A. Application Cover Page

Application Information

1. **Title of project:** We t **Turkey Crce k** Watershed Restoration and Enha en

2. **Type of project:**
   - Water Acquisition
   - ✔ **Capital Project or other**
   - Water Conservation
   - ✔ **Research**

3. **Stream type**
   - v **Perennial**
   - **Intermittent**
   - ✔ **Ephemeral**

4. **Date submitted** July 31, 1995

5. **Date received by ADWR**

6. **Applicant name** El Coronado Ranch + **G** Hk Co.

7. **Address (city, county, zip code)**
   C l 3q5
   Pea**rce** Az

8. **In an AMA**
   - ____ Phoenix
   - **Tucson**
   - Prescott
   - **Pinal**
   - ____ Santa Cruz

Outside AMA -/

9. **Contact person/title and phone number:** TOSIAH AUSTIN **El** Ceircx **Co** **5**-20 --ce **33**-6

10. **Type of application:**
    New (.4 **Continuation ( )**

11. **Project start date:** 1995
    End date: 1997

12. **Other grants obtained or will be applied to for funding:**
    Augmentation: ( )
    Partners for Wildlife ( )
    Heritage ( )
    Others _____

13. **Estimated funding:**
    a. **AWPF** 84,700.00
    b. **Applicant** 5[illegible] .**00**
    c. **Other** c,850. cDo (In-kind/Service
    d. **Total** 141,100.00

14. **Tax ID number:** 86 0767909

15. **The undersigned hereby offers and agrees to perform in compliance with all terms, conditions, specifications and scope In the application. Signature certifies understanding and compliance with the attached application. The Arizona Water Protection Fund Commission may approve grant award agreements with modifications to scope items, methodology, schedule, final products, and/or budget.**

Tos A STIN
Typed **Na e of Auth ed3Øpresentative**

Signature

3560
Title and Telephone No.

7/2
Date Sig d

H. Minimum Statutory Criteria

The Arizona Water Protection Fund Commission (AWPFC) realizes that completing an application for our program will be a time consuming process. In trying to help you make sure that all statutory requirements and minimum application information requirements are met, we have devised the following two forms:

1) Minimum Statutory Criteria that must be satisfied; and

2) Application Completeness Checklist

These forms will be part of your completed application. Read through them (but don't try and complete them) before you begin any work on your application. **If your project or program does not meet all the Minimum Statutory Criteria, then it cannot be funded and will not be evaluated.** If you answer NO to any of its questions, you will have to change that portion of your project or program before it is submitted. The Application Completeness Checklist will give you a general idea of the format and types of information that the application requires. **If a form or piece of information is listed as MANDATORY, and it is applicable, it must be included or your application will not be evaluated.**

After completing your narrative proposal, revisit these two forms. Complete the forms and make sure that the minimum requirements are met and your application package is complete. This should save both you and the Commission a great deal of time and effort. If you have any questions regarding these forms, write to Arizona Water Protection Fund Commission, Arizona Department of Water Resources, 500 N. 3rd St., Phoenix, AZ 85004 (Attn: Tricia McCraw), or call (602)-417-2460.

Minimum Statutory Criteria

1. Your application does not require the acquisition of property?
   YES x NO____

2. Your application does not require the use of the State's right of eminent domain to acquire water or water rights?
   YES X NO____

3. Your application includes a description of the relationship between the project and existing plans, reports and information that are relevant to the project?
   YES x **NO**

4. When applicable, your application includes provisions for inspection and evaluation of the project?
   YES x NO____

5. Your application proposes methods for the expenditure of and accounting for any monies granted by the Commission?
   YES X NO____

I. Application Completeness Checklist

APPLICATION COMPLETENESS CHECKLIST

The purpose of this checklist is to ensure that all mandatory application requirements are fulfilled. **If specific forms or information are found to be lacking when the initial completeness review of your application is performed, the application will not be evaluated. It** is extremely important that you complete this checklist when you have finished all other portions of the application and that it is included with your submitted application package.

Form Number	Description	Mandatory (if applicable) Y/N	Completed Y/N/NA
AI	Cover page	Y	y
A2	State map	Y	Y
	Project area outlined	Y	Y
A3	Location Information Sheet/Land ownership	Y	Y
	7.5 minute USGS map	Y	Y
	Land use/agreement documents	Y	Y
A4	Task-Timetable	Y	Y
A5	Legal/Regulatory checklist	Y	Y
A6	SHPO information sheet	Y	Y
A7	Budget forms	Y	Y
A8	Minimum statutory requirements	Y	Y
A9	Application completeness checklist (this form)	Y	Y
	Narrative section	Y	Y
	Project experience references	Y	Y
	Letters of support	N	to be provided

AWPFC FORM A9 page 1 of 1

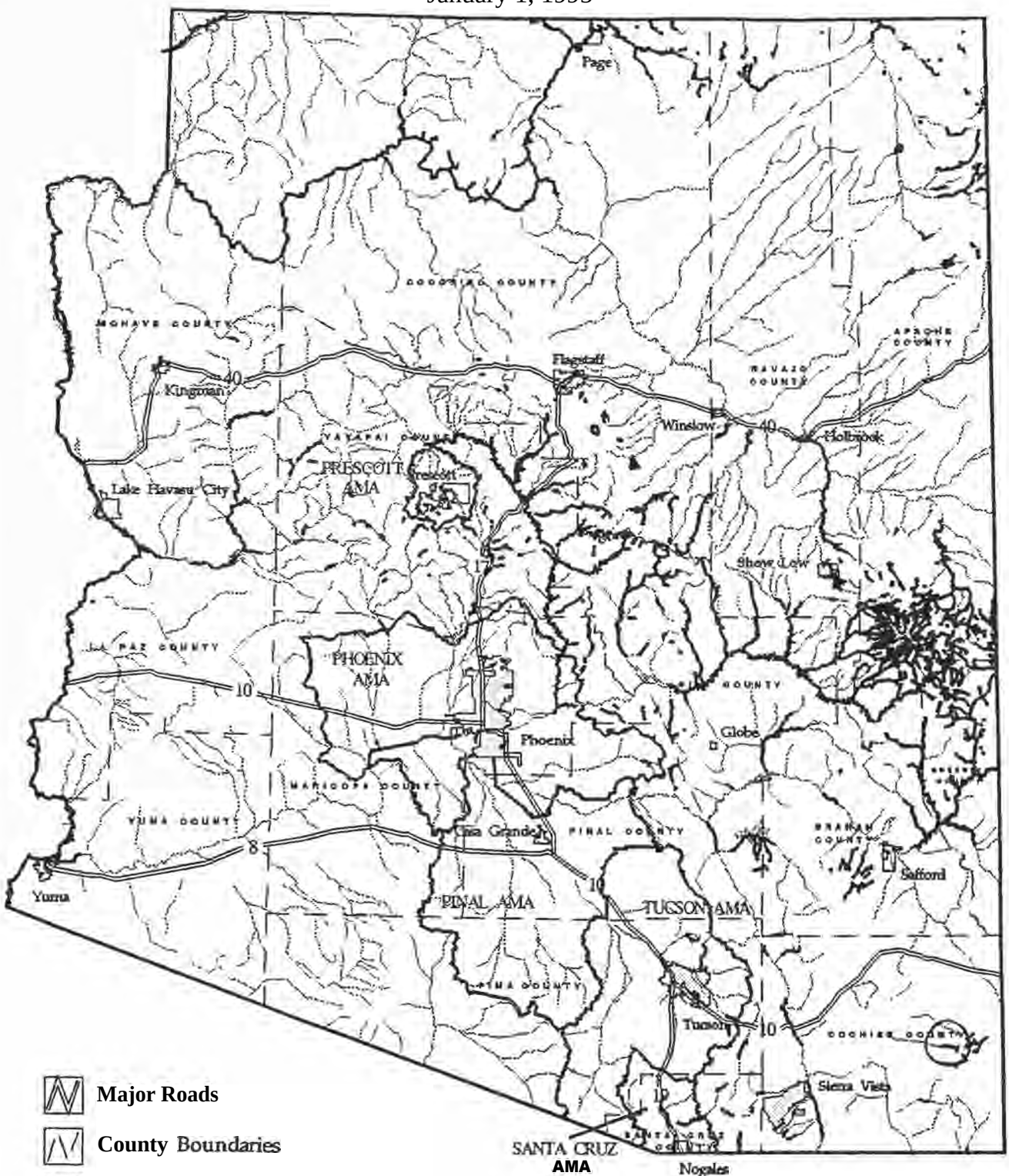
B. Arizona State Map

AWPFC Form A2

STATE OF ARIZONA

Arizona Water Protection Fund

January 1, 1995



Major Roads

County Boundaries

Perennial Streams

Intermittent or Ephemeral Streams

Active Management Areas

0 10 20 30 40 50 100 150

MILES

ARIZONA DEPARTMENT OF WATER RESOURCES

APPLICANT NAME: E C R & C C .

Circle **the general location of proposed project**

5. NARRATIVE PROPOSAL

(a) Title:

WEST TURKEY CREEK WATERSHED RESTORATION AND ENHANCEMENT

(b) Summary:

This project is directed toward the ultimate goal of restoring and enhancing the West Turkey Creek (WTC) watershed in Cochise County, AZ, to perpetuate an economically and ecologically sound program of private ranching while at the same time enhancing its natural biotic communities. It is an effort to integrate an innovative resource management effort to improve watershed health in a manner compatible with private and public land management, with the hope that what is learned may be applied elsewhere.

