UPPER SAN PEDRO PARTNERSHIP

Working together to meet the water needs of area residents while protecting the San Pedro River and building a model for the future

2005 Water Management and Conservation Plan

March 9, 2005

A Working Plan

Partnership Advisory Commission

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Acknowledgments: The work of the Partnership involves an ever-changing and dynamic host of member agency representatives, staff people and interested parties. Their participation often overlaps committees and has substantially contributed to this plan as well as the purpose of the Partnership. They are, in no particular order: *Congressman Jim Kolbe (US House of Representatives), Senator John McCain (US Senate), Senator John Kyl (US Senate), Gretchen Kent (Ft H), Mike Shaughnessey (Ft H), Les Thompson (CC), Marie Hansen (SV), Dan Moore (BLM), Bernadette Polley (Congressman Kolbe's Office), Jim Chambers (Ft H), Tricia Gerrodette (Audubon), Tom Collazo (TNC), Cado Daily (Water Wise), Susan Pater (UofA Cooperative Extension), Dr. Anne Browning-Aiken (Udall Center), Allon Owen (CC), Karla Jensen (CC), Doug Duncan (USFWS), Don Pool (USGS), Linda Stitzer (ADWR), Ginny Sciarrino (Ft H), Lorraine Buck (BLM), Joan Vasey (Ft H), Susan Moran (ARS), Dr. Jim Leenhouts (USGS), Lainie Levick (ARS), Dr. Russell Scott (ARS), Dr. Kevin Lansey (SAHRA), John Sottilare (BLM), Dan Moore, (BLM), Eve Halper (BOR), Mary Ann Black (Hereford NRCD), George Michael (SV), Tweed Kezziah, Susan Watkins,* and all others inadvertently overlooked.

The Upper San Pedro Partnership

In 1998, the Upper San Pedro Partnership (Partnership) was formed through a Memorandum of Understanding (MOU) to facilitate and implement 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, 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 (USPP Organizational Structure, adopted May, 2002). 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.*

Member Agencies

Land Owners And/Or Land Or Water Use Controllers

Resource Agencies

Local Agencies

Cochise County *
Sierra Vista *
Huachuca City
Bisbee
Tombstone

Hereford NRCD
(Natural Resource Conservation District)

Arizona State Agencies

State Land Department
Dept. of Water Resources*

Dept. of Environmental Quality
Assoc. Conservation Districts

Federal Agencies

Fort Huachuca *
Bureau of Land Management *
Forest Service
National Park Service

US Geological Survey*
Agricultural Research Service*
Fish & Wildlife Service
Bureau of Reclamation

Non-Governmental Agencies

The Nature Conservancy *
National Audubon Society
Bella Vista Ranches

***Denotes current Funding Partner/Agency (member of Administrative Committee)**

Other Outside Contributing Entities

Congressman Jim Kolbe – US House of Representatives
National Fish and Wildlife Foundation
University of Arizona – SAHRA (Sustainability of semi-Arid Hydrology and Riparian Areas)
University of Arizona Cooperative Extension Program (Water Wise)

Draft Plan Contents

INTRODUCTION

Since 2003 the Upper San Pedro Partnership (USPP or Partnership) has adopted 'working plans' every year to address water issues in the Sierra Vista Sub-watershed. While intended to be an ever evolving process, the working plans have consistently been developed through consensus among the Partnership's 21 member agencies. Every year provides us with a better understanding and refinement of our water issues as well as new commitments by members to help address these issues.

For a review of the background, issues and objectives of USPP, please refer to the 2004 Working Plan or visit the Partnership's website: www.usppartnership.com/documents.html#consplan .

Planning Process and Adaptive Management

The development of any annual plan is an iterative process that should allow for the incorporation of new information and ideas as they evolve over the course of a calendar year. The water issues in the Sierra Vista Sub-watershed are complex and may not be completely understood in a short timeframe. Therefore, the Partnership must often act on the best information available at the time.

The adaptive management framework, the approach being used by the Partnership, represents an active and focused learning process on the part of both scientists and decision makers, and an acknowledgement that their collective understanding of the issues is not perfect. Perhaps the greatest strength of an adaptive management approach is that while certain management decisions may be delayed due to lack of information, actions that can make a difference with less risk or uncertainty can be implemented early on. Therefore, while certain projects will require substantial information through monitoring, research, modeling efforts, and political assessments, other relatively low risk strategies can be implemented much sooner.

Recent Developments

In November of 2003, Congress passed legislation currently referred to as Section 321 of the National Defense Authorization Act of 2004 (PL-108-136, herein referred to as Section 321), clarifying the responsibilities of the Fort and recognizing the Upper San Pedro Partnership and its members as the vehicle for mitigating water use impacts in the Sub-watershed. Section 321 calls for the Secretary of the Interior, in consultation with the Secretaries of Agriculture and Defense and in cooperation with the Upper San Pedro Partnership, to report on the water use management and conservation measures that have been implemented and are needed to restore and maintain the sustainable yield of the regional aquifer by and after September 30, 2011. The report, which was due to Congress no later than December 31, 2004, was drafted by the US Geological Survey in consultation with the Partnership and submitted to the Department of Interior in August of 2004.

STATE OF THE WATERSHED

General Context

The Sierra Vista Sub-watershed (SVS) extends from the United States-Mexico border north to the USGS gaging station near Tombstone (station number 09471550), about 1.5 miles downstream of the town of Fairbank (Figure 1). The area within these bounds is a sediment-filled valley with surfaces that slope gradually down from the base of the mountains to the San Pedro River, which flows north out of Mexico through the center of the valley. The basin sediments constitute the SVS's regional aquifer.

Ground water is the primary source of water for the residents of the area, including Fort Huachuca, Bisbee, Sierra Vista, Huachuca City, Tombstone, and rural residents within the County. Ground water also sustains the base flow of the San Pedro River, and its associated riparian ecosystem. Water outflow from the SVS, including water withdrawn by pumping, currently exceeds natural inflow to the regional aquifer. As a result, ground-water levels in parts of the aquifer are declining and ground-water storage is being depleted. The continued decline of water levels and associated depletion of storage could eventually diminish ground-water flow to the San Pedro River. A goal of the Partnership is to identify feasible water-management measures that can be implemented by its member agencies to reach a sustainable level of ground-water use.

The local hydrologic system is complex, and not fully understood. The consequences of ground-water use, and the effectiveness of alternative water-management strategies will be better understood as research and monitoring efforts continue. As a result, an adaptive management process provides the best means of reaching sustainable yield. The term adaptive is used because decisions associated with sustainable yield must be made today, in the absence of perfect knowledge about tomorrow's consequences. As new information becomes available, resource decisions can be amended or revised in subsequent years. For this reason, a well-designed monitoring program is important to provide useful feedback on the status and trends of aquifer conditions, and the effectiveness of conservation measures. Without an adequate monitoring program, the future influence of current management decisions can not be fully evaluated thereby limiting the precision of future decisions.

Recharge to the regional aquifer occurs primarily along the basin's periphery, at the juncture between the mountains and basin sediments, because precipitation in the SVS is concentrated in the higher elevation mountain ranges. Water also enters the SVS as ground-water underflow from Mexico. Water that recharges along the mountain fronts moves toward lower elevation discharge locations. Natural ground-water discharge occurs mostly as outflow to the San Pedro River (base flow) and through consumption by the riparian vegetation along the river corridor (evapotranspiration). Some water also crosses the downstream boundary of the Sub-watershed as ground-water underflow.

