Securing Water for Environmental Purposes: Establishing Pilot Programs

Sharon B. Megdal, University of Arizona, Arizona, USA
Joanna Bate, University of Arizona, Arizona, USA
Andrew Schwarz, California Department of Water Resources, California, USA

Abstract: This paper focuses on programs that provide water for the environment through direct check box donation programs or through voluntary municipal water conservation. Existing water conservation programs may not effectively target water users that are motivated by environmental concerns. Megdal et al. (2006) recognized the ongoing need for supplemental inputs of water in riparian restoration projects, which are increasingly common. Also, public concern surrounding the need to protect natural water flows is growing (Katz, 2006). In recent papers, the authors proposed a mechanism by which voluntary municipal water conservation could provide funds to cover the cost of acquiring and delivering water to environmental enhancement projects (Schwarz and Megdal, 2007; Megdal, 2008). These studies explored some of the basic elements as well as challenges involved in implementing this concept. Further, the study identified a need to implement one or more pilot projects using the "Conserve to Enhance" mechanism. Some cities have check box donation programs that generate a new source of funding to pay for riparian restoration projects. Existing check box programs demonstrate some of the critical elements previously identified for successful program development. Through outreach conducted across Arizona over the past year, stakeholders have helped to identify local opportunities and challenges for implementing the concept. Stakeholders have also generated possible variations on the original mechanism that reflect their local setting. This paper describes the Conserve to Enhance mechanism as well as check box donation programs and offers recommendations for implementing this type of program.

Keywords: Water Conservation, Municipal Water Use, Environmental Water Needs, Environmental Restoration, Check Box Fundraising Programs, Water Leasing Programs, Instream Flows

Introduction: Conserve to Enhance

AMIDST GROWING DEMANDS for water in almost all water-using sectors, meeting environmental water needs requires innovative strategies. Megdal, Lacroix, and Schwarz (2006) established that many environmental enhancement projects[1] in Arizona have ongoing needs for supplemental irrigation or secure water supplies. Growing public interest in protecting natural flows in rivers, returning water to the environment, and enhancing riparian habitats has supported several targeted fundraising efforts for meeting environmental water needs (Katz, 2006). With stakeholder input, Schwarz and Megdal (2007) developed a program concept that uses voluntary municipal water conservation

[1] Environmental enhancement projects are projects that improve the quality of the natural environment, often through restoration or revegetation efforts.

The International Journal of Environmental, Cultural, Economic and Social Sustainability
Volume 5, 2009, http://www.Sustainability-Journal.com, ISSN 1832-2077

to provide funds to support environmental water needs. This mechanism, called Conserve to Enhance, connects individual water use behavior with environmental concerns to generate funds for the purchase of water for the environment (Megdal, 2008; Schwarz and Megdal, 2008). This program has the potential to invigorate a community's water conservation efforts and support environmental enhancement projects.

As explained by Schwarz and Megdal (2008), the basic Conserve to Enhance program offers water customers the option of donating the money they save through water conservation to a fund that purchases water supplies for environmental enhancement projects. Thus, as individual households make voluntary reductions in their water consumption, these reductions are measured against prior year's usage for the same month. Participants pay for the higher level of usage, and the money saved by conserving water is deposited into the fund. The fund is used to purchase water for environmental enhancement such as instream flow rights or water transfers.

The perception that municipal water conservation does not directly benefit the environment, cited in Schwarz and Megdal (2008), may currently limit the effectiveness of water conservation initiatives[2]. A Conserve to Enhance program activates a new motivation for participating in water conservation, which has been identified as a low-cost source of water for future water needs (Gleick et al. 2003). This mechanism also generates a revenue stream to purchase water for the environment, thereby contributing to a region's environmental sustainability efforts. Because the water needed for environmental enhancement is often of a lower quality than that needed for municipal supplies, this program should lead to a more cost-effective distribution of available water supplies.

Schwarz and Megdal (2008) identify critical factors for successful implementation of a Conserve to Enhance program, drawn from stakeholder outreach and research of similar programs, such as green pricing, used by energy utilities. These factors include: use of a simple mechanism to account for conservation savings and related donations; an accounting method tailored to the local utility's billing system; an automatic donation system that ensures continuous participation; and demonstration of tangible results of the program[3].