The basis for the healthy ecosystem required to attain this goal is a balanced use of water resources, which in the Southwest are limited to those provided by variable, seasonal rainfall. Enhanced retention and conservation of water is the key to maintaining both upland and riparian values.

The project is designed to increase water availability by instituting erosion control and retention of water on El Coronado Ranch (ECR) and adjacent US Forest Service (USFS) grazing allotments. Such measures will reduce soil erosion and flood damage by slowing runoff and thereby improve environmental conditions for rare fishes and other wildlife dependent on the riparian system. An additional objective and anticipated benefit is improved grazing conditions through topsoil restoration and water retention.

Erosion control, design and construction of a system of rock structures (gabions) that slow and thus retain runoff in situ, has already been partially implemented, and appears to have improved water retention and stream flow in the project area. The owners wish to continue this program, particularly since erosion damage in the upper watershed increased after the devastating Rattlesnake Fire last fall.

Funds are needed to pay some of the costs of gathering data, thereby establishing a baseline of information on the effectiveness of the erosion-control system. The owners wish to commence a scientific evaluation of watershed-level effects of the program. Providing such a database and evaluation are deemed important in determining effectiveness and viability of such a program for other Southwestern watersheds.

In addition, project funds will be used to evaluate and monitor program impacts on native fishes and other species of concern. The program will include a scientific survey of the project area and periodic inspection and monitoring to compile biological data usable for interpretation of future changes in both native and non-native biota. There are currently two native fishes of the Rio Yaqui drainage, longfin dace and Yaqui chub (the latter federal- and state-listed as endangered) on the ranch, and the owners are investigating possibilities of implementing a formal Habitat Conservation Plan (HCP) under Sec. 10 of the Endangered Species Act to properly protect and manage them.

(c) Introduction:

For several years, the owners (hereafter Applicants) of ECR have constructed erosion control and water retention structures in an attempt to slow stormwater runoff throughout the upper WTC watershed. Hundreds of structures, consisting mostly of rock retaining walls across ephemeral tributaries, have been installed to date. The applicants believe the program already shows signs of success. Surface water is present in formerly dry canyons and minor drainages and riparian plants have extended their distributions and become abundant in newly wetted areas. While labor intensive, the program requires little other cost as naturally available material is used. Slowing runoff has numerous benefits, from holding soil and enhancing riparian vegetation to providing greater volumes, longer-term and more stable flow regimes in both temporary and permanent water-courses. All these benefits make for healthier ecosystems and more productive ranching operations.

The Applicants wish to quantify the results of this ongoing program of land management, evaluate its benefits and shortcomings, see how it can be improved and determine if it can serve as a pilot project or model to be broadly shared. It is vitally important to create a baseline of data for documentation of changes that have occurred, thereby creating a data base for predicting effects of future events and actions.

Directly related to this program are the ECR's interest and dedication in seeing native plants and animals that once lived or still live in the area protected and restored and their habitats maintained. Upper WTC is home to the last known native stock of the Sulfur Springs Valley drainage of longfin dace (Agosia chrysogaster). Southern populations of this dace are listed as Candidate 2 species by the US Fish and Wildlife Service (USFWS). Both this dace and the Yaqui chub (Gila purpurea), the latter listed as endangered by USFWS and Arizona Game and Fish Department (AZGFD) and successfully reintroduced to the WTC drainage in 1986, are at the northern limit of their ranges on the ECR. The watershed is specified in the "Fishes of the Rio Yaqui Recovery Plan" produced by the USFWS in 1995 as a key locale for recovery of both. A number of additional, unique, imperiled or otherwise of-concern species also inhabit and are concentrated in the riparian zone of WTC. They too are targeted for consideration in this project, with an ultimate goal of developing a formal HCP in cooperation with AZGFD, USFWS, USFS and ECR.

The ECR is immediately downslope from part of the Coronado National Forest (CNF) that is a popular recreation area in the Chiricahua Mountains (see enclosed map of ECR and its CNF grazing allotment). As recreational pressures increase, the watershed may be threatened by water-quality deterioration or other impacts of greater human use. The 1994 Rattlesnake Fire demonstrated a need for improved watershed management and protection against erosion once ground cover is lost. Lack of funds for such management by the USFS are obvious and admitted (see appended article from the Arizona Daily Star, 17 July 1995), which has resulted in increased concern about watershed protection by the ECR.

Flooding after the fire resulted in severe damage to ETC and ECR's ponds and water distribution system by large amounts of ash and sediment transported downstream. Massive fish kills occurred in both the creek and in ponds connected to the creek, and presumably elsewhere. Both native and non-native fishes were decimated. While a past policy of fire suppression is listed as a major cause of fuel accumu-

lation contributing to intensity (and subsequent damage) of the Rattlesnake Fire, it is clear that this long-standing policy will take time to modify. In the meantime the ECR seeks to take steps to protect what it can of the lower watershed from further erosion and, as noted above, to also protect sensitive species from future harm.

(□)□Objectives:

Three major objectives have been set for the watershed-scale project:

1. Compilation and documentation of erosion-control activities. Prepare a map based on Geographical Information System (GIS) principles, accompanied by detailed narrative, of the upper WTC watershed, including all ephemeral and permanent watercourses, water-delivery canals and ponds, as well as erosion control and riparian conservation activities undertaken by the ECR since initiation of its project in 1987.

Benefits--The map and narrative will form the point of departure between historic activity (to be scientifically evaluated) and planning for future activities. The basis of the entire project is to identify not only those ephemeral washes already modified, but also those usable as controls for evaluation of future, more scientifically designed modifications. Watershed and sub-watershed acreages must be determined for evaluation of runoff/precipitation/watershed-retention attributes. Water-delivery system and pond relationships to WTC must be delineated in planning management for native fishes. All these tasks are best done through GIS processing from detailed maps.

2. Establish permanent sampling stations. Establishment of sampling points, both for use as controls to assess future modification/enhancement and as points which may be repeatedly and consistently sampled to evaluate past and future modifications.

Benefits--Establishment of permanent sampling stations will insure development of an institutional database. Permanency of stations, in turn, insures that future sampling and monitoring can be done in fixed and consistent manners by a diversity of personnel without jeopardizing data quality. It also incorporates scientific control, areas never before and never-to-be modified, into project development. Direct comparisons between and among modified and unmodified sites are the only means of objectively evaluating the effects of conservation actions.

3. Sample and monitor selected ecosystem components. Sampling and monitoring details are in Sec. 5(e). The following ecosystem components have been selected for baseline study and monitoring on a comparative (modified vs. unmodified) basis, selected for their relevance and feasibility for acquisition of quantitative data within funding and personnel limitations: a) estimation of stream-flow volumes and durations in ephemeral and permanent watercourses; b) determination of water quality in ephemeral and permanent watercourses; □) assessment of levels of soil moisture/water table along both ephemeral and permanent watercourses and ponds; and □) survey and delineation of resident biota, viz. documentation of short- and long-term changes in floral, vegetational and faunal composition of biotic communities and study/descriptive ecology of native fishes and aquatic in-

vertebrates and their interactions with nonnative organisms, primarily in permanent watercourses, water-delivery systems and ponds.

Benefits--Volumes and durations of surface flow from ephemeral watersheds after precipitation will presumably change as upstream gabions mature from raw stone barriers to soil-retaining vegetated plots. Greater water retention (slowed downslope movement) should be reflected in longer term and more stable discharges measureable through appropriate gauging protocols, both in sub-watershed and in mainstem WTC.

Water quality is also anticipated to change from that characterizing turbid, rapid runoff chemically similar to precipitation to less turbid, soil-influenced water seeping through interstices of sediments accumulated above gabions.

Soil moisture and groundwater accumulations are further expected to increase after modifications are allowed time to influence the system. Sampling along WTC will provide data which in the longer term will be useful in evaluating collective effects of upstream modifications on downstream, permanent portion of the system. In all instances, direct comparisons of controls (unmodified) vs. experimental (modified) drainages will provide quantification for changes.

Biological data have their own special attributes and values for interpretation of ecological change. Faunal and floral lists provide baselines from which vast amounts of information may be extracted since each species has its own ecological requirements. Its simple presence as a viable population provides a positive index of the continued presence and acceptable quality of environmental features upon which it depends for life. A diverse assemblage consisting of a mixture of common and rare, generalized and specialized, "important" and "unimportant" species is, therefore, a healthy community, buffered against environmental change, and indicating that ecosystem linkages are being perpetuated. Loss of diversity, typically through ascendency of one or a few species to clear and pervasive dominance, is a strong indication that linkages are already broken. On-going survey and delineation of biotic components of the ecosystem are viable monitoring strategies to apply in long-term evaluation of this project.

Specific studies of the ecology of native organisms (native fishes and aquatic invertebrates) of WTC and the water-delivery/pond system on ECR is geared toward future development of a formal HCP, involving cooperation among AZGFD, USFWS, USFS, and ECR toward recovery of Yaqui chub and precluding necessity for listing the longfin dace.

(e) Methods and Monitoring:

1. Compilation/documentation of past erosion-control activities. A digitized map will be prepared from existing US Geological Survey (USGS), USFS and other maps. GIS layers will then be prepared by detailed ground survey through use of Global Positioning System data to include: **a)** hydrological data (all natural channels and riparian wetlands, as well as diversions, delivery canals and ponds); **b)** positions of erosion-control structures; c) positions of sampling sites and other points of data acquisition, historical, contemporary and projected; **d)** distributions of various plant communities (e.g., riparian etc.); e) distributions of sensitive species and their habitats; **f)** land-use patterns and transportation routes (private and federal lands, various management boundaries [e.g., wilderness, etc.], public use

areas, roads, trails,other access) with possible watershed impacts; and g) other features deemed important to pattern interpretation and evaluation of erosion-control structures or species of concern.

