

UPPER SAN PEDRO PARTNERSHIP

**A Consortium of Agencies and Organizations
Dedicated to the Protection and Preservation of
the People and Natural Resources of the Sierra
Vista Sub-watershed of the Upper San Pedro River**

PLANNING ACTIVITY

2002 Progress Report



**2002
Progress
Report**

INTRODUCTION

The Upper San Pedro Partnership (Partnership) was created with the objective of facilitating and implementing sound water resource management and conservation strategies in the Sierra Vista sub-watershed. It is a consortium of agencies and organizations that **“(1) own land and/or (2) control land or water use, and/or (3) make policy with regard to land or water use in the Sierra Vista Sub-watershed of the Upper San Pedro River Basin and will provide significant resources to help the Partnership accomplish its purpose; or agencies and organizations that will provide significant technical or financial resources to help the Partnership accomplish its purpose.”** Members of the Partnership are primarily public agencies with the authority and/or resources to identify reasonable, feasible, and cost effective projects and policies. Membership is voluntary. A member may withdraw at any time.

The Partnership was organized through a Memorandum of Understanding (MOU) signed by each of the participating agencies. The parties to the MOU agreed to A) participate in the Upper San Pedro Partnership and B) assist each other in identifying sources of funding

to meet the objective of sound water management in the sub-watershed. The Memorandum does not limit the legal authorities, or decision-making, of any of the participants, nor require expenditure of any funds. Some parties (Cochise County, Sierra Vista, The Nature Conservancy, Arizona Department of Water Resources, Fort Huachuca, and the Bureau of Land Management) have separate agreements to provide funding to support the activities of the Partnership.

The purpose of the Partnership is **“to coordinate and cooperate in the identification, prioritization and implementation of comprehensive policies and projects to assist in meeting water needs in the Sierra Vista Sub-watershed of the Upper San Pedro River Basin .”**

The Partnership’s first priority is to develop an Upper San Pedro Conservation Plan to “protect the people and natural resources of the Sierra Vista sub-watershed of the San Pedro River.” The Plan’s goal is to **“ensure an adequate long-term groundwater supply is available to meet the reasonable needs of both the area’s residents and property owners (current and future),**

and the San Pedro Riparian National Conservation Area (SPRNCA).” The Partnership hopes to develop consensus on a package of planning options that its members will agree to implement in order to accomplish the stated planning goal. However, no member of the Partnership is obligated to adopt or implement all, or part of, the recommended Conservation Plan. The Partnership will actively support its members in seeking funds and taking action to implement the Plan adopted by the members.

UPPER SAN PEDRO PARTNERSHIP ACTIVITY SCHEDULE

YEAR = QUARTER =	PRE-	2000				2001				2002				2003				2004				2005			
	2000	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
<u>CONSERVATION PLAN DEVELOPMENT</u>																									
Introduction, Background, Water Quality																									
Plan Options- Feasibility/ Cost/ Benefit Analysis																									
Reduce Human Consumption Report																									
Reclaim Water Resources (Effluent) Report																									
Augment Water Resources (Import) Report																									
Augment Water Resources (Storm Water) Report																									
SPRNCA Riparian Water Needs Study																									
Preliminary Report																									
Riparian Vegetation Water Use																									
Functioning Condition Assessment																									
Hydrologic Conditions Analysis																									
Summary Report, Options Analysis																									
Options Packaging, Packaging Analysis																									
Draft Working Plan																									
Update Groundwater Model																									
Review Plan and Results																									
Adopt Final Water Conservation Plan																									
<u>WATER RESOURCES STUDIES/ RESEARCH</u>																									
Quantify Mountain Front Recharge																									
Quantify Valley Recharge																									
Investigate Runoff Decline/ MET																									
Investigate Subsurface Geology																									
Data Collection																									

PARTNERSHIP'S YEAR 2001 PROGRESS

During 2001, the Partnership members participated in a reorganization that brought elected officials and agency senior management staff into the process. The resulting structure will improve communications with the public and legislative leaders, and promote public acceptance of the Conservation Plan. Committees and working groups were established to facilitate public outreach, technical reviews, planning, administrative and financial functions. The Partnership continually reviews the organizational structure and the roles of the various groups within the organization to improve the efficiency and functionality.

The Partnership continued the realization of a five-year financial plan to provide the resources to carry out its work. Local funding agencies have

been very supportive of the Partnership's activities. The Arizona Department of Water Resources has provided some administrative support and seed money in helping the Partnership get organized. Congressman Jim Kolbe has been instrumental in assuring adequate funds are available to the federal member agencies to support Partnership planning, implementation, and research activities. Member agencies spent nearly \$20.5 million on water conservation activities by the end of year three.