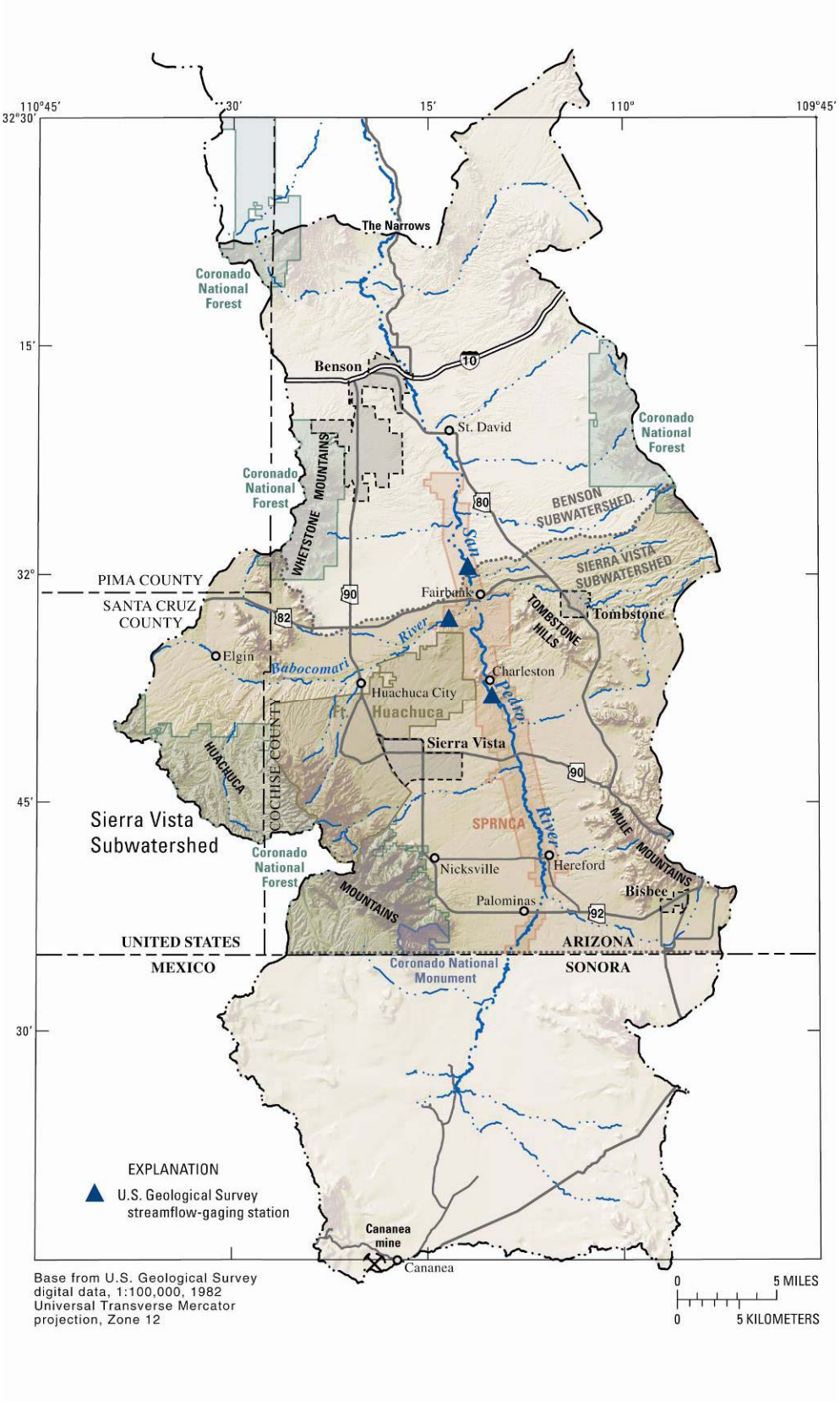


Figure 1. Location of the Sierra Vista Sub-watershed (SVS).

In the SVS, the San Pedro River flows perennially (all year) in some reaches and intermittently in others. The ecologic condition of the riparian forest directly depends on the presence of shallow ground water within the flood plain, whereas the San Pedro Riparian National Conservation Area's (SPRNCA) aquatic habitats are directly dependent on stretches of perennial streamflow. This hydrologic context depends on consistent ground-water flow from the regional aquifer system to the stream. The location of perennial streamflow is controlled by geology as well as by the amount and location of ground-water recharge and discharge. The primary perennial reach extends from about 7 miles south to 1 mile north of the town of Charleston where the USGS streamflow-gaging station, at Charleston (station number 09471000) is located.

Managing Ground Water Resources for Sustainable Yield

The National Defense Authorization Act of 2004, Public Law 108-136, Section 321 directs the Secretary of the Interior to prepare reports to Congress on steps to be taken to reduce the overdraft and restore sustainable yield of groundwater in the SVS, in consultation with the Secretary of Agriculture and the Secretary of Defense, and in cooperation with other member agencies of the Upper San Pedro Partnership. It is important to note that the concept of managing groundwater for sustainable yield differs significantly from managing for safe yield. The Partnership has adopted the definition offered by Alley and others (1999) for sustainable yield, which is "…managing it [ground water] in a way that can be maintained for an indefinite period of time, without causing unacceptable environmental, economic, or social consequences." Therefore, a sustainable level of ground-water pumping for the SVS could be an amount between zero and a level that stops storage depletion, with the understanding that a level of use greater than zero will include some consequences in the amount of natural discharge at some point in the future. What consequences are unacceptable are not yet fully defined, but will be decided as a collective result of stakeholder discussion, debate, and consensus. The role for science is to frame the range of options within which a goal can be established and to describe and predict the consequences of a given level and distribution of pumping within the SVS.

The essential goal in achieving sustainable yield is to ensure that water of sufficient quantity and quality is available for the SVS's social, economic, and environmental needs. Section 321 requests a plan that specifies "the quantity of overdraft of the regional aquifer to be reduced by the end of each of fiscal years 2005 through 2011 to achieve sustainable yield." Overdraft in the SVS may best be defined as ground-water consumption in excess of sustainable yield. Sustainable yield, however, can not currently be quantitatively determined. Therefore, this plan does not assign numerical values to overdraft but does present quantities of planned reductions in net ground-water withdrawals. Reductions in net ground-water withdrawals represent reductions in overdraft from the regional aquifer.

In seeking sustainable yield for the SVS, what ultimately matters is not whether a specific calculation of storage deficit or overdraft is correct, but how the aquifer system responds through time both to human attempts to eliminate the storage deficit and to natural climatic variability. When storage depletion is reversed and accretion begins, water levels will gradually begin to rise. In the future, monitoring in the SVS will track water-level changes, and new measurement techniques to directly monitor storage change will be implemented.

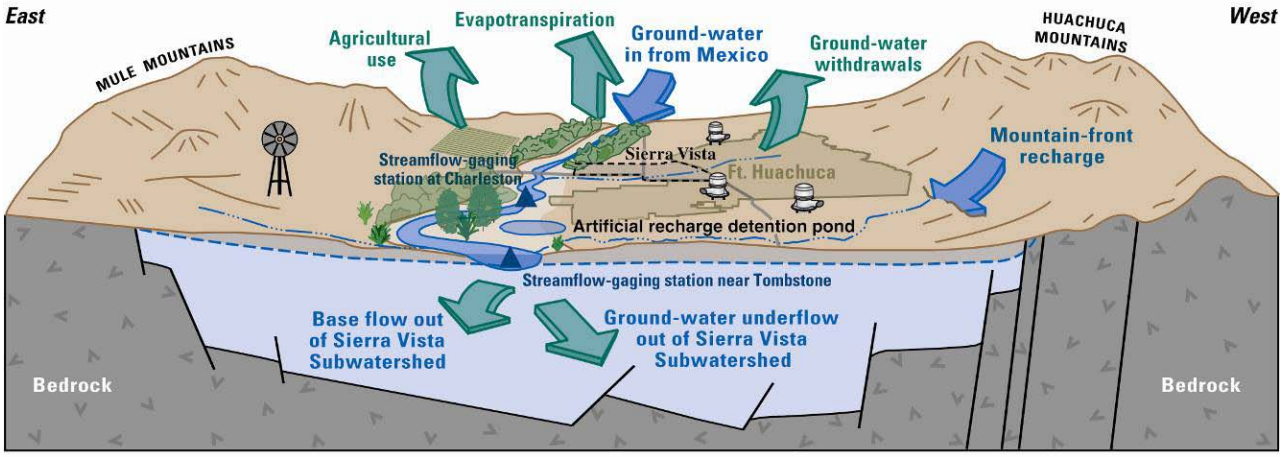
For water-management planning, however, a management target equal to annual storage depletion is useful for the Partnership to set conservation and water augmentation goals to 2011. The minimum level of reduction in ground-water use requires elimination of current annual aquifer storage depletions and initiation of storage accretion. In this plan, the management-target goal for elimination of annual storage depletion serves as an initial metric to evaluate progress toward sustainable yield.

Annual aquifer storage depletion has been calculated using a water-budget approach. Measured or estimated annual inflows and outflows of water are subtracted to estimate annual change in aquifer storage. Calculations assume natural recharge has remained constant at predevelopment levels and climate change has not altered recharge.

Recent Water Budget Estimates

The Partnership has adopted the Arizona Department of Water Resources (ADWR) water budget of 2002 for the purposes of establishing an initial water-management target to achieve sustainable yield. Science cannot establish precise values for every component in a ground-water budget but rather can establish a range of values that brackets the true value. Therefore, Figure 2 presents value ranges that have been reported in a subset of area studies and includes, for comparison, the ADWR values for 2002. More recent and refined estimates are available from ADWR and will be reflected in future Section 321 reporting. However, for illustration purposes only, this plan is using those numbers reported in the Section 321 Report to Congress in 2004.

The ADWR water budget reports pumping specific to 2002. Other inflow and outflow values in the ADWR water budget represent a variety of time periods. Natural outflow is calculated using 1996 to 2002 streamflow-gaging station records and 1986 to 1990 evapotranspiration estimates. Natural recharge is based on analysis of predevelopment stream base-flow data for 1935-40. More recent stream base-flow data can not be used to calculate recharge because pumping may have affected streamflow in the absence of any changes in recharge.



