

Riparian Roots Reinforce Riverbanks

One of the primary attributes of good riparian vegetation is the extraordinary root system of many riparian species. These root systems help reinforce stream banks and floodplains during flood events by providing protection against the erosive effects of moving water, as well as the large rocks and logs that often surge downstream during flooding. In order to resist these powerful forces, vegetation must be well anchored.

We don't have nearly enough good information on the rooting characteristics of most riparian species, but a Master's Thesis from Arizona State University provides some helpful data applicable to Texas. From a study site in southern Arizona, Caitlin Cornwall provides the following information from her 1998 thesis:

Plant Species	Above Ground Biomass (lbs/acre)	Total Root Biomass (lbs/acre)	Total Root Length (miles/cu ft)
Spikerush	6,198	27,667	22.0
Knotgrass	6,198	24,527	18.8
Deergrass	23,302	65,033	7.2
Baltic rush	17,758	47,276	8.7
Rabbitsfoot grass	1,479	8,540	0.9

From this study, we discover several important things about riparian-wetland plant species. Root biomass is typically 2.5 to 5 times greater than above ground leaf and stem biomass. For species that are considered strong stabilizers, such as deergrass and Baltic rush, the root mass (and hence, root strength) is the more critical feature. For species that are considered more as colonizers, such as spikerush and knotgrass, the primary feature is the phenomenal length of roots present in a relatively small volume of soil. Wimpy annuals, such as rabbitsfoot grass, are better than nothing, but do not provide adequate root mass or root length.

Above ground biomass is also important, as this is what helps to dissipate the energy and velocity of floodwaters, allowing some sediment to drop out of the water column. The plants then stabilize the newly deposited sediment and gravel, helping to build bigger and more effective floodplains. The water storage capacity of these enlarged floodplains is also enhanced, which in turn helps sustain baseflow.

Spikerush (*Elyocharis* spp.) is found in most riparian systems across the state. Knotgrass (*Paspalum distichum*) is common in many areas and is noted for having fast growing stolons that root at the nodes for a quick mat-forming cover. Deergrass (*Muhlenbergia rigens*) is a large riparian bunchgrass found in the Trans Pecos and may have a similar rooting characteristic as switchgrass. Baltic rush (*Juncus balticus*) is not common in the state; however there are many other species of *Juncus* that may have similar type roots.

Next time you walk across a riparian area, try to visualize the amazing root mass and the length of roots that lie below your feet.

This article contributed to *Stream Lines* by Steve Nelle.



Photo. Strong roots help to hold riverbanks in place, even in during high flows.

Riparian Service Team,
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While the NRST was in Texas conducting these workshops, they met with NRCS State and Zone Office staff to discuss the possibility of developing a Texas Riparian Team—state Riparian Teams already exist in a number of other states—as well as ways in which the NRCS might use the PFC assessment method compatibly with their Stream Visual Assessment Protocol. The NRCS and NRST also have interest in pursuing additional training based on the new interagency technical reference *Grazing Management Processes and Strategies for Riparian-Wetland Areas* (TR 1737-20). The team will be exploring these opportunities over the coming year.

To learn more about the PFC method of stream assessment, a number of technical references are available free of charge from the agencies that provide support to the NRST: the U.S. Forest Service, the Bureau of Land Management, and the NRCS. Two to begin with are *A User's Guide to Assessing PFC and the Supporting Science for Lentic Areas* (TR 1737-16) and the same guide for lotic areas (TR 1737-15).

This article contributed to *TRA Stream Lines* by Emily Schieffer (LOPEZGARCIA GROUP) and Janis Staats (National Riparian Service Team).

A Listserv Primer

The Riparian Listserv is a service of the University of Texas, created to encourage the exchange of information on riparian issues among the citizens of Texas. You do not need to be a member of TRA to subscribe. Notices about recent riparian research, conferences, training, and activities are posted daily. The listserv also provides a forum for finding, sharing, and discussing riparian-related information and issues. TRA member business is generally conducted through a membership email list and snail mail.

To subscribe to the Riparian Listserv, send an email to: listproc@lists.cc.utexas.edu. Leave the subject line blank. In the body of the email, type: SUBSCRIBE RIPARIAN your first name your last name (for example: SUBSCRIBE RIPARIAN JOHN DOE). Soon afterwards, you should receive an email response confirming your request and providing general listserv info.

To receive listserv postings in a daily digest instead of receiving individual emails for each posting, send an email to the address above, leaving the subject line blank. In the body of the email, type: set RIPARIAN mail digest.