Preparing an Upper San Pedro Conservation Plan for the sub-watershed is the first priority, and the Partnership is completing the first step of a feasibility/ cost/benefit analysis of identified planning options. Emphasis has been placed on producing science-based information to support the planning

process. Experts have been hired to investigate and present the factual pros and cons for the ideas that have been suggested to reduce consumption, to reclaim water resources, and to augment water supplies. The Partnership members, with input from the public, will then use the information developed by the experts to select the most viable options for meeting the goals of the Partnership. These will then be formulated into a Conservation Plan for adoption and implementation by the member agencies.

Member agencies have begun implementation of a number of projects that were identified and investigated prior to the formation of the Partnership. These projects should help maintain base flows of the San Pedro River, while other projects are identified, investigated and implemented.

PARTNERSHIP'S OBJECTIVES and PROGRESS

The USPP is in the process of reviewing and revising its operational objectives and establishing plan objectives, but progress on the operational objectives previously established was as follows:

1 Organize into an effective working group that can accomplish the purpose of the partnership and meet the goals of the agencies involved.

PROGRESS TO DATE:

- The member agencies of the Partnership initially appointed a senior staff person to serve as their representative on the Partnership. These representatives possessed expertise in water and watershed planning, particularly in regard to the San Pedro River basin, and knowledge of member agencies' concerns. The purpose of the group was to coordinate Partnership activities and funding, to guide the development of requisite technical information, to recommend plan options, and to guide implementation of the adopted Plan. This group, known as the Coordinating Committee, has met at least monthly for the past three and one half years to coordinate Partnership activities.

Over the past two years, the Partnership established a **Partnership Advisory Commission** and restructured the organization. The Advisory Commission

was established to provide leadership and direction to the Partnership's operational committees and subcommittees, to ensure the public, legislative leaders and member agencies are informed on the activities of the Partnership, to assist the Partnership with legislative issues, and to ensure that the Conservation Plan receives widespread public acceptance and support. Originally, the Advisory Commission was to receive recommended plan options from the Coordinating Committee, seek/review public opinion on those options, and then work with the Committee to develop a plan that could be recommended to the member agencies as both technically sound and publicly acceptable.

In 2001 the Partnership recognized that the Coordinating Committee's decision-making responsibilities overlapped with the Advisory Commission's role. The Coordinating Committee was then restructured as a **Staff Working Group** to provide staff support directly to the Advisory Commission.

- The change in the decision-making role of the Coordinating Committee precipitated a need to re-examine the membership of the Advisory Commission. It was originally structured to create a balance between local public opinion and state/federal interests in reviewing options and developing a Conservation Plan. The Commission

members included: eight local officials (three County, three Sierra Vista, one Huachuca City and one Bisbee), one local rural land owner, one conservation group, and a representative from three state agencies and four federal agencies. When the Staff Working Group was formed the Advisory Commission membership was expanded to ensure that all members were represented, particularly for the purpose of Conservation Plan approval. As it stands now, the Partnership hopes to develop a consensus for Plan approval. If consensus is not possible, Plan approval requires a 2/3 vote of the entire membership, along with the consent of any member agency that would be requested to act or implement the portion of the Plan upon which consensus cannot be achieved.

Based on these changes, the Advisory Commission now has 24 members, including: nine local agency officials representing five agencies, four state agencies, seven federal agencies, two conservation groups, one resource conservation district, and a water company/developer.

- The Partnership initially established four subcommittees to perform more specialized functions. The Partnership believes it is extremely important to the success of their work that no agency or interest group be in, or be perceived to be in, a position to unduly influence the analysis of the plan options.

The subcommittee oversight approach seemed to be the best way to guard against that possibility. With the evolution of the Coordinating Committee to a Staff Working Group, all of the former subcommittees were given “committee” status:

