

TEXAS WATER RESOURCES INSTITUTE  
AND  
TEXAS TECH UNIVERSITY

Development of the Upper Llano River Watershed Protection Plan  
FY 2011 Workplan 11-04

Quarter no. 7 From 4/1/13 Through 6/30/13

**I. Abstract**

This quarter, TPWD awarded the SLWA the 2013 Lone Star Land Steward Award for the Landowner Association Category due to the organization's dedication to land stewardship. The fourth meeting of the Coordination Committee was held on June 1, 2013. A quorum wasn't present, but working groups were the point of discussion by those present. Working groups will be reviewed again at the next Coordination Committee meeting on August 1, 2013. A Texas Well Owner Network Program was held on June 1, 2013. Forty landowners participated in the workshop. Additionally, TTU-LRFS attended and participated in 16 meetings in order to communicate project goals, activities and accomplishments. There were 10 media mentions this quarter primarily related to the water well owner training and SLWA Award. There were 1651 visits and 774 unique visitors to the website. The largest activity spikes were associated the SLWA Land Stewardship Award, the River Clean-up, and the Texas Well Owner Network. Also, the Facebook page reached between 20 and 1883 people on a weekly basis this quarter. The peak reach was 723 people associated with the pulse flow event on the North Llano in late May.

The revised modeling QAPP was resubmitted to TSSWCB on May 20, 2013. Hopefully, modeling can be initiated next quarter upon its approval. The fourth quarterly sampling at 14 stream sites and 6 spring sites was conducted on June 3-6, 2013. Also, TTU-LRFS completed mapping of invasive aquatic plants and eroding banks in the North and South Llano Rivers in June 2013. Finally, TTU-LRFS continued work on the historical data review for the upper Llano River. It is expected to be completed next quarter.

**II. Overall Progress and Results by Task**

**Task 1 Project Administration**

*Subtask 1.1 TWRI will prepare electronic quarterly progress reports (QPRs) for submission to the TSSWCB. QPRs shall document all activities performed within a quarter and shall be submitted by the 15th of January, April, July and October. QPRs shall be distributed to all project partners and posted on the project website.*

The following actions have been completed during this reporting period:

- a. The seventh quarterly report was prepared and submitted on July 15, 2013.

**55% Complete**

*Subtask 1.2 TWRI will perform accounting functions for project funds and will submit appropriate Reimbursement Forms to TSSWCB at least quarterly.*

The following actions have been completed during this reporting period:

- a. As of the May 31, 2013 invoice, \$139,800 (21%) of federal project funds had been expended.
- b. As of July 10, 2013, Progress of Allocations to each Project Partner was as follows:
  - TWRI has expended 32% of their funds.
  - ESSM has expended <1% of their funds
  - SSL has expended 16% of their funds.
  - TTU has expended 24% of their funds.

**21% Complete**

*Subtask 1.3 TWRI will host coordination meetings or conference calls, at least quarterly, with project partners to discuss project activities, project schedule, communication needs, deliverables, and other requirements. TWRI will develop lists of action items needed following each project coordination meeting and distribute to project personnel.*

The following actions have been completed during this reporting period:

- a. No coordination meetings were held this quarter.
- b. Next quarter, a coordination meeting will be held on August 1, 2013 at 3:00 pm in Junction.

**55% Complete**

*Subtask 1.4 TWRI will work with project personnel from ESSM, TTU-WRC, TTU-LRFS, and SLWA to prepare the WPP incorporating input from stakeholders and findings of monitoring, modeling, and data analysis tasks.*

The following actions have been completed during this reporting period:

- a. No activity to report this quarter.

**0% Complete**

*Subtask 1.5 SLWA will continue to host and maintain a website (<http://southllano.org/>) to serve as a public clearinghouse for all project- and watershed-related information. All presentations, documents and results will be posted to this website. The website will serve as a means to disseminate information to stakeholders and the general public. TWRI and TTU-LRFS shall contribute content matter for the website as appropriate.*

The following actions have been completed during this reporting period:

- a. The SLWA website, listserv, and facebook page continue to be a resource for stakeholders in the watershed on land and water stewardship, hydrologic and weather conditions, latest news, upcoming events, community participation, and related topics.
- b. Specific topics this quarter included:
  - Announcement of Water Conservation Workshop on April 20<sup>th</sup>
  - The SLWA winning the 2013 Lone Star Land Steward Award for the Landowner Association category
  - Announcement of the "Water Is Life" Conference on April 18<sup>th</sup> in Sonora
  - Woody plant dieback on Edwards Plateau
  - Announcement of Texas Well Owner Network Training on June 1<sup>st</sup>
  - South Llano River Cleanup on June 29<sup>th</sup>