To remove yourself from the Riparian listserv, follow the instructions for subscribing, except in the body of the email, type: UNSUBSCRIBE RIPARIAN. Again, a confirmation email will be sent when your request has been processed.

To post messages to the listserv, direct your email to riparian@lists.cc.utexas.edu.

Please remember: When using the listserv, please be courteous to other users by not pushing the "Reply" button after viewing a message unless you want your reply sent to everyone that subscribes to the service.

That's about it! We suggest saving this primer for future reference. If you have questions, or encounter problems using the Riparian listserv, email Kevin at Kevin.anderson@ci.austin.tx.us.

Newsletter Basics

It's difficult to believe, but we're already into our fifth year of producing *TRA Stream Lines*. It is our hope that this newsletter will serve as a means of orienting new members and updating existing members to the developments and activities within our organization. I am sure that *Stream Lines* will evolve with the TRA, and I welcome your comments and suggestions for improvement, topics, and features (as long as you're nice). I also hope that you will contribute ideas, articles, and calendar entries for future issues.

We plan to publish this newsletter biannually, in the winter and the summer; the deadlines for submittals will be November 1st and May 1st, respectively. I encourage you to submit articles on topics you find interesting, but please be sure to make your submittals ahead of the deadline so that the newsletter can be printed on schedule. I will always edit articles for clarity and space constraints. Please send submittals (text as .doc files and images as .jpg files) and comments to Emily Schieffer at 512-451-5240 or eschieffer@lggroupinc.com. Thanks!

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Calendar of Riparian Events

March 30. Environmental Defense hosts its annual state-wide water conference at the Lady Bird Johnson Wildflower Center in Austin, TX. The focus this year is Texas Springs: Protection, Restoration and Stewardship. More information is available at www.texaswatermatters.org.

April 22. Deadline for submission of abstracts for the National Nonpoint Source Monitoring Workshop: Monitoring for Decision Making. The conference is sponsored by the U.S. EPA, TCEQ, and River System Institute. It will be held in Austin, TX on August 26-30. For more information, contact Chuck Dvorsky at cdvorsky@tceq.state.tx.us or Annette Paulin at NPS07@grandecom.net.

May 14. Deadline for submitting an abstract for the AWRA Annual Water Conference, to be held November 12-15 in Albuquerque, NM. A broad array of resource topics will be covered. For more information, see www.awra.org.

◆ = Event sponsored by TRA.



Texas Riparian Association
 c/o Center for Environmental Research
 2210 S. FM 973
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National Riparian Service Team Comes to Central Texas

In 1996, the National Riparian Service Team (NRST) created the *Creeks and Communities* program with the goals of 1) increasing awareness and understanding of riparian systems and 2) creating a shared vocabulary so that communities can discuss these systems. In service of these goals, the NRST conducts community-based trainings and service trips around the country. One of the tools they teach in the trainings is an assessment method, the Proper Functioning Condition (PFC) method, which utilizes interdisciplinary teams of stakeholders and scientists/skilled technicians in the areas of vegetation, hydrology, and landforms (erosion/deposition) to assess the physical functioning of a stream. A key of this method is that this assessment is made independent of any value judgments. For example, the species diversity of a stream is documented without discussion of whether these species are considered invasive. The benefit of this approach is that it provides a shared starting point (namely, a description of the current condition of a stream) and shared vocabulary for groups interested in developing a particular future state for that stream (e.g. increased livestock forage, improved bird habitat).

While the PFC assessment method is straightforward, it takes into consideration a number of variables and, as such, is most effective when undertaken by a skilled interdisciplinary team who is familiar with the stream being evaluated, as well as typical riparian systems in the region.

In the field, the team considers three physical components of a stream, in order to assess its health: vegetation, hydrology, and erosion/deposition. These are assessed by means of a checklist, which asks specific questions about each component. Most questions require a certain amount of subjective judgment on the part of the assessment team. With respect to the vegetation composition in the riparian corridor, a combination of woody and herbaceous species, of different ages, classes, and abilities to colonize and stabilize stream banks are considered preferable. Questions about the hydrology of the stream address the stream's access to the floodplain, frequency of flooding, and width/depth ratio. Erosion and deposition within the stream are explored with questions about lateral stream movement, point bars, and floodplain and channel characteristics. Additional information the team members judge to be important (even if not specifically requested) can be added to a "remarks" section at the end of the form and considered when making the final designation of the stream. These remarks can also be helpful after the stream assessment is complete, as the stakeholders begin to use the collected information to identify goals and design a management and monitoring plan for the stream.