GIS maps will be augmented by cross-referenced narratives that include, for example, status of watercourses (permanent vs. ephemeral), installation times, sizes and other features of erosion-control structures, field descriptions and guides to data storage for sampling sites and so on as necessary. Detailed maps are just as important for future planning as for historic information, and will be critical for successful design and positioning of unmodified controls for use in evaluating modified components of the watershed.

2. Establish permanent sampling stations. Permanent sampling stations will vary in number for each parameter (Table 1) to be evaluated. A single site may, for example, be used only for documentation of seasonal or annual changes discernible on photographs. Another may be for many purposes, maintaining daily climatic records, sampling vegetation annually, gauging streamflow weekly, water sampling for laboratory analyses quarterly, measuring soil moisture or height of water table periodically when water is present, and studying fish/invertebrate ecology at selected times, and photographing seasonally or annually as well.

Table 1. Numbers of permanent evaluating and monitoring sites for erosion-control structures and downstream effects in WTC watershed.

Weather records		Stream discharges	
	Precipitation	7	Baseflow volumes
	Temperature	3	Flow duration
			Floodflow volumes
Photographic records			
	Annual	20	12
			\Water quality 12*
Studies of fish and invertebrate ecology		3	Vegetation/faunal change 10

*Water quality analyses will emphasize two stations on WTC. Water is obviously not present for much of the year on ephemeral tributaries; it will be sampled when present. Some additional water-quality measurements may be made on groundwater samples, as available.

Climatic (temperature/precipitation) records are already available at a single station on ECR. Five additional stations (rain gauges/maximum-minimum thermometers) will be needed to assess variations due to elevation, exposure, storm yield and other factors. Photographic records will be maintained for the four cardinal compass directions through use of fixed height/orientation posts permanently mounted at appropriate sites and visited on a fixed schedule.

Baseflow discharges will measured by standard formulas (width X depth/velocity) at two or more stations once a week on WTC (above/below ECR) and through installation of calibrated V-notch wiers installed as part of the gabions in modified ephemeral washes or to intercept surface flows in unmodified (control) washes.

Obviously, V-notch wiers will be read only when water is present following precipitation. Flow duration will be estimated from the same wiers and by observation of WTC. Gauges from which discharge rating curves may be estimated will be installed on WTC. Estimates of floodflow volumes in ephemeral washes are calculable from water heights indicated by debris accumulations.

Soil moisture estimates will be made by sampling at different soil depths by auger or other coring device and analysis of subsample weights before/after drying at 100^{o} C. A minimum of 10 sampling wells, consisting of 2-inch perforated PVC pipe installed in riparian terraces will sample variations in groundwater elevation. Depth to water will be measured weekly or more frequently during changes in discharge to evaluate infiltration rates, porosity and other parameters of streamside subsurface water. Wells will also be installed on 10 ephemeral tributaries (5 modified vs. 5 unmodified) to evaluate presence/absence of subsurface water and its relations to surface flow.

Biological sampling will be ongoing throughout the program, with records of occurrences, population sizes, reproduction and other events or observations maintained and entered into the GIS mapping database. Participants will compile taxonomic, distributional, populational, and ecological information on biotic components of the WTC watershed ecosystem. Collections will be accomplished with methods and under permits appropriate to the species or taxonomic groups concerned. An effort will be made to develop comprehensive collections of flowering plants of the watershed, emphasizing communities and species characterizing wetland, riparian and upland livestock forage groups. Fishes will be sampled by seines, traps and electrofishing devices; aquatic invertebrates by Surber sampler and dredge or by use of sweep nets and light traps deployed for capture of adult (flighted) life stages.

Photographic records will provide data on phenology of vegetation at the sites, and for a long-term record of change under different modification regimes. Detailed sampling of vegetation and observation of animal components of the ecosystem by graduate students and other personnel will be encouraged and is anticipated to occur, with data incorporated in the final report.

The project will accommodate sampling of at least 5 modified (those with gabions) and 5 unmodified (control) sub-watersheds in a 2-year period and obtain information on a number of parameters (stream flow vs. precipitation, groundwater/ soil moisture relations, water quality, biological responses, etc.) for rigorous statistical comparison. Precise details of study design, data collection and analysis will be subcontracted to qualified researchers.

(f) Project Location and Landownership Status (see following page):

As a supplement to Form A3 a topographic map is enclosed depicting the project area which includes ECR (private) and USFWS lands within leased grazing allotments. Enclosed copies "El Coronado Ranch Land Management Plan"and "1995 Annual Grazing Plan for the Turkey Creek Allotments" demonstrate the applicant's legal use of these lands for livestock. USFS has knowledge of and has verbally approved the Applicant's improvements. It is the applicant's intent to include USFS lands within the project, assuming approval, if required, of special-use or other permits. Note also that an objective is to plot on GIS maps the improvement structures installed and to be added, as well as ECR's water storage/distribution system.

C. Location Information Sheet/Land Ownership

LOCATION INFORMATION SHEET/LAND OWNERSHIP FORM

This sheet is to be completed for capital, water acquisition, or research projects, which involve a specific stream reach or watershed area. If the exact extent of the project area is not completely defined at the time this sheet is completed, please make note of this in the appropriate space provided, and complete the form with location information which is as accurate as possible.

1. County: Cochise **2. Section:** See map **3. Township:** 18 S

4. Range: 29/30 E **5. Stream Name:** West Turkey Creek (watershed and tributaries)

6. Landownership: Private (El Coronado Ranch) US Forest Service

7. Current land use: Ranching, recreation

8. Upstream extent of project area and elevation: See map - 9000 ft.

9. Downstream extent of project area and elevation: See map - 5200 ft.

10. Length of stream through project area: Approximately 8 miles of mainstem

11. Size of project area (in acres): 15,193

12. Is the project area fully defined at this time: Y/N?

13. Ownership of land surrounding project area and its current use:

North: Rock Creek Ranch, private and US Forest Service	South: Sanders Ranch, private and US Forest Service
East: US Forest Service	**West:** Sanders Ranch, private

14. Provide directions to the project site from the nearest town. List any special access requirements.

From junction of AZ Highway 181–191 (Sunizona, Arizona) proceed east on 181 approximately 17 miles, depart pavement on Turkey Creek Road and proceed 7.5 miles to El Coronado Ranch Headquarters.

AWPFC Form A3 page 1 of 1

(g) Task - Timetable:

Estimates of costs on the Form A4, supplied for each year of the project as the following two pages, exclude salaries, wages, travel/per diem and consultant costs ($70,800), since times and effort will be applied to the different taxks as needed for their successful completion. All costs estimated in this narrative are for combination of funds requested from AWPF and contributed (including in-kind contributions) by the Applicant. Total supervisory (administrative) costs charged to requested AWPF funding is $2,400, 2.8% of the total amount requested.

Many tasks associated with the project are complex and do not lend themselves well to narrative description. GIS base maps are the key to the project and will be prepared in the first six months of the project at an estimated cost (including capital expenditures) of $17,000. Ground truth and quarterly updating GIS maps for the remainder of the first year is estimated at $4,000, and maintaining that same level of GIS activities will require $7,450 the second year.

Installation of watershed improvement structures (gabions) will be an on-going task throughout the project as weather conditions permit at a total (2-year) construction cost of $17,000 (both years).

Costs for establishment and installation of sampling/monitoring sites and devices in the first 3 months of the project are estimated as follows: climatology ($850), photography ($400), V-notch wiers for measurement of stream discharge ($2,800), soil moisture ($200) and water quality (no cost). After locating sites and installing devices, simultaneous quarterly sampling of each (insofar as possible) will involve expenditures for materials in the remainder of the 1st year only for photographic stations ($600). The second year will require $500 for photographic supplies. Analyses of quarterly and sporadic samples for hydrologic, water quality and soil moisture stations will amount to $3,500/year. Sampling runoff from ephemeral sub-basins and during unusual discharge events in WTC will be event-dictated during winter and summer precipitation for flooding and in spring and fall droughts for baseflow and desiccation. Costs for event-dictated sampling are included within the above estimates.

Biotic surveys and ecological studies will also be on-going, but concentrated in the first three months of the project (comprising at first a thorough literature review associated with GIS data acquisition, plus field work) and quarterly thereafter (involving mostly personnel costs for field work). Costs are for sampling devices, an electrofisher ($2,600), miscellaneous supplies such as nets, traps and UV-lights for attrating flighted aquatic insects at night (-$1,350 of the amount budgeted for miscellaneous supplies) and for office supplies such as field notebooks, data sheets, software for database construction and so on ($1,000 of the $2,550 budgeted)

An interim data and project evaluation and preparation of an interim report (1st Annual Report) will occur at the end of the 1st project year. It is antipated to take at least 2 months to prepare. Three months and $1800 is allotted for data compilation, evaluation and analysis plus report production.

Interim interpretation and evaluation will set the groundwork toward production of the final project report to be commenced 9 months later ($2000). Evaluation of all project and ancillary data will be presented in a manner that will provide the Arizona Water Protection Fund Commission all pertinent information and research gained from the investigation.

D. Task - Timetable

1st Year

Start Date: Spring 1996 **Yrs of Benefit:** 20+
End Date: Spring 1997 *Start based on funds availability.