The authors indicate that water providers or communities interested in implementing this concept might benefit from starting with a pilot program. A pilot would provide an opportunity to measure public support for buying water for the environment and build some of the necessary partnerships and administrative mechanisms for a larger program. Specifically, a pilot effort could involve testing the predictions made by Schwarz and Megdal (2008) about participation levels, conservation savings, and program revenues.

This paper discusses ongoing efforts to initiate a pilot program to pay for water for the environment using municipal water conservation efforts. This paper also reviews the development and success of existing check box donation programs that seek to protect or restore environmental flows in riparian areas. Based on these elements, guidance is provided for communities who are interested in implementing a voluntary, community-based program to pay for water for the environment.

[2] See Syme, Nancarrow, and Seligman (2000) and Bauman, Opitz and Egly (1992) for additional information.
[3] Schwarz and Megdal (2008) provide an in-depth discussion of the critical factors for implementation.

Stakeholder Outreach

As part of earlier phases of the project, project staff conducted multiple meetings with local stakeholders, which culminated in a stakeholder roundtable in February 2007 in Tucson, Arizona. These early outreach efforts sought to explain the concept and obtain general feedback about the proposed mechanism. Starting in the spring of 2008, outreach efforts were expanded to identify possible levels of interest in and obstacles to implementing a Conserve to Enhance program (Table 1). In addition, two half-day, interactive stakeholder workshops were held with the specific intent of identifying one or more communities to pilot a Conserve to Enhance program in Arizona.

Table 1: Outreach Presentations of Conserve to Enhance in 2008 and 2009

University of Arizona Water Resources Research Center	**April 2008**
Arizona Riparian Council Annual Meeting	April 2008
Tucson Stakeholder Workshop	September 2008
Watershed Management Group	September 2008
Arizona Hydrological Society/American Institute of Professional Geologists	September 2008
Northern Arizona Stakeholder Workshop	October 2008
American Water Resources Association Annual Conference	November 2008
Tucson Water's WaterSmart Businesses	March 2009
Arizona Water Association Conference	May 2009
Pima Association of Governments Watershed Planning Subcommittee	May 2009
Water Smart Innovations Conference	October 2009

Feedback from local and national stakeholders has helped to confirm common strengths and weaknesses of the original concept as well as to identify innovative variations on the proposed mechanism. Also, feedback from stakeholders in three different cities in Arizona may be useful in determining local factors that may guide appropriate program development. This feedback is summarized below.

Stakeholder Feedback

Public officials from several Arizona communities with existing water conservation programs have expressed interest in starting a Conserve to Enhance program. City and utility staff and representatives from environmental organizations generally liked the idea of providing individuals with a way to directly contribute to environmental enhancement projects. Additionally, stakeholders from all regions acknowledged the value that such a program would have as an educational tool for increasing awareness about local environmental issues. In outreach meetings, stakeholders often recognized that a Conserve to Enhance program would help cities address the common question: "Why should I conserve if the water I save goes to support more growth?"

Stakeholders recognized that environmental concerns would motivate additional water conservation behavior for some people. However, many stakeholders have expressed concern that the costs of making household improvements for conservation might deter individuals from contributing additional money to a Conserve to Enhance fund. On the other hand, willingness-to-pay studies have shown that most people are willing to contribute as much or more than the amount of money they could save through conservation behavior to protect and restore local riparian areas and waterways (e.g. Colby, 1993; Berrens et al, 1996; and Loomis et al, 2000). And, all of the cities in Arizona who participated in the implementation workshops already run conservation incentives programs that subsidize homeowners' implementation of conservation technologies. Additionally, stakeholders have repeatedly suggested the use of tax incentives to encourage participation, most frequently in terms of making contributions tax-deductible.

