

Proactive Management of Aquatic Invasive Species through a Watershed Protection Plan Upper Llano River, TX

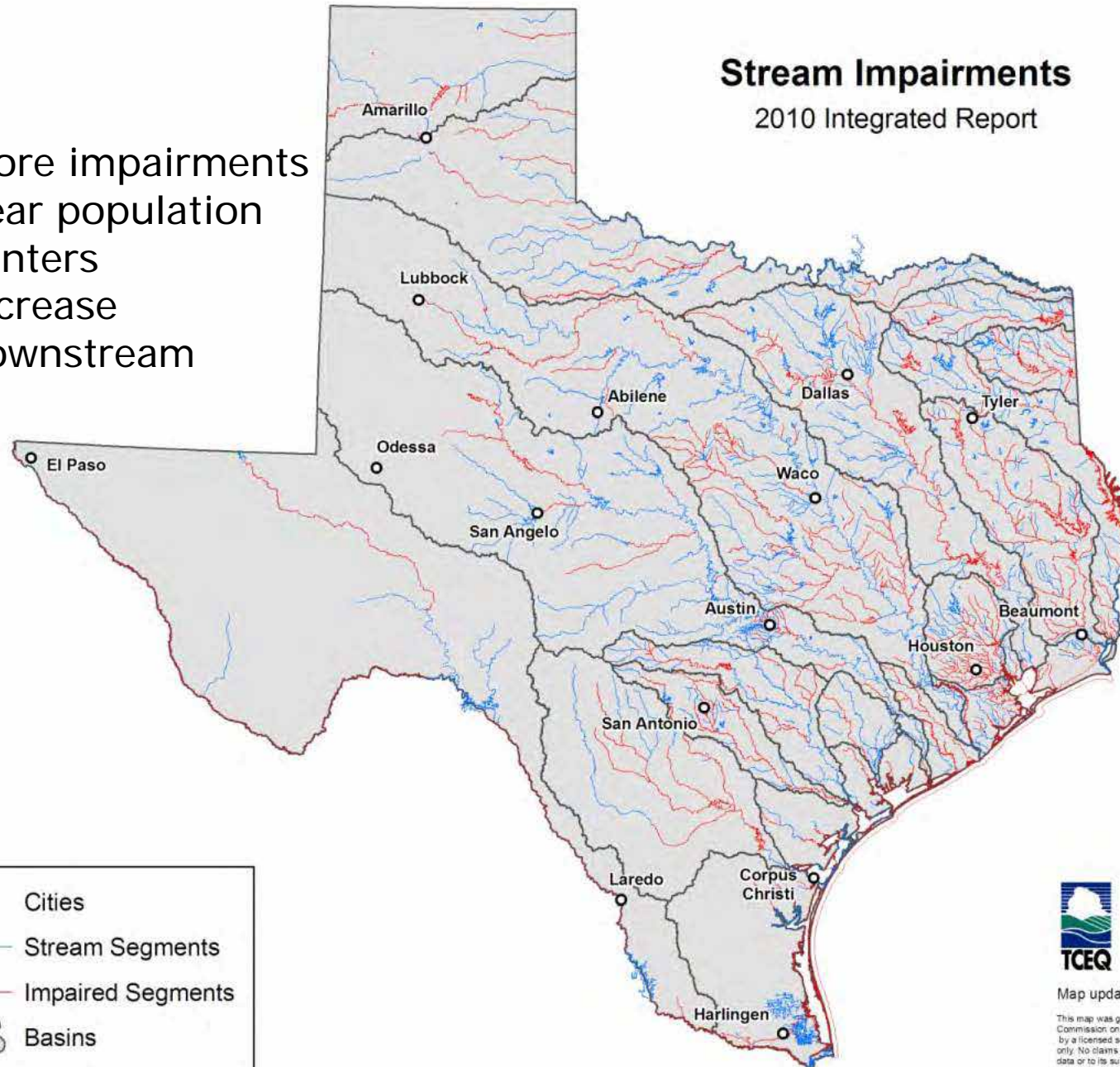
Emily Seldomridge, Tom Arsuffi, Earl Chilton, Gary Garrett,
Melissa Parker, Luci Cook-Heldreth, Preston Bean
Texas Tech University, Llano River Field Station
Texas Parks and Wildlife Department