- c. For the quarter Apr-Jun 2013, there were 1651 visits and 774 unique visitors to the website, with daily visits at 19/day. (Note: Google Analytics was not recording traffic to the website during a 4 day period in early April when average daily traffic was about 30 visits/day; the missing data are not represented in the above information.) This represents a 52% increase from the second quarter of 2012. The largest activity spikes (45-55 visits/day) were associated the SLWA Land Stewardship Award, the River Clean-up, and the Texas Well Owner Network, the latter event being part of the WPP.
- d. A Facebook Page (<https://www.facebook.com/pages/South-Llano-Watershed-Alliance/>) was launched by the SLWA on March 4, 2013. The page currently has 95 likes, a gain of 24 likes this quarter. In this quarter, the peak reach was 723 people. This maximum was associated with the pulse flow event on the North Llano in late May. This quarter, the page reached between 20 and 1883 people on a weekly basis.

### **55% Complete**

*Subtask 1.6 The Director of TTU-LRFS will serve as the Upper Llano River Watershed Coordinator and be responsible for the general oversight and coordination of all project activities, reporting requirements, and educational activities, and serve as the primary conduit for interaction with landowners, citizens, and entities to facilitate the development of the WPP. The Watershed Coordinator shall successfully complete (or have already completed) the Texas Watershed Planning Short Course and participate in Texas Watershed Coordinator Roundtables.*

The following actions have been completed during this reporting period:

- a. Dr. Tom Arsuffi, Director of the TTU-LRFS and Upper Llano River Watershed Coordinator, completed the Texas Watershed Planning Short Course on November 14-18, 2011.
- b. Project partner Tyson Broad of the South Llano Watershed Alliance completed the Texas Watershed Planning Short Course on September 24-28, 2012.

### **100% Complete**

## **Task 2 Quality Assurance**

*Subtask 2.1 TWRI will develop a QAPP for water quality monitoring activities in Tasks 4 and 5 and a QAPP for watershed modeling activities in Task 6 consistent with the most recent versions of EPA Requirements for Quality Assurance project Plans (QA/R-5) and the TSSWCB Environmental Data Quality Management Plan.*

The following actions have been completed during this reporting period:

- a. QAPP for Tasks 4 and 6 – GIS & Modeling
  - Revision 0 (covering only GIS inventory & LULC) approved on July 27, 2012
  - Revision 1 (adding modeling) was submitted to TSSWCB on December 3, 2012. Comments were received from EPA via TSSWCB on March 18, 2013 and were provided to TTU-WRC on March 25, 2013 to address. Additional comments were received from EPA on April 5, 2013. The revised QAPP was resubmitted to TSSWCB on May 20, 2013.
- b. QAPP for Task 5, Water Quality Monitoring, was approved on September 6, 2012.

### **85% Complete**

*Subtask 2.2 TWRI will implement the approved QAPPs. TWRI will submit revisions and necessary amendments to the QAPPs as needed.*

The following actions have been completed during this reporting period:

- a. QAPP for Tasks 4 and 6 – GIS & Modeling
  - No progress to report.
- b. QAPP for Task 5 - Water Quality Monitoring
  - Revision 1 approved on March 5, 2013.

**55% Complete**

### **Task 3 Public Participation and Stakeholder Coordination**

*Subtask 3.1 TTU-LRFS, with input from TWRI, SWLA, and Texas AgriLife Extension Service, will compile (Months 1-3) and maintain (Months 4-36) a database of watershed stakeholders and affected parties for use in engaging the public in the watershed planning process. The stakeholder group will be added to based upon previous efforts of SLWA. The database and stakeholder group will represent a diverse cross section of Upper Llano River landowners, citizens, local businesses, local and regional governmental entities and elected officials, state and federal agencies, and environmental and special interest groups.*

The following actions have been completed during this reporting period:

- a. The TTU-LRFS continued work on the database of Upper Llano River watershed stakeholders providing the initial list to the TSSWCB in July 2012. The database continues to consist of 437 landowners, citizens, local businesses, local and regional governmental entities and elected officials, state and federal agencies, and environmental and special interest groups.

