



Verde Watershed Currents

Spring 2015

A new grant will improve irrigation efficiencies.

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Sonora mud turtles: spring means nesting begins.

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Winter weather recap and the outlook for spring.

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Irrigation Efficiencies: Partners Working Together

On January 14th of this year, Secretary of Agriculture Tom Vilsack announced Arizona projects funded by the Regional Conservation Partnership Program (RCCP), a new program created by the 2014 Farm Bill. The RCCP program is administered by the USDA's Natural Resources Conservation Service (NRCS). A \$2.8 million grant was awarded to The Nature Conservancy (TNC) and its partners for the Verde River Flow and Habitat Restoration Initiative, which works toward restoring river flows and riparian health while supporting the irrigation requirements for agricultural producers in the Verde Valley.

The Verde River was one of two sites in Yavapai County selected for the RCCP/NRCS public-private initiative. TNC will guide the project and local partners will match the grant with another \$2.8 million. Key partners and their roles are: The Nature Conservancy - project lead and large on-farm irrigation and conveyance projects; Verde Natural Resource Conservation District - small farm/property conservation plans; Friends of Verde River Greenway - riparian habitat improvement; Arizona Game and Fish Department - technical advice for wildlife and habitat; Tamarisk Coalition - technical advice for invasive plant removal; and Natural Resource Conservation Service - grant administration and technical support. Furthermore, partners will collaborate with several irrigation companies, farmers, agencies, municipalities, and organizations in the Verde Valley.

In addition to the broad coalition of partners, the basis for carrying out the RCCP/NRCS grant is TNC's work over the past five years to improve irrigation practices in the Verde Valley. Improvements have included providing ditch associations with solar-powered automated head gates to monitor and adjust the flow of water diverted from the Verde River, to take only what users need.



Growing watermelons using flood irrigation - soon to be converted to efficient subsurface drip irrigation.
Photo by Hauser and Hauser Farms
Title photo: West Clear Creek by scott1956 (Flickr)

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Farm at Shield Ranch, photo by Chris Bertrand

Irrigation Efficiencies (continued from page 1)

Lining ditches has also reduced water loss. These projects resulted in an increased flow for 20 miles of river by an estimated 10 cubic feet per second (cfs).

One of the goals of the RCCP/NRCS grant initiative is to improve irrigation practices on 1,000 acres. The result will boost continued efficiency in irrigation and water management to restore river flow, while supporting farming operations.

To reach this goal, the grant implementation has two components: large commercial farms and small farms. Both will have customized conservation plans that assess individual farm challenges and opportunities in order to identify conservation practices to meet agricultural goals.

Large farms would convert from flood irrigation to subsurface drip irrigation, which is a low-pressure, high-efficiency system that uses buried drip tubes or tape to meet crops' water needs. It saves water and improves yields by eliminating surface water evaporation. It reduces weeds because water is applied directly to the root zone of the crop, not to the soil surface where most weed seeds germinate after cultivation. This technology has been used since the 1960s and has rapidly advanced in the last three decades. A subsurface system is flexible, provides light irrigation, and is particularly apt for arid, semi-arid, hot, and windy areas with limited water supply - a great fit for the Verde Valley.

Small acreage farms would use a sprinkler system in place of flood irrigation. This technique is especially suited for truck farms, gardens, and pastures. This practice would be coupled with soil moisture monitoring to apply water only when needed.

What does this mean on the ground and for the river? Actually, quite a lot... Converting from flood irrigation to subsurface drip may yield water savings of as much as 50%. For example, a 10 cfs diversion from the Verde River for flood irrigation would decrease to a 5 cfs diversion for subsurface drip irrigation. Likewise, converting from flood irrigation to a sprinkler system may yield water savings of as much as 30%. For example, a 10 cfs diversion from the Verde River for flood irrigation would decrease to a 7 cfs diversion for a sprinkler system. Sprinkler systems must be used appropriately at night rather than when it's hot and windy in order to reduce evapotranspiration.

The RCCP/NRCS project helps public and private partners that are working together to support rural economies and sustain a healthy flowing Verde River and riparian habitat. More efficient watering systems help farmers save labor and time while tending crops and pastures. Consequently, *living within our means* through this project leaves more water in the river to safeguard its flow and riparian habitat, which in turn provides a lifestyle valued by local communities and visitors alike.

Article by Kathy Davis

"A river seems a magic thing. A magic, moving, living part of the very earth itself."

~ Laura Gilpin



Sonora Mud Turtles

Arizona has seven species of native turtles, including both aquatic and terrestrial species. This may be surprising, since many Arizonans may never see a turtle in the wild.

One of Arizona's turtle species, which directly depends on aquatic and riparian areas, is the Sonora (or Sonoran) mud turtle (*Kinosternon sonoriense*). This species ranges from Central Arizona to Southeast Arizona and then south to Chihuahua and Sonora, Mexico, and from Southeastern California (historically) east to New Mexico. They can be found in and near creeks, rivers, lakes, ponds, stock tanks, and ciénegas at elevations ranging from near sea level in the lower Colorado River to over 6,500 feet.

