in the United States.

Today, these acequias and community ditches contribute significantly to farming in New Mexico. Irrigated agriculture by non-native inhabitants came into widespread use in the mid-1800s. By 1875 a number of ditch systems had been established on the Gila and San Francisco Rivers. By 1890, much of the land suitable for irrigation with surface water was under cultivation. Most of the diverted water was used to irrigate small farms, although part of the water was appropriated by owners of large ranches for livestock purposes. Ranching spread throughout the remainder of the area away from the main stem of the rivers, and by the late 1800's some of the larger ranches in New Mexico had been established.

After 1940, irrigation using groundwater had begun in both New Mexico and Arizona. Farm development in New Mexico increased substantially in the 1950's, with the realization that soils and climatic conditions enabled successful cash crop production, if water became available. This resulted in the creation of many farming enterprises where only livestock grazing existed prior to 1940. The flood plains of the main stream channels and tributaries were formerly highly productive farm lands. The proliferation of the woody species within the last 100 years, and the recent wildfires, caused much erosion in the uplands. The water table has lowered and the valley flood plains are dry with limited productivity. Livestock grazing has been greatly reduced for many years.

The recent wildfires have caused a substantial shift in ecosystem health on thousands of acres in Catron County. Ecosystem health and the productivity of the lands impacted by severe wildfire intensity will remain below their potential for many years and there will be major effects on downstream water quality and quantity. There will be negative effects on traditional uses and the ability for long established residents to remain in the area.

Catron County has a long heritage of farming and ranching in coping with major changes in environmental quality. It is very important to the local community to continue the historic uses that are so much a part of Catron County. Citizens whose families have lived here for generations believe that their values and livelihoods are being mostly ignored as the modern environmental movement sweeps through the county.

The original purpose of the 18,000 acre-feet of Central Arizona Project (CAP) water, was granted to New Mexico in the Arizona vs. California US Supreme Court decree. It was to offset the hardships to Gila/San Francisco basin agricultural producers. It fulfills and supplements existing diversion rights for agricultural production. The New Mexico congressional delegation ensured the local water users that the 18,000 acre-feet of CAP water was to offset the hardships created on the New Mexico water users by the Colorado Basin Project Act of 1968. By taking away Gila/San Francisco Basin traditional agricultural water usage levels and common law water use rights, the Colorado Basin Project Act of 1968 lowered the value of farm and ranch lands in the Gila/San Francisco Basin and the real property market values were reduced. This in turn reduced the borrowing power of farmers and ranchers for operational loans, equipment upgrades, and the ability to purchase more productive land with associated water rights. This situation prevailed in Catron County for many years until the Arizona Water Settlement Act came about. This act attempts to again make additional water available for agricultural purposes in New Mexico.

As the capability to utilize the additional water, made available by the recent wildfires, through the implementation of the AWSA, and the projects in this proposal, are realized, the Catron County Commission and Catron County Acequias Commission may consider applying for the portion of the 4,000 acre-feet of water available for use in the San Francisco River basin sometime in the future. The ability to increase the beneficial use of water rights will increase the productivity of the land and secure the continuation of the customs and cultures in Catron County.

b. Current and future demands for water in the Southwest Planning Region. [up to 20 points]

~~This project would preserve Catron County's traditional, customary and cultural economic sectors, which are agriculture and natural resource based: Livestock, logging, and production of wood products. The county currently suffers the effects of prolonged drought conditions, which may continue into the indefinite future; water demands for traditional uses will increase even without increase in the current activity levels.~~

~~Catastrophic wildfires such as the 2011 Wallow Fire in eastern Arizona and western New Mexico demonstrate the critical need for protection of our watersheds. This need has been addressed in the Catron County Community Wildfire Protection Plan (CWPP) and associated WUI level CWPPs. In the absence of sufficient precipitation to maintain current levels of water availability for maintenance of a healthy forest, aquatic environments and riparian areas as well as for human use locally and downstream, measures must be taken to protect and conserve water sources that do exist.~~

~~While this project may not increase the actual quantity of water in the San Francisco River system and watershed, it will conserve water. The effective availability of water will be increased through minimization of loss through evaporation and flood, and through lengthening the amount of time water flows in the river system. Additionally, through watershed restoration, forage will increase for livestock and wildlife, the logging industry (retooled for small diameter) will be supported, and both the timber and woody byproduct industries will be provided with raw materials (woody biomass for energy/heat is being developed at this time; it is vital that projects which provide the raw materials for this use be carried through).~~

Water demands to support the traditional uses of water in Catron County will need to be sustained or increased in the future as more people move into the County. As people living in the high tax rate states leave to live in the remote poorer regions of the nation, the demand for water to support this migration of

people will become even more evident. While Catron County remains sparsely populated and not a rapidly growing county, the low land values that currently exist will eventually attract people who are looking to get away from high tax rates and high levels of social problems. The migration of people from California into Arizona and now into portions of New Mexico has already been documented.