Stream Impairments

2010 Integrated Report

- More impairments near population centers
- Increase downstream



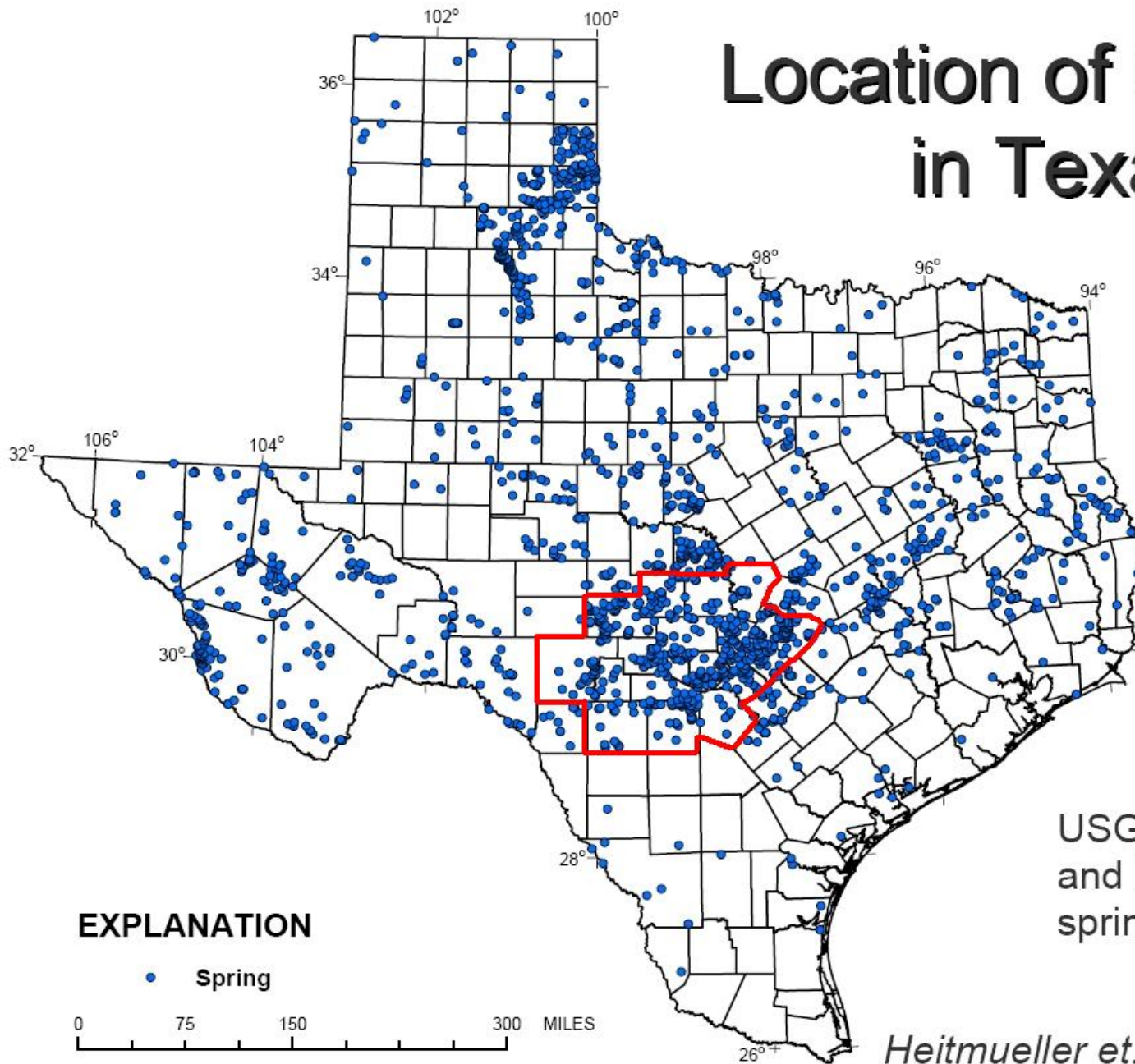
Protecting Texas by
Reducing and
Preventing Pollution



Map updated March 2012

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Location of Springs in Texas