- An **Administrative Committee** was formed with representatives from the agencies that are contributing funding to develop the Conservation Plan (Cochise County, Sierra Vista, The Nature Conservancy, AZ Dept. of Water Resources, Fort Huachuca, and Bureau of Land Management). Also represented are the U.S. Geological Survey (USGS) and U.S. Department of Agricultural Research Service (ARS), who provide technical resources and contribute some financial resources to the Partnership. The committee’s function is to direct the work of consultants working for the Partnership. The City of Sierra Vista has volunteered to be the fiscal and contracting agent for the Partnership. It establishes agreements with the funding agencies to pool the financial resources that will be used to develop the plan. The City then contracts with consultants to complete the planning work on behalf of the Partnership.
- A **Public Outreach Committee** was formed to assist the Partnership in informing the public on the water issues the community faces and on the purpose, function and activities of the Partnership in its effort to address those issues. The Outreach Committee will also assist the Partnership in presenting the Conservation Plan options to the public and soliciting public comment.
- The **Open Space Subcommittee** was formed to look at washes and streams that have significant recharge capacity and are important components of a well functioning San Pedro watershed. The subcommittee also evaluated the importance of these washes as potential wildlife corridors. After completing the Hydrologic Protection Areas Final Report, this subcommittee was redefined as a **Joint Planning Subcommittee** with an expanded planning role. However, as a result of the restructuring of the Coordinating Committee, the role of this subcommittee was absorbed by the Staff Working Group and the Joint Planning Subcommittee was eliminated.
- The **Technical Committee** was formed to provide technical reviews and advice to the Partnership, and to ensure that information disseminated by the Public Outreach Committee is technically correct.
- The Partnership hired a Coordinating Manager and Outreach Coordinator and assigned administrative staff to assist them in carrying out their duties.

2 Develop the financial resources needed to carry out the objectives of the partnership.

PROGRESS TO DATE:

- The Partnership developed a \$33,965,000, five-year financial plan that pools financial resources from several agencies

to:

- Develop a Conservation Plan that identifies the projects and policies that could be put into practice to accomplish the Partnership’s goal of ensuring an adequate long-term groundwater supply to meet the needs of residents and the SPRNCA.;
- Execute previously identified programs and projects, and those that will be identified by the plan, to reduce water consumption, reclaim water resources and augment water supplies; and
- Improve the level of understanding of the hydrologic system by collecting and analyzing data that will support future development of resource management decisions.
- The Financial Plan is updated periodically to reflect approved and requested funding and the allocation of those funds. Funding approved for years one, two, and three of the financial plan totals \$20,394,000.
 - \$2,510,000 is being used to prepare the Conservation Plan. An additional \$437,000 is projected in year four and five to complete the Plan;
 - \$14,979,000 will be used to complete conservation projects. Most of the funds are being used for the Sierra Vista (\$7,500,000) and Fort Huachuca (\$6,000,000) effluent recharge projects that are expected to reclaim about 3,400 acre feet of water per year;
 - \$2,552,000 will be used for studies to improve the knowledge database and better describe the biological, chemical and physical aspects

- of the hydrologic system;
- \$353,600 will be used for administrative support.
- Contributing agencies included Cochise County (\$645,000), Sierra Vista (\$3,833,000), and The Nature Conservancy (\$60,000); Arizona Department of Water Resources (\$240,000); Arizona Water Protection Fund (\$2,562,000); Fort Huachuca (\$7,165,000); Bureau of Land Management, through the efforts of Congressman Kolbe (\$2,989,000); National Fish & Wildlife Foundation (\$540,000); US Geological Survey (\$121,500); and Bureau of Reclamation (\$1,750,000).
- Funding for year four is still under review, but approximately \$3.83 million will be requested. Expected contributions include \$759,200 from local agencies and \$3,070,600 from federal agencies. This will provide the funding to complete the Conservation Plan (\$437,000), and to continue conservation projects (\$2,802,000), on-going research and studies (\$387,000), and administration of the Partnership (\$203,800).

3 Identify potential solutions.

PROGRESS TO DATE:

- The Partnership first developed a list of projects and policies to be considered and investigated. The list was based on the input provided during meetings with other groups and agencies, and the general knowledge of the situation possessed by the various members of the Partnership. Some member agencies gathered ideas from public forums held before the Partnership was officially established.
- Categorization of these options

identified the general strategies that will be included in the Conservation Plan. The strategies include: 1) reducing consumption; 2) reclaiming water resources (effluent recharge/ reuse); and 3) augmenting water resources (storm water recharge, relocating supplies downstream, or importing water).

- The list of ideas to investigate was then developed into a planning options outline. These options, along with others suggested by the consultants, are being investigated. The planning options outline is currently being reviewed and revised and will eventually evolve into a Conservation Plan.

4 Hire experts to investigate the feasibility/ cost/ benefit of each project or policy.

Hydrologic and economic consultants have been hired to determine the feasibility of various projects or policies, the probable cost, and an estimate of the amount of water that might be gained or saved. A separate study is quantifying the SPRNCA water needs. Considerable information on these issues already exists and continues to be assembled by many agencies and groups concerned with the area's water resources. The Partnership will need to draw on the many resources, both inside and outside the community, to develop the planning options to be considered.