**55% Complete**

*Subtask 3.2 TTU-LRFS will facilitate public participation and stakeholder involvement in the watershed planning process, specifically project meetings and activities. TTU-LRFS will coordinate meetings, secure meeting locations, prepare and disseminate meeting notices and agendas. Meeting summaries will be prepared and posted to the project website. It is anticipated that at a minimum, quarterly public meetings will be sufficient; however, if more meetings are deemed necessary, they will be scheduled accordingly. Meeting frequency may be adjusted throughout the course of the project to accomplish project goals. TSSWCB will review and approve all meeting notices, agendas, and meeting summaries prior to public dissemination.*

The following actions have been completed during this reporting period:

- a. The third meeting of the Coordination Committee, the Watershed Tour, was canceled due to scheduling conflicts.
- b. The fourth meeting of the Coordination Committee was held on June 1, 2013. A quorum wasn't present, but working groups were the point of discussion by those present. Working groups will be reviewed again at the next Coordination Committee meeting on August 1, 2013.

**55% Complete**

*Subtask 3.3 TTU-LRFS will participate in other public meetings as appropriate in order to communicate project goals, activities and accomplishments to affected parties. Meetings may include, but are not limited to, city councils, county commissioners' courts, Clean Rivers Program Basin Steering Committee and Coordinated Monitoring, groundwater conservation districts local soil and water conservation districts (SWCDs), and other appropriate meetings of critical watershed stakeholder groups.*

The following actions have been completed during this reporting period:

- a. This quarter, TTU-LRFS met with/participated in the following meetings:
  - TTU-LRFS and TWRI staff met with TTU graduate student Trace Thomas to help prepare sound bites for the "Texas Water Update."
  - SLWA Board meetings on April 18, May 16, and June 20, 2013.
  - Emily Seldomridge attended the Annual Planning Meeting for Coordinated Water Quality Monitoring on April 1, 2013 in Austin, TX.
  - Kimble County Wise Living Event/Texas Trash Off on April 6, 2013; SLWA coordinated a river clean up that drew 6 participants. A second clean up took place on June 29, 2013 that drew about 50 participants.
  - Emily Seldomridge and Tom Arsuffi participated in a Texas Parks and Wildlife Department Watershed Conservation Program kayak trip to discuss the Upper Llano Watershed Protection Plan.
  - Emily Seldomridge attended the Kimble County AgriLife Extension Agent "Meet and Greet" on April 15, 2013.
  - Tom Arsuffi, Emily Seldomridge, and Donn Edwards attended the Texas A&M AgriLife Research Station "Water is Life Conference" on April 18, 2013.
  - Emily Seldomridge and Tom Arsuffi participated in the Texas Parks and Wildlife Foundation Board of Trustees site visit to TTU-LRFS.
  - Society of Freshwater Scientists from May 19-May 23, 2013 in Jacksonville, FL. .  
Presentations included:
    - i. Emily Seldomridge, Tom Arsuffi, Donn Edwards, and Preston Bean: "Watershed Preservation and Maintenance Through a Watershed Protection Plan, Upper Llano River, Texas"
    - ii. Tom Arsuffi, Emily Seldomridge, Donn Edwards, Ken Rainwater, and Kevin Wagner: "Role of Upstream Watershed Protection Plans in Mitigating Water Quantity and Biological Pollution Impacts on Texas Hill Country Urban Stream Ecosystems"
    - iii. Donn Edwards, Emily Seldomridge, and Tom Arsuffi: "Macroinvertebrate Based Assessment and Characterization of a Healthy Texas Hill Country River"
  - Southwestern Restoration Conference from May 28-30, 2013 in San Antonio, TX.  
Presentations included:
    - i. Earl Chilton, Gary Garrett, Tom Arsuffi, Chris Moret, and Luci Cook-Hildreth: "Use of Herbicide to Control Elephant Ear *Colocasia Esculenta* in the Llano River Basin"
    - ii. Tom Arsuffi, Emily Seldomridge, Ken Rainwater, Kevin Wagner, and Gary Garrett: "Using a Healthy Watershed Protection Plan to Develop Proactive Management, Protection, and Restoration for the Upper Llano River while Mitigating Water Quantity and Biological Pollution Impacts on Downstream Texas Hill Country Urban Stream Ecosystems"

- Heart of Texas Green Expo from June 7-9, 2013 in Bastrop, TX. Presentations included:
  - i. Tom Arsuffi: “Natural Resource and Environmental Literacy Plan for Texas: Strategies on Getting the Hearts and Minds of the Next Generation Informed on Land, Water, Climate, and Ecosystems”
  - ii. Tom Arsuffi: “Trailblazing Paths to Informal and Formal Education”
- Universities Council on Water Resources from June 11-13, 2013 in Lake Tahoe, CA. Presentations included: Tom Arsuffi, Emily Seldomridge, Ken Rainwater and Kevin Wagner: “ Texas Hill Country Watershed/Climate/Riparian-based Multiple Approaches and Stakeholders”
- Keep Texas Beautiful from June 17-20, 2013 in San Antonio, TX. The presentation was given by Christine Moseley, Tom Arsuffi, Courtney Crim, and Greg Wukasch: “Creating Natural Resource Stewards: The Texas Natural Resource/Environmental Literacy Plan Panel Discussion”
- Emily Seldomridge spoke about the lessons learned from the Texas Well Owner Network to Junction Rotary Club on June 13, 2013