USGS verified existence
and location of 1,891
springs in Texas

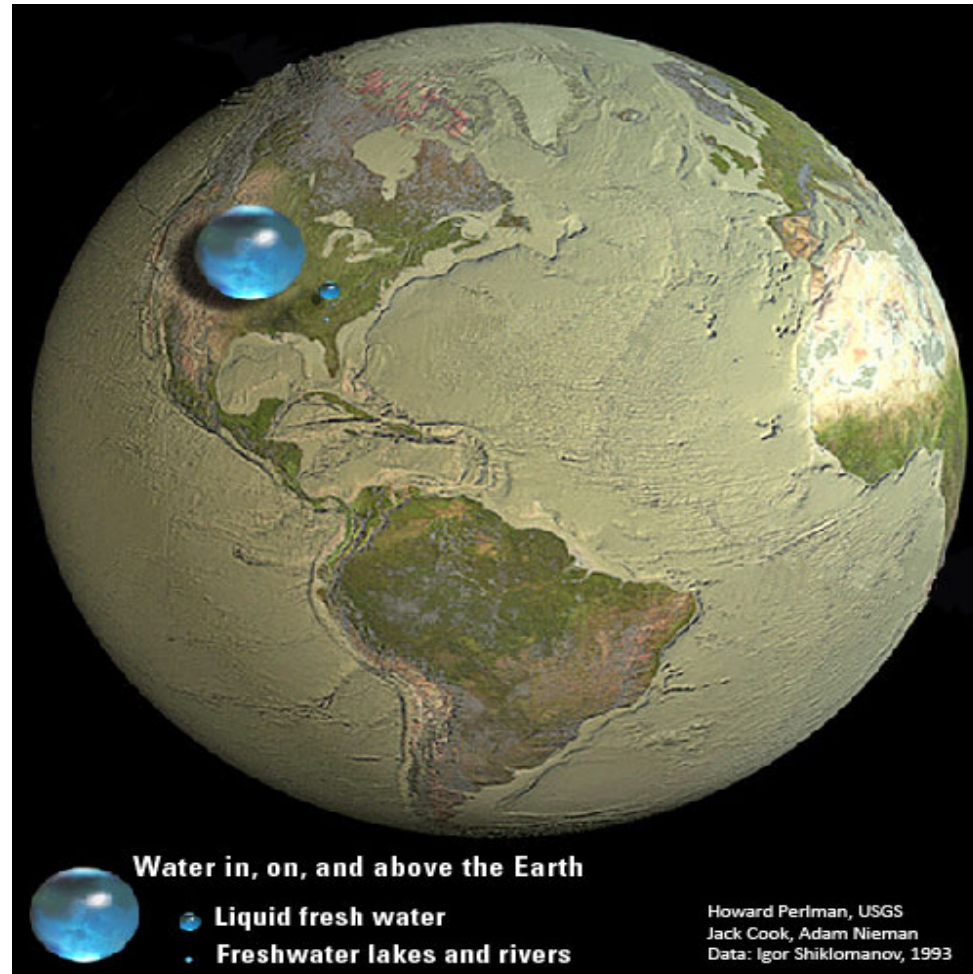
Heitmueller et. al (2003)

Healthy Watersheds Approach

- } Maintenance of aquatic ecological integrity by protecting our highest quality watersheds or those intact components of watersheds
- } Goal: Stop threats from becoming full-blown problems
- } Locally-developed, volunteer, stakeholder-driven process
- } CWA § 319(h) grant from TSSWCB and EPA



Threats to health of Upper Llano: Water quality and conservation



Threats to the health of the Upper Llano: Brush



Threats to health of Upper Llano:

- 1) Land fragmentation
- 2) Riparian Protection
- 3) Upland management



Threats to health of Upper Llano: Axis deer



Threats to health of Upper Llano: Hog



Threats to health of Upper Llano: Invasive plants



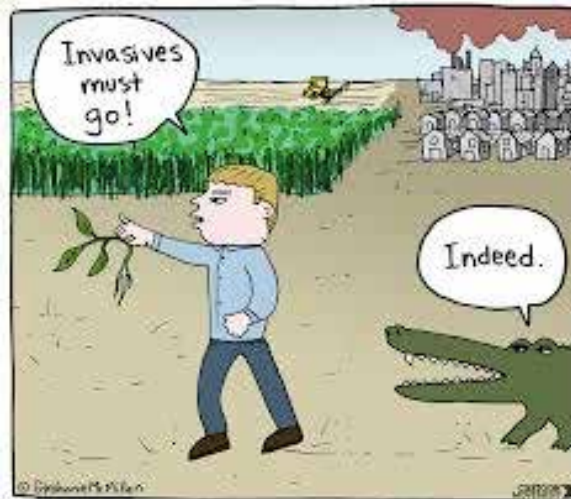
Invasive species

- } Defined as non-native, alien, or non-indigenous to the ecosystem (Executive Order 13112)
- } Potential to cause economic or environmental harm or harm to human health
- } >50,000 invasives in the US (Pimental et al. 2005)
 - Tremendous negative impacts
 - \$120 billion per year

