

TEXAS WATER RESOURCES INSTITUTE
AND
TEXAS TECH UNIVERSITY

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

Quarter no. 6 From 1/1/13 Through 3/31/13

I. Abstract

The 2nd Coordination Committee was held on February 21, 2013. At the meeting, Ground Rules were approved; committee membership was confirmed; the EDYS hydrologic model was reviewed; and the Coordination Committee prioritized watershed issues outlined in the SLWA Watershed Conservation Plan. The top 3 priority issues identified by the Committee were: 1) surface and ground water use, 2) riparian habitat, 3) incentives for brush management and land stewardship. Outreach efforts grew this quarter. For the quarter Jan-Mar 2013, there were 2016 visits and 990 unique visitors to the SLWA website, representing a 59% increase over the same period in 2012. A new Facebook Page was launched by the SLWA on March 4, 2013. The page currently has 71 likes and reaches 300-1500 people a week. Finally, TTU-LRFS participated in 12 public meetings, including meetings with the SLWA Board, local SWCDs, numerous professional conferences, the 700 Springs Tour and the Texas Water Symposium. The next Coordination Committee meeting will be held on May 4th and will consist of a Watershed Tour.

On the science side, Revision 1 of the Water Quality Monitoring QAPP was approved. Comments were received on Revision 1 of the LULC/Modeling QAPP and are currently being addressed by TTU-WRC and TWRI. Modeling will be initiated upon QAPP approval. The 3rd quarterly stream and spring sampling, along with the 2nd semi-annual biological sampling, was conducted on February 18-28. Additionally, TTU-LRFS began mapping invasive species and cut banks in the North Llano in March.

Next quarter, routine sampling will continue; the 3rd Steering Committee meeting and Texas Well Owner Network Program will be held; the LULC/Modeling QAPP will be completed; modeling will be initiated; and mapping of invasives and eroding streambanks will be completed.

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 sixth quarterly report was prepared and submitted on April 15, 2013.

45% 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 January 31, 2013 invoice, \$93,306 (14%) of federal project funds had been expended.
- b. As of April 4, 2013, Progress of Allocations to each Project Partner was as follows:
 - TWRI has expended 22% of their funds.
 - ESSM has expended <1% of their funds
 - SSL has expended 6% of their funds.
 - TTU has expended 19% of their funds.

14% 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. On February 22, 2013, the Upper Llano Project Team met to discuss project status and activities. Primary discussion items included the website, water quality monitoring, modeling, planning for 2013 Coordination Committee Meetings, WPP preparation, outreach, project timeline, and upcoming events. Following the Team Meeting, the team proceeded to the field to view TTU-LRFS staff performing semi-annual fish and benthic collections.
- b. On March 22, TWRI and TTU-LRFS met via conference call to discuss the Watershed Tour and finalize plans.

45% 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 continues 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:
- History of 700 Springs
 - Recording of the Texas Water Symposium on Texas Springs: Making Connections between Groundwater, Surface Water, Science, and Stewardship
 - Powerpoint presentations from stakeholder and coordination committee meetings
 - Announcements of SLWA Board, LCRA, GMA7, and Region J Meetings
 - AgriLife 40 Gallon Challenge
 - Steve Nelle's Riparian Notes
 - Whooping Cranes: Ruling on Water Policy Felt Across State
 - Best Management Practices Website
 - Release of the 2nd issue of the Upper Llano WPP Newsletter
 - Announcement of February 21, 2013 WPP Coordination Committee Meeting
- c. For the quarter Jan-Mar 2013, there were 2016 visits and 990 unique visitors to the website, with daily visits at 22/day. This represents a 59% increase from the first quarter of 2012. The largest activity spikes (80-85 visits/day) were associated with the tour of 700 Springs and drought; secondary spikes (30-40) were related to WPP announcements and meeting presentations.
- 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 71 likes and reached a peak audience of 1,566 people. Since its launch, the page has reached between 300 and 1500 people on a weekly basis.

45% 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) 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 25th to address.
- 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.

45% 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.

45% 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 second meeting of the Coordination Committee was held on February 21, 2013. At the meeting, Ground Rules were approved; the EDYS hydrologic model was reviewed; and the Coordination Committee prioritized watershed issues outlined in the SLWA Watershed Conservation Plan. The top 3 priority issues identified by the Committee were: 1) water use: surface and ground water, 2) riparian habitat, 3) incentive for brush management and land stewardship. A meeting summary and presentations can be found at: <http://southllano.org/projects/upper-llano-watershed-protection-plan/>
- b. The next Coordination Committee meeting will be a Watershed Tour on May 4, 2013.