**55% Complete**

*Subtask 3.4 TTU-LRFS will facilitate communication with stakeholders in order to engage the public and affected entities in the watershed planning process. TTU-LRFS will utilize all appropriate communication mechanisms including direct mail, e-mail, the project website, and mass media (print, radio, television). TTU-LRFS will utilize the existing SLWA Google Group to facilitate direct discussion between stakeholders. TTU-LRFS will develop, publish, and distribute 5 semi-annual newsletters (1 in year 1 and 2 in years 2 and 3) that highlight Upper Llano River watershed activities; the newsletter shall be distributed as most appropriate to individual landowners and entities in the watershed. TSSWCB must approve all project-related content in any educational materials and publications prior to distribution.*

The following actions have been completed during this reporting period:

- a. TTU-LRFS emailed invitations to watershed stakeholders prior to the August coordination committee meeting. The invitation was also sent to newspapers for posting on the community calendars and posted to the SLWA webpage.
- b. The SLWA Google Groups "South Llano River Project" group continues to be an effective tool for communicating with stakeholders. Those interested can sign-up for the group at the SLWA website (<http://southllano.org/>). This quarter, the Google group transmitted a variety of info as described in subtask 1.5.
- c. Media mentions this quarter included:
  - **Water-well owner training set for June 1 in Junction**
    - <http://today.agrilife.org/2013/05/13/water-well-owner-training-set-for-june-1-in-junction/>
    - <http://www.texasfarmbureau.org/newsmanager/templates/DailyNews.aspx?articleid=14609&zoneid=1>
    - [http://article.wn.com/view/2013/05/13/Waterwell\\_Owner\\_Training\\_Set\\_For\\_June\\_1\\_In\\_Junction\\_The\\_Texa/#/related\\_news](http://article.wn.com/view/2013/05/13/Waterwell_Owner_Training_Set_For_June_1_In_Junction_The_Texa/#/related_news)
    - <http://www.junctioneagle.com/2013/05-15-13%20pages%201-9.pdf>

- **Award given to South Llano Watershed Alliance**
  - <http://www.tpwd.state.tx.us/newsmedia/releases/?req=20130418a>
  - [http://www.lasr.net/travel/videos.php?Lone+Star+Land+Stewards+2013%3A+South+Llano+Watershed+Alliance+-+Texas+Parks+and+Wildlife+\[Official\]&VideoID=754298](http://www.lasr.net/travel/videos.php?Lone+Star+Land+Stewards+2013%3A+South+Llano+Watershed+Alliance+-+Texas+Parks+and+Wildlife+[Official]&VideoID=754298)
  - <https://twitter.com/TexasSierraClub/status/337659082146209795>
  - <http://www.texashuntfish.com/app/view/Post/37270/Regional-Lone-Star-Land-Steward-Awards-Honor-Texas-Conservationists>
  - [http://content.govdelivery.com/accounts/TPWD/bulletins/796b3c#link\\_1366220419888](http://content.govdelivery.com/accounts/TPWD/bulletins/796b3c#link_1366220419888)
- **Houston Chronicle: Water, fishing, wildlife combine to make South Llano River a gem**
  - <http://www.chron.com/sports/outdoors/article/Water-fishing-wildlife-combine-to-make-South-4646239.php>

**55% Complete**

*Subtask 3.5 TTU-LRFS will coordinate with SCSC to host a Texas Watershed Steward Program workshop focused on the Upper Llano River through TSSWCB project 11-05, Continued Statewide Delivery of the Texas Watershed Steward Program.*

The following actions have been completed during this reporting period:

- a. A Texas Watershed Steward Program was held on August 30, 2012. Thirty-five local stakeholders participated in this exceptional training program.