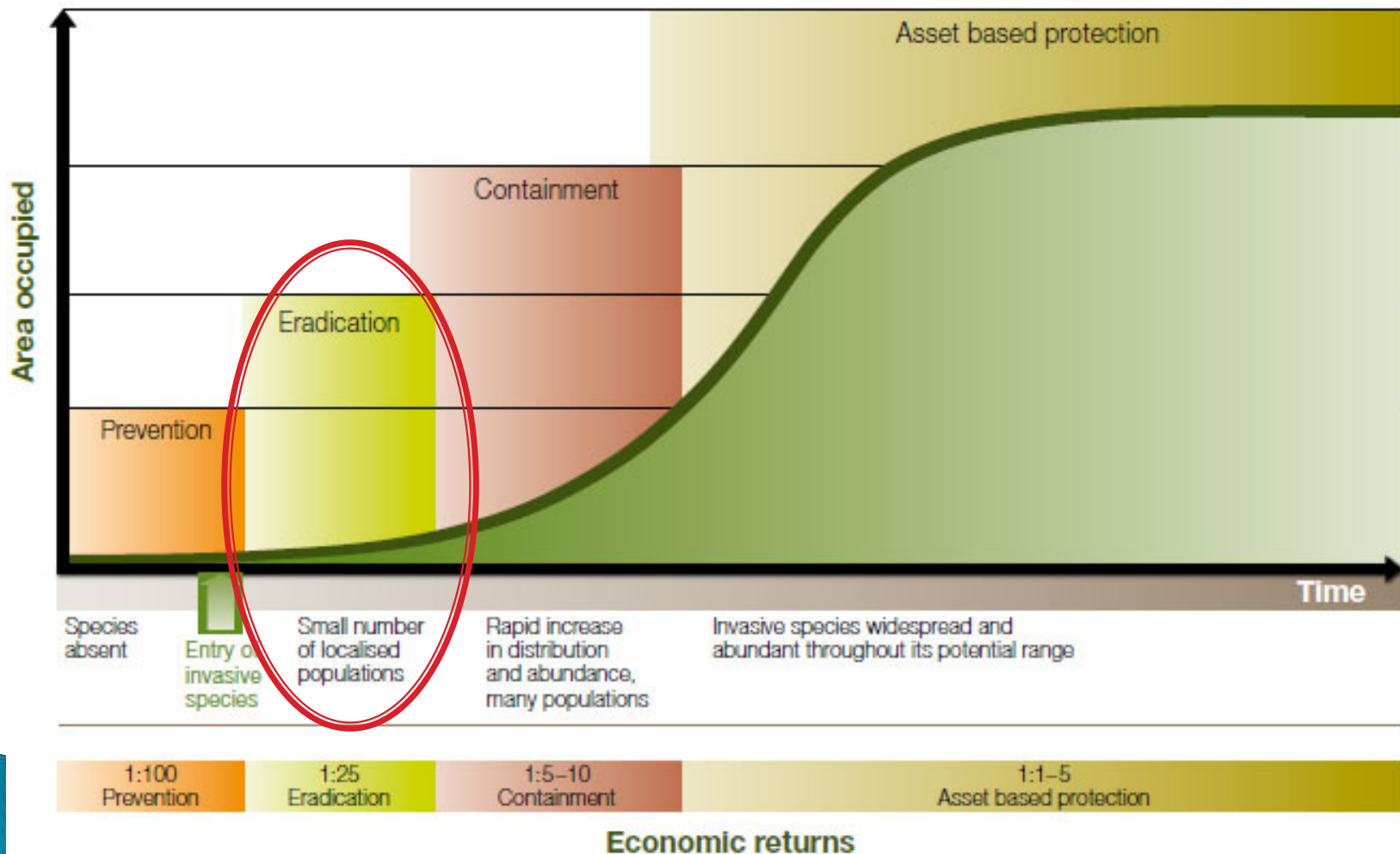


Ecological threats from invasive plants

- } Colonization of riparian areas, which creates monocultures
 - Reduces biodiversity
- } Elimination of native vegetation
- } Alteration of soil conditions
- } For some, enhance water loss to the system