Project Name: West Turkey Creek Watergned Restoration and Enhanremenr

Project Categories and Tasks

Months Since Project Initiated (Year 1)

Task No.	Task Cost	Task Description	1	2	3	4	5	6	7	8	9	10	11	12
1	17,000	Begin/Prepare GIS Base Maps												
2	4,000	Update GIS Mapping												
3	8,500	Construct watershed imp. struct.												
4	4,250	Estab./Install sampling/monitor.												
		sites and devices												
5	----	Environmental Measurements:												
	600	- Photographic Stations												
	No Cost	- Climatological (daily;weekly)												
		- Hydrologic												
	3,500	- Water Quality												
		- Soil moisture												
6	3,450	Survey Biota;perf. ecol. studies												
7	1,800	Interim data analysis/report												

Start Date: Spring 1997 **Yrs. of Benefit:** 20+
End Date: Spring 1998

Project Name: West Turkey Creek Watershed Restoration and Enhancem Alt

Project Categories and Tasks

Months Since Project Initiated (Year 2)

Task No.	Task Cost	Task Description	13	14	15	16	17	18	19	20	21	22	23	24
2	7,450	Update GIS Mapping												
3	8,500	Complete const. of Watershed Restoration Structures												
5		Environmental Monitoring:												
	500	- Photographic Stations												
	No Cost	- Climatological (daily;weekly)												
		- Hydrologic												
	3,500	- Water Quality												
		- Soil Moisture												
6	1,500	Survey Biota;Ecological Studies												
8	2,000	Preparation of Final Report												

(h) End Products and Significance of Project:

Four major deliverables are anticipated at the completion of this overall project:

1. A Final Report. A interim report will evaluate progress of the study and summarize progress at the half-way point, thereby serving to keep the project on track and allow for corrections if flaws are detected. A final report will be submitted at the end of the 2-year study period which: a) reports and evaluates project results; b) notes apparent trends; c) recommends modifications in design that should be implemented in any future projects; and d) includes full set of the data collected. Progress toward meeting the above objectives will also be analysed.

2. Completion of a Data Base. Item 1d (above) will comprise a database pertinent to long-term evaluation of conservation efforts on WTC and ECR. The project further should result in accumulation of credible baseline data upon which to build a longer term evaluation process to determine if such modifications in other watersheds like WTC can produce measurable improvements in both the environment and economic sustainability.

3. Fish and Wildlife. By incorporating a rigorous inventory and periodic monitoring program of the biota, positive or negative impacts on species of concern may be ascertained during and following the 2-year project. These data will also form the basis for a HCP being developed for the area, assist in implementation of recovery plans for a listed fish species and help obviate the need for listing species currently considered candidates.

4. Significance of the project. Specific monitoring of the effects of gabions, that is answering the specific question of whether they work to retain water and enhance local environment and the ecosystem in general, will be accomplished through rigorous statistical comparisons of carefully collected data from modified (experimental) subbasins (washes) with those from unmodified (control) subbasins.

Positive results (or equivocal to negative results) will not mean that gabions function as we perceive they should, only that over the experimental period there were positive, equivocal or negative results. The vagaries of Arizona climate alone make the probability of obtaining concrete answers in a short-term experimental study of this type highly unlikely.

That is not to view this project as a short-term gamble. Ecosystem-wide effects of such a watershed improvement program are elusive and must be studied in a long time-frame. It is clear, however, that only through initiation of headwater restoration and conservation can one work progressively downstream to enhance and maintain whole-stream environments.

WTC reflects in some way in its volume, water quality, riparian values and riparian/aquatic biology all things that fall into or happen within its watershed. Catastrophes or chronic damage upstream are reflected and sometimes intensified far downstream, such as was demonstrated following the destructive Rattlesnake Fire. So, in turn, good upstream management can only serve to benefit the downstream system. This project will provide a solid baseline of both historical and current information upon which to base future analyses and evaluation of the impacts of events in the long-term.

(i) Personnel:

Principal personnel for the project include:

1. **Josiah and Valer Austin,** owners and operators of ECR. They have considerable hands-on experience in watershed management, restoration and improvement, and have been actively pursuing such a program since they acquired the ECR. Mr. Austin planned and oversaw implementation of a major watershed enhancement effort that was nationally recognized. In 1993, the Willcox - San Simon Natural Resource Conservation District selected the El Coronado Ranch for its "Conservationist of the Year" award.

2. **Wendell L. Minckley,** Ph.D., Arizona State University, will oversee research, data collection and data analysis for the project. He is an active researcher and conservationist, with broad experience in natural aquatic systems and endangered habitats and species of the Southwest. As leader of the Desert Fishes Recovery Team he worked closely with USFWS personnel in production of the "Fishes of the Rio Yaqui Recovery Plan" that applies directly to the WTC watershed.

3. **Dale Pontius,** an attorney and consultant specializing in natural resource issues, will be involved regarding endangered species and legal issues and is currently assisting the ECR in development of a Habitat Conservation Plan.

4. **A Research Assistant** (a graduate student, yet to be named) will be selected as project and data manager. The candidate chosen will have field research experience and a broad knowledge of riparian and aquatic systems, and will likely use some part of the data collected in the present project as thesis materials for an advanced degree.

5. Additional **student assistants** (to be named) will include one or more field and laboratory assistants (on hourly stipends) for data collection, input of data to computers, field work and other miscellaneous duties, including data analysis.

The WTC riparian zone provides a natural classroom that has been used successfully for years as part of the training for graduate and undergraduate students from a number of universities and colleges of Arizona and elsewhere. In addition to paid and formally participating volunteer personnel, is anticipated that students will at a minimum use species inventories and field sampling efforts as educational experience. The applicants encourage such activity and expect the project to derive additional information from such efforts.

(j) Legal or regulatory compliances (Forms A5 and A6):

Forms A5 and A6 are completed as the following 2 pages. Note that the Endangered Species Act applies to work on aquatic habitats of ECR due to the presence of endangered Yaqui chub.

Dr. Minckley, one of the principal project personnel (i, above), and his students and associates, currently hold both federal and state permits to work with the Yaqui chub as well as a state permit for the candidate longfin dace. He also has access to applicable and current Native Plant Collecting Permits through the Arizona State University Herbarium.

E. Legal and Regulatory Compliance Checklist and Permit Descriptions

Applicants\Grantees are responsible for determining that all necessary permits that apply to their project are identified and obtained. For convenience, we have provided the following checklist consisting of some of the local, state and/or federal ordinances and laws that may be applicable to some projects. In addition, the following 3 pages provide a short narrative on the applicability of the permits. While the checklist is not all inclusive, it does provide a basic list of some permits which may potentially be required.

Applies to project:		REGULATIONS/PERMITS	Regulatory Authority
Yes	No		
LOCAL			
	X	Floodplain Ordinances	County
	X	Planning and Zoning Ordinances	City and County
	X	Other	
STATE			
	X	Floodplain Use Permits	ADWR
	X	Water Quality Certification (Section 401)	ADEQ
	X	Aquifer Protection Permits	ADEQ
	X	Wastewater Reuse Permits	ADEQ
	X	Groundwater and Surface Water Laws	ADWR
	X	State Historic Preservation Act	SHPO
	X	Special Use Permits	ASLD
X		Arizona Native Plant Laws **(see text of narrative)**	ADA
	X	Other	
FEDERAL			
	X	CWA (Section 402): Point Source/Stormwater Discharges	EPA/ADEQ
	X	CWA (Section 404): Section 10 Rivers and Harbors Act	COE
	X	Wilderness or Wild and Scenic River Acts	BLM/USFS
X		Endangered Species Act **(see text ofnarrative)**	USFWS
	X	National Environmental Policy Act	BLM/USFS
X		Special Use Permits	BLM/USFS
	X	Other	
INDIAN RESERVATIONS			
	X	Tribal Permits	
	X	Other	

AWPFC Form A5 page 1 of 1

F. State Historic Preservation Office Information

SHPO Certification

This certification is required by regulations implementing the State Preservation Act (A.R.S. 41-861 through 41-864), effective July 24, 1982. It is understood that recipients of state funds are required to comply with this law throughout the project period. The State Historic Preservation Act mandates that all State agencies consider the potential of activities or projects to impact significant cultural resources. Each State agency is required to consult with the State Historic Preservation Officer with regard to those activities or projects that may impact cultural resources.

PROJECT TITLE: West Turkey Creek Watershed Restoration and Enhancement

Please answer the following questions which provide information about the potential of the project to impact cultural resources:

Does the project have the potential to disturb the surface and/or subsurface of the ground?
YES:_____ **NO:**_____

Are there any buildings or structures (including mines, bridges, dams, canals, etc.) which are 50 years or older within the project area that have the potential to be disturbed by the proposed activity?
YES:_____ **NO:** X

Are there any known prehistoric and/or historic archaeological sites within the project area?
YES:_____ **NO:**_____

Are you aware of any archeological investigations that have been performed within one (1) mile of the project area?
YES:_____ **NO:**_____

If you have answered **"NO"** to all of the above questions, please sign on the line below certifying that the activity or project is in compliance (and will remain in compliance throughout the project period) with the State Historic Preservation Act.

_____

Authorized Signature

27 July 1995

Date

If you have answered **"YES"** to any of the questions above, please answer all applicable questions on the other side of this form.

F. State Historic Preservation Office Information

SHPO Certification

This certification is required by regulations implementing the State Preservation Act (A.R.S. 41-861 through 41-864), effective July 24, 1982. It is understood that recipients of state funds are required to comply with this law throughout the project period. The State Historic Preservation Act mandates that all State agencies consider the potential of activities or projects to impact significant cultural resources. Each State agency Is required to consult with the State Historic Preservation Officer with regard to those activities or projects that may Impact cultural resources.