Simulated annual water budget for a ground-water-flow model — Values are in acre-feet per year

GROUND-WATER INFLOW

	Estimated range	2002 Estimates	2011 Projections
—Natural recharge	11,200–16,000	15,000	15,000
—Underflow from Mexico	3,000–3,400	3,000	3,000
—Total		18,000	18,000

GROUND-WATER OUTFLOW

	Estimated range	2002 Estimates	2011 Projections
—San Pedro base flow	3,250–6,290	3,250	3,250
—Net ground-water withdrawals		16,500	18,600
—Riparian and wetland evapotranspiration	6,230–7,700	7,700	7,700
—Ground-water underflow at Tombstone streamflow-gaging station	300–440	440	440
—Total		27,900	30,000

ANNUAL STORAGE CHANGE (no management measures)

—2002 Estimated	–9,900
—2011 Projected	–12,000

Figure 2. Ground-water budget for the Sierra Vista Sub-watershed.

A water-budget approach is an accounting technique that is a tabulation of inflows and outflows representing a particular time. This approach has no ability to predict ongoing or future changes in the hydrologic system that may result from past and present pumping. For example, a water budget approach cannot predict times when, or locations along the river where changes caused by pumping may capture base flow. Only a physically-based ground-water model can provide an evaluation of the temporal and spatial effects of pumping. Such a model is currently in development by the USGS and will play a central role in future reports and plans.

The Partnership has chosen the annual storage deficit value of 9,900 acre-feet/year (rounded to 10,000) derived from ADWR's 2002 water budget, and calculated, assuming no implementation of any water-management efforts, as a minimum-management target. The Partnership plans to offset net ground-water use in excess of 10,000 acre-feet/year.

Given the planning horizon of 2011, the Partnership plans to mitigate overdraft considering both the expected population growth and needed water-management measures. Population growth rates were determined by Cochise County based on population estimates by the Arizona Department of Economic Security.

By considering population growth, the Partnership projects that annual storage depletion will increase to 12,000 acre-feet/year by 2011 if no water-management measures are implemented. Fluctuations in future human water demand, climatic variability, and other factors that are currently difficult to predict could influence inflows and outflows during this time period; these values of population growth and ground water storage deficit are merely estimates.

The success of water-management measures will be evaluated in annual reports to Congress relative to several metrics, including reductions in ground-water consumption, and responses of water levels and ground-water storage in the regional aquifer system. A ground-water flow model will be used in conjunction with a decision support system (DSS) to evaluate and plan for projects and water management strategies that can address the spatial aspects of ground-water management associated with sustainability.

Monitoring Programs

Section 321 requests a description of monitoring and verification activities to be undertaken by the Partnership to measure the reduction of the overdraft to the regional aquifer in the SVS and stipulates the minimum sources of information that will be considered. These minimum sources considered alone, however, are inadequate to confidently document reductions in overdraft. For example, Section 321 specifies consideration of the Arizona Corporation Commission (ACC) annual report of pumping. The ACC report, however, does not include private domestic wells in the SVS. Base flows at the Charleston gaging station may reflect both human-induced and climatic changes and not necessarily within the time scale of Section 321 reporting. Ground water levels currently measured in the basin are of inadequate timing and spacing to accurately separate human-caused changes from natural variability.

Establishment of a well-designed monitoring program will be essential to meet annual reporting requirements for Congress, and to provide a feedback mechanism for the adaptive management process. Without this information, the feedback mechanism to the adaptive management process will not provide sufficient information to fully evaluate the effects of prior management decisions. In order to satisfy the requirements of future Section 321 reporting, monitoring will track regional hydrologic conditions, riparian ecosystem trends, and also the progress of Partnership member agency projects. Regional monitoring and

project-specific monitoring will be conducted separately. Some project monitoring will be borne by appropriate Partnership member agencies.

SUMMARY OF 2004 ACCOMPLISHMENTS

2004 Planning Tasks

The 2004 Working Plan outlined planning tasks that would be undertaken throughout 2004 by the different committees of the Partnership to further its goal and objectives. Following is a summary of the planning accomplishments from 2004:

1. ***Review Bureau of Reclamation (BOR) Appraisal Findings****:* The Bureau of Reclamation completed three appraisal level studies for potential augmentation projects during 2004 for the Partnership. These studies addressed the Copper Queen Mine in Bisbee, the mine workings in Tombstone, and the relocation of wells to the Benson Sub-watershed. The Partnership's Technical Committee and Staff Working Group worked closely with BOR staff to develop and ultimately finalize these documents.

   It is important to recognize that these draft documents represent only very preliminary conceptual designs. They are intended to initiate a dialogue with all interested parties affected by the respective alternatives. The Bureau of Reclamation defines an appraisal study as a brief investigation to determine whether to proceed with an in-depth "feasibility" study. The appraisal study uses existing data and information to identify plans to meet current and projected goals. It evaluates an array of options and identifies at least one potential solution.

   A feasibility study is a much more detailed investigation. In order for Reclamation to conduct such a study, congressional authorization is required. Feasibility studies result in reports to Congress (i.e., a Planning Report/Environmental Impact Statement). These reports support a request for congressional authority for Federal actions. They go to the Secretary of the Interior, and ultimately, to Congress. Congress will determine whether to pass a bill authorizing implementation and the President will decide whether to sign the bill into law. No feasibility studies have been conducted by the Bureau of Reclamation on behalf of the Partnership.

   The three appraisal studies completed in 2004 will be combined with additional augmentation studies in 2005 and prioritized for future consideration.

2. ***Review and Incorporation of ADWR Water Budget:*** The Partnership worked closely with ADWR staff throughout 2004 to refine the 2002 water budget for the Sierra Vista Sub-watershed. Numerous meetings were held to exchange and update information relevant to the development of the budget. These same estimates were later incorporated into the Section 321 report. ADWR's final AMA report, for which the 2002 water budget was initially developed, will be released in 2005.

3. ***Summary of Legislative Impediments and Additional Funding Needs:*** The Partnership, through its newly-formed Government Affairs Committee (GAC), identified legislative impediments (local, state and federal), as required by Section 321, to implementing specific water management and conservation activities. These will serve as the basis for legislative proposals by the Partnership in the coming years. Identifying funding needs is an ongoing process and will be an integral part of the Partnership's planning tasks for this calendar year.

4. ***Section 321 2004 Report:*** This report, due to Congress on December 31, 2004, was written and transmitted through the Department of Interior to Congress by USGS in consultation with the Partnership in August of 2004. This task involved defining the terms of Section 321, such as 'sustainable yield,' and reporting the most recent version of a water budget, as well as project areas by which the Partnership will seek to achieve sustainable yield by 2011.

5. ***Incorporate preliminary findings from Partnership-sponsored studies into ongoing planning considerations, decision-making, and reporting:*** The stormwater feasibility study was completed in February, 2004 and provided many insights into groundwater recharge processes associated with detention basins, and with urban development in general. The magnitude with which recharge increased in response to urban development alone, was a particularly interesting outcome of this AGWA (Automated Geospatial Watershed Assessment) modeling study. The results of modeling efforts within Coyote Wash, a small urban watershed in Sierra Vista, were later extrapolated to the entire Sierra Vista Sub-watershed, and used to refine water budget estimates. Additional research and monitoring efforts that can help to verify the results of this modeling effort are planned for 2005. The study also highlighted the need for better quantification of the recharge benefits attributable to individual stormwater detention basins, and as a result a detention basin workshop was held in January of 2005 to focus on this issue.

   The Phase Two decision support system (DSS), was completed by SAHRA staff during 2004 and accepted by the Partnership in January 2005. While the Phase One DSS model was based on water budget calculations, this is a more sophisticated version that is spatially explicit, and relies upon a groundwater model to predict where and when groundwater conditions change, based on various management scenarios presented by the user. Now that the Phase Two model is operational, it can be further modified for different applications, including internal decision making by the Partnership, and potentially for outreach and/or educational purposes. SAHRA has provided additional staff support to assist the Partnership with customizing this tool during 2005 so that it can best address our needs. The DSS model is currently linked to ADWR's groundwater model as a place holder, until the USGS groundwater model is complete later in the year, at which time the DSS will be linked to that more updated model.

   The SPRNCA Water Needs study, and USGS groundwater model are not yet finalized. However, the final USGS Special Investigation Report being published by the USGS for the SPRNCA study will undergo final review by the Partnership during the first quarter of 2005. Final review of the groundwater model began in February 2005 and is expected to be completed by September.

Recommended Activities from 2004

Codes – Model Ordinance

A joint planning meeting between the County and the City of Sierra Vista and Huachuca City was convened to address the details of a proposed model water conservation ordinance. The draft model ordinance will serve as a template for both the County and cities within the sub-watershed to adopt specific water conservation requirements in their respective codes. In addition, the idea of a water conservation manual was initiated that will provide guidance to residential and commercial property owners, developers and jurisdictions on options and alternatives available to meet the new requirements, if adopted.

Incentives

The City of Sierra Vista and Cochise County provided rebates for the replacement of old toilets with low-flow toilets. As funding becomes available, other retrofit-rebate programs should be initiated. The City of Sierra Vista estimates that it is saving approximately 26 acre-feet a year annually, so far, through this program with over 940 toilets replaced over the last 4 years. Cochise County estimates that it is saving approximately 10 acre feet a year so far with 348 toilets replaced in 2004, the first year of the program.

