



Upper Llano River Watershed Protection Plan

Newsletter Issue No. 5

January 2018

2017 Year in Review

Welcome to the fifth Upper Llano River Watershed Protection Plan (WPP) newsletter and thank you for your continued interest in preserving our valuable natural resource.

In late 2016, the Environmental Protection Agency (EPA) accepted the Upper Llano River WPP – without suggesting any changes! This remarkable achievement reflects the hard work and dedication the Coordination Committee and Working Groups put into developing a holistic plan that finds creative ways to protect the Upper Llano.

Now a new phase of work begins – *Implementation*. To guide this work, the Coordination Committee has been reorganized, consisting of both previous members as well as some new faces.

During 2017, the Llano River Field

Station was also active in helping guide the implementation of the WPP. Dr. Tom Arsuffi and Tyson Broad (who replaced Dr. Emily Seldomridge in April 2015) have been promoting the plan to community leaders and organizations, hosting workshops to address issues identified in the WPP, and seeking funding to implement management measures.

The Field Station has also served as a base for research into ways to improve the effectiveness of management measures identified in the WPP.

We hope you enjoy this edition of the newsletter. Should you have any questions, please do not hesitate to contact [Tom Arsuffi](#) or [Tyson Broad](#) at the Field Station in Junction.

Upper Llano River
Watershed Protection Plan

Page 2

Technical Assistance

Pages 3-6

Project Implementation

Pages 7-8

WPP Management Measures

Upper Llano River Watershed Protection Plan

A Healthy Watershed Approach



Partners

Texas Tech University at Junction
Llano River Field Station

Texas Water Resources Institute

Llano River Watershed Alliance

Texas Parks and Wildlife
Department

Texas State Soil and Water
Conservation Board

Funding provided through a
federal Clean Water Act §319(h)
Nonpoint Source Grant
administered by the Texas State
Soil and Water Conservation
Board from the U.S. Environ-
mental Protection Agency.

The Implementation of the Upper Llano River Watershed Protection Plan is on a 10-year timeframe, focusing on eight different management measures.

Each measure has annual implementation milestones, expected funding needs and identified organizations that will guide and carry out each of the plan's recommended actions.

Recommended Voluntary Actions

- **Septic Systems** : Repair and replace 100 systems
 - **Feral Hogs** : Decrease the feral hog population by 66% (or 26,000)
 - **Wildlife & Exotics** : Increase the number of ranches with wildlife management plans by at least two annually, particularly in riparian areas
 - **Livestock** : Enroll >
- 250,000 acres of ranchlands in conservation plans
 - **Brush Control** : Treat > 144,000 acres of brush to improve range conditions and increase water supply
 - **Streambank Restoration** : Begin restoration of 14 miles of areas lacking a riparian buffer and begin to improve vegetation conditions along 10% of riparian zone.
 - **Stormwater Runoff** : Identify and implement best management practices to address urban runoff
 - **Water Conservation** : Improve urban water use efficiency by 10%

Coordination Committee Members

Cities – Mayor Russell Hammonds
(Junction)

County Extension – James Crockett

Counties– Judge Delbert Roberts /
Judge Gary Merritt

Soil Districts – Bob Brockman / Marty
Graham

Texas Parks Wildlife – Melissa
Parker/Megan Bean

Groundwater Districts – Jerry
Kirby/Joel Pigg/Jim Polonis

Texas Forest Service – Lori Hazel

Llano River Watershed Alliance –
Znobia Wootan

South Llano River State Park – Scott
Whitener

Prescribed Burn Association – Sam
Jetton

NRCS – Dandy Kothmann

Landowners – Art Mudge/Tom
Vandivier/Ruth Russell/Andrew
Burnard/Roland Trees/Joe David
Ross

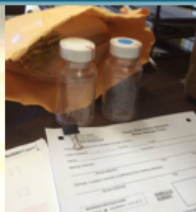
Technical Assistance

Education & Outreach

Technical Assistance via Education and Outreach is an important component of the Watershed Protection Plan.