45% Complete

Subtask 3.3 TTU-LRFS will attend and participate in other public meetings as appropriate in order to communicate project goals, activities and accomplishments to affected parties. Such meetings may include, but are not limited to, city councils, county commissioners' courts, Clean Rivers Program Basin Steering Committee and Coordinated Monitoring, local soil and water conservation districts (SWCDs), groundwater conservation districts 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:
 - SLWA Board meetings on January 17, February 28, and March 28 2013.
 - Watershed Coordinators Roundtable on January 22, 2013 in Temple, TX.
 - Texas Natural Resource/Environmental Literacy Plan Summit in San Antonio, TX. Tom Arsuffi was a lead facilitator in the breakout sessions.
 - Local Soil and Water Conservation District (including Upper Llanos, Edwards Plateau, and Upper Nueces-Frio) meetings on February 13, 2013 to discuss upcoming events associated with the WPP, as well as to answer questions surrounding the WPP.
 - Texas Academies of Science on February 28-March 1, 2013 in Kerrville, TX. Presentations included:
 - i. Emily Seldomridge, Tom Arsuffi, Donn Edwards, and Preston Bean: "Development of a Healthy Watershed Protection Plan in the Upper Llano River Watershed, TX"
 - ii. Zack Thomas and Tom Arsuffi: "Recreational Effort and Economic Impact of Guadalupe Bass Angling in Central Texas Streams"
 - iii. Tom Arsuffi and Christine Mosely: "Natural Resources and Environmental Literacy Plan for Texas: Strategies on Getting the Hearts and Minds of the Next Generation Informed on Land, Water, Climate, and Ecosystems"
 - River Management Society conference on March 11-16, 2013 in Grand Junction, CO. Emily Seldomridge gave a presentation titled "Proactive Watershed Management for the Upper Llano River, TX Through a Healthy Watershed Protection Plan."
 - A Texas Water Symposium on Texas Springs: Making Connections between Groundwater, Surface Water, Science, and Stewardship held on March 8, 2013 at TTU-LRFS
 - 700 Springs tour held on March 9, 2013. Tom Arsuffi gave remarks about the springs and the groundwater-surface water connection.

45% 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 direct mailed and emailed invitations to watershed stakeholders prior to the February coordination committee meeting. The invitation was also posted to the SLWA webpage. This proved effective as indicated by the participation at the meeting.
- 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:
 - **Upper Llano Watershed Coordination Committee meeting set Feb. 21 in Junction**
 - <http://www.hillcountryalliance.org/HCA/News020613>
 - http://www.gosanangelo.com/news/2013/feb/16/ag_briefs/?print=1
 - <http://www.llanonews.com/news/108525/>
 - <http://today.agrilife.org/2013/02/05/meeting-junction-feb-21/>
 - **Texas Water Symposium-the precious springs of Texas**
 - Hill Country Alliance: <http://www.hillcountryalliance.org/HCA/News031313>
 - Junction Eagle
 - **Stewardship in Action**
 - Hill Country Alliance:
 - Aqua Vita newsletter (Lower Colorado River Authority):
<http://archive.constantcontact.com/fs171/1109057043195/archive/1112770554410.html>
 - **Award given to South Llano Watershed Alliance**
 - Hill Country Alliance: <http://www.hillcountryalliance.org/HCA/News032713>
 - Junction Eagle
- d. The second semi-annual newsletter was completed in March and distributed in April 2013. Topics included the status of the WPP and Coordination Committee, the Texas Natural Resource/Environmental Literacy Plan, the Texas Water Symposium, the new interpretive trail and best management practice (BMP) demonstration areas, resources for understanding BMPs, a guide to water quality standards, an explanation of the upcoming Well Owner Network, upcoming events, , and contact information for the project team. It can be found at: http://southllano.org/blog/wp-content/files/Newsletter_Issue_2_amended.pdf

45% 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 third quarterly sampling was conducted on February 18-28, 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.

30% 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 third quarterly spring sampling was conducted in February 18-28, 2013.
- b. After QA/QC checks, data will be prepared for upload into TCEQ SWQMIS database.

30% 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*) have been mapped on the South Llano River and herbicide treated (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 will be conducted in May 2013 on the South Llano River.
- c. A survey of elephant ears on the North Llano River will be conducted in May 2013 and a treatment plan developed based on survey results.
- d. TTU-LRFS began mapping the North Llano River in March 2013. Mapping should be completed by the end of next quarter.

10% 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 Llano River began in March 2013. Surveys should be completed by the end of next quarter.

10% 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.

75% 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

45% 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.

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. The EDYS (Ecological Dynamics Simulation) model has been selected for use in the project. Upon approval of the QAPP, modeling will be initiated.

5% 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 has been scheduled for June 1, 2013.
- b. A Riparian Education Program has been tentatively scheduled for October 11, 2013.
- c. The project team continues to work on arranging delivery of the Lone Star Healthy Streams Program in the watershed.

- d. 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.

45% 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.

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 of Unusual Developments

- N/A

IV. Projected Work for Next Quarter

- First, 2nd and 3rd quarterly sampling data will be uploaded into TCEQ SWQMIS database
- Fourth quarterly routine sampling will be completed.
- Revise LULC/Modeling QAPP and resubmit it to TSSWCB and EPA.
- Initiation of modeling following approval of LULC/Modeling QAPP.
- April 6: Kimble County Wise Living Event/Texas Trash Off; SLWA coordinated a river clean up
- April 20: SLWA Water Conservation Workshop and Annual Membership Meeting
- May 4 (tentative): Watershed Tour
- June 1: Texas Well Owner Network