Water Conservation Surcharges

Following meetings with the Arizona Corporation Commission members regarding conservation rates, the Partnership received a legal opinion that indicated a requirement for new legislation in order to implement excessive water use rates/surcharges. A white paper was drafted and discussed at both the Government Affairs Committee and the Partnership Advisory Commission meetings. A legislative file was opened by Senator Tim Bee, Senate Majority Leader, for the 2005 legislative session. Following the public community workshops on this issue, drafting of the salient points to be incorporated into legislation has begun.

Public Conservation Awareness

In addition to continued funding and expansion of the Water Wise Program, the Partnership conducted an extensive public outreach effort to gauge the public's awareness of the water conservation efforts of member agencies and USPP. Surveys were followed up with community connector meetings and public workshops. The outreach efforts are described in more detail in the Public Outreach chapter.

Public Facilities and School Districts

Water Wise Audits resulted in the Bisbee High School rescheduling a controller to more efficiently irrigate landscaping. It's estimated that perhaps over half an acre-foot of water a year may be saved as a result. The Apache Middle School's new drip irrigation landscaping is being managed by a PTO member and the students because of Water Wise efforts here.

Irrigated Agriculture Restrictions

Although a draft legislative proposal to create a modified Irrigation Non-expansion Area in the Sierra Vista Sub-watershed was developed and approved by the Partnership, there was a lack of a sponsor in the legislature.

Water Demand Management Tools

Cochise County assisted in a draft legislative proposal to give counties the authority to establish a "transfer of development rights" (TDR) program that could have the effect of geographically shifting demand to areas in the Sub-watershed that are better equipped, infrastructure-wise, to handle growth – areas on sewer, for example. This proposal should be introduced in the 2005 legislative cycle through the County Supervisors Association. In addition, alternatives in lieu of enabling legislation were explored and are proposed for 2005.

2005 WATER MANAGEMENT AND CONSERVATION ACTIVITIES

Every year, the Partnership strives to report in a cohesive manner on the water management activities of its member agencies. The Section 321 Report transmitted to Congress in 2004 helped the Partnership further refine the project "areas" where its members are having the greatest impact on achieving sustainable yield, as defined in the report and in earlier chapters of this plan. These nine project areas, ranging from Conservation Measures to Vegetation Management, now provide the basis by which water management activities will be categorized, evaluated and accounted for in future Section 321 reports to Congress.

This chapter will, by project area, summarize recurring projects and list those activities that will begin in 2005 as committed and/or funded projects by one or more member agencies. There is also a listing of projects that are not yet funded, but may seek funding and support from the Partnership later in the calendar year. These tables may not be representative of all potential member or USPP projects/activities that may occur in 2005. The list of unfunded projects are illustrative of the kinds of activities that may be pursued by a particular agency and may serve as the basis for 2006 funding requests by the Partnership. However, before the Partnership commits support to any one specific unfunded member agency project, that project will be subject to a review by USPP for its technical merits and feasibility through a rigorous challenge cost-share process. Finally, this chapter includes a map showing the approximate location of the listed "Funded" projects throughout the sub-watershed (Figure 2).

Note: Quantities of savings or yield summarized in the tables below are estimates only and should not be construed as official tallies for the purposes of a water budget. They were reported by member agencies as estimates and were intended for comparison purposes only. Member agencies should be contacted directly for questions, details or status of any project listed in this plan.

Project Area: *Conservation Measures*

This project area captures those activities by member agencies that seek to either reduce existing uses or avoid future use within their institutions through conservation. These activities should reduce the amount of water currently being pumped or that could be pumped from the aquifer in the future. Recurring activities in this category listed in the 2004 plan include measures by Fort Huachuca to decrease existing uses through leak detection and replacement of old infrastructure, creating post-wide policies to restrict residential landscape watering to two times per month and replacing evaporative cooling with air conditioning, among others. Following is a list of new projects to be undertaken by member agencies in 2005 that require no further funding or approvals.

2005 Funded *Conservation Measures* Activities

ACTIVITY	DESCRIPTION	YIELD OR BENEFIT	MEMBER AGENCY
Convert turf sports fields to artificial turf	Reduce irrigation through replacement with lower new generation artificial turf. Drain system also generates urban runoff for reuse and recharge.	5 ac ft/yr per project plus urban runoff for reuse or recharge	Fort Huachuca
Reduce irrigation on Fort Huachuca Golf Course	Replacement and modernization of irrigation system	100 ac ft/yr	Fort Huachuca

Purchase of Conservation Easements (Precluding Future Ag or Subdivision)	BLM and TNC are working to limit future subdivision or irrigation on key habitats near SPRNCA on private lands through conservation easements that place restrictions on their deeds, using Land and Water Conservation Funds.	0.15 (residential) to 5 ac ft/yr (ag) per acre under easement	The Nature Conservancy and BLM
Purchase of Land or Conservation Easements- Mexico	Acquire Los Fresnos Ranch working with Mexico partner agencies and organizations via land acquisition or conservation easements to conserve key habitats, and ground-water resources.	Protection of inflows from Mexico	The Nature Conservancy

Project Area: *Irrigated Agricultural Retirement*

This project area refers to Partnership members' efforts to retire existing irrigated agricultural operations in the sub-watershed. Irrigated agriculture is recognized as one of the highest water users in the sub-watershed, accounting for nearly 4000 acre-feet per year of consumptive use by agriculture in 1990. Since the year 2000, approximately 1139 acre-feet of agricultural pumping per year has been permanently retired through conservation easements purchased by the Bureau of Land Management, The Nature Conservancy and the Department of Defense. Another 3400 acre-feet of agricultural pumping remains in the sub-watershed.

2005 Funded *Irrigated Agriculture* Activities

ACTIVITY	DESCRIPTION	YIELD OR BENEFIT	MEMBER AGENCY
Purchase of Conservation Easements (Retire Existing Irrigated Ag)	DOD, TNC and BLM are working together to pay willing sellers to retire agricultural pumping on private lands through conservation easements that place restrictions on their deeds.	90 ac-ft/yr	The Nature Conservancy BLM, Ft. Huachuca

Project Area: *Effluent Re-Use*

Once effluent is processed by a wastewater treatment facility it is available either for recharge or re-use. Re-using effluent has the effect of replacing any pumping that would have otherwise occurred for an existing use, such as landscaping. Fort Huachuca has a recurring program of re-using effluent on its parade field, golf course and outdoor sports complex where an estimated 400-450 acre-feet of water a year is no longer pumped.

At this time no effluent re-use projects are planned by Partnership members for 2005.

Project Area: *Effluent Recharge*

If effluent is not being re-used, as mentioned above, then it is recharged into the aquifer to replenish the water that was taken out by pumping. The City of Sierra Vista's Environmental Operations Park recharged approximately 1867 acre-feet of water a year back into the aquifer in 2004. The City is seeking ways to increase the amount of effluent that reaches the park for recharge, as reflected in their proposed projects for 2005. The Fort also actively recharges its effluent into the aquifer and may one day be able to supplement its total with Huachuca City's effluent. The Fort's estimate of effluent recharge for 2004 is 520 acre-feet/year

(Section 321 Report). The City of Bisbee will be following suit in 2005 with the construction of its new wastewater treatment facility near Greenbush Draw.

2005 Funded *Effluent Recharge* Activities

ACTIVITY	DESCRIPTION	YIELD OR BENEFIT	MEMBER AGENCY
Bisbee Wastewater Reclamation Project	Treats and recharges City's wastewater into Greenbush Draw	600 ac-ft/yr	Bisbee
Golden Acres Interceptor Sewer Project	Connects into SV's existing sewer lines	62 ac ft/yr	Sierra Vista

The following table lists those projects and activities that are planned but are in need of funding. These projects will be reviewed further in 2005 for their technical merits, feasibility and whether or not they warrant funding or support from the Partnership.

UnFunded *Effluent Recharge* Activities

ACTIVITY	DESCRIPTION	YIELD OR BENEFIT	MEMBER AGENCY
Huachuca City Wastewater Reclamation Project	Transfer of wastewater from Town of Huachuca City to Fort Huachuca Recharge Facility for treatment and recharge.	up to 170 ac ft/yr	Fort Huachuca and Huachuca City
Bio-Solids Dewatering System Project	Construct dewatering beds for waste bio-solids (sludge) at the City's Water Reclamation and Effluent Recharge Facility at the Environmental Operations Park.	100 ac ft/yr	Sierra Vista

Project Area: *Storm Water Recharge*

Storm water retention and detention basins and check dams have been used for years to control flooding and run-off caused by impervious surfaces in development - a legitimate concern of cities and county flood control districts. Urbanization increases flooding and downstream erosion and the Partnership has come to understand the potential, as a secondary benefit, for effectively recharging storm water run-off back into the aquifer instead of allowing it to flow out of the system. Very preliminary analyses estimate storm water recharge in ephemeral channels from urbanization in the sub-watershed to be approximately 3200 acre-feet a year. There are issues to address with this technology, such as making sure that storm water recharge does not adversely affect natural flood regimes. The Partnership is committed to studying and locating the best areas for storm water capture and recharge, as well as monitoring the impact of recharge on the aquifer.