PROJECT TITLE: West [illegible] [illegible]

Please answer the following questions which provide information about the potential of the project to Impact cultural resources:

Does the project have the potential to disturb the surface and/or subsurface of the ground?
YES: ✓ NO:

Are there any buildings or structures (including mines, bridges, dams, canals, etc.) which are 50 years or older within the project area that have the potential to be disturbed by the proposed activity?
YES:_____ NO:_____

Are there any known prehistoric and/or historic archaeological sites within the project area?
YES: NO ✓

Are you aware of any archeological investigations that have been performed within one (1) mile of the project area?
YES:_____ NO

If you have answered NO to all of the above questions, please sig on the line below certifying that the activity or project is in compliance (and Wll remain in co plia throughout the project period) with the State Historic Preservation Act

Authorized Signature

Date

If you have answered "YES" to any of the questions above, please answer all applicable questions on the other side of this form.

(k) Community Support:

The applicant is committed to work closely with all interests and the local community to accomplish the goals of this project. The Applicants are active members of the ranching community in Cochise County, AZ, have, as noted above, been given special recognition by theWillcox-San Simon Natural Resource Conservation District for their previous work, and have received support as well from conservation organizations.

Letters of support will be provided to the AWPFC if necessary. The Applicants stand ready to work with other groups to further understanding of the interplay of ranching and natural riparian or other such systems and are currently allowing access for other research projects being carried out on their property. The Applicants will allow access by interested and appropriate personnel to the project area whenever necessary to provide for inspection and evaluation of the WTC Restoration and Enhancement Project.

(1) Existing Plans:

We know of no other programs of this type underway in the region at the present time. There is an "El Coronado Ranch Management Plan" (enclosed) which oversees use and management of the Turkey Creek Allotment by the USFS, and a USFWS "Fishes of the Rio Yaqui Recovery Plan" includes recommendations toward recovery of listed and candidate species that involve management options in the WTC basin, specifically on ECR property.

6. Budget

The budget detailed on the following four pages reflects a 2-yearplan to implement the GIS mapping and survey/monitoring system for the WTC Watershed Restoration and Enhancement Program including completion of the gabion construction plan so that impacts of these improvements can be measured for an extended period of time into the future.

The applicant proposes to purchase and maintain all the necessary capital equipment needed for the project, and, in addition, to provide support for staff, lodging/ per diem and office space as necessary, and also to provide considerable labor resources for work in the field. It is anticipated than an additional 250-300 gabions will be constructed as part of this project.

The applicant will provide documentation and receipts for all expenditures of the project.

Requested from AWPF:

1st Year	$45,400
2nd Year	$39,300

WPF Sub-total: $84,700

Applicant Funding:

1st Year:	$23,850
2nd Year:	$ 1,700

Sub-total: $25,550

Applicant In-kind/Services

1st Year:	$14,400
2nd Year:	$16,450

Sub-total: $30,850

Applicant Sub-total: $56,400

PROJECT BUDGET:

1st Year:	$83,650
2nd Year:	$57,450

TOTAL $141,100.00

G. Project Budget Sheets

PROJECT BUDGET
Cost Estimates: Capital/Water Acquisition (CAP or Effluent) FIRST YEAR

W T C W R Enhancement	FUNDING SOURCES			
	AWPF	Other A	Applicant Donated Materials/Services	TOTAL
ADMINISTRATION (management and overhead) (1)				
S	400			400
PROJECT LABOR				
Personnel (2) G . Asst	16000			16000
Travel/Per diem	1800			1800
Field Work/Construction			8500	8500
CONTRACT SERVICES				
A C	500			500
m	7000			7000
Legal – E	2500	1250		3750
PROJECT MATERIALS/SUPPLIES				
A P	1500	1500		3000
M ,	750			750
O &	500		250	750
CAPITAL OUTLAY				
Tech/Industrial Equip. (3)				
Water (CAP/Effluent)				
Other (Describe) (list att.)		14600		14600
TOTALS	30950	17350	8750	57050

(1) Administration is limited to 5% of the total dollars requested for a project.
(2) Include wages, salaries, and fringe benefits.
(3) Attach list of capital equipment expenditures over $1,000.00.

AWPFC FORM A7 page 1 of 2

CAPITAL EQUIPMENT:

To be purchased by the Applicant for project use:

Geolink GIS Field Recovery Unit	$5,500.00
Global Positioning System Receiver	2,500.00
GPS laptop computer	2,600.00
Geolink Field Mapping and other Software	4,000.00
Stream flow gauges (constructed V-notch wiers)	2,800.00
Electrofisher	2,600.00
Weather-station Equipment	800.00
TOTAL	$19,800.00

PROJECT BUDGET
Cost Estimates: Research or Data Collection/Water Conservation

FIRST YEAR

W T C W R E	FUNDING SOURCES			
	AWPF	A Other	Applicant Donated Materials/Services	TOTAL
ADMINISTRATION (management and overhead) (1)				
S	400			400
PROJECT LABOR (2)				
Personnel Student A.	6000			6000
Travel/Per diem	1500		2400	3900
F Assts/Labor			3000	3000
CONTRACT SERVICES				
W Q	1500			1500
S ,	2000			2000
PROJECT SUPPLIES/EQUIPMENT (3)				
Electrofisher		2600		2600
F G		2800		2800
Photographic&& suppl.	750	250		1000
C		850		850
O /	500		250	750
PRINTING/PUBLIC RELATIONS				
I	1800			1800
TOTALS	14450	6500	5650	26600

(1) Administration Is limited to 5% of the total dollars requested for a project.
(2) Include wages, salaries, and fringe benefits.
(3) Attach list of capital equipment expenditures over $1,000.00.

AWPFC FORM A7 page 2 of 2

- **G. Project Budget Sheets**

PROJECT BUDGET
Cost Estimates: Capital/Water Acquisition (CAP or Effluent) SECOND YEAR

W[illegible] T[illegible] C[illegible] W[illegible] R[illegible] E[illegible]	FUNDING SOURCES			
	AWPF	Applicant Other	A[illegible] Donated Materials/Services	TOTAL
ADMINISTRATION (management and overhead) (1)				
S[illegible]	400		400	800
PROJECT LABOR				
Personnel (2) R[illegible].A[illegible].	16000			16000
Travel/Per diem	1800		1800	3600
F[illegible] W[illegible]/C[illegible]			8500	8500
CONTRACT SERVICES				
GIS [illegible]	3000			3000
L[illegible] - Environental	2500	1250		3750
PROJECT MATERIALS/SUPPLIES				
M[illegible], [illegible]	750	200		950
O[illegible] & [illegible]	400		200	600
CAPITAL OUTLAY				
Tech/Industrial Equip. (3)				
Water (CAP/Effluent)				
Other (Describe)				
TOTALS	24850	1450	10900	37200

1) Administration is limited to 5% of the total dollars requested for a project.
(2) Include wages, salaries, and fringe benefits.
(3) Attach list of capital equipment expenditures over $1,000.00.

AWPFC FORM A7 page 1 of 2

PROJECT BUDGET
Cost Estimates: Research or Data Collection/Water Conservation

SECOND YEAR

Wes t Turkey Creek Watershed Restoration and Enhancement	FUNDING SOURCES			
	AWPF	**Applicant Other**	**Applicant Donated Materials/Services**	**TOTAL**
ADMINISTRATION (management and overhead) (1)				
Supervision	4 00		400	800
PROJECT LABOR (2)				
Personnel Student Assts.	6000			6000
Travel/Per diem	1500		2000	3500
Field Asst. /Labor			3000	3000
CONTRACT SERVICES				
Water Quality Testing	1500			1500
Soil ,hydrology services	2000			2000
PROJECT SUPPLIES/EQUIPMENT (3)				
Photographic & other suppl.	750	250		1000
Office supplies/expenses	300		150	450
PRINTING/PUBLIC RELATIONS				
Preparation of Final Rept.	2000			2000
TOTALS	14450	250	5550	26600

(1) Administration is limited to 5% of the total dollars requested for a project.
(2) Include wages, salaries, and fringe benefits.
(3) Attach list of capital equipment expenditures over $1,000.00.

AWPFC FORM A7 page 2 of 2

The Arizona Daily Star
Tucson, Sunday, July 16, 1995

Di rou tire leaves legacy of risky residue

Erosion and fuel buildup follow Rattlesnake' blaze

By Jim. Erickson
The Arizona Daily Star

• CHIRICAHUA MOUNTAINS – Chris French stood in the middle of what used to be a 5-acre lake stocked with rainbow trout. He scooped a handful of sand, then let it stream through his fingers and drift off in the hot breeze.

"This used to be a nice fishing hole," French, a U.S. Forest Service employee, said of the debris pile that was once Rucker Lake, the only fishing lake in the Chiricahua Mountains of eastern Cochise County.

"But the sides of the hills just washed away," he said. "This is all topsoil that was once on the mountain."

Rucker Lake is gone, filled to the top of its dam with cobbles, gravel 'and' sand washed from the Chiricahuas since last July's monthlong Rattlesnake fire. Rucker's lakeside campground remains closed, with picnic tables nearly buried in sediment.

The transformation is striking, but it is merely "the most visible symptom" of a far more massive, widespread erosion problem caused by the

• Accordingto Forest Service critics, both the fire and the erosion are products of a wrongheaded fire-suppression policy that allowed a lightning-sparked wildfire on Rattlesnake Peak to escalate into a

27,500-acre Rattlesnake fire – the largest fire in the Chiricahuas in 77 years, French said.