PROGRESS TO DATE:

- **Storm-Water Recharge Options:** Requests for Proposals were prepared by the Partnership in October 1999 to obtain consulting services for the Augment Water Resources

(storm-water recharge) section of the planning options outline. This work was to include constructing and monitoring three pilot recharge projects using three different recharge methods. The techniques studied were to include retention/detention basins, in-channel check dams and infiltration galleries. The results were to be analyzed to determine if one or more of these recharge techniques could be effectively implemented on a larger scale. A contract was awarded in May 2000 to the team of Navigant Consulting and GeoSystems Analysis, from Phoenix and Tucson respectively, in the amount of \$341,700. Change orders in the amount of \$89,034 were issued to monitor recharge in two additional detention basins receiving urban runoff to compare with a retention/detention basin receiving natural runoff.

The monitoring wells were installed and instrumented to collect baseline infiltration data. The design of the check dam and infiltration gallery pilot projects was not completed. This project was terminated in May 2001 due to changes in the U.S. Army Corps of Engineers 404 permit processes and resulting design issues. The scope of work was modified and a new contract was awarded. GeoSystems Analysis is continuing the monitoring work and will complete an analysis of detention/retention basins as an option for augmenting the groundwater recharge. The ARS will assist in the analysis of storm-water recharge feasibility. This should be completed by mid-2002, so the option can be compared with others.

Tri-Core Engineering has

been hired to prepare a concept design report for five potential check dam and infiltration gallery pilot projects. The recommended projects may be designed and constructed during 2002. If constructed, they will be monitored to determine any improvement in recharge, but the information will not be available for inclusion in the initial phases of the Partnership planning process.

- **Plan Options Feasibility/ Cost/ Benefit Analysis:** Requests for proposals were announced in January 2000 to obtain consulting services for part of the Reduce Consumption and the Reclaim Water Resources (effluent Recharge) section of the planning options outline. The Reduce Consumption section reviewed public education programs, residential and commercial users, recreational users, irrigated agricultural users, rural/open space users, groundwater exportation, and water company consolidation. The Reclaim Water Resources section reviewed effluent reuse/recharge practices by Sierra Vista, Fort Huachuca, Huachuca City, Bisbee, and Naco (AZ). A contract was awarded in May 2000 to the team of Fluid Solutions and BBC Research and Consulting, from Phoenix and Denver respectively, in the amount of \$317,583.

The consultants have met with the Partnership and public on two occasions to confirm and characterize reduce consumption options that will be evaluated. Several options were added, deleted or consolidated with others in the course of these meetings. It was decided that augment water

resources options, such as moving water supply locations and importing water, should also be evaluated. The consultants have completed the preliminary analysis of all resultant options. The options list has been shortened to those that appear to be the most feasible and cost-effective, and those that need a more detailed analysis. The final report describing the results of the detailed analysis will be completed by the third quarter of 2002.

- **SPRNCA Needs Study:** Because the amount of water used by riparian vegetation in the San Pedro Riparian National Conservation Area is not known, the Partnership identified a need to develop this information. The scope of work for the study was completed, consultants were hired and data collection is now in its second year. The SPRNCA Needs Study comprises three components and will cost an estimated \$1.4 million. The ARS will determine riparian vegetation water use. Arizona State University will describe the riparian functional conditions. The USGS will describe the hydrogeologic conditions. The resultant analysis will be used to develop or modify the Conservation Plan. There will also be an analysis of potential activities to reduce water consumption within the SPRNCA. Preliminary reports will be prepared every six months with the final report due at the end of 2003
- Requests for Proposals to prepare other parts of the plan options outline will be prepared at appropriate times in the planning process.

5 Determine the cumulative effects of implementing some, if not all, of the most feasible and cost effective options.

The Partnership is currently determining how this part of the planning process will be completed.

6 Present information, developed by the experts, to the public and develop a recommended plan.

The Partnership is currently determining how this part of the planning process will be completed.

7 Adopt a Conservation Plan.

The Partnership is currently determining how this part of the planning process will be completed.

8 Implement the adopted plan.

The Partnership will be instrumental in leveraging funding from several sources to implement various parts of the Plan. Some projects will be done during the planning process because they were efforts already planned by member agencies. These include existing water conservation programs, the Sierra Vista Water Reclamation (effluent recharge) Project and similar projects to recharge and reuse Fort Huachuca effluent.