Storm water projects completed to date include state of the art basins and infiltration galleries that recharge, in average rainfall years, an estimated 370 acre-feet a year on Fort Huachuca and its East Range per Section 321, and an estimated 697 acre-feet a year in basins reported by the City of Sierra Vista for the year 2004. Check dams have been employed by the County and City of Sierra Vista as well as berms by the Bureau of Land Management (BLM) in an effort to decrease erosion and increase infiltration of run-off.

Cochise County is funding a study of the Hereford-Moson Road area to investigate the feasibility of storm water recharge basins in each of the major washes that intersect this region. Funding and Partnership support

will be sought for the design and construction of basins once the study is completed. The City of Sierra Vista's Surface Water Plan, pending funding, will be revised to include more specific details for places like the confluence of Garden Canyon Wash and Summit Wash within the City. Pending funding and Partnership support, this effort may also include the participation of the Hereford NRCD to create a linear park along South Garden Canyon Wash that would employ storm water recharge technology.

2005 Funded *Storm Water Recharge* Activities

ACTIVITY	DESCRIPTION	YIELD OR BENEFIT	MEMBER AGENCY
Hospital Roof Top Storm Water Capture	Roof top capture and diversion into sanitary sewer for recharge and re-use.	0.04 ac-ft/yr	Fort Huachuca
South Garden Wash Storm Water Basin Project	Construction of a new storm water detention/retention basin on Fort	To Be Determined	Fort Huachuca
City School Property Basin	Located near Hwy 90 / Charleston Rd intersection	23 ac-ft/yr	Sierra Vista

The following table of unfunded projects is illustrative only of the types of storm water recharge activities that may be considered for support by the Partnership during 2005 and beyond. Specific requests by member agencies for support will be subject to a rigorous technical and feasibility review by the Partnership to ensure the most prudent use of Partnership resources before funding support is granted.

Unfunded *Storm Water Recharge* Activities

ACTIVITY	DESCRIPTION	YIELD OR BENEFIT	MEMBER AGENCY
Summit/South Garden Wash Confluence Storm Water Basin Project	Located at the confluence of the Summit Drainageway and the S. Garden Wash, just north of Avenida Cochise near Home Depot, construction of a new storm water detention/retention basin within the City of Sierra Vista.	189 ac ft/yr	Sierra Vista
Chaparral Village Basin	Located between Hwy 92 and Avenida Del Sol	122 ac ft/yr	Sierra Vista
Surface Water Plan And Update	Revision of this plan to review basin locations and potential recharge yield. Estimate channel recharge resulting from urbanization and effect of basins on downstream flooding.	n.a.	Sierra Vista
Miracle Valley Detention Basin	A dual basin system that detains pre-development storm water runoff and captures some additional post-development runoff for flood/erosion control and recharge.	13.4 ac ft/yr	Cochise County
Moson Road Area Detention Basins	6-12 basins to "meter" storm water runoff so as to maximize contact time within the natural washes, thus increasing recharge capabilities and allowing of the post-development runoff.	To be determined	Cochise County

Garden Canyon Linear Park	Employ storm water recharge facilities like gabions, plunge pools, infiltration trenches, injection wells	To be determined	Hereford NRCD
Grace McCool Wash recharge and flood control project	Construction of several small detention basins, construction of several types of check dams along main wash and tributaries, removal of brush and seed with native grasses to improve natural stormwater infiltration and support cattle grazing.	To be determined	Hereford NRCD

Project Area: ***Public Education***

Although difficult to quantify potential water savings, public education is an important tool in creating a "culture of conservation" as noted by Governor Napolitano at the 85th Town Hall in the fall of 2004. The University of Arizona's Cooperative Extension program, Water Wise, continues to be supported by the Partnership and funded by some of its members as the flagship of public education for water conservation. The funding of an auditor position with Water Wise in 2004 has greatly enhanced their ability to quantify public education efforts. Another recurring activity is the voluntary participation by local restaurants and hotels in the County's Hospitality Program. This program educates visitors and local residents alike on the area's water issues through participants agreeing to use signage reflecting serving of water only on request or changing linen once per 3 days at hotels. Participants also agree to Industrial, Commercial and Institutional (ICI) water audits and other practices to save water. Following is a table of new, funded projects committed to by member agencies for 2005.

2005 Funded *Public Education* Activities

ACTIVITY	DESCRIPTION	YIELD OR BENEFIT	MEMBER AGENCY
Developers' Guide	Manual in conjunction with Model Ordinance to guide developers in water conservation techniques and technology	To be determined	Cochise County
Industrial, Commercial, Institutional Water Audits	Non-residential enterprises that have had an ICI audit can apply for grant for matching funds to implement ICI recommendation	To be determined	Fort Huachuca
Water Conservation Kits for Schools	Kits with water conservation fixtures to target areas on septic handed out in schools as part of Water Wise program	To be determined	Fort Huachuca and Water Wise

Following is a table of projects and activities that may seek Partnership support and funding in 2005 or beyond for Public Education activities.

Unfunded *Public Education* Activities

ACTIVITY	DESCRIPTION	YIELD OR BENEFIT	MEMBER AGENCY
Television Educational PSAs	As part of Water Awareness Month, proposal to air 3 15-30 second educational spots on television in SV area.	To be determined - part of educational outreach efforts yield	Cochise County and Water Wise
Rainwater Harvesting Demonstration	Rainwater harvesting demonstration project at UofA South Observatory and Plant Sciences Center, using a 660 gal. corrugated pipe cistern and 550 gal polyethylene tank to collect rainwater.	To be determined - part of educational outreach efforts yield	Cochise County and Water Wise

Project Area: ***Incentives (Rebates)***

This project category provides residents a way to be compensated for voluntary measures to conserve water. The City of Sierra Vista as well as Cochise County have ongoing programs that provide residents a rebate for changing out their older, high flow toilets with a low flow toilet. The Partnership has been a source of funding for these programs and several member agencies are proposing similar programs in 2005. The following table highlights projects that will seek funding this calendar year.

Unfunded *Incentive (Rebates)* Activities

ACTIVITY	DESCRIPTION	YIELD OR BENEFIT	MEMBER AGENCY
Rainwater Harvesting Rebate Program	100 - $50 rebates on a 500+ gallon cistern and/or materials for the collection of rainwater on residential or commercial properties	To be determined	Cochise County and Water Wise
Home Retrofit Program	Free residential program to modify high-flow water fixtures into low-flow units.	2 ac ft/yr	Sierra Vista
Evaporative Cooler Exchange Program	Up to a $200 rebate to replace evaporative coolers with a standard air-conditioning unit. This equates to an approximate household annual water savings of 10,000 gallons.	4.6 ac ft/yr	Sierra Vista

Project Area: ***Codes***

Partnership research and public involvement efforts in 2004 revealed that many residents throughout the sub-watershed support both voluntary and mandatory measures for water management and conservation. The project category Codes would be the regulatory mechanism by which the County and the cities in the sub-watershed could employ water conservation measures on new development. An intercept survey conducted early in the year showed that 46.6% of respondents would accept increased regulation to save water. In a series of Community Connector meetings held in the spring, 74.8% of participants supported regulation through codes.

Over the last several years, the County has investigated numerous regulatory measures used in other jurisdictions around the nation ranging from limitations on residential and commercial irrigated turf to requiring rainwater capture on every new residence. These proposed measures have been the basis of discussion between the County and the four cities in the sub-watershed through a joint planning process. In 2004, the Partnership, as well, committed to the idea of developing a model ordinance of measures that may be adopted by all of the jurisdictions. The City of Sierra Vista already has a number of these water conserving standards adopted in their code which may further serve as a model for the other cities. In 2002 Cochise County adopted site development standards requiring waterless urinals and drought-tolerant landscaping in new commercial development as well as and pool covers on all pools. These standards continue to be enforced.

In addition to water conserving standards for new commercial and residential development, the category of Codes includes proposals to better manage growth in the sub-watershed. Growth management is a way to ensure that future development is a part of the solution rather than a part of the problem. One tool to accomplish this is the transfer of densities from areas where pumping could impact river flows to areas where newly generated effluent could be recharged more effectively into the aquifer. The following table highlights the Code activities committed to in 2005 by member agencies.