Discussions with stakeholders about selecting enhancement projects to receive generated funds raised some concerns about the administrative and hydrological feasibility of local water transfers. As part of a Conserve to Enhance program, managers would need to identify available water sources to buy with generated funds. In communities where surface water is not available for reallocation, groundwater and reclaimed water may be the only available water supplies for enhancement projects. The potential legal, financial, or administrative restrictions on the purchase and delivery of these types of water supplies should be explored as part of program development in a local setting. Because the proposed mechanism allocates money, rather than water, saved through conservation, this money can purchase water for enhancement projects at a different time, location, or quality than water saved. This provides more flexibility and efficiency in the allocation of limited supplies.

Findings from earlier phases of the project were echoed in the recent phase of stakeholder outreach as well. For example, stakeholders repeatedly emphasized that identification of tangible projects, such as a specific river segment or enhancement project, is critical for motivating public support. Specifically, stakeholders suggested that, where possible, ongoing, successful local restoration projects be selected to receive generated funds. Stakeholders also cautioned that a pilot program must be made available to all water users and be described simply. A recent study found that participants in water conservation programs preferred messages that involved saving rivers for future generations as opposed to messages about protecting the environment (Simbanin and Lee, 2007). Communities implementing a pilot program may wish to investigate a range of program designs and messages to best reflect the economic considerations and societal values of local water users (Schwarz and Megdal, 2008).

Stakeholders in recent outreach meetings have proposed a few variations to the Conserve to Enhance concept to address local circumstances. For example, in a community where rivers are currently in good condition, and the general concern is future overdevelopment of aquifers and streams, one city representative proposed their city might "Conserve to Preserve" instead of Conserve to Enhance. The program could be used to generate funds to buy groundwater pumping credits or instream flow rights for local streams, thereby preserving local water resources for the future.

Due to their complex billing system, one community considered the proposed mechanism too expensive and burdensome for the utility to implement. In light of this, stakeholders at the Tucson workshop proposed a variation on the mechanism that requires less from the utility but still connects conservation action with benefits for environmental enhancement.

In their proposal, customers would be invited to participate in a check box program and would receive a worksheet, or calculator, that helps them identify conservation actions that would save them money. Thus, through conservation savings, the customer could generate the same amount of money that they chose to donate to the environmental enhancement fund.

Most potential partners expressed interest in starting with a pilot program as an opportunity to test participation levels and work out fund management details. While thus far no community has initiated a pilot program for Conserve to Enhance, some cities have check box donation programs to provide water for the environment.

Check Box Water-for-Environment Programs

Like the Conserve to Enhance program, check box donation programs seek to protect or restore environmental flows and riparian areas by generating a new source of funding to pay for water for the environment. These check box programs offer water customers the opportunity to contribute directly to projects that benefit the environment, and they increase public awareness about local rivers and environmental issues. Existing check box programs may provide a model for the development of similar programs in other places.

In Bend, OR, Santa Fe, NM, and Albuquerque, NM, water users are provided with the option of making a donation on their water bills that supports protection of a local river. These check box programs are being implemented in a variety of forms by partnerships among city water authorities, private water utilities, and local environmental organizations. Funds raised by the Blue Water program in Bend have been used to leverage other funds to lease water for instream flows. The success of existing check box programs has often been affected by local circumstances. Findings from these examples can help guide local communities in starting their own programs to provide water for the environment.

Bend, Oregon

The Deschutes River Conservancy (DRC) was founded in 1996 by a tribal confederation, an environmental advocacy group, and several irrigation districts to restore the Deschutes River's degraded fish habitat and poor water quality (Deschutes River Conservancy, 2009a). After years of conversations, the Avion Water Company partnered with the DRC to create the Blue Water program, which provides Avion customers an opportunity to support DRC efforts to increase flows in the Deschutes River (Hubert, 2009). Funds raised through the Blue Water program are allocated to the DRC's streamflow enhancement efforts on the River (Deschutes River Conservancy, 2009b). The DRC's extensive water leasing program compiles funds from many sources to lease water for instream flows in the Deschutes River.

