

**FINAL REPORT:**

UPPER HASSAYAMPA RIVER  
WATERSHED RESTORATION:  
WAGONER AND  
CROOKS-MAVERICK ALLOTMENTS

ADEQ Contract #EV03-0006 (Project #5-013)

Submitted to

WATER QUALITY IMPROVEMENT GRANT PROGRAM  
Arizona Department of Environmental Quality  
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## INTRODUCTION

The Hassayampa River (HUC 15070103) was the target of this Water Quality Improvement Grant (WQIG). Located on the Prescott National Forest (PNF), the project site on the Hassayampa watershed (Fig. 1) has been the focus of intensive human occupation. Historically mining was a major activity, and presently livestock grazing occurs throughout the area.

The Hassayampa River from its headwaters to its confluence with Blind Indian Creek is listed as “water quality limited” by the State of Arizona according to the provisions of the Clean Water Act Section 303(d). The Arizona Department of Environmental Quality (ADEQ) listed the upper reach of the Hassayampa River for non-attainment of Aquatic and Wildlife warm water designated use standards for cadmium, copper, and zinc.

The Wagoner and Crooks-Maverick Allotments on the PNF were sites of significant mining activity, which is still evident on the upper slopes of these allotments. The project proposed herein will improve soil condition and vegetation cover in significant pastures of these allotments, and thus assist efforts to reduce sediment and chemical transport into the Hassayampa River.

Distribution of livestock grazing is limited on both the Wagoner and Crooks-Maverick Allotments, resulting in low ground cover and severe soil erosion in units of these allotments that have reliable stock water. Thus, relatively little water percolates into aquifers to sustain the resident springs. The imperiled soils of the upper Hassayampa River watershed contribute to poor quality and inconsistent quantity of water flow in the Hassayampa River below Milk Creek, and aid in the distribution of pollutants identified in the TMDL report. Sediment transport is evident in the Hassayampa River after periods of concentrated rainfall during the summer monsoons.

At approximately 58,880 acres in size (31,580 acres for Wagoner Allotment, and 27,300 acres for Crooks-Maverick Allotment), this area of upland contributes significant runoff into the Hassayampa River. Results of the Terrestrial Ecosystems Survey (TES) on the PNF indicate that these allotments are characterized by soils that range from severe to moderate in erosion hazard. The TES inventory reports that revegetation potential is high on significant portions of the allotments, and that maintenance of ground cover is essential to minimize erosion. It further states that soil compaction associated with trafficability problems can be mitigated by managing livestock movements on the allotment.

A “Watershed Restoration Action Strategy” (WRAS) currently does not exist for the upper Hassayampa River Watershed. However, the TES performed by PNF has guided management strategies on the allotments, as reflected in current range management plans and activities of PNF.

## PROJECT GOAL

This WQIG project proposes to develop two livestock waters in areas of the pastures that currently have very inconsistent water sources. Each development will consist of a well, a storage tank, pipeline and a drinker. Footprint of each development will be a maximum of 3 acres. All improvements will meet Forest Service specifications.

The proposed project will improve available livestock water, widening cattle distribution to areas of forage, and increasing the contribution of both pastures to the flexible rest-rotation grazing system. This will restore vegetation cover, and recuperate soil condition. Buffers of enhanced grass and scrub cover will trap sediment that contributes to chemical pollution and turbidity in the Hassayampa River. In addition to improving surface flow and water quality of the Hassayampa River below its confluence with Milk, the project will benefit numerous springs on the allotments.

Currently, the potential to distribute livestock in the southern portion of the Horse Unit of the Wagoner Allotment is limited by inadequate livestock waters. As a result, livestock frequently congregate and overutilize forage in the western areas of this pasture, and underutilize good forage in the eastern regions. A major goal of the 1979 Wagoner Allotment Management Plan is to stabilize and reverse a declining range and watershed trend. Many structural improvements identified in this plan have been implemented, and improvement of range and watershed are being achieved. Field coordination with PNF range staff identified the proposed water development as a means of further improving range and watershed conditions. The applicant currently is operating a rest-rotation grazing system on the Wagoner Allotment in an effort to cooperate with the PNF to restore groundcover on the watershed.

#### ANTICIPATED PROJECT OUTCOME

The proposed project will use vegetation cover to reduce slope soil erosion. The reduction of soil transport will result in the reduction in both turbidity and chemical pollutants in the Hassayampa River.