2005 Funded *Code* Activities

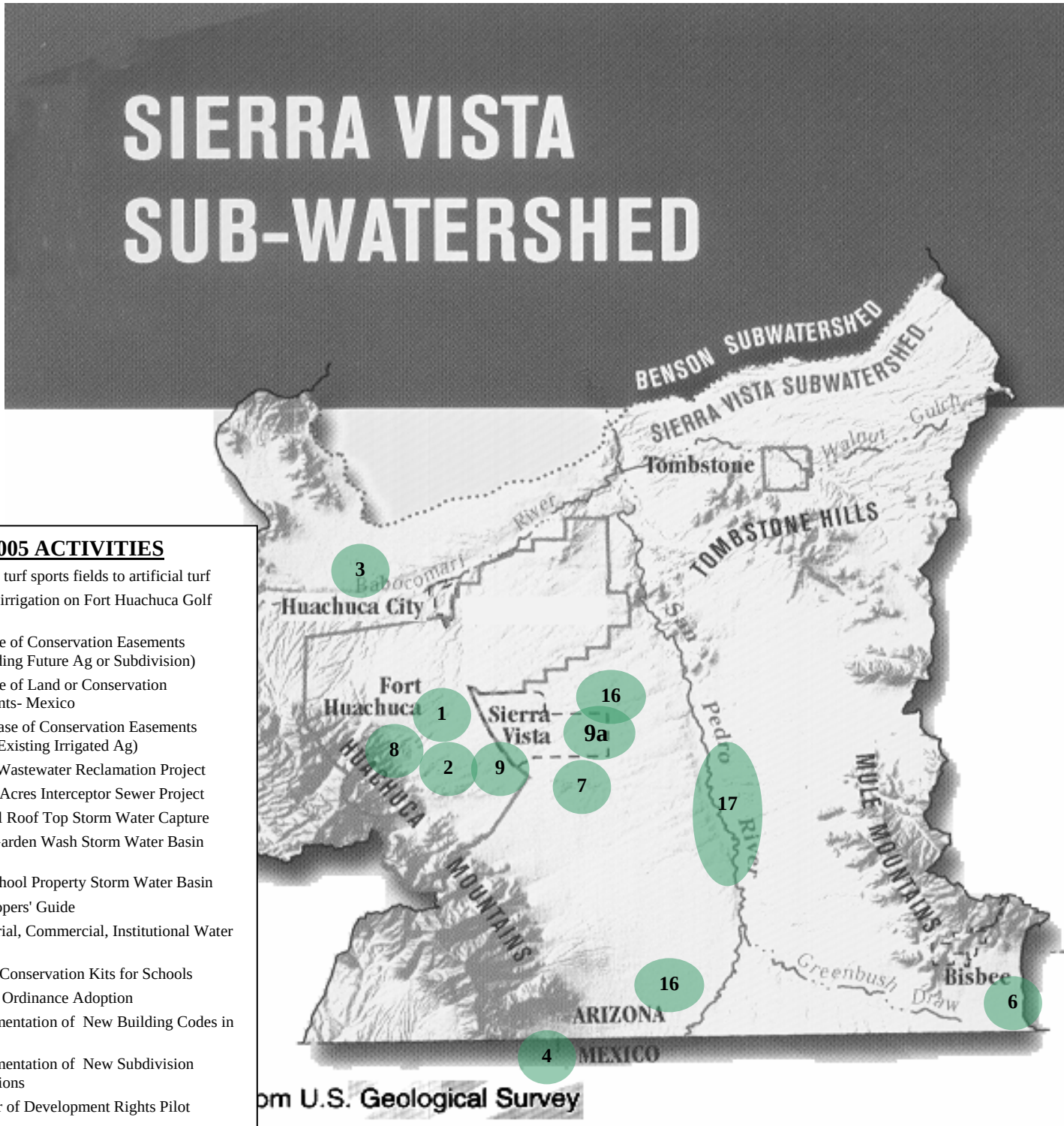
ACTIVITY	DESCRIPTION	YIELD OR BENEFIT	MEMBER AGENCY
Model Ordinance Adoption	Adoption of additional water conservation codes that may include prohibition of water features, misters; require interior pipe insulation and hot water on demand; gray water plumbing; limitations on turf and turf irrigation; standards for evaporative cooler installation; requirement for rain sensors to turn off irrigation systems.	To be determined	Cochise County and other jurisdictions
Implementation of New Building Codes in County	Adopted in 2004, will implement International Building Code (IBC) for new construction. This will be a mechanism by which certain water conservation standards may be adopted and enforced.	To be determined	Cochise County
Implementation of New Subdivision Regulations	Adopted in 2004, will enforce water conservation standards for common areas in new subdivisions.	To be determined	Cochise County
Transfer of Development Rights Pilot Project	Establishment of a voluntary, local, market-based TDR pilot project to transfer potential residential densities away from the river and into an area where effluent can be captured and recharged.	19 ac ft/yr	Bella Vista Ranches and The Nature Conservancy

Project Area: *Vegetation Management*

This project area is focused on those activities generally undertaken by land management agencies, like the Bureau of Land Management (BLM), the Forest Service or Natural Resources Conservation District (NRCD). These activities are generally multi-purpose, but of primary concern to the Partnership is the ability of these projects to enhance infiltration of rainfall and natural recharge. Examples of recurring projects in this category are the restoration of agricultural fields, grazing allotment management plans, and upland vegetation restoration. The BLM is proposing in 2005 to implement prescribed burns in the SPRNCA to reduce brush invasion and increase grassland health. The benefits projected for this project are increased infiltration of rainfall into the aquifer and reduced consumption by mesquites. Future modeling efforts should better quantify actual yields. The project is summarized below.

2005 Funded *Vegetation Management* Activities

ACTIVITY	DESCRIPTION	YIELD OR BENEFIT	MEMBER AGENCY
Prescribed Fires and Fuels Reduction Project	Re-introduce controlled fire to allow natural processes that reduce brush invasion, lower the risk of catastrophic fire & increase grassland health, mown fuel breaks & remove dead & down materials.	136 ac-ft/yr	BLM



2005 ACTIVITIES

1. Convert turf sports fields to artificial turf
2. Reduce irrigation on Fort Huachuca Golf Course
3. Purchase of Conservation Easements (Precluding Future Ag or Subdivision)
4. Purchase of Land or Conservation Easements- Mexico
5. *Purchase of Conservation Easements (Retire Existing Irrigated Ag)
6. Bisbee Wastewater Reclamation Project
7. Golden Acres Interceptor Sewer Project
8. Hospital Roof Top Storm Water Capture
9. South Garden Wash Storm Water Basin Project

9a. City School Property Storm Water Basin

10. *Developers' Guide
11. *Industrial, Commercial, Institutional Water Audits
12. *Water Conservation Kits for Schools
13. *Model Ordinance Adoption
14. *Implementation of New Building Codes in County
15. *Implementation of New Subdivision Regulations
16. Transfer of Development Rights Pilot Project
17. Prescribed Fires and Fuels Reduction Project

* activities that have sub-watershed wide application or no specific location identified yet and may not be depicted on the map.

This map represents projects already committed to by member agencies and reported to the USPP, but may not be representative of all water conservation and management projects occurring in the Sierra Vista Sub-watershed.

Figure 2

2005 STUDIES AND APPRAISALS

An important agreement established at the inception of the Partnership was that policies and recommendations would be based on sound science. In pursuit of data and an understanding of the region's hydrologic characteristics, the United States Geologic Survey (USGS), the Agricultural Research Service (ARS), Bureau of Land Management (BLM), Fort Huachuca and other outside entities are conducting important studies. We have learned that the aquifer system is more complex than has been assumed in the past, and that these complexities appear to explain variations in water levels and stream flow from year to year. Partnership studies are exploring these complexities, and are providing new data, information, and knowledge that will help us better quantify how the system responds to climate change, pumping, and riparian-zone changes. These studies are describing many aspects of the Sub-watershed: the physical characteristics of the aquifer and how they interact; the distribution and densities of vegetation types in the SPRNCA and quantification of how much water they respectively use and require to remain healthy; where, when, and how much recharge is occurring; and how the river, the aquifer system and the riparian vegetation are related.

INVESTIGATIVE STUDIES BY THE USPP AND ITS MEMBER AGENCIES			
Scientific and Technical Research			
Name of Study	**Brief Description**	**Responsible or Assisting Agency**	**Funding Agency**
SPRNCA Water Needs	Objectives: 1) Determine the spatial and temporal water needs of riparian vegetation to ensure its long-term ecological integrity, 2) Quantify total consumptive water use of riparian vegetation, and 3) Determine the source of water consumed by key riparian plant species. A scientific investigation report will be published by the USGS this year with the final results of this interagency study.	ARS USGS Arizona State University SAHRA (UofA) University of Wyoming	USPP USGS Fort Huachuca SAHRA ARS
Augmentation studies	Objectives: 1) Development of an appraisal study for stormwater collection, storage and utilization options. 2) Updating of the 1992 CAP augmentation appraisal study. 3) Summary, comparison, and prioritization of all USPP augmentation studies to date.	Bureau of Reclamation	USPP
Infiltration in ephemeral channels	Prediction of where infiltration is more or less likely to occur in ephemeral channels near Sierra Vista, based on channel width, vegetation, and mapping of electrical conductance.	USGS	USPP/USGS
Comparison of runoff from developed and undeveloped watersheds	Drainage and land cover surveys, and analysis of rainfall-runoff data from new USGS stream gages and ARS raingages from two small watersheds: one urban, and one undeveloped. Comparison with similar data from Walnut Gulch for a small watershed with rural low density residential development.	ARS/USGS	ARS/USPP
Refined estimate of increase in recharge due to urbanization in SV sub-watershed	Analysis of 2001 landcover data to refine extrapolated estimates of the increase in recharge due to urbanization for the SV Subwatershed	ARS	ARS