Prevention is most economical solution



Map of invasive riparian plants



Riparian Threat: Invasive plants

- } Elephant Ears
- } Giant Cane
- } Chinaberry



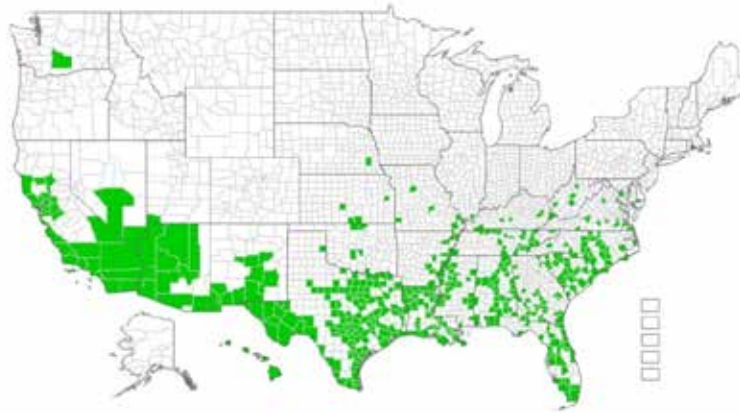
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Systemic treatment: Elephant ear



Systemic treatment: Giant Cane



September 2012



April 2013

Replanting riparian areas after removal



Exclosures: Plant recruitment



Conservation Demonstration Area




- } Diversity Trail
 - BMPs
 - Wind and solar energy
- } Linked to South Llano Paddling Trail



Public outreach and education

- } Seminars
 - Stop the Invasives
 - Conservation Land Easements
 - Texas Well Owner
- } TTU Outdoor School
 - K-12 TEKS water and watershed curriculum unit
- } Texas Natural Resources/
Environmental Literacy
Plan



A scenic landscape featuring a calm body of water in the foreground, which perfectly reflects the sky and the surrounding vegetation. The sky is a vibrant blue, filled with large, fluffy white clouds. A thick line of green trees and shrubs forms the background, their colors mirrored in the water. The overall scene conveys a sense of natural beauty and tranquility.

Holistic watershed management provides
countless ecosystem services, which translates into
more water of higher quality for
downstream users

For more information: www.southllano.org



South Llano Watershed Alliance

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Upper Llano Watershed Protection Plan

BACKGROUND

- [Upper Llano River Watershed Protection Plan](#)
- [Development of the Upper Llano River Watershed Protection Plan](#)
- [Frequently Asked Questions about the Watershed Protection Plan -New](#)
- [Stakeholder Questions about the Watershed Protection Plan -New](#)
- [Watershed Protection Plan Program – Texas State Soil & Water Conservation Board](#)
- [Healthy Watershed Initiative – Environmental Protection Agency](#)

MEETINGS

- [Stakeholder Meeting – August 14, 2012 agenda- meeting summary](#)
- [Stakeholder Meeting – October 9, 2012 agenda-meeting summary](#)
- [Coordination Committee Meeting – December 11, 2012 agenda-meeting summary](#)
- [Coordination Committee Meeting – February 21, 2013 agenda](#) **NEXT MEETING**

PROJECT DETAIL

- [Watershed Protection Plan Newsletter Vol 1 -New](#)
- [Project Workplan](#)
- [Quality Assurance Project Plan-Modelling](#)
- [Quality Assurance Project Plan-Monitoring](#)
- [Quarterly Reports](#)
 - 1st Qtr Report 2011
 - 2nd Qtr Report 2012
 - 3rd Qtr Report 2012
 - 4th Qtr Report 2012
 - 5th Qtr Report 2012

Quick Links

- Join the Alliance's [email list](#)
- [Contact us](#)

WEATHER AND CLIMATE

- [Junction Weather forecast](#)
- [LCRA Hydromet: Temperature, Rainfall, Streamflow](#)
- [Historical LCRA Hydromet Data](#)
- [How Dry Is It?..latest drought map](#)
- [Central Texas 180 - Day Rainfall Deficit](#)
- [Long Range Outlook](#)
- [Office of State Climatologist](#)

HYDROLOGICAL INFORMATION

- [South Llano River at Flatrock Crossing](#)
- [Llano River at Junction](#)
- [Llano River at Llano](#)
- [700 Springs nr Telegraph](#)

Partners



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A scenic view of a river with rapids, surrounded by lush greenery and trees with autumn foliage. The water is turbulent and white with foam as it flows over rocks. The banks are covered in dense vegetation, including tall grasses and trees with yellow and orange leaves. The sky is blue with some clouds.

Emily Seldomridge, PhD
Llano River Field Station
emily.seldomridge@ttu.edu

Threat: Terrestrial Invasives

- } Herbivory/rooting
- } Trampling of vegetation
- } Tree mortality during rut
- } Trailing behavior



Threat: Landuse change

- } Changing land use may encourage erosion
- } In Hill Country, landuse dominated by low quality grasses and monotypic forbs
 - Not capable of supporting deer, exotics, and livestock populations



Pictured: Floodplain disconnected from river processes

Threats to the Llano River: Invasives

- } Invasive species
 - Axis deer