And according to Forest Service critics, both the fire and the erosion are products of a wrongheaded fire-suppression policy that allowed a lightning-sparked wildfire on Rattlesnake Peak to escalate into a firestorm. It devoured entire canyons, reducing 'vast expanses. of biologically rich high elevation conifer forest to sterile "moonscape."

Spending priorities controversial

Forest Service critic
throw millions of doll
but has done
ucethe erosion

"It was
then (allow
which is expected.

And the agency seems t
from the Rattlesnake and the other large wildfires S
the worst fire seasons since the early 1900s,
ics charge.

• Forest Service officials in Arizona stressed the need to' use' more deliberately set fires to reduce the accumulation of fuels in the state's national forests, thereby heading off catastrophic fires like the Rattlesnake.

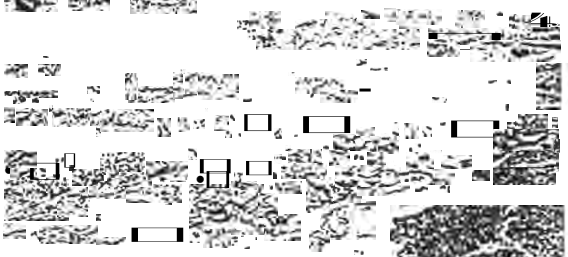
But a year later the fire policy hasn't changed: Suppression is still the rule in the upper Chiricahuas, and the agency will "throw the kitchen sink" at wildfires in the high elevations of the range, according to Douglas District Ranger Brian Power.

"When the crisis is over, everything gets put on the back burner again, and it's back to business as usual," said Josiah T. Austin, owner of El Coronado Ranch on the western slope of the Chiricahuas.

"There re places out there off trail where you've got 2 or 3 feet of pine needles, and that's just asking for trouble," Austin said. "It's going to happen again."

Austin's 14,000-acre Forest Service lease runs

SEE ARE, Page 6B



tracks line the banks of what was once Rucker Lake.

Fire

Continued from Page 1B

dear to the 9,795-foot summit of Chiricahua Peak. The Rattlesnake fire, which burned most intensely in ponderosa pine, surged over the top of Chiricahua Peak last July and consumed a small amount of the spruce forest that cloaks the crest of the range – the southernmost spruce forest in the United States.

Animal habitats destroyed

The fire ate big chunks of prime black bear habitat, devoured nesting sites in an internationally known bird haven and killed all the fish in the upper South Fork of Cave Creek.

The Chiricahuas contain about 100 miles of wilderness trails – one of the largest wilderness trail networks in Southern Arizona – used by 10,000 to 15,000 backpackers, hikers and birders each year.

About three-quarters of those trails were damaged by the fire and subsequent erosion. Though much of the network *has* been repaired in the past year, new erosion damage is expected during this summer's monsoon season, said French, a member of the recreation and lands staff at the Douglas district of the Forest Service.

'Aspen, ferns, raspberry bushes, wildflowers and other patches of green can now be found within the boundaries of the Rattlesnake, but some steep-sided canyons contain little more than rock fields and "match sticks," the blackened trunks of dead standing trees.

• The fire killed vegetation that used to soak up rainwater like a giant sponge. And the rains that followed the fire carried away soil that would have allowed new life to gain a foothold. Pouring off the hillsides and into canyons, the raging muddy water and stones scoured riparian areas down to bedrock. After that, it ruined wells and stock ponds at ranches in the flats below, Austin said.

Check dams helped trap soil

Last August, Austin and a five-member crew built 243 small rock check dams in Saulsberry canyon, on Forest Service land within the boundaries of his lease, to slow the rain waters, trap some of the sediment, and help restore some of the lost riparian areas.

Hiking up Saulsberry Canyon this month, Austin pointed out where grass, weeds and flowers were sprouting in the soil trapped by his check dams, which slow the water but don't block it completely.

Austin said the Forest Service should have made more of an effort to keep some of the soil on the mountain – by building erosion-control structures and felling dead standing trees, for example.

"I guess what annoys me about the Forest Service is that they're being paid to take care of this forest and they're not doing it," he said.

"When the fire stops, then the emergency's gone to them," he said. "But in reality, it's really just beginning."

Richard van Loben Sels, a Mesa high school science teacher with a summer home on the western slope of the Chiricahuas, agreed that the Forest Service hasn't done enough.

"They Just walked away"

"This place burned, and they just walked away," he said. "I don't know how many cubic Meters of dirt moved off that hill, but they just let it go.

"The question is whether or not there's enough topsoil to support reforestation where large trees burned," said van Loben Sels. "There are going to be some areas that will not reforest."

District Ranger Power said the Forest Service spent about $8.5 million fighting the fire and has spent in the ballpark of $100,000 on post-fire restoration. There is no written rehabilitation plan and a lot of the costs aren't being tracked, in part because much of the work is being done by volunteers, he said.

The restoration money comes out of the Douglas district's $1 million annual budget, while the firefighting money came out of a national fund for fire emergencies, he said.

Power said he expects to spend about $100,000 a year on restoration for the next five years. That does not include the estimated $1 million cost of dredging Rucker Lake and building a dam above it to collect some of the sediment.

Power said the Forest Service already has installed "at least a few hundred" erosion-control structures in the Chiricahuas to slow the erosion, and that additional efforts would have been futile in some places.

"If I had a couple thousand people I probably could have kept more of it on the mountain," he said. "But I don't think you could have done enough to keep a lot of the soil from moving in certain areas."

In addition, about 75 percent of the fire burned in a designated wilderness area, where felling trees and building wire-mesh-reinforced dams are considered inappropriate. Austin's loose-rock check dams are effective in small canyons like Saulsberry, but they would have been washed away elsewhere, he said.

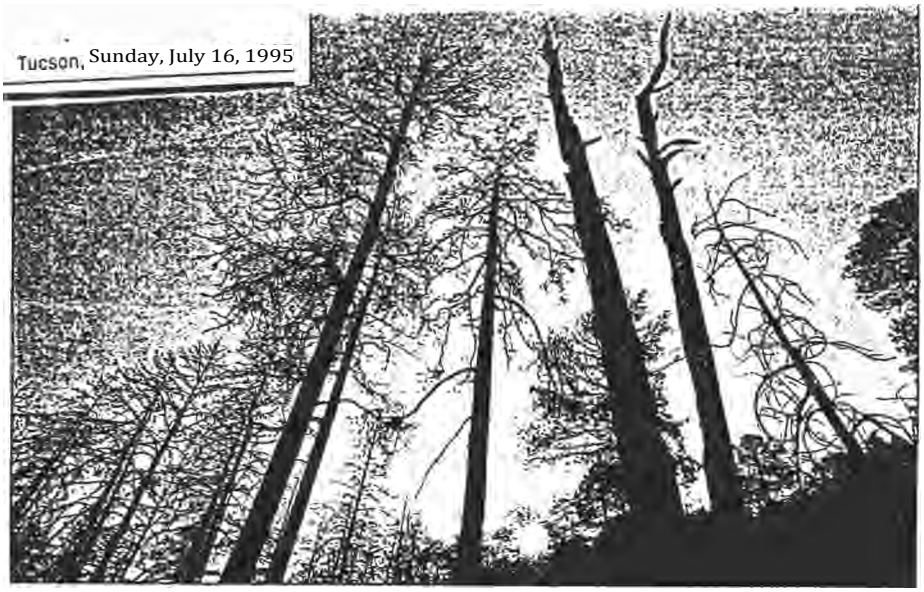
"We appreciate what he did, but it's not the panacea that (Austin) thinks it is," Power said.

Reseeding, planting planned

Aerial reseeding with grasses is planned in some of the burned areas, and young conifers - grown from seeds collected in the Chiricahuas – will be planted, Power said.

The Arizona Daly Star

Forest Ranger Brian Power



Photos by David Sanders, The Arizona Daily Star

Burned trees In Rustler Park are a silent reminder of the huge, 27,500-acre Rattlesnake fire

Up to 5,000 young trees would be planted near Rustler Park, a popular campground high in the Chiricahuas, after dead burned trees are removed from 69 acres in a salvage timber sale proposed by the Forest Service.

In a June 19 letter to the Forest Service about the proposed timber sale, David Hodges of the Southwest Center for Biological Diversity's Tucson office said removing the dead trees will accelerate soil loss and hinder long-term recovery in the Rustler Park area. But the Forest Service says the timber sale and subsequent replanting will have the opposite effect.

Power said erosion now occurring in the Chiricahuas is "part of a natural system."

But critics said the massive soil loss is *not* natural because it is the result of a long-standing fire-suppression policy that allowed a lightning-sparked wildfire on Rattlesnake Peak to become a firestorm that consumed entire canyons.

"Yes, it was caused by lightning, but it was a man-made disaster" because of the fire policy, Austin said.

Fire suppression's results

The Forest Service has been aggressively suppressing wildfires in the Chiricahuas since the 1930s, and this allows dead wood, pine needles and other burnable material to accumulate.

Prescribed burns — fires intentionally set to reduce this "fuel loading" problem — have rarely been used in the Chiricahuas.

Excessive fuel loading increases the likelihood of catastrophic fires, and it's a serious problem throughout Southern Arizona's rare "sky islands" — isolated mountains on or near the border, surrounded by desert or grassland, with coniferous trees on the summit.