Along with potential increases of demand for water use, due to people moving into Catron County, there is a growing demand for water that can be taken from the San Francisco and Gila Rivers to be moved to the growing population centers downstream. This shift in water-use from irrigation to domestic-use has already occurred in many locations within the nation. It is only a matter of time that the irrigation water currently used in Catron County will be considered as potential domestic water for places like Tucson or Phoenix.

c. Flood control. [up to 20 points]

~~Downstream streambed and riparian areas are currently subject to periodic flood damage that increases water turbidity through watershed erosion; destroys stream banks, riparian areas, bridges, dams and roads; and deposits debris in streams and fields and washes away seeds and plantings. Watershed restoration helps to moderate runoff so that more gradual release of water occurs and thus mitigates flood damage. Streams remain clearer; water remains cooler as riparian areas retain plant growth that shades the water; wild and agricultural plant areas are not subject to gravel and rock deposited by floodwaters; bridges and roads and associated structures (culverts, ditches, etc.) require less time and funding for repairs.~~

In regard to flood control the proposal priorities are to implement watershed restoration practices to reduce runoff so that a more gradual release of water will occur; and, to improve infrastructure to sustain existing water rights and improve ecosystem health and functioning downstream. The recent large wildfires have subjected downstream Gila and San Francisco River channels and riparian areas to the risk of periodic flood damage and increased water turbidity due to the degradation of the upland watershed conditions. These periodic floods have the potential to destroy stream banks, riparian areas, public infrastructure such as utilities, bridges, dams and roads, private property and deposit tons of debris and fine sediments in streams and fields. As mentioned in Criterion 1c, above, the County exists in a continued State of Emergency/Disaster due to the potential for flooding, soil erosion, and excessive runoff affecting domestic and agricultural use of water.

The proposed projects will help to improve water quality; ensure that downstream riparian areas remain intact; and, ensure that much of the transportation and farming infrastructure is protected. Infiltration galleries and piped irrigation water system are an improvement over traditional head gate diversion/ditch irrigation systems. These upgraded irrigation systems will be able to cope with high levels of debris and sediment and make possible the diversion of water during high flow events. Flooding often occurs with the summer monsoons and can be a daily event at times. Infiltration galleries are more likely to withstand heavy flooding, on a daily basis, with little maintenance after a flood event. Experience has shown that often the second day of rainfall can produce more damaging effects than the first, with subsequent events worsening the downstream conditions. The main purpose of the water storage/sediment ponds is to capture water during episodes of high stream flow. They also allow the settling of particulates and nutrients, thus improving overall water quality for irrigation and downstream uses. These practices will help to improve water quality, meet water demands, and fulfill existing diversion rights.

d. Fire protection, prevention, or suppression. [up to 20 points]

~~Prolonged county drought conditions increases risk of catastrophic wildfires as well as other emergency conditions that may occur due to insufficient access to immediate water needs. Catron County's Community Wildfire Protection Plan of 2006 (CWPP, currently under revision/updating) identified some of the highest potential for downstream agricultural damage from wildfire to be the areas downstream of the San Francisco watershed. (see Map C)~~

~~San Francisco Watershed Restoration Proposal Healthy forests are more resistant to disease, insects and drought conditions, thus making them more able to tolerate wildfire. Thus watershed restoration will help to prevent catastrophic wildfire and the resulting damage to soils, habitat, and water quality. The CWPP recommends a bare minimum of 40,000 to 50,000 acres per year of forest restoration to reduce hazardous fuels and the risk of catastrophic wildfire. This project will help meet CWPP goals.~~

The prolonged drought in Catron County made the conditions more conducive for wildfires. The Governor's Executive Order 2012-007, a supplement to Executive Order 2011-063, issued May 11, 2012, relating to enhanced flood potential caused by severe wildfire, recognized that several counties, including Catron, had been impacted by severe wildfires. Extensive amounts of vegetation were destroyed, potentially leading to excessive runoff in critical watersheds necessary for domestic drinking water and agricultural use. Before the Whitewater Baldy fire, Catron County's Community Wildfire Protection Plan of 2006 identified the areas downstream of the San Francisco watershed as high potential for downstream agricultural damage from wildfire. (See Map C). Unfortunately this prediction was prophetic and accurate.