Development of Partnership Planning Tools			
Name of Study	**Brief Description**	**Responsible or Assisting Agency**	**Funding Agency**
Ground-water model development	Completion of an improved MODFLOW groundwater model based on new empirical data that can be used to determine how the ground-water system will respond to resource development and management scenarios.	USGS	USPP
Evapotranspiration modeling	Maintenance and improvement of the GIS-based tool to predict ET losses under various vegetation management scenarios within the SPRNCA.	ARS	ARS
Decision Support System	Refinement of a user-friendly interface that integrates ground-water model results with other Partnership studies and data sources to allow decision-makers to explore specific "what-if" scenarios regarding various water conservation and use alternatives.	SAHRA (UofA)	SAHRA USPP
Monitoring Programs			
Name of Study	**Brief Description**	**Responsible or Assisting Agency**	**Funding Agency**
Regional aquifer monitoring for Section 321 reporting	Basin-wide monitoring to detect changes in groundwater storage, vertical gradients, and outflows including: well and micro-gravity measurements, streamflow, and spring flows.	USGS	USGS/USPP
Alluvial aquifer monitoring for Section 321 reporting	Monitoring of groundwater levels in the alluvial aquifer with shallow piezometers and deep wells.	BLM	BLM/USPP
Precipitation monitoring	Installation of new precipitation gages in urban areas and along the riparian corridor. Production of an annual precipitation map for the SV subwatershed. Input of rainfall observations as observed by public via a web site (scope of public participation being considered by USPP outreach Comm.)	ARS/USGS/USPP	ARS/USPP/SAHRA
Evapotranspiration monitoring	Monitoring of ET, vadose zone, water table, and meteorology in sacaton, sacaton/mesquite, and mesquite bosque habitats. Production of an annual map of vegetation change occurring from BLM management. Improved annual estimates of SPRNCA's total consumptive water use will be available in mid-2006.	ARS	ARS
Detention basin monitoring	Installation of stage recorders in four detention ponds to produce annual detention pond water balance estimates for each pond.	ARS	ARS
Riparian vegetation monitoring	Periodic monitoring of riparian vegetation condition and comparison with baseline estimates, as established in the SPRNCA Water Needs Study.	BLM	BLM
San Pedro Community Monitoring Network	Production of annual maps showing spatial distribution of surface flows along the mainstem San Pedro during June, each year.	The Nature Conservancy BLM	BLM

2005 PARTNERSHIP PLANNING TASKS

In addition to the recommendations for water management and conservation actions, the Partnership has several planning tasks to address every year in order to move forward on its objectives and reporting requirements to Congress per Section 321. These planning efforts will be addressed by the various committees and serve as the underpinning of future decisions. As always, new information and technology will continually enhance the Partnership's ability to make informed decisions and recommendations. The tasks for 2005 are:

1. Challenge Cost-Share Review Process for 2005 Projects/Activities: How the Partnership will expend funds slated for 2005 projects will be the focus of a review process that will consider individual agencies' requests for support. The process will entail a technical and feasibility review of each project requesting USPP funding by the Technical Committee and Staff Working Group. Recommendations from these committees will then be forwarded to the Partnership Advisory Commission for a final decision on how Partnership resources will be spent this calendar year.

2. Long-Range Planning and Budget Cycle: The Partnership has reached a point where longer range planning, project funding requests and the budget cycle would better serve the USPP's ability to request funding, as well as approve, support and implement water conservation and management strategies. The Administrative Committee has restructured the budgeting process so that the Partnership's budgeting year is the same as the federal fiscal year (October 1 to September 30). A long range plan would establish the crucial timeframes within a given calendar year to address the Partnership's funding needs and expenses, as well as the challenge cost-share process where member agencies propose projects needing Partnership support (Figure 3). A long range plan would also facilitate the USPP's Section 321 annual reporting requirements to Congress and eliminate duplicate efforts to produce an annual work plan and the Section 321 report.

3. Storm Water Recharge Planning and Coordination: As noted earlier in the plan, the Partnership has come to understand the potential for effectively recharging storm water run-off back into the aquifer. Studies regarding this potential have been completed, yet more work needs to be done to better understand and choose how and where storm water recharge would have the greatest benefit. The Bureau of Reclamation (BOR) has committed to doing a preliminary evaluation and summary of storm water collection, storage and utilization ideas on a basin-wide scale, as well as develop an appraisal level analysis of several alternative concepts. Their work will be greatly enhanced through a coordinated effort with the County, City of Sierra Vista, Fort Huachuca, Bureau of Land Management, USGS, Agricultural Research Service, the Hereford NRCD and consultants – all of whom have a stake in this important strategy.

4. Bureau of Reclamation Augmentation Appraisal Studies' Screening Process: In 2005, the Bureau of Reclamation will summarize all reports and augmentation studies that have been completed to date for the Partnership and, with the assistance of USPP members, develop a screening process for these alternatives based on effectiveness, implementability and cost.

5. 2005-2006 Legislative Proposals: Water and land use legislation will be actively monitored and supported where appropriate, such as transfer of development rights enabling legislation and excessive water use surcharge legislation.

6. DSS and Ground-Water Model: These important models will be used to prioritize funding and locations for USPP projects, used as a tool to help meet reporting requirements for Section 321, and used for outreach education efforts and other internal decision-making.

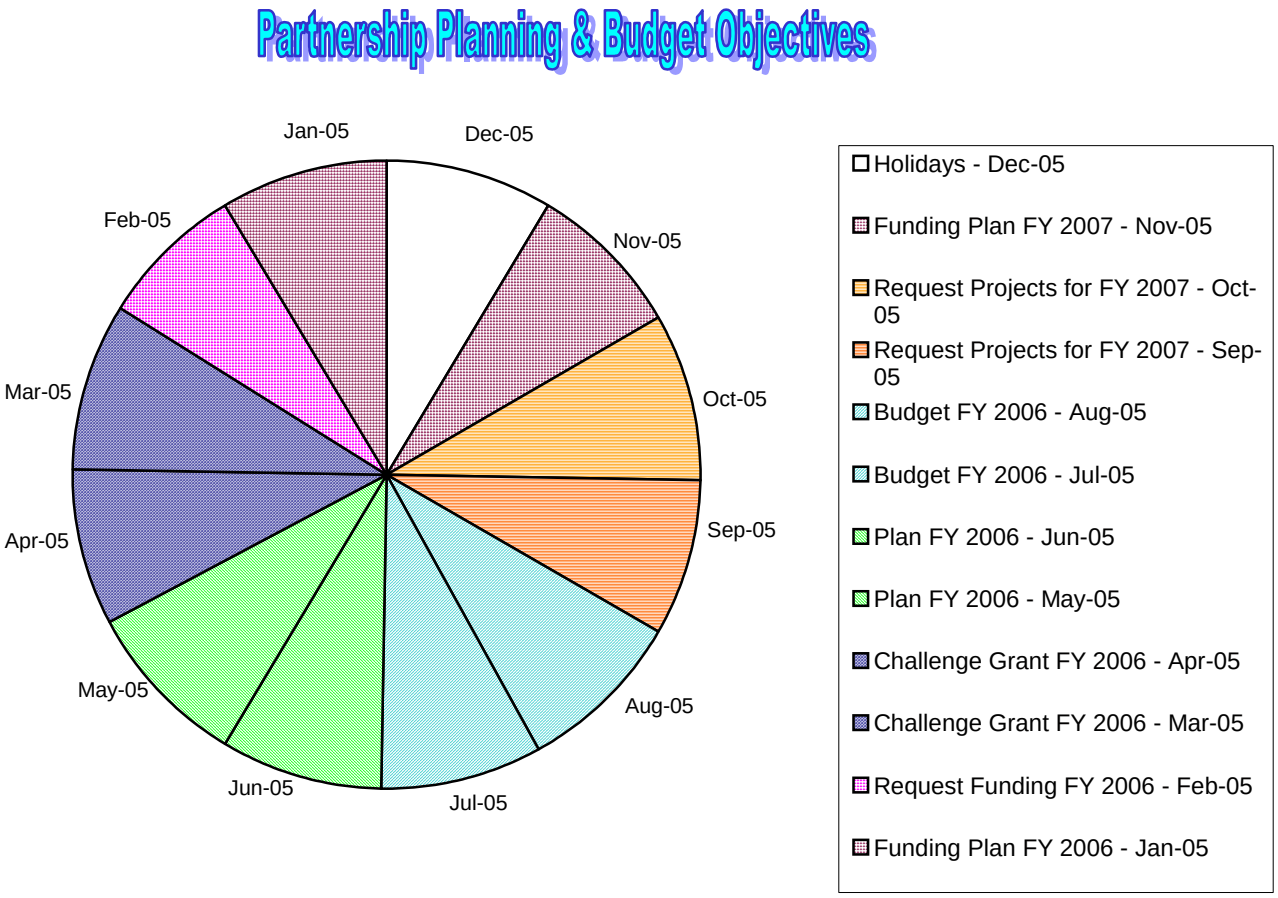

Partnership Planning & Budget Objectives
Jan-05
Dec-05
Feb-05
Nov-05
Mar-05
Oct-05
Apr-05
Sep-05
May-05
Aug-05
Jun-05
Jul-05
Holidays - Dec-05
Funding Plan FY 2007 - Nov-05
Request Projects for FY 2007 - Oct-05
Request Projects for FY 2007 - Sep-05
Budget FY 2006 - Aug-05
Budget FY 2006 - Jul-05
Plan FY 2006 - Jun-05
Plan FY 2006 - May-05
Challenge Grant FY 2006 - Apr-05
Challenge Grant FY 2006 - Mar-05
Request Funding FY 2006 - Feb-05
Funding Plan FY 2006 - Jan-05