The final designation of the stream as being *proper functioning condition*, *functional – at risk*, *nonfunctional*, or *unknown* is a qualitative decision based on quantitative data and is reached following the team's discussion of all issues identified during the assessment.

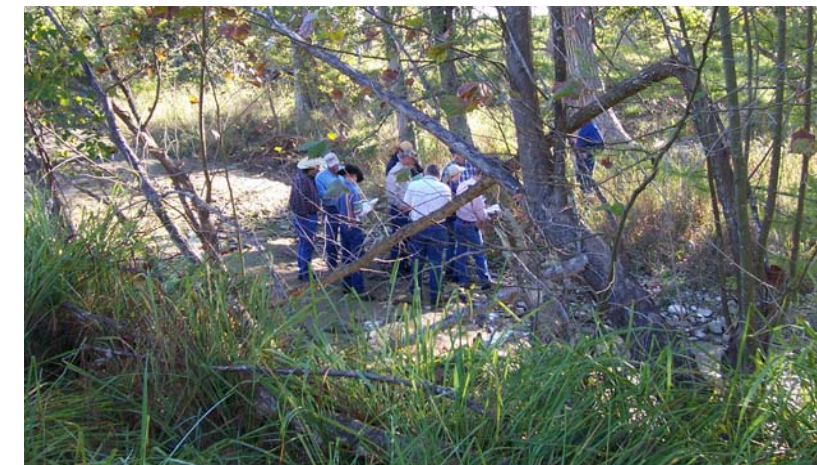


Photo 1. A group discusses their assessment of a stream outside Kerrville.

Photo 2. Steve Nelle discusses the role of various riparian plants with the group.



At the request of the Natural Resources Conservation Service (NRCS) and with the assistance of local coordinators Steve Nelle and Ricky Linex, the NRST presented this process to a total of almost 100 participants over the course of two, two-day workshops in Kerrville and Corsicana October 16-17 and 19-20, 2006. After a full day of classroom instruction covering the basics, participants headed to the field on the second day, to practice using the methodology. Sponsors of the workshops included NRCS, The Nature Conservancy, The Grazing Lands Conservation Initiative, Navarro Soil and Water Conservation District, and Dunaway Consulting.

For more information, contact Kevin Anderson at 512-972-1960 or kevin.anderson@ci.austin.tx.us
 Or check us out on the web at www.texasriparian.org

Membership Update. The Texas Riparian Association is an all-volunteer, nonprofit organization dedicated to encouraging healthy riparian systems in Texas. The TRA's efforts in education, research and healthy watershed management are possible largely through the funds provided by members like you. Please consider joining us or renewing your membership today. Thank you for your support!

Yes, I want to become a member of the Texas Riparian Association and help to encourage healthy riparian systems within Texas!

Name _____ Affiliation (if any) _____

Address _____

Phone (work/home) _____ Phone (cell/pager) _____

Email _____

Please check one of the following annual membership categories:

- | | | | |
|--|------|--|-------|
| <input type="checkbox"/> Member | \$20 | <input type="checkbox"/> Business Member | \$50 |
| <input type="checkbox"/> Student Member | \$10 | <input type="checkbox"/> Sponsoring Member | \$150 |
| <input type="checkbox"/> Government or Non-profit Member | \$35 | <input type="checkbox"/> Life Member | \$300 |
| | | <input type="checkbox"/> Sustaining Member | \$20 |
- (add to cost of any other membership category)

I would like to serve on a committee! My first choice is:

- Administration (finances, incorporation, by-laws, membership)
- Program (agendas and logistics for conferences, workshops, seminars, meeting planning)
- Outreach (educational materials- except programs- including newsletter, website, brochures)
- Research & Demonstration (library, database, demonstration projects)

Please make checks payable to the Texas Riparian Association and mail with this form to: TRA c/o Center for Environmental Research
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For more information on membership, contact Kevin at kevin.anderson@ci.austin.tx.us

Long Live the Rio Laja!

The Rio Laja watershed comprises most of the state of Guanajuato in central Mexico. Fed by several mountain streams, the Laja is depended upon by many people for many purposes. Campesinos living along the river make use of it for household water needs and occasionally for irrigation; for many of them, the Laja is the only economically viable water supply. Commercial agriculture, much of it run by multinational agribusinesses, is also a big consumer of the river's water. These farms use a variety of means to irrigate, ranging from efficient central pivots to inefficient flood systems, with many still using spray irrigation gun techniques. Among those dependent upon the Rio Laja for day-to-day purposes are the citizens of San Miguel de Allende, long known as an artist colony and a haven for expatriates of many nationalities.