One of the worst fuel buildups is on Mount Graham, northeast of Tucson, where there are up to 100 tons of dead fuel per acre in some high-elevation locations, according to Safford District *Ranger Rich* Kvale. A "desirable" fuel load is about 20 or 30 tons per acre, Kvale said.

"I think the potential is extremely high" for a catastrophic wildfire on Mount Graham, Kvale said.

"On the right day, once it reached a certain size, there's probably not much we could do about it, other than getting people out of the way," he said.

To reduce the fuel load on Mount Graham, Kvale allows the public to collect firewood along Swift Trail, the road that winds nearly to the 10,720-foot summit. Last year about 400 cords of wood were given away, and about 200 have been collected so far this year, he said.

Kvale and Power said the obsession with suppression must change, but new rules must come from Washington, D.C. There are signs that it may happen soon.

Last month, a task force representing several federal agencies released a draft fire policy that recognizes fire as a "critical natural process" that "will be used to protect, maintain and enhance resources."

Natural and controlled, deliberately set fires should have a greater role in making forests healthy while preventing worse, potentially deadly blazes, the task force concluded. Years of suppression have allowed vegetation to build up on the ground and enabled smaller trees to flourish, creating "fuel ladders" from the ground to the crowns of the tallest trees.

Rancher Josiah T. Austin by a check dam

Such conditions breed fires, like the Rattlesnake, which burn out of control and replace entire stands of mature trees, the task force stated. A draft version of the new federal fire policy is open to public comment and will be used to write new rules after this summer's fire season.

Kvale and Power wanted that new rules won't inunediately change the dangerous fuel-loading conditions atop Southern Arizona's sky islands and elsewhere in the West.

"You can't just turn fire 'on' at this time," Kvale said. "With 80 or 100 years of accumulation of fuels, the presence of fires in those areas will probably cause stand-replacing fires."

Firewood sales, thinning of unnaturally dense forests and judicious use of prescribed burns during cooler parts of the year would help reduce the fuel load, he said.

"We're going to have bad fire seasons in the West for a while. Rattlesnake was part of it, and Yellowstone was part of it," Power said. The great Yellowstone fires of 1988 blackened nearly 800,000 acres, about a third of the national park.

"We'll slowly work on it, but it's going to be a problem as long as you've got that type of fuel loading," he said.

"It took us 100 years (of suppressing fires) to get where we we're at, and it's going to take us 100 years to get back where we ought to be."

EMINet

The National Park Service has on-line information about the wildlife at Chiricahua National Monument.

EL CORONADO RANCH

aNvI MANAGMENT PLAN

DESCRIPTION:

GENERAL:

The El Coronado Ranch is located on the West side of the Chiricahua Mountains, approximately 16 miles east of the community of Sunizona. Elevation range from 5420 feet where Turkey Creek leaves the private land to 9,600 on the side of Chiricahua Peak. The El Coronado Ranch is composed of 15,193 acres, and is the entire Turkey Creek Watershed; plus portion of the Upper Rock Creek drainage. The ranch is in the upper sonoran life zone and has Oak/Pine Woodland, Pine Forest, mixed-conifer forest, and riparian woodland. The average annual precipitation for this area is 19.0 inches. Of the 15,193 acres, 13,273 acres are in the national forest. More than half of this acreage (7,028) is classified as unsuitable for livestock grazing. The remaining acreage is ranch deeded land (1920 acres).

As part of the Coronado National Forest Land Management Plan, five management units comprise the national forest. Management Area 3 emphasizes dispersed recreation along Turkey Creek, Grazing is allowed with management controls on livestock numbers so that livestock use is within present grazing capacity. Management Area 4 is delineated for livestock grazing, game habitat, and fuel wood harvest. Management Area 7 is for the enhancement of riparian areas; manage to perpetuate the unique wildlife or vegetative species. Grazing can occur if livestock are managed at level D (intensive management). If level D is not achievable, manage at level A (no livestock). Management Area 8A refers to research natural area and wilderness. The specific designation is for Chiricahua Pine Pole Bridge Area. Management excludes livestock grazing to protect other values. Management Area 9 is for the preservation of the Chiricahua wilderness that encompasses 90% of the national forest that lie within the El Coronado Ranch. Livestock grazing in the wilderness can occur at management levels A, B, & C, with use limited at no more than 35% of full capacity range. Refer to the Coronado N.F. Land Management Plan, page 116 for definition of different grazing levels.

CURRENT PERMITTED NUMBERS AND LIVESTOCK OPERATION:

The El Coronado Ranch is owned and operated by Joe and Valer Austin. A total of between 60 and 135 cattle are run on the ranch. Ranch is a cow/calf operation with brangus/barzona bred herd. The Turkey Creek Allotment, that portion of National Forest is permitted 66 cattle for 3/01-2/28 and 25 cattle for 9/15-12/15; a total of 867 annual months (AMS). In recent years Joe and Valer have taken non-use for resource protection and with their management style have improved allotment range condition and riparian areas significantly. With this plan the Forest Service will renew term permit based on animal months rather then on animal numbers to allow for flexibility called for in this plan.

Forest Service stocking records show when grazing first became permitted on the Coronado National Forest, the Turkey Creek Allotment was obligated 1090 animal months. Permit was reduced in 1956 to 65 cattle yearlong, when CTR Bates acquired permit. In 1982 Joe and Valer Austin acquired ranch from Mr. Bates for the existing permit to date. Appendix B summarizes the historical use on the Turkey Creek Allotment prior to 1956.

OTHER USES

Since a large portion of the El Coronado Ranch entail National Forest, other type of resource uses occur. These other uses are mostly recreation oriented from wilderness explorers, canyon serves as trailhead to numerous forest trails two developed campgrounds (West Turkey Creek and Sycamore) and there are fourteen cabins homes in canyon under special use permits. Only the lower campground, West Turkey Creek is fenced from cattle. In the area used by hunters, the main species hunted are white tail deer, javalina, bear, and an occasional mountain lion and turkey. Some ponds within the deeded portion of the ranch are being used **to** increase the habitat of Yaqui chub in south eastern Arizona. The permittee is working in cooperation with the U. S. Fish & Wildlife Service in this effort. There is also a life study of Sonoran **mud** turtles taking place currently.

II. GOAL

A habitat that supports livestock as well as an ever-increasing diversity of flora and fauna. Turkey Pen, Turkey Creek and Coal Pit are flowing year-round. There is high water-retention on hillside soils; soils themselves are stable and increasing. Erosion is reduced by 90% from present. Exposed, bare soil is reduced by 90%. Water tables are raised in areas where they are not presently adequate.

A complex diversity of vegetation species and age classes exists within creek drainage and on hills, providing an abundant forage base for wildlife and livestock. There is a significant increase in numbers of native perennial grasses, replacing exotic and introduced species.

Human activities on the Forest are managed to allow vegetation and soil to stabilize and increase. Age dispersion of vegetation has broadened. Overall stability and productivity of Forest has increased.

OBJECTIVES

Maintain and improve watershed condition through better range practices to achieve litter accumulation, increase water infiltration, and prevent soil erosion. Rehabilitate those sore areas (Turkey Pen Corral, Bath Tub, trails) and continue to construct rock check dams to increase rainfall infiltration and slowing sediment flow.

Improve riparian areas to satisfactory or better condition by stabilizing banks, increasing diversity of riparian dependent plant species, and improving age classes through increase in tree regeneration. Actualize year-around water flow on springs and main drainage (Turkey Pen & Turkey Creek) with clean water.

Maintain workable ranch plan that is compatible to El Coronado Ranch operation, but also is conducive to other National Forest uses (recreation, Wilderness values, hunting, and special uses).

Cattle will be used as a tool to maintain soil and vegetation to improve plant diversity, soil stability and wildlife habitat.

MANAGEMENT SYSTEM

The ranch plan to be implemented can be described as "Best Pasture Management system". Where by there is no set schedule but one cattle herd is rotated through deeded and forest

pastures based on forage production, plant physiological needs, and National Forest other uses, Intent is to improve production by not allowing a pasture to be used continuously during the same time each year.

To reduce conflict between recreationist and cattle, grazing the main Turkey Creek canyon would be avoided during the heavy recreational use periods in the summer months. Forest Service Horse pasture may be grazed by permittee on approval from the District Ranger on an annual basis. As part of this plan on the National Forest permittee will agree to reduce numbers in those years of drought. At the same time cattle numbers will be allowed to exceed 66 on the National Forest, but not to exceed the permitted animal months (867 AMs).

IV. DISTRIBUTION OF AIDS

A. WATERS:

Developed waters on the Forest will be used to distribute cattle where possible. These water developments will be maintained annually by permittee listed under the term permit. All developed waters on forest will provide wildlife escape ramps.

B. TRAILS:

Designated forest recreation trails will be maintained by the Forest Service to standards defined, Stock trails authorized for permittee use will be maintained by the permittee through ranch operation.

C. SALT AND SUPPLEMENTAL FEED:

Salt and supplemental feed on the forest will be placed away from water, at least 1/4 mile, where feasible. Placement of salt and supplemental feed at or close to meadows and main stock trails should *be* avoided. These feed locations will be located at a different site each year.

D. HERDING:

Riding to distribute livestock may be necessary, in order to break up concentrations of stock, or tendency of cattle to use the "traditional" areas. It will be necessary to move stock around for more uniform utilization.

E. FENCING:

No new fences are planned as part of this ranch plan on the National Forest, Permittee will be expected to maintain existing fences assigned responsibility to him under his term grazing permit. Any ***fences*** to be re-constructed, or if any new fences are approved they will be built to Forest Service specification. On deeded land further fencing may be installed to improve distribution.