PROGRESS TO DATE:

- See the Upper Sand Pedro Conservation Plan Progress Report

9 Improve the knowledge database.

Considerable descriptive hydrologic information is available for the Sierra Vista sub-watershed of the Upper San Pedro Basin. However, recently collected data have shown that the hydrology of the area is more complex than had been assumed by earlier investigators. The Partnership believes that a more complete understanding of how the river and the groundwater system are related is part of the information base needed to assess Partnership strategies. Consequently, the Partnership developed a program of studies to develop this information.

PROGRESS TO DATE:

Funds for the first three years of these studies has been obtained primarily from appropriations introduced by Congressman Kolbe. It is anticipated that, with his continued support, adequate funding will be available to complete the planned studies. The USGS and ARS have developed work plans and begun the necessary data collection to address the questions raised by the Partnership. The research will result in an improved groundwater model that can be used to estimate the effect of implementation of Partnership strategies.

- **Quantify Mountain Front Recharge**—This study will use new technology to collect data in some of the ephemeral drainages and major mountain streams, and will use traditional methods of calculating watershed recharge based on rainfall, ground cover and other watershed characteristics, to more accurately estimate mountain front recharge. Over 50 monitoring sites have been established. Surveys of these

sites are completed quarterly to determine gravity and mass changes at each. These data will be used to calculate estimates of the amount of recharge that has occurred.

- **Quantify Valley Recharge**—Previous modeling studies have assumed that recharge occurs only at the mountain fronts, but new information suggests that recharge may be occurring in and between drainages away from the mountain fronts. This study will investigate the significance of this recharge and estimate recharge rates.

Study sites have been established at 15 locations throughout the upper basin. The sites comprise instrumented drill holes that in some cases reach the water table. Information gleaned from core samples and drill cuttings from each hole will enable a preliminary estimate of the depths to which water has moved, help develop a conceptual understanding of how water moves through the unsaturated zone, as well as the infiltration and recharge away from the mountain front.

- **Investigate Decline in Run-off**—Declining stream flow has led to a substantial decline in outflow from the sub-watershed over the past several decades. The reasons for this decline are unknown. This study will examine existing data to attempt to determine the cause(s).

Review of annual discharge summaries for the Charleston gauge through 1956 have shown that discharge accuracies to that time were influenced by channel shifting and diversions upstream. This poses more of a concern with regard to base-flow accuracies than to those of higher flows. The sub-

stantial variability of discharges from year to year suggest that it would be difficult to resolve the extent to which the several gauge relocations between 1910 and 1935 might contribute to the trends noted in Pool and Coes (1999). A tentative method for evaluation of the utility of base-flow data has been developed and is being explored.

- **Investigate Subsurface Geology**—This task will yield a better understanding of the subsurface geology in the vicinity of the river and how it influences the hydrologic system. It will describe the lithology and distribution of channel alluvium or floodplain aquifer. This information will contribute to a better understanding of the relations between the channel alluvium, the regional aquifer, and flow in the river.

Electrical resistivity surveys have been conducted at 13 transects perpendicular to the San Pedro River to explore the geometry and lithology of the channel alluvium. Seismic surveys were also conducted along some transects to provide additional information. Piezometers installed as part of the water level monitoring effort provide ground truth data with which the survey results are being compared.

- **Install Monitoring Well and Stream Gauge Network**—Nine existing, unused, water supply wells that sample the regional aquifer were instrumented with continuously recording transducers to measure groundwater elevations. These sites have shown relatively rapid water-level rises in response to seasonally wet conditions, something that has not been

observed in the past by the USGS. Stream gauges were installed at four sites west of the river: two on the Babocomari River and one each in Huachuca and Ramsey Canyons. Two sites were installed east of the river on Greenbush Draw and on Banning Creek. Existing gauges at Palominas and Tombstone were modified to provide redundant records in case of channel changes that prevented the original installations from recording flow. A stream-stage

transducer also was installed in the river near the existing Lewis Springs well transect. Real-time data from each stream gauge, and from the wells and stage recorder in the Lewis Springs transect, can be observed at <http://az.waterdata.usgs.gov/nwis/current/?type=flow>.

- Update and Improve the Groundwater Model—The hydro geologic framework for the groundwater modeling effort has been developed. GIS covers for the individual model

layers have been constructed based on the framework. These covers will be used to develop the input data sets for the model. GIS covers also have been developed that will be used to distribute recharge over the modeled area, which will include the headwaters region in Mexico. Some water-level data for this additional area have been obtained and compiled.