**100% Complete**

#### **Task 4 GIS Inventory and Land Use/Land Cover Analysis**

*Subtask 4.1 TAMU-SSL will collaborate with project partners, local agencies and stakeholders to develop a comprehensive GIS inventory of the Upper Llano River watershed. This GIS inventory will include the most recent information available on land use, elevation, soils, stream networks, reservoirs, roads, public park lands, municipalities and satellite imagery or aerial photography. Locations of SWQM stations, USGS gages, public access points to the waterbodies, floodwater-retarding structures, wetlands, known OSSFs, TPDES permittees (including WWTFs, CAFOs and MS4s), and subdivisions will also be included. Sites permitted for land application of sewage sludge and septage should be included. Information from subtasks 5.4 and 5.5 should be included. The cumulative impact of TSSWCB-certified WQMPs on the management of agricultural and silvicultural lands should be documented. TAMU-SSL will provide watershed maps for stakeholder meetings as needed.*

The following actions have been completed during this reporting period:

- a. With the exception of including data from the yet-to-be completed Subtasks 5.4 and 5.5, the compilation of GIS data for the watershed is complete.
- b. Initial data collection for Subtasks 5.4 and 5.5 began in March 2013. Collection is projected to be completed next quarter.

**90% Complete**

*Subtask 4.2 TAMU-SSL will perform a combination of satellite based image (2006-2010) classification schemes and where needed “heads-up digitizing” of the 2006-2010 NAIP aerial photos of the watershed using ESRI’s ArcGIS 9.x software. TAMU-SSL will identify individual LULC classes and delineate them in shapefile or ArcGIS grid format with a minimum mapping unit of 2 ac on screen. LULC classes will be comparable to NLCD. TAMU-SSL will verify LULC classification through field sampling and ground truthing information to an accuracy of 80% or greater. Ground control points used in the field sampling will be collected for at least ten locations per land use type using GPS units with an accuracy of 1-10 m.*

The following actions have been completed during this reporting period:

- a. TAMU-SSL has classified the LULC in the watershed, ground truthed the data using ground control points, and provided it to the project team.

**100% Complete**

*Subtask 4.3 TAMU-SSL will provide the GIS inventory and LULC update to the TTU-WRC for utilization in the watershed model. TAMU-SSL will also provide TTU-LRFS needed maps for the WPP.*

The following actions have been completed during this reporting period:

- a. On October 10, SSL provided the GIS inventory and LULC update to the project team.

**100% Complete**

## **Task 5 Water Quality Monitoring**

*Subtask 5.1 TTU-LRFS will conduct routine ambient monitoring at 14 mainstem sites and tributaries quarterly, collecting field parameters, conventional parameters, and flow. The QAPP, as detailed in Task 2, will precisely identify sites. The sampling period extends over 30 months. The number of samples planned for collection through this subtask is 140. Currently, routine ambient monitoring is conducted quarterly at 2 stations by LCRA and TCEQ (16701 and 17425) through the Clean Rivers Program. Sampling will be coordinated with these entities to prevent duplication of efforts and ensure comparability. Flow data will be collected by gage, electric, mechanical or Doppler, and flow severity will be noted. Field parameters measured will include pH, temperature, conductivity, and dissolved oxygen. Conventional parameters measured will include total suspended solids, turbidity, sulfate, chloride, nitrate nitrogen, ammonia nitrogen, total kjeldahl nitrogen, chlorophyll a, pheophytin, total hardness, total phosphorus and E. coli (enumerated using USEPA Method 1603). The Edwards Aquifer Research & Data Center at Texas State University, a NELAC accredited laboratory, will conduct sample analysis, provide all containers and chain of custody.*

The following actions have been completed during this reporting period:

- a. The fourth quarterly sampling was conducted on June 3-6, 2013. Field parameters, conventional parameters, and flow were measured. Field parameters were measured using the Hydrolab DS5X, and flow using an Acoustic Doppler current meter. Conventional parameters were delivered to Edwards Aquifer Research and Data Center and are awaiting analysis.
- b. After QA/QC checks, data will be prepared for upload into TCEQ SWQMIS database.

**40% Complete**



*Subtask 5.2 TTU-LRFS will conduct biological monitoring (fish, macroinvertebrate, and habitat assessment) at 14 locations twice a year for 2 years to assess the cumulative impact of pollutant loading on stream health and biological communities of stream health. Biotic conditions and assessments for main stem and lower portions of the watersheds are just beginning as part of the Guadalupe Bass Restoration Project for the South Llano River with TPWD in conjunction with TTU-LRFS and Texas State University.*

The following actions have been completed during this reporting period:

- a. The first semi-annual biological sampling was conducted in September 2012.
- b. The second semi-annual biological sampling was conducted February 18-28, 2013
- c. The third semi-annual biological sampling is planned for September 2013.