Into this community, almost 30 years ago, came Susan Porter Smith from New York. After studying painting and photography for several years and enjoying some success, Susan reinvigorated her interest in environmental issues and soon became president of the only Audubon chapter in Mexico. Her personal issue was the connection between environmental degradation in the watershed and the steady increase in population. The water table was dropping; forests were being harvested for firewood for the cities and charcoal for commercial operations; cows and goats were consuming not only the grasses and forbs, but also the mast from oak trees, substantially limiting forest renewal; riparian areas were being damaged by erosion and improperly controlled livestock access.

Susan began to coordinate the efforts of numerous organizations with environmental and community connections to promote more sustainable practices within the watershed. She sought technical support from the U.S. Forest Service and secured grant funds and technical assistance from the U.S. Fish and Wildlife Service, National Fish and Wildlife Foundation, and the North American Wetlands Foundation, in addition to Mexican governmental agencies. Ultimately, she founded a private, volunteer-powered, non-profit organization, Salvemos al Rio Laja, which is dedicated to conserving and rehabilitating the Rio Laja Watershed, including Santa Rosa, the major watershed forest.

The program that developed from the collaborative efforts of these various organizations focused on building small rock dams in gullies and on steep, almost barren hillsides within the various communities, as well as a massive effort to pinpoint and create a photo database of these structures, using GIS. Salvemos al Rio Laja has carried out many of these projects. Other projects have been undertaken by landowners, under the supervision of the U.S. Forest Service.

In August of 2006, Susan Hughes of Save the Laja, a sister organization in Texas, invited a team of natural resource professionals to assess funded projects in the watershed of the Laja River. The team included Al Medina (Research Ecologist, U.S. Forest Service, Rocky Mountain Experiment Station, Flagstaff, AZ), Dr. Gilberto Soliz Garza (Riparian Professor, University of Sonora, Mexico), Jaci Winter, a Canadian archaeologist, Dr. Fran Gelwick (Asst. Professor, Dept. of Wildlife & Fisheries Science, Texas A&M University), and Mike Mecke (Water Programs Specialist, Texas Water Resources Institute, TAMU and co-founder of TRA). The team was ably assisted by two Mexican graduate students, Gerardo Lopez Mora and Jose Maria "Chema" Suarez Duena, who had participated in several of the Laja projects.



Arriving in San Miguel for a lengthy tour of the watershed, the team found a surprising diversity in topography, elevation, geology and vegetation, but also much degradation throughout the watershed. After assessing the watershed and the projects that had been completed within it, the team gave a report to the Save the Laja leadership. In general, it was felt that while the projects indicated a tremendous amount of effort and dedication on the part of the volunteers, much more would be needed in order to both heal and slow the deterioration of the watershed and riparian areas. Plans were made and recommendations given for the work that would be undertaken. Just as the causes that combined to produce the deteriorated watershed were many, so would be the array of tools used to stabilize and improve the riparian conditions of the Rio Laja, its flows and surrounding watersheds. Some of the proposed projects will involve negotiations and agreements with landowners, land managers, and the irrigation district that has completely cut off Laja River flows in the valley

with a dam built to provide irrigation water. A long and intense education program of conservation, riparian awareness and resource management will be needed before significant changes may be visible downstream. Cultural issues and economic stability of the largely agricultural population must be addressed prior to achieving a healthy and sustainable watershed.

The team was immensely grateful to Save the Laja for inviting us to this beautiful and historic part of Mexico and for the true hospitality, friendliness and professionalism shown by them and many Mexican locals during the visit. After five days our motto became: **Long live the Laja! Viva Mexico!**

This article provided to *TRA Stream Lines* by Susan Hughes and Mike Mecke.

