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## **INVOLVING CITIZENS IN WATERSHED MANAGEMENT: THE ARIZONA MASTER STEWARD WATERSHED PROGRAM**

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Arizona faces many complicated water resource issues including: groundwater overdraft; non-point source pollution; population growth; and water use conflicts. The Arizona Master Watershed Steward (MWS) Program is designed to prepare, educate and train volunteers who can provide knowledge, leadership, and service in the protection and monitoring of local watersheds. The first MWS training course was presented in Prescott, Arizona in fall of 2001, and expanded in 2002 and 2003. The training course has 10 four-hour sessions and two daylong field trips. Topics covered are: hydrology; climate; geologic processes; ecology; human impacts; water quality; land uses; geospatial tools; water law, and water resources management. Principles are taught using lecture/discussion format with hands-on activities that reinforce subject matter. Instructors typically include: Extension specialists, agents, and staff; agency professionals, and other authorities. MWS trainees become certified after contributing 40 hours of volunteer service. In 2003, Arizona MWS received \$350,000 from the Arizona Department of Environmental Quality to develop a statewide curriculum guide and establish a statewide Arizona MWS program. A statewide MWS Coordinator was hired and the curriculum guide was published in August 2005. As of 2005-06, MWS courses have been offered in Benson, Cottonwood, Phoenix, Prescott, Safford, Flagstaff, Tucson, Bullhead City, and Sierra Vista. A total of 202 volunteers have completed the course and contributed 2,500 hours of volunteer service. Volunteer projects have included: organization of local water conferences and watershed groups, water quality monitoring, noxious weed management, rangeland monitoring, well water testing, and restoration projects.

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# **Involving Citizens in Watershed Management: The Arizona Master Watershed Steward Program**

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## **Introduction**

Arizona faces many complicated water resource issues. Throughout history, human activities have affected Arizona's rivers and streams. People cleared land near rivers for agriculture and to build towns and mines. Many areas were harvested for lumber throughout the 19<sup>th</sup> and 20<sup>th</sup> centuries. People built irrigation and canal systems, dams and flood control structures. The most significant of these resultant water resource issues include groundwater overdraft; non-point source pollution; rapid population growth; and water use conflicts. Long-term sustainability of water supplies is one of the most vexing and important issues facing the State of Arizona in the early 21<sup>st</sup> century. That sustainability is inevitably tied to issues of quantity and quality, especially as drought conditions persist and non-point source pollution increases with expansion of urban land use (Colby et al. 2004). The Arizona Master Watershed Steward (MWS) Program was designed by the University of Arizona (UA) and its partner, the Arizona Department of Environmental Quality (ADEQ) to develop a cadre of knowledgeable volunteers across the State of Arizona that assist in delivering watershed-related education to their communities, as well as serving in a variety of capacities in the protection, restoration, and monitoring of their watersheds.

The Pollution Prevention Act of 1990 called for the established prevention of non-point source pollution. In agriculture, run-off can occur from crop production (fertilizers, herbicides and insecticides), from rangeland, feedlots and irrigated return flows. In silviculture, run-off can occur from forest harvesting and road construction. Mining (including sand and gravel) operations and mine tailing sites can have run-off and process fluids. Land development, highway building and construction practices can result in run-off. Urban development can result in run-off from sewer and unsewered urban areas, including industrial and commercial activities, highway run-off and recreational growth. Septic and on-site water treatment systems can generate waste water leachate from individual homes, especially in low density developments in rural settings. All these examples are considered non-point source pollution. The Clean Water Action Plan identified non-point source pollution, including runoff from animal feeding operations, as the most important remaining source of water pollution. Non-point source pollution and sustainability of water supplies are the two primary issues facing Arizonans. Watershed integrity is inextricably linked to varying land uses and quality and quantity of water resources. Better land use decisions are the key to protecting the natural resources, community character, and long-term economic health of Arizona's communities.

## **Program Description**

The mission of the Master Watershed Steward program is to educate and train citizens across the state of Arizona to serve as volunteers in the protection, restoration, monitoring, and conservation of their water and watersheds. In the MWS Program, the people making land and

water use decisions are the primary target audience. Secondary audiences include agencies and decision-makers who interact with these publics. Our goal is that municipal and county governments, public land managers, ranchers, miners, hunters, recreational users, and other concerned citizens will come together to discuss land and water use practices. From this cooperation, it is expected that these groups will develop watershed-based goals that further non-point source pollution reduction, reduce conflict, as well as increase water sustainability. The goals of the program include:

- ❖ Create a network of motivated, volunteer stewards with short or long-term projects to enhance water quality and quantity in their communities and watersheds.
- ❖ Enhance knowledge of watersheds and water resources
- ❖ Enhance critical thinking and critical observation skills in the target audience.
- ❖ Promote communications between and among the target audience, other stakeholders, and natural resource managers.
- ❖ Create or enhance the local knowledge-base for locally-appropriate practices in watersheds across the state.