**50% Complete**

*Subtask 5.3 TTU-LRFS will conduct spring sampling at 6 sites including 700 Springs, Big Paint and Tanner Springs. TTU-LRFS will work with Kimble County Groundwater Conservation District to identify other priority springs. Quarterly field, conventional, and flow parameters will be collected. Water quality parameters to be measured are defined in Subtask 5.1. The QAPP, as detailed in Task 2, will precisely identify sites. The sampling period extends over 30 months. The number of samples planned for collection through this subtask is 60. The Edwards Aquifer Research & Data Center, a NELAC Accredited Laboratory, will conduct sample analysis and provide all containers and chain of custody.*

The following actions have been completed during this reporting period:

- a. The fourth quarterly spring sampling was conducted in June 3-6, 2013.
- b. After QA/QC checks, data will be prepared for upload into TCEQ SWQMIS database.

**40% Complete**

*Subtask 5.4 TTU-LRFS will conduct surveys and map distribution and abundance of invasive emergent and aquatic plants from the headwaters (Llano Springs, 700 Springs, South Llano River and North Llano River) to Junction. TTU-LRFS and ESSM will work with the TPWD Aquatic Habitat Enhancement Program Director to determine BMPs for controlling or eradicating invasive species and develop an invasive species management plan for incorporation into the WPP.*

The following actions have been completed during this reporting period:

- a. TTU-LRFS in conjunction with Texas Parks and Wildlife Department Watershed and *Aquatic Habitat Enhancement Programs*, invasive elephant ears (*Colocasia esculenta*) were mapped on the South Llano River and treated with herbicide (Aquaneat, Clearcast) during summer and fall of 2012 (June 20-21; August 7-8 and September 13).
- b. Follow up surveys to determine effectiveness of treatments was conducted in May and June 2013 on the South Llano River.
- c. A survey of elephant ears on the North Llano River was conducted in April 2013. A treatment plan will be developed in conjunction with the WPP based on survey results.
- d. TTU-LRFS began mapping the North and South Llano rivers in March 2013. Mapping was completed in June 2013. Google Earth maps of the invasive emergent and aquatic plants were created.

**100% Complete**

*Subtask 5.5 TTU-LRFS will conduct surveys and map the distribution, abundance, and severity of cut and eroding banks on the South and North Llano Rivers.*

The following actions have been completed during this reporting period:

- a. Surveys and maps of the distribution, abundance, and severity of cut and eroding banks on the North and South Llano rivers began in March 2013. Surveys were completed in June 2013

**100% Complete**

*Subtask 5.6 TTU-LRFS will conduct a historical data review for the waterbody, to be included in the WPP, in order to assess and characterize trends and variability in water quality. Historical data collection activities will concentrate on 1) ambient water quality data (including groundwater); 2) stream flow and water level data; 3) precipitation records; and 4) biological data. U.S. Geological Survey, National Weather Service, TPWD, Texas Water Development Board, GCDs, LCRA, TCEQ, EPA and others will be queried for data related to the study area.*

The following actions have been completed during this reporting period:

- a. TTU-LRFS continues work on the historical data review for the upper Llano River. Robin Cypher, TCEQ Surface Water Quality Monitoring Program, provided a comprehensive sampling history report for the Llano River. A draft report is completed and under internal review.

**85% Complete**

*Subtask 5.7 Through TSSWCB project 05-02 FY05 Statewide NPS Pollution Management Project, USGS will install and operate one new real-time streamflow gage at an appropriate location on the South Llano River as near the outlet of the assessment unit as is practical. Through this project, and contingent upon TSSWCB project 05-02, TTU-LRFS will work with USGS to provide operation and maintenance for this new real-time streamflow gage. Continuous sampling extends over 36 months. This gaging station will complement the existing gages maintained by the USGS. The USGS maintains real-time gages at 08150000 Llano River near Junction and 08148500 North Llano River near Junction and collects periodic data at gages 08149500 Seven Hundred Springs near Telegraph and 08149400 South Llano River near Telegraph. TTU-LRFS will work with USGS to ensure continued operation of these other USGS gages throughout the duration of the project.*

The following actions have been completed during this reporting period:

- a. The USGS stream gage was activated on May 16, 2012 on the South Llano River at Flatrock Crossing near the Texas Tech Campus. The SLWA website includes a link to this gage: [http://waterdata.usgs.gov/tx/nwis/uv/?site\\_no=08149900&PARAMeter\\_cd=00065,00060](http://waterdata.usgs.gov/tx/nwis/uv/?site_no=08149900&PARAMeter_cd=00065,00060)