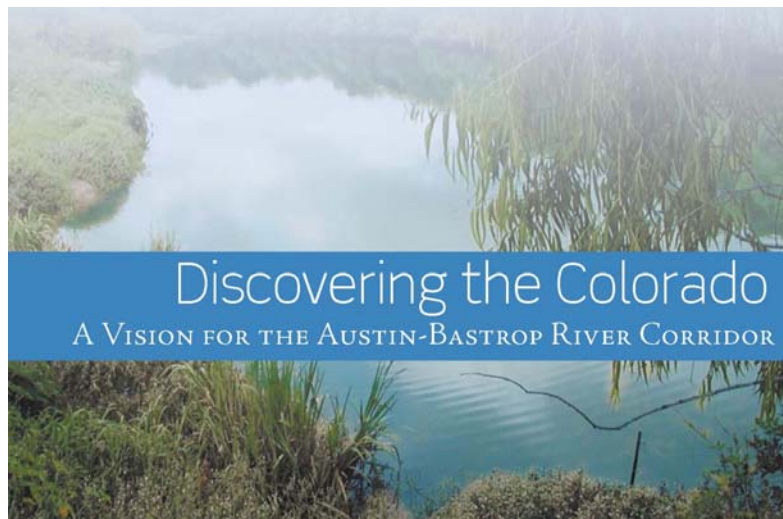
New Riparian Publications

Discovering the Colorado: A Vision of the Austin-Bastrop River Corridor

Since 2003, neighbors along the Colorado River between Austin and Bastrop have gathered together as stakeholders to have a conversation about the future of the Colorado River corridor. The 60-mile portion of the corridor discussed by this group begins as the river is set free from the Highland Dam system at the foot of Longhorn Dam, which forms Austin's Town Lake. Downstream from Longhorn Dam, the free-flowing river meanders southeastwardly across the bottomland toward Bastrop. In Bastrop, the corridor ends with the sandstone bluffs, which tower over the river just downstream from Tahitian Village. The river continues flowing freely all the way to the Gulf Coast.

These neighbors formed the Austin-Bastrop River Corridor Partnership and together have articulated a vision of the river corridor in which people of all ages and interests recognize and appreciate the river for its clean and flowing water, recreational opportunities, scenic beauty, economic resources, and sustainable land development.

Now in early 2007, this vision has taken the form of a report written with the help of the National Park Service Rivers, Trails, and Conservation Assistance Program. It contains recommendations for collaboration in the areas of recreation, water resources, cultural resources, land use, sand and gravel mining, and education. This "Vision Report" is intended to provide a framework for city and regional policy, riparian protection and restoration efforts, public recreational infrastructure investment, educational programs, future development proposals, and an overall tool for the community to promote a sustainable river corridor. Implementation of the plan will require support and cooperation among landowners, businesses, and governmental bodies, and the community's commitment to its fulfillment. This plan is the first step toward orchestrating agency and community actions and finding funding to make this vision a reality.



This stretch of the Colorado River has played an important role throughout the history of Central Texas – from prehistoric times to Native American tribal cultures and Anglo settlements, to the modern day urban lifestyle of the greater Austin/Bastrop metropolitan region. Studies suggest that the pattern of unprecedented growth of the region over the past ten years will continue, and likely accelerate into the foreseeable future. Highway construction, sand and gravel mining, and large development projects already planned for the area will dramatically change the landscape of this river corridor. What was once a vast bottomland forest – a great thicket of green or the "monte grande" described by early Spanish explorers – is now a thin collection of remnant forests along the riverbanks. Pastures, pecan orchards, housing developments, or gravel pits claim the majority of the bottomland.

For these reasons and more it is a critical time to recognize the value of the Colorado River and its riparian ecosystem and work cooperatively to protect and enhance those aspects most valued by the community. By working together to articulate a vision for the river corridor from Austin to Bastrop, project supporters hope to promote development that is sensitive to the importance of the river, conservation of the delicate natural resources, river-based recreational opportunities, river interpretation and education programs for all ages and interests, and a necklace of protected natural areas that can comfortably support all of the above uses.

Streamside Management in the Hill Country: An Edwards Aquifer Plateau Landowners Guide

The Nature Conservancy (TNC) along with the USDA Natural Resources Conservation Service (NRCS), Nueces River Authority, and Guadalupe-Blanco River Authority recently released a new publication, *Streamside Management in the Hill Country: An Edwards Plateau Landowners Guide*, in order to provide information to landowners on riparian areas and their management. Among the topics covered in the publication are: the benefits of a healthy riparian zone, recognition of both healthy and impaired riparian zones and how a riparian zone can become impaired and repaired. Also included are a landowner checklist of riparian health, a short riparian zone plant list for the Edwards Plateau, and a list of riparian information resources including the Texas Riparian Association. The publication is being distributed without charge to landowners and others interested in Edwards Plateau riparian management. You can obtain a copy from NRCS Zone 2 offices, the Nueces River Authority, Guadalupe-Blanco River Authority, and TNC offices in central Texas. You can also contact the Conservancy's Blanco River Project office at 512-847-0790 if you would like to have one delivered.