V. RANGE IMPROVEMENTS

The following range improvements are needed in order to implement this ranch plan and improve the range and watershed condition on the El Coronado Ranch. For these improvements proposed on the National Forest, the Forest Service will provide the materials necessary for the improvement construction while the permittee will provide the labor and equipment.

A. STRUCTURAL IMPROVEMENTS:

1. One-half mile of cross-fence in the wilderness will be removed by the Forest service in 1992. This fence is located on Saulsbury trail, 3/4 miles into the wilderness.

2. Several forest boundary fences need to be evaluated, Normal fence maintenance is permittee responsibility. For fence reconstruction Forest Service will provide ,materials and permittee will reconstruct fence. This evaluation will be done by Forest Service in cooperation with permittee sometime in 1993. Estimated cost = ?

3. Mormon Spring will be reconstructed to provide more reliable water. Water and Hillside springs will be located and evaluated for development. Forest Service will be responsible to complete in 1994. Cost = $1,200.

4. Bates tank will be modified where upper sediment dam will be installed with stand-pipe with lead-pipe to lower dam. Forest Service will provide materials and permittee will supply equipment, project planned for 1994, Estimated cost at $1,400.00.

5. A 12,000 gallon trick-tank made from fiber glass will be located on the boundary fence of Rock Creek Ranch and El Coronado Ranch in Section 12; directly north of Turkey Pen Corral, Forest Service will provide trick tank and transport to site; permittee and Forest Service will install, Project planned for 1995 at an estimated cost of $5,000.00. Since site location is within the wilderness, Regional Forester approval will be required. Second alternative is to locate at top of Forest Service Horse pasture, just outside the wilderness boundary.

6. Fencing will occur in West pasture and Lower Bean pasture to more properly distribute grazing. These improvements will occur on deeded land with the El Coronado Ranch providing materials and labor.

B. NON-STRUCTURAL IMPROVEMENTS:

1. A series of loose rock check dams will be installed in order to stabilize the areas within the National Forest. One area is next to Bates Tank in the Bath Tub pasture, and the other area is next to Turkey Pen Corral; which is within the wilderness, Both of these sore areas are eroding and were initially caused by human activity. Project will be done by the Forest Service with help from permittee. Planned for fall of 1992 and estimated cost at $2,200 using inmate and permittee labor. Loose rock check dams will continue to be installed as needed.

VI. RANGE IMPROVEMENT MAINTENANCE:

Range improvement maintenance responsibilities are noted on form 2200-5 of the term permit. All new improvements will be equitable assigned to the permittee for operation and maintenance upon completion - see attached map (appendix A).

VII. EVALUATION:

The National Forest portion will be inspected annually to look at range condition, determine if problems exist in pasture rotation, and what possible solution to the problems may be feasible. Inspections will be conducted by Forest Service personnel; permittee participation will be

encouraged. At time of validating your permit, an annual operating plan will be developed between permittee and the Forest Service. Annual operating plan will be an extension of this plan, and document rotation for the season, range improvements needing maintenance, construction of project(s) proposed, and other related activities that involve the forest. Photo points have been and are being developed to monitor a sample of the rock check dams, both on deeded and forest lands.

VII. APPENDIX:

A. ALLOTMENT MAP

B. HISTORICAL USE

APPENDIX B.

GRAZING USE HISTORY, TURKEY CREEK ALLOTMENT

1930 - Acquired by CC Cooper from W.L. Hatly with waiver

1931 - 10 Yr. temporary permit to Mr. Cooper for 142 cattle from 4/1 - 7/31 and 71 temporary for same period

1935- Annual permit issued to Mr. Cooper for 121 cattle from 4/1 - 7/30 and 43 cattle temporary permit

1936 - Permit issued to Mr. Cooper for 71 cattle year long

1936 - Sold to El Coronado Ranch

1943 - Term permit issued to El Coronado for 71 cattle

1946 - Sold to Sherman Willard

1949 - Sold to Thas R. Lindsey, no reduction in permit

1951 - Sold to Bates, no reduction - 85 cattle during 10/1 - 6/30.

1056- Preference adjusted to season of use and new 10 year preference permit issued to Bates for 65 cattle yearlong

Somewhere between 56 and 82, permit adjusted to 66 cattle - 10/31 and 25 cattle 9/15 - 10/31

1982 - Sold to Joe Austin with above permit.

United States Department of Agriculture
Forest Service
Douglas R. D.
Coronado N. F.
FTS 762-5460
R.R. #1, Box 228R
Douglas, AZ 85607
(602)364-3468
FAX (602)670-5074

Reply To: 2230

Date: February 13,1995

El Coronado Ranch:
Star Route, Box 395
Pearce, AZ 85625

Dear Joe:

This letter will be your 1995 Annual Grazing Plan for the Turkey Creek Allotment(s).

I. Herd Management

Pasture	No. of Cattle	Dates
Coal Pit Pasture	90 cattle	03/19/95-04/01/95
Main Forest Pasture	90 cattle	04/09/95-05/10/95
Turkey Pen Pasture	90 cattle	05/10/95-06/01/95
Bath Tub Pasture	90 cattle	07/01/95-07/21/95
Turkey Pen Pasture	90 cattle	10/01/95-10/15/95

This year use of the Forest Service Horse pasture will be avoided due to district need.

These dates are flexible depending on unusual range conditions or other unforeseen circumstances. Should your actual livestock use deviate drastically from the dates above, you must notify us and maintain some kind of written record in order for us to determine resource needs and actual use.

II. Branding, Counting and Inspections

All livestock placed on this allotment must be branded with the brand specified on the Term Grazing Permit and under ownership of the permittee specified on that same Term Grazing Permit.

Inspections are conducted on all allotments to evaluate range and improvement conditions and to monitor permittee compliance with annual instructions. If this allotment is scheduled for an inspection this season, we will attempt to notify you of the date. You are invited and encouraged to participate in allotment inspections.

If time permits, we will be present to count livestock on and off the allotment. All calves branded after January 1 are counted.

III. Maintenance of Improvements

The permittees are responsible for checking and maintaining assigned improvements prior to entering the allotment or as soon as weather

permits. The following improvements are scheduled for maintenance this year: Continued maintenance of allotment developed waters and fences assigned to you.

IV. Salting, Supplem Water Developments

Salting and supplemental feed locations are to be used as a tool to improve cattle distribution on the pastures. Salt blocks and supplemental feed stations are to be placed at least 1/4 mile from established waters and at least 100 yards away from traveled roads. The salt and mineral blocks should be placed on upper slopes and on ridges to improve cattle distribution and kept away from canyon bottoms and where cattle naturally congregate.

We are again asking that permittees remove all livestock carcasses found within stream channels or in developed waters. When you remove cattle from the National Forest or move out of a pasture, leave water available to wildlife.

V. Fire Protection

You are expected to take reasonable precautions to prevent, and report promptly all fires on or endangering Forest Service administered land. Wildfires should be reported at any of the following locations: Douglas Ranger Station (602) 364-3468, Portal Ranger Station (602) 558-2221, Rucker Ranger Station (602) 824-3555, Cochise Stronghold (602) 826-3593, Tuscon Dispatch (602) 670-6432.

VI, Comments

a. This last summer was drier then normal but the winter months have brought much needed rains, if this continues we can expect a lush green spring.

b. With the departure of Randy Mead last april, we have hired a new range conservationist by the name of Mark Hocken. Mark is from Phoenix and has worked for the Forest Service as a seasonal in the Safford District in prior years. Help me welcome Mark to the area, as he will be spending lots of time out in the field working with permittees.

c. Sometime this year I would like to take the opportunity to inspect the allotment with yourselfs. I will let you know ahead of time so as you can schedule the time.

d. This year if you have the time and desire you have my permission to repair Mormon Spring. It is important that the wet marsh area below spring be maintained at all possible efforts.

e. If I get the permission to proceed with the thining project at the Forest Service Horse pasture, I will keep you informed.

e. If you have any questions regarding your grazing permit or bill, please call me at the Douglas Office (602)364-3468.

Sincerely,

MARCELLO MARTINEZ
Range/Watershed Staff

N

WEST TURKEY CREEK WATERSHED
RESTORATION AND ENHANCEMENT PROJECT

U.S. DEPARTMENT OF AGRICULTURE
504. CONSERVATION SERVICE

CS-CONS-16
OCTOBER 1974

CONSERVATION PLAN MAP

Owner Joe Austin Operator = same =

County Cochise State Arizona Date 3/9/2

Approximate acres 15,193 ac. Approximate scale 1 inch = 2000 feet

Cooperating with Willcox - San Simon Conservation District

Plan Identification Photo number

Assisted by D. Decker USDA Soil Conservation Service

MAP SYMBOL LEGEND

road
ditch
house
natural boundary
spring
corral
headquarters
private land boundary

	completed	planned
fence (barbed)		
fence (elec.)		
water storage		
pond		
trough		
pipeline		

PASTURE LEGEND

Field #	Name	Acreage Private	FS
1	West	779	0
2	Three Tanks	382	0
3	Lower Bean Patch	429	0
4	Upper Bean Patch	115	0
5	Eighty Acre	90	0
6	Lodge	60	81
7	Coal Pit	65	591
8F	Bathtub	0	323
9F	Turkey Pen	0	963
10F	Horse	0	98
11F	Forest	0	11,217
	Sub Totals	1,920	13,273

Ranch Total = 15,193 ac.

ALL FIELDS ARE RANGELAND.