Blue Gold

Got water? Want more? Read on.

article and photos by Larry D. Hodge

A variety of types and sizes of plants are present in a properly functioning riparian area, including colonizer plants that move in first to hold soil, and stabilizer plants that build on that foundation. Large woody plants (trees) play an important role in dissipating the energy of floodwaters and trapping soil that can then be first colonized and then stabilized. A scene on the Nueces River north of Uvalde.

Standing on a rock at the edge of the Nueces River north of Uvalde, Steve Nelle points his white walking stick toward the opposite shore and, for a moment, I'm not sure if he is about to smite the stone and bring forth water or if he is indicating the way to the Promised Land.

In a way he's doing both.

Nelle, TWA member and wildlife biologist with the National Resources Conservation Service in San Angelo, is surrounded by a motley crew of landowners, ranchers, natural resource conservation agency employees and one writer/photographer. We've all come to learn how to look at a stream and determine if it is in the right condition to do its job properly.

"You will see things in creeks after you leave this workshop you didn't see before," Nelle tells us.

He even sounds like a prophet.

"No other landscape feature connects people as effectively as riparian areas and stream systems," points out Wayne Elmore, a riparian specialist from Prineville, Oregon, who is conducting the workshop with Nelle; Janice Staats, a hydrologist for the interagency National Riparian Service Team; and Nueces River Authority education director Sky Jones-Lewey.

"What you do on your land in the upper part of a watershed influences conditions throughout," Elmore continues. "After the rain stops and water no longer runs over the surface, all the water in a stream comes from the ground. The condition of riparian areas and their associated catchments affects how much of that rain goes into the ground and how fast that water comes out of the ground. The opportunity is to increase our water storage area and volume and keep water on the land longer by managing our catchments together. We need to think in terms of water *catchment*, not *watershed*."

Nelle likens the function of a riparian area to a sponge. "Many folks have put their water hopes in such plans as reservoirs, inter-basin transfers, brush control and desalinization," he says. "Yet there is another large and mostly unrecognized source of water that can be developed in nearly any part of the state."

Nelle sweeps his walking stick toward the trees, grasses and shrubs thickly covering the riverbank we stand on. It doesn't feel like a sponge, but

Steve Nelle (on rock) explains the role of vegetation in stabilizing the soil in a riparian area to allow it to become a giant sponge that traps water and releases it slowly over time. Plants also serve a number of other functions in a riparian area (see sidebar).

Why did the students cross to the other side? To identify the plants growing there. Sometimes you have to jump in with both feet and get wet to learn what a stream has to teach you.

that's exactly what it is.

"One of the attributes of a properly functioning riparian area is the sponge effect and water storage within the area," he explains. "This does not refer to water storage in the creek channel itself, but to water detention in the land on either side of the channel. This large, absorbent sponge will soak up, store, and then slowly release water over a prolonged period—and it can be managed in a way to greatly increase and improve this storage."

Wayne Elmore has documented the process for nearly 30 years on Bear Creek in central Oregon, where average annual rainfall is about 12 inches. Before management of the riparian area began, the channel was downcut, wide and shallow. Flow was intermittent and there was no fish life. When rains did come, floodwaters were heavily laden with sediment that washed downstream to an irrigation reservoir.

Elmore's analysis showed the size of the riparian "sponge" was only 3.8 acres

per mile of stream and was storing less than 500,000 gallons of water per mile.

By 1996, following several years of rest and implementation of a grazing plan, the creek had completely changed in both appearance and function. Formerly broad, shallow, and relatively straight, it became narrow, meandering, and shaded by vegetation. Banks and floodplain were rebuilding, and the stream now flowed year-around and supported a healthy fish population. But the most important change was invisible. Beneath the surface, the riparian sponge now amounted to 12 acres per mile and stored 4 million gallons of water per mile.

"When the land can capture, store and safely release water, we can have more flow later in the season and a higher diversity of values," Elmore points out.

"This natural phenomenon can be duplicated on thousands and thousands of miles of creeks all across Texas," Nelle says.

"We have a tremendous opportunity in Texas," says Lewey. "Just in the upper Nueces River basin alone there are 2,400 miles of major perennial streams, almost all on private land."

The idea of all that water-catching capacity is as appealing to the group as manna was to the Israelites, and we are hungry to learn more. We know that while the price of oil is uppermost in people's minds today, the value of black gold will someday pale in comparison to the blue gold that is water.

The two-day workshop sponsored by the Nueces River Authority and funded by the Dixon Water Foundation consists of one day of classroom instruction and one day in the field. On day one we learn the basic functions of riparian areas, are briefed on the procedure for assessing the condition of a stream, and are introduced to the 17-point checklist we will take into the field on day two, when we will apply what we have learned and compare our results to those of the team of experts.

As Nelle, Elmore and Staats make their presentations, it is obvious that most of us have to adjust our thinking about streams. We are so used to seeing streams as conduits for "excess" water that it's hard to realize that this is a relatively recent phenomenon, and that a properly functioning creek does not carry as much water as possible away as quickly as possible but instead keeps it on the land as long as possible.

Elmore gets our heads straight by debunking eight common myths, beginning with "floods are bad" and ending with "cutbanks are bad." In between we're told why—among other things—droughts are not all bad, streams should not all be wide and straight, all riparian plants are not alike, and killing water-using plants is not always a good thing.