The Blue Water program was launched in March 2007 and was initially promoted through press releases and inserts included in Avion water bills (Hubert, 2009). The Blue Water program is prominently featured on the Deschutes River Conservancy website, where the program design is summarized. Customers who sign up for the Blue Water program see donations automatically added to each month's bill until they choose to discontinue their enrollment. Four monthly donation levels are offered to Avion customers, ranging between $1.60 and $6.40 per month. The Avion Water Company collects Blue Water donations and sends a check to the DRC.

The partnering organizations predicted that $10,500 could be raised in the first year, given a 5% enrollment at the lowest contribution level. While this goal was not initially achieved, as of January 2009, close to $1000 a month is being donated to the Blue Water program by 250 participants (2.3% enrollment), and a total of $14,589 has been raised to date (Hubert, 2009). Thus far, Blue Water funds have been used to pay for 1470 acre-feet of water leases in the Deschutes River, and another 1668 acre-feet of instream flows will likely be paid for by Blue Water in 2009.

Santa Fe, New Mexico

American Rivers designated the Santa Fe River "America's Most Endangered River" in 2007 (American Rivers, 2007). In July of the same year, the City of Santa Fe introduced the Santa Fe River Fund as part of a larger initiative to restore the Santa Fe River, in partnership with the Santa Fe River Watershed Association and the WildEarth Guardians (City of Santa Fe, 2009). The City cited the impact that municipal water needs have had on the river's flows as one of the reasons for starting the initiative. This initiative has drawn donations from a local tobacco company and a profit-sharing agreement with a local hotel (Matlock, 2007; "Hotel Wants S.F. River Restored", 2007). These monies financed public meetings about river restoration priorities and studies of environmental flows in the River.

The Santa Fe River Fund was created to raise money for the purchase of water rights for the Santa Fe River. The River Commission, the City's Water Division, and the Santa Fe River Watershed Association have been working for several years to identify sources of water for restoring environmental flows in the River. The WildEarth Guardians invited people to sign up for the Fund with a $1 monthly pledge to promote the program before it officially began (WildEarth Guardians, 2007). Newspaper articles and an insert in the utility bill promoted the program when it started (Friedman, 2009). To encourage participation and demonstrate commitment, the City promised to match every dollar donated to the Fund by individuals.

The Santa Fe Living River Fund is managed by the City's Water Division, which promotes the program and collects funds for the program. The citizen-staffed River Commission and the non-profit Santa Fe Watershed Association, which advocates for restoration of the river, provide program oversight. Both the City and the Watershed Association provide promotion on their websites, each with a page or more devoted to describing the River Fund efforts (City of Santa Fe, 2009; Santa Fe Watershed Association, 2009). The City's website posts frequently asked questions (FAQs) about the Fund, a printable application form for making donations, and semi-monthly reports on the status of the River Fund.

Information on fund management is reported to the River Commission throughout the year. The City reserves funds for River Fund administration in an escrow account. While the City anticipated that $1.5 million could be raised in the first year, only $100,000 (including matching funds) had been raised as of January 2009, a year and a half after the program began (Friedman, 2009). City staff reports that no purchases of instream flow rights have yet occurred, due to the limited availability of leases in the Santa Fe River Basin.

Albuquerque, NM

In 1999, a collection of six environmental groups, which includes the Forest Guardians and Defenders of Wildlife, filed a lawsuit (Rio Grande Silvery Minnow vs. Martinez) over endangered species needs in the Rio Grande. In February 2005, the City of Albuquerque and the Albuquerque-Bernalillo County Water Utility Authority entered into an agreement with these groups to settle the lawsuit (Defenders of Wildlife, 2007). As part of the agreement, the Water Authority and the environmental groups contributed $225,000 and $25,000, respectively, to the newly established Living River Fund. This money will support the implementation of an agricultural water-leasing program to preserve instream flows in the Rio Grande. In addition, the agreement required that the Water Authority establish a Living River Fund check box program to allow residents to contribute to the Fund.