Healthy forests are more resistant to disease, insects and drought conditions, thus making them more able to tolerate wildfire. Watershed restoration will help to prevent catastrophic wildfire and the resulting damage to soils, habitat, and water quality. The CWPP recommends a bare minimum of 40,000 to 50,000 acres per year of forest restoration to reduce hazardous fuels and the risk of catastrophic wildfire. This project will help meet CWPP goals.

The improvement to the irrigation systems in Catron County will also provide multiple ponds along the San Francisco River which make the use helicopters to suppress wildfires, much more convenient and feasible.

An improvement in fire protection, prevention or suppression in Catron County is important to all people who live in or visit Southwest New Mexico. Furthermore, these improvements should eventually lead to suspending the State and County emergency declarations.

e. Recreation. [up to 20 points]

~~The headwater areas of stream systems of the Gila National Forest are difficult to access and do not favor farming or ranching; thus much of these areas remain primitive and undeveloped. Part of the Gila Wilderness is located in the project area and is a popular destination for outdoor recreation for people worldwide. Watershed restoration which protects and preserves the project area and the streams of the watershed from disease, insect infestation and wildfire, also protects and preserves the beauty and view shed of the area for hunting, hiking, camping, birding, horseback riding, orienteering, photography and other activities.~~

The headwater areas of the stream systems in the Gila National Forest (GNF) are difficult to access for farming or ranching and so remain primitive and undeveloped. The Whitewater/Baldy Fire burned large portions of these scenic areas, which are popular destinations for back packing and other remote area forms of outdoor recreation. The proposed restoration of the burnt areas will return the beauty and visual quality of the area for hunting, hiking, camping, birding, horseback riding, orienteering, photography and other activities.

The upgraded irrigation systems will enhance the scenic beauty of the valley bottoms by allowing irrigated fields to be scattered across the landscape. The green of fragrant, irrigated fields; the increased riparian vegetation; and, even the increased relative humidity and improved air quality that will be made possible due to irrigation of the land will enhance the experience of visitors to Catron County.

f. Environmental protection and/or enhancement. [up to 20 points]

~~This project proposal serves to enhance a landscape scale watershed while identifying and protecting sensitive resources during the NEPA process. Watershed restoration is broadly supported by private individuals, public agencies at local, county, state, and federal levels, and various environmental groups.~~

~~The goals of this project are to increase water quantity and quality through improvement of watershed condition over a significant portion of the San Francisco watershed including improved herbaceous ground cover, watershed storage and capture functioning. Over the years, tree canopy has increased over a large portion of the project area, with more than 1,000 trees per acre in many areas. Because of competition for light and water, woody vegetation has proliferated at the expense of herbaceous ground cover.~~

~~NEPA analysis will be conducted. Consultation with US Fish & Wildlife Service (FWS) will be completed and safeguards for listed species will be implemented as specified by the best available evidence or directed by FWS. There will be no tree harvest or road construction or reconstruction in Inventoried Roadless Areas. Wilderness values are protected by designating Whitewater Creek WS as the control watershed.~~

The expected outcomes of these projects are improvement of water quality and water resources for agricultural producers, citizens, and threatened and endangered species, through the restoration of watershed and vegetative conditions over part of the burn scar of the Whitewater/Baldy Fire and other recent wildfires. This proposal will provide for the planning and implementation of the long term restoration of severely burnt areas and the mitigation of adverse impact to water quality. Also the proposal will introduce measures to protect and enhance the habitat of threatened and endangered species in both the uplands and in the riparian habitats in the valley bottoms. The efforts to restore watersheds and native vegetative communities and increase the efficiency of irrigation systems, while making them more environmentally friendly, is broadly supported by private individuals, public agencies at the local, county, state, and federal levels, and environmental groups.

NEPA analysis will be conducted where required. Appropriate measures will be incorporated into the various project designs as needed to mitigate possible adverse impacts to the environment. Consultation with US Fish & Wildlife Service (FWS) will be completed and safeguards for listed species will be

implemented as specified by FWS. Wilderness values will be protected by limiting activities within designated Wilderness and by following all permitting requirement when working in stream channels.

g. Any others. [up to 10 points] (NO TEXT IN ORIGINAL)

Devastating wildfires impact the lives of all who live near them. As it is with agricultural enterprises, the life styles of those who have chosen to live surrounded by national forests are somewhat at the mercy of natural processes, including forest fires. The San Francisco River, its tributaries, and surrounds, are integrated with the local culture. Many residents purchased homes here for retirement in a peaceful, beautiful setting. Other settlers came to raise families in a rural location where plenty of opportunities for camping, hunting, fishing, riding, hiking, and just getting out in nature abound, with the belief that, as children benefit from enriching outdoor experiences, so does the nation. These values and viewpoints are shared with families long established in Catron County.