**55% Complete**

*Subtask 5.8 TTU-LRFS will transfer monitoring data from activities in Subtask 5.1-5.3, and 5.7 to TSSWCB for inclusion in SWQMIS at least quarterly. Data will be transferred in the correct format using the TCEQ file structure, along with a completed Data Summary, as described in the most recent version of TCEQ Surface Water Quality Monitoring Data Management Reference Guide. TWRI will submit Station Location Requests to TCEQ, as needed, to obtain TCEQ station numbers for new monitoring sites. TWRI will input monitoring regime, as detailed in the QAPP, into the TCEQ CMS. Data Correction Request*

*Forms will be submitted to TSSWCB whenever errors are discovered in data already reported. All monitoring data files, Data Summary, and Data Correction Request Forms will also be provided to LCRA. TTU-LRFS will post monitoring data from activities in Task 5 to the project website in a timely manner.*

The following actions have been completed during this reporting period:

- a. As QA/QC checks are completed, data will be prepared for upload into TCEQ SWQMIS database.
- b. A temporary student worker was hired to create Binary Large Object (BLOB) reports to accompany biological data to be uploaded into TCEQ SWQMIS. The first semi-annual biological sampling reports were completed in June 2013.

**0% Complete**

*Subtask 5.9 TTU-LRFS, with assistance by TWRI, will incorporate the watershed assessment findings in the WPP developed through Task 8.*

The following actions have been completed during this reporting period:

- a. No activity to report this quarter.

**0% Complete**

## **Task 6 Modeling and Data Analysis**

*Subtask 6.1 TTU-WRC, with cooperation from project partners, will evaluate models, such as SWAT and EDYS, to simulate flow and water quality at appropriate subwatershed scales and identify BMPs and targeted locations to enhance the quality of runoff and recharge. TTU-WRC will recommend the use of a suitable candidate model. Once the most suitable model is selected by TTU-WRC, TWRI, and TSSWCB, TTU-WRC will assist TWRI in developing a modeling QAPP (Task 2). TTU-WRC will collect and evaluate relevant hydrologic data for the Upper Llano River watershed, including rainfall, stream flow, and groundwater conditions, and recent land use and vegetation distributions generated through Tasks 4-5.*

The following actions have been completed during this reporting period:

- a. TTU-WRC initiated a subcontract with KS2 Ecological Services for the EDYS modeling tasks. All GIS data from the TAMU-SSL is in hand, and compilation of hydrologic data has begun.
- b. Ken Rainwater of the TTU-WRC and Terry McLendon of KS2 are in regular communication in preliminary discussions of conceptual model assembly. Full simulations with EDYS are pending relative to the final QAPP acceptance.

**10% Complete**

*Subtask 6.2 TTU-LRFS will employ EPA's Causal Analysis/Diagnosis Decision Information System (CADDIS) to conduct a causal evaluation of the benthic macroinvertebrate data. CADDIS, an online application, provides a pragmatic guide for determining the causes of detrimental changes and undesirable biological conditions observed in aquatic systems. CADDIS supports defensible causal analyses of the mechanisms, symptoms, and stressor-response relationships for various stressors in order to draw appropriate conclusions.*

The following actions have been completed during this reporting period:

- a. No activity to report this quarter.

**0% Complete**

*Subtask 6.3 TTU-WRC, with cooperation from project partners, will summarize modeling findings to inform the stakeholders about the physical behavior of their watershed resulting from various implementation scenarios and work with project partners to incorporate this into the WPP.*

The following actions have been completed during this reporting period:

- a. No activity to report this quarter.

**0% Complete**

### **Task 7 Public Outreach and Education**

*Subtask 7.1 ESSM, in conjunction with the TTU-LRFS, TTU-WRC, and SLWA will provide watershed training workshops for landowners on riparian protection, land stewardship, grazing management, invasive species, brush control, conservation, wildlife and habitat plans and water resource issues. Two workshops per year are planned to provide adequate coverage of the broad range of elements associated with water and watersheds and to allow a broad coverage of stakeholder groups. Pre- and post-participant surveys will be administered at selected events to evaluate (1) changes in producer knowledge and awareness and (2) expected adoption of BMPs.*

The following actions have been completed during this reporting period:

- a. A Texas Well Owner Network Program was held on June 1, 2013. Forty landowners participated in the workshop.
- b. SLWA Annual Membership Meeting and Seminar on Water Conservation was held on April 20, 2013.
- c. A Riparian Education Program has been tentatively scheduled for October 11, 2013.
- d. The project team continues to work on arranging delivery of the Lone Star Healthy Streams Program in the watershed.