Maughan Ranches will operate, and perform all maintenance necessary on the improvements proposed herein for a period of 20 years. Furthermore, Maughan Ranches is committed to cooperate with the PNF to continue improving the range and watershed conditions of the Wagoner and Crooks-Maverick Allotments.

## PROJECT MILESTONES

Task #1: Permits, Authorizations, Clearances and Agreements

Task #2: Prepare and Submit Plans

Task #3: Materials and services procurement

Task #4: Construct Upper Hassayampa Watershed Water Project

Task #5: Write and submit final report to ADEQ

Task #6: Public Education

## PROJECT RESULTS

Task #1: Completed. Copy of SHPO and Drilling Permit obtained and submitted to ADEQ with 21 June 2004 progress report.

Task #2: Prescott National Forest plans to install two (proposal called for only one) proposed monitoring sites in June 2005. They will use their TES process as proposed, and provide the Project Administrator with a diagram and map of the plots and the first set of data in the fall of 2005, at which time these documents will be forwarded to ADEQ for inclusion in project file.

Task #3: For Wagoner and Crooks-Maverick Allotments all materials and services were ordered.

Task #4: For the Wagoner and Crooks-Maverick Allotments all project components installed and operating. See Appendices A and B, photos of completed projects.

Task #5: The final report herein completed.

Task #6: The public education component of this project consists of an article in an Arizona Cattlegrowers' Association publication. This article has been initiated, and will be completed when final coordination with the report occurs with Steve Barker of the USDA. Anticipated publication is the winter of 2005-06. A copy of the article will be submitted to ADEQ upon publication for inclusion in the project file.

## CONCLUSION

The water improvement at Horse Mountain on the Wagoner Allotment was completed in time for the fall 2004 grazing season. Without this element of the project in place, livestock would not have been able to utilize the pasture in a way that did not over-utilize the lower portion of the pasture near an existing water site, and under-utilize that portion of the pasture on higher ground near the dry earthen stock tank.

The outcome of having the two additional waters is a more even distributed grazing pattern on the relevant pastures, which provides for better land and soil management, and greater livestock production.

## APPENDIX C

### **Monitoring on the Wagoner and Crooks-Maverick Allotment**

Bud Maule, Mike Steward, and Dave Evans

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Two locations were selected on the Wagoner Allotment. The first site is approximately ¼ mile north of the Horse Mountain windmill that was constructed in 2004, see figure 1. This site was selected in close proximity to the mill to determine livestock effects on upland forage resources. The site is on a south aspect on a ridge cattle currently utilize. While improving livestock distribution is a common goal across the forest, structural improvements must also provide for maintenance/improvement of forage resources and watershed function in areas that have historically received light use. Overall the goal of this project is to improve herbaceous ground cover and watershed function in areas that historically have received moderate to high livestock use and maintain/improve groundcover and watershed function in areas that receive occasional to light use.



**Figure 1: Horse Mountain Site**



The second site on the Wagoner Allotment is located in close proximity to Indian Springs, an area that historically has received heavy livestock use (figure 2). This is evidenced by the high frequency of annual plants and low frequency of perennial herbaceous plants. With improved livestock distribution, herbaceous perennial groundcover is expected to improve providing for improved watershed function.



**Figure 2: Indian Springs Site**

Only one monitoring site was selected on the Crooks-Maverick Allotment. This site is south of the newly constructed Johnson Flat Windmill. The windmill was constructed in close proximity to a seasonal water catchment and will likely reduce livestock use around a more dependable water source (Tin Trough Spring) in this area. The location selected is on an open, grassy, hill side approximately  $\frac{1}{4}$  mile from the spring, see Figure 3. While this site has better herbaceous groundcover than either site on the Wagoner Allotment, it receives heavy livestock use and, over time, could move away from desired resource conditions. Construction of the new windmill will aid in improving livestock distribution and will likely aid in the maintenance/improvement of herbaceous groundcover across this pasture leading to improved watershed condition.





**Figure 3: Johnson Flat Site**

A second monitoring site was going to be set up near the new windmill but the vegetative composition is dense chaparral with little herbaceous groundcover due to the dense shrub canopy. It was determined that a monitoring site in this location would yield little if any additional information regarding the windmills affect on improving livestock distribution and overall maintenance/improvement of herbaceous groundcover and watershed function.