Lifestyles and optimistic plans for the future have changed since the recent devastating wildfires have impacted Catron County. The threat of flooding has robbed the peace of mind from the citizens living downstream along the major drainages. Citizens of this County, who love the Gila National Forest and its surroundings, look forward to the return of what has been lost. Restoration of the impaired ecosystems will help the economy of Catron County and reap untold benefits for families, retirees, businesses, agricultural producers, County and State entities, schools, etc. All efforts to this effect are greatly appreciated.

Fishing is not available because of fish die off. Wells have dried because fine sediment is sealing off ground water replenishment. The leaves on old Cottonwood and Sycamore trees yellowed before the onset of fall. Camping and recreating near the river are more hazardous than ever if any chance of precipitation exists. Citizens of this county, nearby counties, and all others, who love the Gila National Forest and its surrounds, look forward to the return of what has been lost. Restoration of the impaired ecosystems and the other improvement projects will help the economy of Catron County and reap untold benefits for families, retirees, businesses, agricultural producers, County and State entities, schools, etc. All efforts to this effect are greatly appreciated.

7. List those supporting the application, including federal, state, and local government entities; Indian nations, tribes or pueblos; irrigation or conservation districts; non-profit organizations; and other entities. Provide letters or resolutions of support for the application. [up to 40 points]

~~Letters for the following supporters are attached to this document~~

~~US Forest Service~~

~~NM Environment Department—Water Quality Bureau~~

~~NM Department of Forestry~~

~~Catron County Acequias Commission~~

~~Catron County Citizens Group~~

The following have been contacted and are involved in the process of formal approval: Gila National Forest, U.S. Fish and Wildlife Service, Natural Resource Conservation Service, San Francisco Soil and Water Conservation District, New Mexico Department of Agriculture, New Mexico State Forester, New Mexico Environment Department, New Mexico State University Cooperative Extension, New Mexico

State University WRRRI and RITF, New Mexico Game and Fish Department, Catron County Commission, and Catron County Acequias Commission.

8. Describe whether the proposal would benefit one or more than one of the counties in the Southwest New Mexico Planning Region – Catron, Grant, Hidalgo, and/or Luna Counties. [10 points/county up to 40 points]

~~While the primary benefits of this project will be to Catron County, the four-county area of Grant, Luna, Hidalgo and Catron would enjoy opportunities for employment and contracting, and would benefit from:~~

~~Increased ground water and surface water quantity~~

~~Improved water quality in streams due to reduced soil loss and deposit into live water courses~~

~~Capture of water runoff within watershed to decrease overall water loss to the Gila River system~~

~~Increased biological diversity and wildlife habitat~~

~~Decreased risk of catastrophic wildfire~~

~~Increased effective access to water for agricultural uses~~

~~Maintenance or improvement of multiple uses~~

~~Enhanced forest and river recreational opportunities~~

This project fully supports the historic agricultural use of land in the Gila/San Francisco and other water Basins of Catron, Grant, Hidalgo, and Luna Counties of New Mexico, and enables such use to continue in the future, and provides additional opportunities for growth. Of the four counties Catron has the largest proportion of landmass and headwaters impacted by the Wildfires. It also is an immediate recipient of runoff from the Wallow fire. As such, improvements to the watershed within this county have beneficial effects to all of the downstream counties.

While the primary benefits of this project will be to Catron County, the four-county area including Grant, Luna, and Hidalgo would enjoy opportunities for employment and contracting, and would benefit from:

- Increased ground water supplies and surface water quantity
- Improved water quality in streams due to reduced soil loss and deposit into live water courses
- Capture of water runoff which will decrease overall water loss within the Gila/San Francisco River system
- Improve critical habitats for threatened and endangered species
- Increased biological diversity and wildlife habitat
- Maintain and improve ecosystem health within and along the river
- Decrease risk of catastrophic wildfire
- Increased effective access to water for agricultural uses
- Expand agricultural production options
- Expand recreational opportunities
- Maintenance or improvement of multiple uses
- Enhanced forest and river recreational opportunities
- Preservation of local ranching and farming heritage
- A more dependable and adequate water supply throughout the year

- Fulfill existing water rights for irrigation and stock tanks, and restore any rights lost in the 1964 adjudication
- Increase the capability for full utilization of the additional 4,000Aft of AWSA water
- Provide water for non-consumptive domestic wells
- Increased knowledge dealing with the impacts of catastrophic wildfire and recovery of moderate and severely burnt areas within the Southwest.