In October 2008, the Water Authority started offering its customers a $1 check box donation option for the Living River Fund on their bill ("Water Authority Starts Fund", 2008). While the check box donation on the bill is limited to $1, customers can make donations of any amount in person at City Hall. The check box program was promoted through a bill insert that went out to all customers and was publicized in a short Albuquerque Journal news piece (Morris, 2009). On their website, the Water Authority posts a list of frequently asked questions (FAQs) about the program (Albuquerque Bernalillo County Water Utility Authority, 2009). As of January 2009, three months after the program commenced, $1,642 had been donated to the fund by 60 out of 175,000 total customers (Morris, 2009).

Check Box Program Findings

In Albuquerque, the Living River Fund was established in response to a legal challenge, as part of an agreement for protecting fish habitat in the Rio Grande. The Santa Fe Living River Fund was developed in response to the designation of the Santa Fe River as "America's Most Endangered River" in 2007. The Avion Water Company in Bend, Oregon initiated the Blue Water program not because of a legal mandate but due to a desire to contribute to the local community. While the drivers for each program differ, these check box programs all target restoration of a specific river, are promoted through easily-readable websites and bill inserts, and allow water customers to make donations through their water utility bills. These programs have also faced a common challenge: fund participation in the first year is generally less than predicted. However, all of the programs are less than two years old, and donations to all of the funds are increasing. All of the existing check box programs studied had planned to use program funds to obtain instream flow rights for surface water that is otherwise diverted. The unavailability of water rights for purchase has hindered the success of the programs in Santa Fe and Albuquerque, New Mexico.

In Bend, funds generated by the check box have been used to support existing river restoration programs, producing tangible benefits for the Deschutes River. The success of the Blue Water program reflects local circumstances to some extent, because of the pre-existence of local riparian restoration projects and available water rights for lease. In all studied programs, the city or utility partnered with established environmental organizations, but the New Mexico programs emerged in an environment where water rights are over allocated. In Al-

buquerque, the partners intend generated funds to be used to purchase water leases from farmers, but they await establishment of a local agricultural water market for this purpose.

The Santa Fe Living River Fund program demonstrates the role that the city and utility can play in promoting a check box program and demonstrating commitment and accountability. In Santa Fe, the City features the Living River Fund prominently in information about their river initiative, both in press releases and on websites, and reports regularly on funds raised. Additionally, the city has kept its promise to match donations made by citizens, further demonstrating the city's level of commitment to the project. The citizen-staffed River Commission, which receives reports on fund management, ensures accountability.

Several partners from the check box programs described above have acknowledged the potential for linking conservation actions with providing water for the environment. The Santa Fe River Watershed Association and Santa Fe Mayor David Coss both identified water conservation as a key element in preserving river flows (City of Santa Fe, 2009). Mayor Coss was quoted as saying that water saved through conservation should be dedicated to river flows. John Horning, the executive director of Forest Guardians, who works with both the Albuquerque and Santa Fe programs, has also suggested that conserved water should be allocated to the river (Horning, 2007). The City of Santa Fe has several ongoing conservation programs, including a water-wasting ordinance, rebate programs, and a water conservation program charge that is added to the April water bill. Despite the apparent interest, none of these communities has implemented a Conserve to Enhance-type program.

Recommendations for Water-for-Environment Program Implementation

As stated in Schwarz and Megdal (2008), development of a Conserve to Enhance program or any variation on this concept should be done with input from multiple stakeholders. The review of existing check box programs has confirmed the importance of local circumstances in determining the success of any program to pay for water for the environment. Existing check box donation programs demonstrate some of the critical elements in program development that were identified in Schwarz and Megdal (2008), such as the importance of partnering with existing organizations, the need to describe the program simply, and the value of using an independent board to oversee fund management. Also, lessons learned from these programs suggest that development of any program to pay for water for the environment should involve consideration of the hydrological and administrative feasibility of environmental water transfers.