Sky Jones-Lewey (far left) works with a group along a creek north of Uvalde to evaluate the condition of the riparian area. Although tiny sycamore trees have sprouted among the gravel on this bar, there is little vegetation to trap and hold soil. A healthy bar would be building toward the opposite cut bank, narrowing the stream bed and increasing the distance water has to flow to go around the bend, which decreases its velocity and therefore its ability to erode.

Elmore's message is straightforward and simple: By managing land properly, you can improve stream functioning while increasing the productivity of the uplands surrounding it—and at minimal cost. He is no fan of moving dirt to alter the characteristics of a stream. "The faster the fix, the higher the risk and the greater the cost," he says.

"It's important to work with the physical function of a stream, not against it," says Staats. "If management does not hamper the physical process, many riparian areas will heal themselves."

During the field day we look at two sites, one along the Nueces River and another on a creek tributary to that stream. Armed with our checklists and the knowledge gained in the classroom and counseled and questioned by the team, we find ourselves fulfilling Nelle's prophecy and indeed seeing things in creeks we had not seen before.

We find examples of colonizer plants and stabilizer plants, just as Nelle said we would. (To be fair to Moses and all the other Old Testament prophets, I should point out that the team leaders had seen these sites before.) We begin to understand what Staats meant when she said the sinuosity (no connection to the Ten Commandments) of a stream should be in balance with the landscape setting. And Elmore's explanation of why large trees falling into a stream is a good thing makes a lot more sense when we see how much sediment a fallen tree has collected and how many plants have sprung up in that soil, anchoring it in place with their roots.

To our surprise and pleasure, we find that with just two days' instruction, our opinions of the conditions of the streams we looked at largely agree with those of the experts.

And we begin to wonder: Why did we not see these things before?

"Texas is about 25 years behind the western United States in understanding and managing riparian areas," Nelle tells me. Much of the land in those states is public land, and natural resource agencies have had to develop and follow sustainable management practices for many years now. In Texas, where more than 90 percent of the land is privately owned, and much of that in small parcels, such ideas have been slower to take root.

That seems to be changing faster than a flash flood barreling down a barren gully. As Texas landowners become

more informed and educated about how rivers and creeks function, many are voluntarily adopting progressive riparian management.

"The Dixon Water Foundation is funding the Nueces Riparian Network to help people work together to create a riparian whole that is greater than the sum of the individual parcels of land," says Executive Director Robert Potts. "Good land management along our rivers and creeks can create an environment in which water brings neighbors together for their mutual benefit. Better water retention in our state's rivers benefits everyone by providing cleaner, healthier rivers and more usable water for Texas."

The Nueces Riparian Network Project attempts to bring riparian information to those who manage private lands. "We have the opportunity to recover water catchment capacity and enhance riparian function in the Nueces River basin through voluntary stewardship of private lands," says Lewey. "While many landowners are new to the area and some new to land ownership, most are well-intentioned and want to be good stewards. The only thing lacking may simply be an awareness and understanding of riparian resources. That's why we have created a series of one-day workshops designed to teach people how to assess the functioning of streams."

The next series of workshops will be held on October 16-21, 2008, and Lewey extends a special invitation to Texas Parks and Wildlife Department personnel with responsibilities in the Nueces River basin as well as to landowners and other natural resource agency personnel. Her contact information is below.

Wayne Elmore is fond of a quote from Winston Churchill: "You can always count on Americans to do the right thing—after they've tried everything else."

Texans have tried just about "everything else" when it comes to dealing with water problems in the state: reservoir building, brush clearing, stream channelization and a host of other expensive stop-gap measures. Perhaps it's time to step back and consider another Churchill admonition: "However beautiful the strategy, you should occasionally look at the results."

Past attempts to deal with water shortages in Texas have emphasized increasing the yield, whether by seeding clouds to produce more rain or building reservoirs to hold back runoff. Maybe it's time to look at the results of what we have been doing and listen to what our creeks and rivers have been trying to tell us for years.

Janice Staats (left) with group on the Nueces River talking about the basics of stream hydrology. Staats uses the Rosgen method of stream classification.

For More Information

For information on the Riparian Network Project and the importance of riparian areas, visit http://www.nueces-ra.org/CP/LS/index.php.

For riparian workshop information, contact Sky Jones-Lewey, Nueces River Authority, Uvalde, (830) 278-6810 or slewey@nueces-ra.org.

Technical references on riparian area management are available from the Bureau of Land Management; reading these before attending a workshop will enable you to get a great deal more from the experience, and you'll need them for reference later. Order TR 1737-15, *A User Guide to Assessing Proper Functioning Condition and the Supporting Science for Lotic Areas,* and TR 1737-20, *Grazing Management Processes and Strategies for Riparian-Wetland Areas,* from Bureau of Land Management, National Business Center, P.O. Box 25047, Denver, CO 80225 or contact Don Prichard at (303) 236-0162 or don_prichard@blm.gov.

What Riparian Areas Do

A properly functioning riparian area can be described as one that has the right kinds and amounts of vegetation to:

- Dissipate the energy of floodwater;
- Reduce erosion/stabilize banks;
- Trap sediment;
- Develop floodplains;
- Provide floodwater retention;
- Provide aquifer recharge;
- Provide water storage to sustain base flow.
- When these physical functions are occurring, the side benefits are improved water quality, improved aquatic habitat, diverse wildlife habitat, better livestock forage and enhanced recreational opportunities.