9. Describe whether the proposal would support economic growth or benefit one or more than one of the following interests in the Southwest New Mexico Planning Region – agricultural, ranching, municipal, recreational, or other (specify). [10 points/interest [up to 50 points]

~~The San Francisco River watershed is one of the major sources of water for the Gila River system. In fact, more river system water is available to downstream users from this watershed than it is to Catron County itself. Thus all uses of waters downstream from this watershed will benefit from this project. Downstream agricultural, ranching and municipal users in particular will receive high benefit from this project.~~

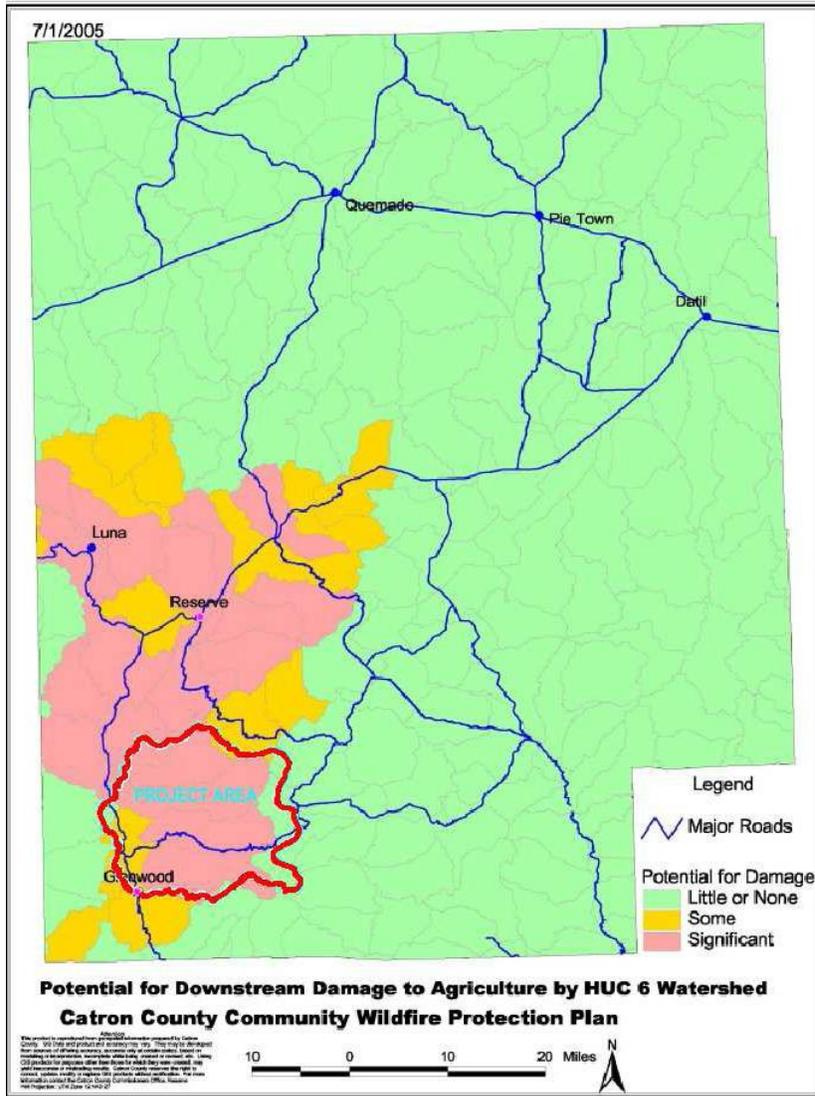
The San Francisco River, and its tributaries, is one of the major sources of water for the Gila/San Francisco River Basin. In fact, more San Francisco River water is available to downstream water users, than is available to water users in Catron County. Thus all uses of waters downstream from the proposed project area, including those in Arizona, will benefit from this project. Downstream farming, ranching and municipal water users in particular will receive high benefit from enhanced water quality. Farms and ranches within the Southwest New Mexico Planning Region will profit from a more reliable and stable source of affordable water. Crop production and the variety of crops produced could increase. New agricultural enterprises could be attracted to the area, which would increase the agricultural economic base of Southwestern New Mexico.

Recreational attractions, such as hunting, biking, fishing, and camping all depend on quantity and quality of water and would benefit from watershed improvement.