Communities with a vibrant environmental ethic and existing water conservation programs are best suited to attempting a Conserve to Enhance program. The Conserve to Enhance mechanism addresses the same ecosystem goals as the check box programs and, in addition, it seeks to utilize water conservation as a source of water for the environment. The design of a Conserve to Enhance program to pay for water for the environment should involve consideration of the local water utility's billing system and possible connections with existing water conservation programs in the program area. A successful pilot program for Conserve will benefit from development of the following:

1. Links to a local river or specific environmental enhancement projects;
2. Use of a program mechanism tailored to utility billing systems;
3. Identification of available water supplies for purchase;

4. A simple program description communicating the importance of local rivers for local heritage;
5. Support from city – e.g. promotion, matching funds, etc.;
6. Links to an existing environmental organization with known success;
7. Connection to existing conservation incentives programs to reduce homeowner costs;
8. Development of a citizen-staffed commission to provide oversight; and
9. A mechanism for reporting publicly on program accomplishments[4].

Most potential partners involved in past outreach have been interested in starting a pilot program of Conserve to Enhance as an opportunity to test participation levels and work out fund management details. A pilot program should include a method for monitoring participation levels, conservation savings, and funds generated over time to test the assumptions made thus far about possible program outcomes.

Schwarz and Megdal (2008) describe a Conserve to Enhance program that measures and accounts for conservation, involves the local water utility, and requires development of decision-making bodies. All billing and money collection is done by the water provider, and the money collected is channeled through the water provider to an external account managed by a third party. Management of the full program may involve direct costs associated with advertising the program to potential participants, modifications to the billing system, and administration of program details, as well as reduced revenues associated with increased water conservation. Federal and private grants for improving the efficiency and sustainability of municipal water management could potentially cover some of these costs for a pilot program.

The simpler check box donation approach does not create the same link between conservation actions and environmental enhancement projects, but it may be an appropriate first step in establishing a larger program. As demonstrated by the existing check box programs, a year of donations may be required to raise enough money to make the first environmental water purchase. Additionally, the fact that participation levels in existing programs continued to increase past the first year suggests that measurements of participation in the first year of a pilot may not accurately indicate the funds that would be generated over a longer period of time.

Efforts are underway to implement a pilot Conserve to Enhance program in Arizona. Outreach will continue to identify additional partnerships for piloting Conserve to Enhance, with the intention that lessons learned from establishing pilot programs will inform future program development in other communities.

Acknowledgements

The authors and the University of Arizona Water Resources Research Center wish to thank the U.S. Bureau of Reclamation for funding and representatives from several cities and environmental organizations for providing their input to this effort.

[4] In addition to the use of annual reports and water bill inserts to communicate results, communities may wish to explore the use of signage at sites receiving funds from a Conserve to Enhance program. See Adopt a Highway (http://www.adoptahighway.com/index.html) and the Thames River Adopt a River (http://www.thamesrivercleanup.ca/ThamesRiverCleanUp/TRCU-AdoptRiver.pdf) programs for examples.

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About the Authors

Dr. Sharon B. Megdal

Sharon B. Megdal is Director of The University of Arizona Water Resources Research Center. She is also Professor in the Department of Agricultural and Resource Economics and Professor and Specialist in the Department of Soil, Water, and Environmental Science. She also serves as Director of The University of Arizona Water Sustainability Program, which is funded by the Technology Research Initiative Fund (TRIF). Her work focuses on state and regional water resources management and policy, on which she writes and frequently speaks. She authors a water policy column for the WRRC's bi-monthly newsletter. Current projects include study of artificial recharge and municipal water use in growing, arid regions. Dr. Megdal teaches the multi-disciplinary graduate course Arizona Water Policy. Sharon B. Megdal holds a Ph.D. degree in Economics from Princeton University.

Joanna Bate

As a Masters candidate in the Planning program at the University of Arizona, Joanna is pursuing the Water Policy Certificate. Her coursework included electives in Environmental Policy, Economics of Environmental Policy, and Water Law. Her current work supports research of Arizona water policy regarding environmental water needs. Her prior experience was as an ecologist for The Nature Conservancy, providing ecological information to the US Forest Service and Bureau of Land Management. She obtained a Bachelors in Biology from Haverford College in 2003.

Andrew Schwarz

Andrew Schwarz is an engineer with the California Department of Water Resources. He has a BS degree in civil engineering from the University of Wisconsin at Madison and an MS degree in environmental planning from the University of Arizona at Tucson. At the time of this research, he was associated with the University of Arizona Water Resources Research Center in Tucson.

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