**55% Complete**

*Subtask 7.2 TTU-LRFS will develop and offer a K-12 TEKS based water and watershed curriculum unit.*

The following actions have been completed during this reporting period:

- a. TTU-LRFS is currently actively rewriting the established curriculums: Aquatic Biology Units have been completely reworked, The Understanding Watersheds unit is complete pending the approval at the next TTU-LRFS curriculum meeting and the Soils/Pedology unit revision is almost complete.
- b. TTU-LRFS received a GLOBE Discover Air Quality grant that will be used in the updated watershed curriculum unit.

**50% Complete**

*Subtask 7.3 TTU-LRFS will organize a Texas Water Symposium in partnership with Texas Public Radio, Schreiner University, Hill Country Alliance, SLWA, and TWRI on EPA's Healthy Watersheds Initiative with this project as a case study for Texas.*

The following actions have been completed during this reporting period:

- a. TTU-LRFS hosted a Texas Water Symposium on Healthy Watersheds and Upper Llano WPP efforts on March 22, 2011. The Symposium was held at TTU- LRFS in front of a live audience and taped for broadcast during Texas Public Radio's Newsmaker Hour. The TWS included panelists from TPWD, TSSWCB, Hill Country Alliance, TTU-LRFS, and TWRI.
- b. A second Texas Water Symposium on Texas Springs: Making Connections between Groundwater, Surface Water, Science, and Stewardship was held on March 8, 2013. The TWS discussed the connection between groundwater and surface water and included a panel of local ranchers, TTU-LRFS, and Texas Water Development Board.

**100% Complete**

## **Task 8 Watershed Protection Plan Development**

*Subtask 8.1 TTU-LRFS, in collaboration with project partners, will develop a WPP for the Upper Llano River watershed that is consistent with and satisfies the expectations of the nine elements fundamental to watershed-based plans as described in EPA's 2004 Nonpoint Source Program and Grants Guidelines for States and Territories [68 Fed. Reg. 60653-60674 (October 23, 2003)] and incorporates the elements of EPA's Healthy Watersheds Framework as described in the technical guidance document Identifying and Protecting Healthy Watersheds (EPA 2011). The WPP shall be founded on decisions made by stakeholders through the watershed planning process (Task 3) and incorporate findings from project Tasks 4-7. TTU-LRFS will facilitate public review and stakeholder approval of the WPP.*

The following actions have been completed during this reporting period:

- a. No activity to report this quarter.

**0% Complete**

*Subtask 8.2 TTU-LRFS will develop an "executive summary" style document, based on the WPP, which will serve as a public outreach tool to garner support for the implementation of the WPP and achieve long term sustainability.*

The following actions have been completed during this reporting period:

- a. No activity to report this quarter.

**0% Complete**

*Subtask 8.3 After EPA has completed a satisfactory nine element consistency review of the WPP, TWRI will publish, print, and distribute the WPP and "executive summary" document to stakeholders.*

The following actions have been completed during this reporting period:

- a. No activity to report this quarter.

**0% Complete**

### **III. Related Issues/Current Problems and Favorable or Unusual Developments**

- As a result of SLWA's dedication to land stewardship through excellent wildlife habitat management, TPWD awarded the organization the 2013 Lone Star Land Steward Award for the Landowner Association Category.
- The North Llano gage was discontinued on June 26, 2013 due to the USGS sequester. The TSSWCB will reinstate the gage in September 2013.
- TTU-LRFS was awarded \$280,000 from the Texas Comptroller State Energy Conservation Office for "Integrated Multiple Renewable Energy Demonstration in the Texas Hill Country at TTU Llano River Field Station." The grant will be used to install solar panels on the administration buildings and a wind turbine. These energy conservation practices will be highlighted on signage along the public Biodiversity Trail.

### **IV. Projected Work for Next Quarter**

- First, 2<sup>nd</sup> and 3<sup>rd</sup> quarterly sampling data will be uploaded into TCEQ SWQMIS database
- Fifth quarterly routine sampling will be completed.
- Initiate modeling following approval of LULC/Modeling QAPP.
- July 2: Follow up treatment of elephant ears on the South Llano River and giant reed treatment on TTU-LRFS campus (coordinated with TPWD)
- July 5: City of Junction Annual Drinking Water Quality Report meeting and tour of drinking water treatment plant
- July 15: Kayak tour of the South Llano River and discussion of Upper Llano WPP during Texas Cooperative Unit Annual Meeting
- August 1: Coordination Committee meeting
- Begin writing third project newsletter