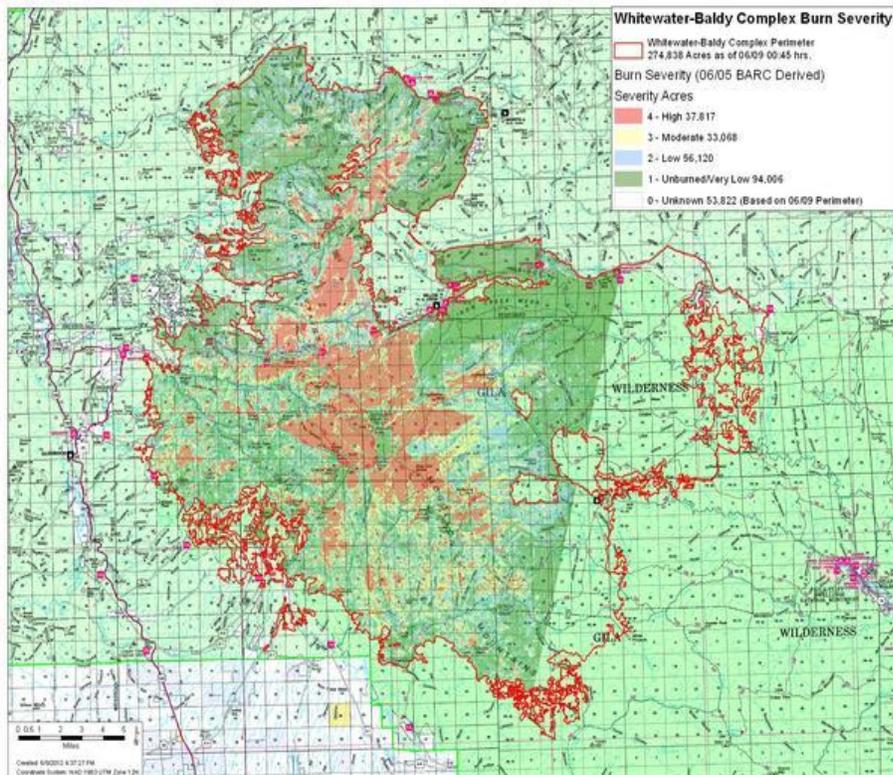
All human endeavors depend on the existence of water. Productive use of the land is extremely dependent on water. Without agriculture the nation fails.

Burn down your cities and leave our farms, and your cities will spring up again as if by magic; but destroy our farms and the grass will grow in the streets of every city in the country. -William Jennings Bryan

Appendix A --Downstream Damage Potential Map



Appendix B-- Burned Area Emergency Response Team Severity Map



Appendix C-- San Francisco River Basin of New Mexico

TOPO! map printed on 04/02/10 from "New Mexico.tpo" and "Untitled.tpg"
 109°00.000' W 108°50.000' W 108°40.000' W 108°30.000' W WGS84 108°13.000' W



D- Supporting Tables

Burn Severity Analysis

Arizona Water Settlement Act - Revised San Francisco Watershed Proposal							
Whitewater Baldy Complex Fire - Burn Severity Analysis							
Burn Severity Acres							
Subwatershed	Total Acres	Unburned	Unknown	Very Low	Low	Moderate	High
Deep Creek	30,520	13,685	38	9,582	4,391	1,465	1,359
Devils Creek	22,766	16,445	24	4,392	1,391	374	141
Devils Creek-San Francisco River	10,021	10,021	0	0	0	0	0
Mineral Creek	32,916	13,745	3	6,396	4,562	2,883	5,326
Mineral Creek-San Francisco River	7,470	7,470	0	0	0	0	0
South Dugway Creek-San Francisco River	5,447	5,447	0	0	0	0	0
Whitewater Creek	34,873	9,758	13	5,556	6,736	4,935	7,876
Totals	144,013	76,571	79	25,926	17,080	9,657	14,701

Vegetation Type	Total Acres	Unburned	Unknown	Very Low	Low	Moderate	High
No Data/Private Property	7,949	7,599	0	193	112	25	20
Aspen	2,462	2	1	234	227	352	1,646
Cottonwood-willow	216	216	0	0	0	0	0
Douglas Fir-Mixed Conifer	36,919	2,520	37	11,000	9,413	5,208	8,741
Engelmann Spruce	116	0	0	34	29	12	40
Grassland	16,083	15,585	1	356	114	20	7
Oak woodland	8,501	2,601	3	2,512	1,562	1,391	432
Pinon-juniper	45,058	39,901	19	3,668	908	437	125
Ponderosa Pine	22,546	8,129	17	7,340	3,600	1,420	2,040
Spruce-Fir	85	0	0	12	9	12	52
White Fir	4,077	18	1	577	1,107	778	1,597
Totals	144,011	76,570	79	25,925	17,080	9,657	14,701

Burn Severity Analysis (continued)