During the past year, there have been several workshops (below), lectures, and demonstrations for Llano Watershed residents, landowners, and school children.

Water Well Owners Educational Event



Tuesday, November 14, 2017
8:30 am— 12:30 pm

Texas Tech Center at Junction
254 Red Raider Ln.
Junction, TX

TEXAS Watershed Steward

The Texas Watershed Steward program is a free educational workshop designed to help watershed residents improve and protect their water resources by getting involved in local watershed protection and management activities.

May 6, 2017:
8:30 am - 12:30 pm



Junction ISD students learn about streambank erosion using Llano River Field Station's new Stream Trailer. Below: The Streambank Restoration Workshop provided hands-on training for participants.



Technical Assistance

Research

Research is a vital component of the Texas Tech Llano River Field Station. Over the past year, several research efforts have addressed issues of concern to the Watershed Protection Plan. Doctoral Candidate Matt Buchholtz, from the Texas Tech Department of Natural Resources is examining axis deer, while Ecological Society of America Summer Intern Maggie Yarnold from Loyola University - Chicago has spent the past two summers monitoring riparian vegetation both in and outside of wildlife exclosures.

Ecology of Axis Deer in the Upper Llano River Watershed

By Matt Buchholtz

The effects of exotics on native habitats and wildlife are poorly understood. This especially holds true for axis deer in the Upper Llano River Watershed. A multi-year study as part of a Ph.D. dissertation research project being conducted by Matt Buchholz from Texas Tech University's Department of Natural Resources Management in coordination with the Llano River Field Station seeks to address these knowledge gaps.

Continued page 5



Ungulate Foraging Pressures on Riparian Zones Along the South Llano River

By Maggie Yarnold

Of the original riparian habitats in the western U.S., The Bureau of Land Management and the U.S. Forest Service estimate that only 20% still exist and what remains continue to decline largely due to livestock. However, some recent work shows that other ungulates have significant effects on riparian health. In developing a Healthy Watershed Protection Plan, we studied the effects of white tail deer and exotic axis deer foraging on riparian structure and function along the South Llano River in Junction, Texas. The whitetail deer population density is 4 deer/acre. The axis deer population has not been quantified, but are visually as abundant as white tail and move in herds of 100 or more. We used transect sampling to assess riparian tree composition and age class, one large exclosure (15x15m) to assess deer browsing and herbivory effects—the same will be completed on 10 smaller (5x5m) riparian exclosures this upcoming summer. We conducted replicated quadrat (.25m²) samples and identified plants and forbs, including plant diversity, height, biomass and litter formation inside and outside of exclosures.

Continued page 6

Axis Deer - Buchholtz

Efforts are ongoing to monitor the effects of axis deer on native riparian habitats and soils, assess their interactions with white-tailed deer, estimate the size of axis deer population, and monitor their movements throughout the landscape. Field observations started last May, and some interesting observations have already been made.

Axis and white-tailed deer were observed feeding and interacting with each other throughout much of the summer and fall. These observations are contrary to what was expected as axis deer have generally been understood to be the more aggressive (as well as physically larger) of the two species and that they will typically chase whitetails away. However, we suspect that the excellent range and forage-nutrition conditions this year that resulted from the high rain totals in spring provided ample food sources and food competition may have been minimal. In years where this is not the case we expect that there may be competition for the limited browse that is available until it is consumed at which point axis deer will switch to consuming more grass and whitetails will need to search for the limited food sources that they can digest.

We have also constructed 30 deer exclosures on the Texas Tech Junction campus, South Llano River State Park, and three private ranches. These exclosures will be used to assess the difference between where both deer species are prevented from feeding and an adjacent control where they can feed. Preliminary results from the first post-construction sampling that occurred in October show that after only 3 months of excluding deer there is substantially more biomass within exclosures than outside. Some of the most striking observations were from one of the private ranches where deer

density is estimated to be quite high. At each of the exclosures on this ranch vegetation was grazed almost to the ground right up to the exclosure fence. At this point we are not able to assess the amount of grazing by axis deer compared to whitetails but hope to differentiate that over the course of this research.