Figure 3

PARTNERSHIP OUTREACH AND COMMUNICATION

In 2004, the Partnership implemented an extensive public outreach program to engage residents throughout the Sierra Vista Sub-watershed in discussions about water issues. The intent of the program was to work with the community in developing a plan that would meet the water needs of area residents while protecting the San Pedro River.

Outreach Program Overview

1. Intercept Survey

The first step in this program was a face-to-face intercept survey conducted by the Cochise College Center for Economic Research in late winter, 2003 and spring, 2004 throughout the Sierra Vista Sub-watershed area. The survey's purpose was to establish a baseline of attitude and awareness against which future responses could be compared. The survey measured public perceptions of:

- water conservation as a value, particularly as compared to other community issues (e.g. school funding, road repair, etc.)
- the extent and nature of the issue—factors that impact water use;
- awareness of the Partnership itself—understanding of what it is and, whether or not it is effective, credibility; and
- willingness to support potential categories of solutions

Approximately 400 surveys were collected with representation from the communities of Bisbee, Hereford/Palominas, Huachuca City, Sierra Vista and Tombstone. Overall the survey found that respondents:

- were concerned with water issues;
- viewed individual action as the most important factor in conserving water;
- viewed replacing high-use water fixtures in the home and accepting increased water regulation as key priorities; and
- cited the protection of the San Pedro River and protecting the future of Fort Huachuca as the two key reasons for water conservation

2. Community Connector Meetings

The second step in the outreach program involved conducting as series of Community Connector meetings -- small group gatherings hosted by residents throughout the sub-watershed. Held in May 2004, these neighborhood gatherings involved presentations by Partnership representatives and discussion of water topics facilitated by KezziahWatkins, an independent company specializing in public participation. The meeting "hosts" were chosen on the basis of representing a balanced grouping of professions, interests, and geography.
The purpose of the Community Connector meetings was three-fold:

- to provide participants with information about the sub-watershed system, its water issues, and the work of the Upper San Pedro Partnership to date;
- to solicit participants' preferences related to the most appropriate overall approach to managing water issues; and
- to get their response to and thinking about a list of possible strategies under consideration by the Partnership.

Both qualitative and quantitative response was solicited from participants through the Community Connector meetings. Following a brief presentation of information, a facilitated discussion was held with participants about possible approaches and actions that could be taken to address local water issues. Following the discussion, all

participants were asked to complete a response form which asked them to rate specific strategies. All of the questions people asked were recorded and tracked by KezziahWatkins.

A number of consistent themes emerged from the Community Connector discussions:

- *The overriding value of fairness*
  The fairness and equitable application of any measure to manage water came up frequently in the Community Connector meetings, both through discussion and in written response. Strategies that are perceived to be inequitable will without question be challenged and those that are considered even-handed are far more likely to be supported.
- *The need for information*
  People are eager for more information about water issues. Many said they – and many of their friends - are not convinced there is a water problem, and expressed an interest in knowing more. They also suggested the Partnership or some local agency sponsor an ongoing informational campaign to help people better understand the area water situation and individual actions that can be taken to improve it.
- *Rural versus urban perspectives*
  In some meetings, it was apparent that people who farm, ranch, and live in the rural County and those who live and work in the more urban center of Sierra Vista have very different perspectives on water issues. There seemed to be an attitude of "us" versus "them" that ran both ways and could be detrimental to reaching consensus and securing support for member agency activities and Partnership plans.
- *The voluntary versus mandatory divide*
  Residents in these sessions offered strong support for both voluntary and mandatory measures in water management and conservation, and seemed to be relatively evenly divided in their perspectives. As the Partnership and its member agencies move forward, it will help to document what types of strategies have been tried and which have produced results.
- *A distrust of public institutions*
  Many Community Connector participants expressed a significant level of skepticism that government and other public agencies such as schools will actually do what they say they will do, especially when it comes to use of funds. This attitude is reflected in the strong preference expressed for conservation and recharge to be paid for through water and sewer rates rather than through taxation.
- *Do we need a change in state legislation?*
  Repeatedly in these meetings, people asked about what Arizona state law does and does not allow when it comes to water management and managing growth. People were interested in issues related to: water availability's relationship to approval of development density; local jurisdictions' role in the management of water and development; local control related to water issues; and the roles and responsibilities of developers and authorizing jurisdictions with respect to water.

Finally, all Community Connector participants were asked to rate on an individual response form their level of support for 11 different water management strategies.

<u>Strategies with the most support</u>
- Replacement of high-use water fixtures
- Regulate water through codes
- Charge for excessive water use

<u>Strategies with the least support</u>
- Increase taxes for water conservation
- Increases taxes for water recharge

- Get additional water sources

Eleven privately hosted Community Connector meetings and four open Connector meetings hosted by the Partnership were held in Bisbee, Hereford/Palominas and Tombstone. Approximately 300 people attended the meetings.

3. Community Workshops

The final step in this outreach program was a series of three Community Workshops. Workshops were held in November 2004 in Bisbee, Hereford/Palominas and Sierra Vista. A total of 92 people attended the workshops, including 12 at the Hereford/Palominas workshop, 22 in Bisbee and 58 in Sierra Vista.

The purpose of the Workshops was to provide participants with answers to many of the questions asked during the Community Connector meetings and solicit input on two specific water management strategies. Working in small groups, participants were asked to comment on a charge for excessive water use and a Transfer of Development Rights (TDR) program.

The agenda for each of the three workshops included the following:

- A re-cap of each step in this public outreach program, as well as a summary of the results of the Community Connector meetings;

- A presentation that defined the nature and severity of the sub-watershed water problem;

- Information about charge for excessive water use and about the transfer of development rights was then provided;

- Small group discussion and completion of group response forms related to each strategy, which were then reported to all Workshop participants; and

- Individual completion of a response form that asked participants to indicate their priorities for action on a list of 12 codes and ordinances under consideration by the Partnership.

<u>Charging for excessive water use responses</u>

Workshop participants were asked whether or not a charge for excessive water use was a strategy worth pursuing. The groups that responded "yes" were then asked to offer their suggestions for fairly defining the term "excessive," and who should be responsible for enforcement of such a strategy.

An overwhelming majority of participants supported this strategy. All of the 17 groups, representing 92 participants, reported they believe it is an idea worth pursuing; however, one individual in one group said it was not worth pursuing. There were consistent themes that emerged from the groups' response to the question posed to them about how they would fairly define "excessive."

- Every group recommended that some sort of baseline be established. There was most support for establishing the baseline by household. Some groups also suggested establishing it by area, and by establishing a per capita average.

- Once the baseline is established, most groups defined "excessive" as a consistent amount over that baseline.

- Some of the groups suggested a tiered rate system be established, so that charges increase proportionally according to use.

- Echoing a theme from the Community Connector meetings, some of the groups mentioned fairness in their responses about the excessive use charge.

Another issue frequently recommended was a system that rewards water conservation in addition to punishing for excessive use. While not specifically asked, 7 of the 17 groups mentioned private wells, with the indication that they believe that a surcharge for excessive use, if enacted, should apply to well users as well as those served by water companies.

Transfer of Development Rights responses

During the group discussion of a Transfer of Development Rights (TDR) program participant groups were asked to list the three most important advantages of a TDR program as well as the three most important disadvantages.

Those who supported the concept felt that the program could provide protection to the San Pedro River and the sensitive rural areas around it. They also felt it would increase the number of homes on water/sewer systems and storm water management opportunities, resulting in increased water recharge and capture. Under disadvantages participants noted concern that there might not be a positive impact on the aquifer and on growth. There was also concern related to creating higher densities in urban areas, potential impacts on property rights, inheritance rights and property values. There was also confusion over how the program might be enforced and administered.

Using the Information

The Partnership will use the results of this extensive public involvement process in development in its ongoing water management and conservation plans. Results from the 2004 outreach effort will also help the Partnership identify public information needs and measure the effectiveness of future outreach efforts.