Vegetation Type	Total Acres	Unburned	Unknown	Very Low	Low	Moderate	High
No Data/Private Property	7,949	96%	0%	2%	1%	0%	0%
Aspen	2,462	0%	0%	10%	9%	14%	67%
Cottonwood-willow	216	100%	0%	0%	0%	0%	0%
Douglas Fir-Mixed Conifer	36,919	7%	0%	30%	25%	14%	24%
Engelmann Spruce	116	0%	0%	29%	25%	11%	35%
Grassland	16,083	97%	0%	2%	1%	0%	0%
Oak woodland	8,501	31%	0%	30%	18%	16%	5%
Pinon-juniper	45,058	89%	0%	8%	2%	1%	0%
Ponderosa Pine	22,546	36%	0%	33%	16%	6%	9%
Spruce-Fir	85	0%	0%	14%	11%	14%	61%
White Fir	4,077	0%	0%	14%	27%	19%	39%

Burn Severity (Stream Length - Feet)			
Stream Type	Total Length	Moderate	High
Ephemeral Stream	152,738	74,480	78,258
Intermittent Stream	15,316	2,795	12,521
Perennial Stream	1,858	1,737	121
Totals (Feet)	169,912	79,013	90,900
Totals (Miles)	32.18	14.96	17.22

Recovery Monitoring Cost

Arizona Water Settlement Act Revised San Francisco Watershed Proposal			
Monitoring Plan/Budget			
Item	Number	Cost/Unit	Total
WRRRI and RITF comprehensive collection, analysis and management of San Francisco Watershed Restoration Project and recovery data. This will include the following:			
Monitor streambank erosion and destruction of riparian vegetation on 32 miles of stream within high and moderate burnt areas (520 hrs/year) for 5 years @ \$30/hour	2600	\$30	\$78,000
Monitor burnt area recovery and implementation of upland restoration treatments (520 hrs/year) for 5 years @ \$30 / hour	2600	\$30	\$78,000
Purchase, install & maintain 10 Crest Stage Gauges within key heavily impacted subwatersheds	10	\$10,000	\$100,000
Mileage and per diem for burnt area monitoring personal (@\$26,000/year) for 5 years	5	\$26,000	\$130,000
Coordinate with the USGS to maintain USGS ALERT rain gauges (Bear Wallow Lookout, Mogollon Baldy Lookout, Hummingbird Saddle) for an additional 5 years (3 rain gauges @ \$8,000/year x 5 Years)	5	\$24,000	\$120,000
Coordinate with the USGS to maintain USGS stream gauges on Mineral and Whitewater Creeks for 5 additional years (2 stream gauges @\$10,000/years x 5 years)	5	\$20,000	\$100,000
Purchase, install & maintain equipment to measure water diverted at 10 enhanced irrigation systems	10	\$25,000	\$250,000
Purchase equipment and monitor sediment and nutrient levels of diverted water at 10 enhanced irrigation systems	10	\$10,000	\$100,000
Fund position to manage the installation/maintenance of equipment and downloading/recording/reporting data (estimated 2080 hrs/year for 5 years@\$38/hr)	10,400	\$38	\$395,200
Develop and maintain an agency accessible data base for all data collected, analyzed and reported concerning the San Francisco Watershed Restoration Project. Products would include developing and maintaining a website and GIS mapping protocols and map data depository. (@ \$100,000/year) for 5 years	5	\$100,000	\$500,000
Collection and analysis of data related to the changing irrigation water use and economics in Catron County. This would include monitoring water use and diversion cost at both enhanced and historic in place irrigation systems. (@ \$ 16,000/year) for 5 years.	5	\$16,000	\$80,000
WRRRI and RITF sponsored data sharing workshops, professional meeting presentations and develop and release publications concerning the San Francisco Watershed Restoration Project (5 meetings/year @ \$2,000/meeting for 5 years)	5	\$10,000	\$50,000
Total			\$1,981,200

Vegetation Restoration Cost

1. Ponderosa Pine-Mixed Conifer Vegetation Treatments

Comment [A1]: The last spreadsheet I edited (3-1-13) had the following costs that differ from the table in the document for Ponderosa Pine: Vegetation

Arizona Water Settlement Act Revised San Francisco Watershed Proposal								
Vegetation Treatments Across High Priority Burnt Areas								
Treatment Acres and Cost Estimates								
Vegetation	Slope	Burn Severity	Within Roadless / Wilderness Areas	Acres	Treated acres	Treatment	Treatment cost per acre	Treatment Costs
		LOW		3600	3600	maintenance burn	150	\$540,000
Ponderosa Pine	0-30%	Moderate	Yes	265	265	maintenance burn	\$150	\$39,762
		High	Yes	392		none	\$0	\$0
		Moderate	No	125	125	maintenance burn	\$150	\$18,695
		High	No	70		none	\$0	\$0
	30-140%	Moderate	Yes	240	240	maintenance burn	\$150	\$36,072
		High	Yes	191		none	\$0	\$0
		Moderate	No	29	29	maintenance burn	\$150	\$4,395
		High	No	18		none	\$0	\$0
			Totals	4,929	4,259			\$638,924