The Arizona MWS Program was first developed by Russ Radden and Jeff Schalaus in 2000 and 2001 in Yavapai County Cooperative Extension. An Advisory Board was formed in 2000 to develop program goals and select curriculum for the first MWS training course in Yavapai County in fall of 2001. In 2002, the program was offered in both Yavapai and Cochise Counties utilizing the *Natural Resource Wonders* curriculum by Ruyle, Howery, Pater, and McReynolds (1999) for Cooperative Extension. The initial training course had 10 four-hour sessions and two daylong field trips. Topics covered included: hydrology; climate; geologic processes; ecology; water quality; human impacts; mapping and Geographic Information Systems (GIS); and water resources management. Since then, the program has also developed trainings on invasive species, riparian ecology, fluvial geomorphic processes, and soils, and working together. Principles are taught using a combination of classroom-based presentation and discussion sessions along with field-based hands-on activities that reinforce subject matter. Typical courses offer between forty and fifty-six hours of intensive training in a variety of topics drawn from these core themes. Courses can be customized to fit local conditions and watershed needs. For example, urban-based courses may place greater emphasis on water conservation while rural-based courses may focus more on water quality and monitoring considerations. Instructors typically include University of Arizona Cooperative Extension specialists, agents, and staff; agency professionals, and other authorities.

Once graduated, MWS trainees are designated as “Watershed Stewards.” MWS trainees become certified as “Master Watershed Stewards” after contributing at least forty hours of volunteer service and attending at least ten hours of continuing education each year thereafter. Volunteer service activities include education, program support, environmental monitoring, and watershed protection or restoration activities. For example in the first category, Arizona MWS has sent volunteers to staff booths at public events, to disseminate knowledge at commercial events, assist K-12 educators, and to develop materials for local media outlets. In the second category, volunteers have assisted in developing newsletters, marketing materials, and internal continuing education events for Watershed Stewards. In the last category, volunteers have conducted restoration projects, dumpsite cleanups, monitored water quality and aquatic wildlife. Watershed Stewards have also contributed valuable time working with watershed partnerships, and serving on local water or land-related advisory boards.

In 2003, Arizona MWS received \$350,000 from the Arizona Department of Environmental Quality (ADEQ) to develop a statewide curriculum guide and make MWS a statewide program. A statewide Coordinator was hired and the curriculum—the *Arizona Watershed Stewardship Guide*—was published in January 2006. Drafts of the guide have been given to incoming classes since 2004, and participants have used these to review the chapters for clarity and usefulness. The *Arizona Watershed Stewardship Guide* was also peer-reviewed by University of Arizona faculty, agents, extension personnel from other states, and staff from other agencies. An on-line version of the guide is available at the website given in contact information at the end of this abstract.

The MWS program has expanded rapidly since 2003. As of May 2006, MWS courses have been offered in Cottonwood (1), Phoenix (1), Prescott (3), Tucson (1), Globe (1), Flagstaff (2), Bullhead City (1), Casabel (1), Sierra Vista (1), Safford (1), and Benson (2). A total of 252 volunteers have completed the course and volunteer service requirements. Volunteer projects have included: organization of local water conferences; organization of watershed groups, water quality monitoring, noxious weed management, rangeland monitoring, well water testing, and restoration projects. Watershed Stewards have donated over 10,267 hours of service to their watersheds. According to the volunteer management non-profit, Independent Sector, those volunteer hours are currently worth \$18.04 per hour. This calculation values MWS volunteer service hours at a little over \$185,216. Of those graduated since 2003, a little less than half (68) have received their official certification as “Master” Watershed Stewards.

Because of the multi-jurisdictional nature of watersheds, administration of the program has been and will continue to be a challenge. The statewide MWS program is coordinated in Tucson through Arizona Cooperative Extension and the School of Natural Resources. MWS is regionally divided between six regions that encompass major watersheds or basins. These basins often encompass a wide variety of environmental gradients as well as a host of overlapping or even competing political jurisdictions. A primary county extension staff in each of the regions is responsible for program delivery with support by the UA, ADEQ, and a variety of other partners such as Central Arizona Project, Salt River Project, tribal governments, cities and municipalities, and the Arizona Department of Water Resources. Since receiving funding in 2003, the program has been a partnership of the Arizona Department of Environmental Quality (ADEQ) and University of Arizona Cooperative Extension with funding provided by the United States Environmental Protection Agency through the Clean Water Act. As of May 2006, the Arizona MWS program was funded for another two years by the ADEQ.

The Arizona MWS program staff has outlined several goals for the short-term. First, the program will continue to expand by providing MWS courses in at least twelve out of 15 Arizona counties including Santa Cruz, Pinal, La Paz, and Apache counties. The program aims to expand on the existing seven counties that already offer MWS. The educational material will continue to be evaluated in the MWS programs and modified as needed. MWS courses will be administered by Extension faculty and staff, with support from the state coordinator. Second, the MWS program will seek to develop new tools for volunteer management including statewide continuing education and volunteer events, a seasonal newsletter, and annual trainings for regional coordinators to create consistency across the state. Internet communications will be expanded to address volunteers in new, more isolated areas. We will reach out to new audiences including youth or young adults, minority and rural clientele. MWS is developing a pilot project to create a program for high school and junior college aged students. Junior Watershed Stewards will work closely with the adults in Pima and Santa Cruz counties on watershed-based service

volunteer projects. Rural populations will be reached by means of distance learning tools and short courses administered through the main campus and counties. Lastly, the MWS program and its partners are in the initial stages of forming a statewide advisory board to that will link the MWS program to a wide array of stakeholders and partners that lend it scientific, programmatic and financial stability. This formal board of at least 13 members will hold annual meetings and/or retreats and work with the statewide coordinator to formulate long-term strategies for the success of the program. The goal of the project is a self-sustaining adult education program that is integrated into the State of Arizona's goals for water sustainability by the completion of the two-year ADEQ grant cycle.

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For additional information see:

<http://cals.arizona.edu/watershedsteward>