Sonora mud turtles can grow up to almost 7 inches in length. They have gray mottled skin and an oval-shaped, olive-brown or dark brown shell, often partially covered with algae. They have fleshy projections under their chins. These turtles have glands on the sides of their bodies that can emit a foul-smelling musk when they are disturbed.

Preferentially carnivorous, mud turtles primarily eat insects,

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Photo by Jeffery Lovich, courtesy of AZ Game and Fish Department

The State of the Watershed

Even though the winter of 2015 will go down in the books as an El Niño winter, the Verde River Watershed did not experience remarkably wet weather. For the December through March period, the watershed received 7.94 inches of precipitation, which is slightly above the 30-year normal of 7.11 inches. However, areas around the western and central Mogollon Rim did receive significantly more precipitation. Some locations recorded precipitation amounts well over 10 inches with the wettest gauge at the Mormon Mountain Summit SNOTEL site measuring over 15 inches for the season.

Due to an unusual amount of warmer than normal precipitation events this winter season, snowfall over the Verde River Basin was exceptionally poor and limited to the higher terrain. Snow conditions did peak near their climatological normal on March 1st; however, the average snow water equivalent at that time was less than 50% of normal.

The lack of snow combined with the near-normal precipitation produced well-below normal stream flow conditions on the Verde River. For the January through March period, the Verde River measured a volume of 140,000 acre-feet of water. Of that volume, 100,000 acre-feet occurred during the month of March. Although the seasonal volume was well below median for the period, it was quite a bit more than last year's seasonal volume of 55,000 acre-feet.



Fortunately, El Niño conditions are still present over the Equatorial Pacific Ocean and expected to continue through this year and maybe into next year. While El Niño is not a reliable predictor for the coming summer, there is still some optimism for additional springtime rain and maybe even a wet winter for 2016.

Article by James Walter, Salt River Project

Xeriscaping for Water Conservation

Xeriscaping is landscaping and gardening that reduces or eliminates the need for watering to supplement rain or snow. Native plants and plants with natural requirements appropriate to local climates are emphasized. Care is taken to avoid losing water through run-off and evaporation. With xeriscapes, almost any landscaping style is possible.

Xeriscaping can include lawns, but it seeks to limit them solely to areas that turf will be used functionally or recreationally - not as default ground cover. In a 2005 NASA-sponsored study, it was estimated that lawns in the US cover 49,000 square miles, making it the nation's largest irrigated crop by area.

Advantages of xeriscaping are:

- less cost to maintain
- lower water consumption
- more water made available for domestic and community uses
- reduced landscape maintenance
- efficient irrigation
- much less fertilizer and pesticide use

The Arizona Department of Water Resources hosts a resource webpage for xeriscaping principles and finding drought tolerant plants for various regions of Arizona. The webpage address to visit is bit.do/az-xeriscape.

The Verde River Basin Partnership

◆ Informing the community about our water ◆

The Verde River Basin Partnership is a non-profit organization comprised of both individual members and entity partner members (public and private organizations) who share a common goal. This goal is to support and preserve the long-term health of the Verde River and its watershed.

Our mission:

The Partnership is a scientific and educational resource raising awareness among citizens and community leaders about the workings and limitations of Verde River Basin's interconnected groundwater and surface water systems, and the life they support.

Our vision:

The Partnership aims to secure the long-term health of Verde River Basin's groundwater and surface waters by assisting citizens and community leaders in exploring strategies and management practices that will sustain the Verde River system for all future generations.

Learn more about us and get involved:

- Visit our website www.vrbp.org
- Find us on Facebook
- Read our Guiding Principles
- Become a volunteer
- Make a donation
- Email us at info@vrbp.org

We highlight valuable and unique qualities of surface waters and groundwater throughout the watershed at www.vrbp.org.

Mud Turtles (continued from page 3)

snails, fish, tadpoles, frogs, and carrion, but they also consume some plant matter. Male and female mud turtles look slightly different from one another. Females have a flat plastron (under-shell) and a short tail. Males have a concave plastron, and a long spine-tipped tail with a hooked tip. Nesting occurs from May to September and females lay one or two clutches of 1 to 11 eggs each year.

Why are they called mud turtles? During hot, dry periods, they aestivate (similar to hibernation, but during the summer) mainly in underground mud burrows along the water's edge. They can remain underground for more than a year during prolonged drought conditions. In higher elevations, they also hibernate during the winter. Although aquatic, mud turtles are able to travel great distances over land in search of water, an ability that proves essential in arid habitats.

Mud turtles are vulnerable to predation by non-native species such as American bullfrogs, largemouth bass,



and crayfish. Introduced non-native turtles may out-compete mud turtles for food and basking sites. In many areas, mud turtles' aquatic habitats have disappeared due to water diversions and groundwater pumping. Understanding relationships between habitat use, invasive predators, and demographics is essential for effective management of at-risk populations.

Article by Marianne Davis

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