Comment [A2]: The last spreadsheet I edited (3-1-13) had the following costs that differ from the table in the document for mixed conifer: Vegetation

Vegetation	Slope	Burn Severity	Within Roadless / Wilderness Areas	Acres	Treated acres	Treatment	Treatment cost per acre	Treatment Costs
		LOW		9413	9413	maintenance burn	150	\$705,975
Mixed Conifer	0-10%	Moderate	Yes	107	107	maintenance burn	\$150	\$8,025
		High	Yes	127		none	\$0	\$0
		Moderate	No	60	60	maintenance burn	\$150	\$4,500
		High	No	96		none	\$0	\$0
	10-30%	Moderate	Yes	430	430	maintenance burn	\$150	\$32,250
		High	Yes	591		none	\$0	\$0
		Moderate	No	190	190	maintenance burn	\$150	\$14,250
		High	No	339		none	\$0	\$0
	30-140%	Moderate	Yes	341	341	none	\$150	\$25,575
		High	Yes	514		none	\$0	\$0
		Moderate	No	94		none	\$150	\$0
		High	No	112	94	none	\$0	\$0
			Totals	12,414	10,635			\$790,575

* 50% not treated due to MSO, soils and NEPA concerns.

Vegetation	Slope	Burn Severity	Within Roadless / Wilderness Areas	Acres	Treatment	Treatment cost per acre	Treatment Costs
Aspen	All	Moderate	Yes	17	none	\$0	\$0
		High	Yes	121	none	\$0	\$0
		Moderate	No	25	none	\$0	\$0
		High	No	152	none	\$0	\$0
Totals				315			\$0
Total Estimated Priority Treatment Area:				17,658	14,894	Total Cost to Treat Priority Areas: \$1,429,499	

2. Riparian/Wetland Restoration Treatments Cost

Arizona Water Settlement Act Revised San Francisco Watershed Proposal			
Riparian/Wetland Restoration Cost			
Item	Hours	Cost	Total
<i>Perennial/Intermittent Stream (3.25 miles in high/moderate burn severities)</i>			
Riparian Planting Crew @\$25/hr	2500	\$25	\$62,500
Cottonwood/Willow poles @\$1.25 ea to harvest, process and transport	5000	\$1.25	\$6,250
<i>Ephemeral Stream (29 miles in high/moderate burn severities)</i>			
Grade Stabilization Structures	1000	\$300	\$300,000
<i>Springs/Wetlands Restoration</i>			
Wetland Restoration Contractor/Crew @\$85/hr	2500	\$85	\$212,500
Equipment Operator @\$45/hr	2500	\$45	\$112,500
Supplies (rock, etc.)			\$100,000
Equipment @\$50/hour	2500	\$50	\$125,000
Mobilization/Demobilization			\$25,000
Total			\$943,750

3. Piñon/Juniper Treatment

Arizona Water Settlement Act Revised San Francisco Watershed Proposal								
Pinyon/Juniper Treatment								
Vegetation	Slope	Burn Severity	Within Roadless / Wilderness Areas	Acres*	Treated acres	Treatment	Treatment cost per acre	Treatment Costs
Grassland	0-10%	All	Yes	419	419	Untreated if open grassland; Hand thinning if invaded by juniper. 30% estimated to be intact open grassland. Determine final extent of juniper encroachment by aerial photos.	\$50	\$10,475
			No	7,964	5,933		\$50	\$148,325
	10-30%	All	Yes	595	595		\$50	\$14,875
			No	3,408	3,408		\$50	\$85,200
	30-140%	All	Yes	297	0		\$50	\$0
			No	668	0		\$50	\$0
Totals				13,351	10,355			\$258,875
*exclude 50% due to lack of P/J on site and untreatable acres due to terrain and cultural resources								
Vegetation	Slope	Burn Severity	Within Roadless / Wilderness Areas	Acres*	Treated acres	Treatment	Treatment cost per acre	Treatment Costs
Pinyon-Juniper	0-10%	All	Yes	4,343	4,343	Prescribed Burn	\$70	\$91,203
			No	13,528	12,319	Push	\$200	\$739,140
	10-30%	All	Yes	8,099	8,099	Prescribed Burn	\$70	\$170,079
			No	7,091	7,091	Fuelwood cutting/ thinning	\$25	\$53,183
	30-140%	All	Yes	3,189	0	Prescribed Burn	\$70	\$0
			No	1,806	0	Prescribed Burn	\$70	\$0
Totals				38,057	31,852			\$1,053,605
*exclude 70% for probable NEPA/cultural site/watershed/wildlife concerns								
							TOTAL	\$1,312,480