Preliminary observations of the movement of axis deer suggests that they spend the vast majority of their time within the riparian zone. Movement into the uplands by axis appears to be limited to canyons and not onto the tops of the hills. This may provide separation between axis deer and whitetails during the times when the two species are competing for food. However, the best food sources will still likely occur in the riparian zone. This affinity for the riparian zone as well as other behaviors such as trailing also means that they may be having significant effects on the vegetation and soils within the riparian zone.

For questions about this research, please contact Matt Buchholz at matthew.buchholz@ttu.edu



Ungulates - Yarnold

Results/Conclusions

Plant species richness was higher in exclosures than open riparian areas, especially among grasses, forbs and saplings. Very few seedlings/saplings were quantified along riverbank transects, whereas within exclosures, pecan, basswood, hackberry and elm were common with few china berry and mesquite. Standing crop above ground plant biomass was 3-25 times greater within exclosures and litter layer biomass was 2-5 times higher than outside. Highly preferred browse species (pecan, hackberry, elm, wild four o'clock) were taller and denser inside the exclosures.

Clearly, ungulate herbivory pressures are impacting riparian zones of the South Llano River, resulting in streambank erosion, periodic bacterial exceedances and lack of streamside forest canopy regeneration. Implementation of the Upper Llano Watershed Protection Plan calls for a coordinated effort to managing white-tailed deer and non-native, exotic populations (primarily axis deer) through increased landowner participation in wildlife management plans and the establishment of exclosures along critically degraded riparian zones.

Moving forward, there is immediate urgency for research on herbivore impact, exclosure effectiveness and demonstration value of restored riparian plant communities to further watershed protection efforts.



Implementation

Implementation of Management Measures defined in the Upper Llano River Watershed Protection Plan (page 2) has gotten off to a good start in the first year. Thanks to partnerships with Natural Resources Conservation Service, local Soil and Water Conservation Districts, and local Prescribed Burn Associations, both the annual goal for brush control and prescribed burning were reached. And thanks to a partnership with Texas Parks and Wildlife Department and volunteer efforts from Hill Country Alliance, Texas Master Naturalist, and Llano River Watershed Alliance, significant strides in Riparian Restoration were made in the Watershed.



In the first year, over 13,000 acres of brush were treated in the Watershed. The annual goal in the WPP is 9,000 acres.



Over 6,700 acres in the Watershed were treated with Prescribed Burning in the first year. The annual goal is between 5,400 and 7,700 acres.



Elephant Ear were treated on 24 miles of riparian habitat along the Llano. The WPP goal is to improve vegetation conditions along 10% of the riparian zone lacking riparian buffer.



Volunteers dedicated an August weekend to removing Mexican Needlegrass, a new invasive species, at South Llano River State Park.

Implementation



Volunteers from Texas Master Naturalist, Texas Parks and Wildlife, South Llano River State Park, Llano River Field Station and Llano River Watershed Alliance place cages around saplings in the riparian area to protect them from wildlife browse.

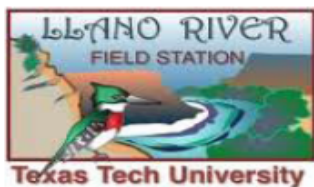


Volunteers treat invasive Chinaberry trees at Llano River Field Station.

Stay in Touch



For weekly updates on happenings in the Llano Watershed, go to **llanoriver.org** and sign up for the weekly newsletter. The newsletter is a publication of the Llano River Field Station and Llano River Watershed Alliance. It's Free!



Contact Us

Tom Arsuffi
Llano River Field Station
Texas Tech University –
Junction
325-446-2301
tom.arsuffi@ttu.edu

Jana Lloyd
Texas State Soil and
Water Conservation
Board
254-773-2250 x-224
jlloyd@tsswcb.texas.gov

Tyson Broad
Llano River Field Station
Texas Tech University –
Junction
325-446-2301
tyson.broad@ttu.edu

Michael Schramm
Texas Water Resources Institute
Texas A&M University-College
Station
979-458-9191
Michael.schramm@ag.tamu.edu

