

Texas Water Resources Institute

Lone Star Healthy Streams FY 06 CWA 319(h) TSSWCB Agreement No. 06-05-07-02

Quarter no. 13 From 1/1/10 Through 3/31/10

I. Abstract

Based on input received from the Steering Committee, changes to the educational presentation and manual have been completed. The manual has not been made available to the general public to date pending arrival of the new Program Specialist that will be tasked with further development of the beef cattle manual and integration of the manual with other educational materials. Texas AgriLife Extension Service (AgriLife Extension) began full delivery of the *Lone Star Healthy Streams* (LSHS) program this quarter providing 8 programs to 1,333 people. Extension is now beginning to work to establish a continuing education component and certificate of completion for participation in the education program. Demonstration and evaluation of BMPs continued this quarter. Three runoff events occurred at the Welder Wildlife Refuge sites while eight occurred at the Riesel sites. Next quarter, delivery of the education program will continue, grazing treatments will be conducted, and runoff from the watershed sites will be monitored. Work on bacteria source tracking using *Bacteroidales* will also continue.

II. Overall Progress and Results by Task

TASK 1: Project Coordination and Administration

Subtask 1.1: TWRI, in coordination with Extension, will organize a Project Steering Committee to coordinate project efforts with all project participants. This Committee will be composed of TSSWCB, SWCDs, Extension, AgriLife Research, TWRI, NRCS, TDA, FSA, GLCI, and producer groups such as TFB and TSCRA. This Committee will meet at least semi-annually to provide input on the evaluation of BMPs and the education program; provide input into curriculum development, program delivery and CEU processes; discuss project status, provide input on demonstration/BMP evaluation efforts, and coordinate project activities.

The following actions have been completed during this reporting period:

- a. No activity to report this quarter. Work will begin next quarter on scheduling and preparing for the 4th LSHS Steering Committee Meeting.

89% Complete

Subtask 1.2: TWRI will prepare electronic quarterly reports for submission to the TSSWCB. All progress reports will be provided to the Steering Committee.

The following actions have been completed during this reporting period:

- a. TWRI submitted Year 3, Quarter 4 Progress Report on January 15, 2010.

89% Complete

Subtask 1.3: TWRI will conduct quarterly TTVN meetings as appropriate with project participants to discuss project activities, project schedule, lines of responsibility, communication needs, and other requirements.

The following actions have been completed during this reporting period:

- a. On January 21, March 16, and March 26, AgriLife Extension and TWRI met to discuss the project contract, budget, and deliverables (LSHS Guide and Presentation).

89% Complete

Subtask 1.4: TWRI will attend meetings with the TSSWCB project manager and other meetings, as needed, to review project status, deliverables, etc.

The following actions have been completed during this reporting period:

- a. TWRI routinely communicates with the TSSWCB project manager on project status and issues.

89% Complete

Subtask 1.5: TWRI will submit appropriate Reimbursement Forms.

The following actions have been completed during this reporting period:

- a. As of February 28, 2010, \$348,958 or 86% of federal project funds had been expended.
- b. Progress of Allocations to each Department is as follows:
 - TWRI has expended 93% of their funds
 - SCSC has expended 86% of their funds
 - ESSM has expended 74% of their funds

86% Complete

Subtask 1.6: TWRI will develop (Months 1-3), host and maintain (Months 3-36) an internet website for the dissemination of information.

The following actions have been completed during this reporting period:

- a. In September 2007, TWRI developed the website titled "Improving Water Quality of Grazing Lands" to disseminate information on *Lone Star Healthy Streams* and related projects. The website (<http://grazinglands-wq.tamu.edu/>) was viewed by:
 - a. 12 unique visitors in January 2010
 - b. 6 unique visitors in February 2010
 - c. 19 unique visitors in March 2010
 - d. A grand total of 981 unique visitors since September 2007

89% Complete

TASK 2: Compile Existing Information

Subtask 2.1: Extension will hire a LONE STAR HEALTHY STREAMS Extension Assistant to assist with and coordinate a review of the literature of the state of current knowledge regarding the effects of grazing animals on bacterial levels of riparian areas and associated water bodies and BMPs designed to minimize these impacts. Further, the Extension Assistant will lead all future LONE STAR HEALTHY STREAMS Program efforts.

The following actions have been completed during this reporting period:

- a. Complete. Garrett Norman was hired as the LSHS Extension Assistant.

100% Complete

Subtask 2.2: Extension will organize internal Extension Planning Team consisting of Extension personnel specializing in animal production systems and associated environmental issues.

The following actions have been completed during this reporting period:

- a. Complete. No activity to report this quarter.

100% Complete

Subtask 2.3: Extension will assess and inventory education/training materials within Extension and related materials developed through similar efforts in other states addressing bacteria from grazing cattle. In order to make the program more thorough, educational materials addressing nutrient and sediment runoff from grazing lands and proper grazingland management will also be assessed and inventoried.

The following actions have been completed during this reporting period:

- a. Complete. However, AgriLife Extension will continually review existing literature regarding information on BMPs that help reduce livestock bacteria levels in water bodies. Any new relevant material will be incorporated into the LSHS program.

100% Complete

TASK 3: Develop Bacterial Education Programs for Beef Cattle Producers

Subtask 3.1: Extension will facilitate the modification necessary to integrate existing materials from subtask 2.3 into the LONE STAR HEALTHY STREAMS Program.

The following actions have been completed during this reporting period:

- a. Based on input received from the Steering Committee, changes to the educational presentation and manual have been completed. The manual has not been made available to the general public to date pending arrival of the new Program Specialist that will be tasked with further development of the beef cattle manual and the integration of the manual with other educational materials.

95% Complete

Subtask 3.2: Extension will develop a core land/grazing management educational component that provides growers with state-of-the-art production technology training on fundamental BMPs and strategies which can be employed to protect and conserve water resources from bacterial and other NPS contamination originating from grazing lands.

The following actions have been completed during this reporting period:

- a. AgriLife Extension has completed development of the educational program for *Lone Star Healthy Streams* as outlined in subtask 3.1.

95% Complete

Subtask 3.3: Extension will integrate and coordinate the Lone Star Healthy Streams Program with the Texas Master Watershed Steward program to provide producers with a more comprehensive environmental education curriculum incorporating basic training in watershed form and function, watershed management, sources of nonpoint source (NPS) pollution and BMPs and strategies which can be employed to protect and conserve water resources.

The following actions have been completed during this reporting period:

- a. AgriLife Extension meets regularly with members of the Texas Watershed Steward team to discuss integration of the two programs.

89% Complete

Subtask 3.4: Extension will establish a continuing education component that enables acquisition of CEUs in both environmental and production management.

The following actions have been completed during this reporting period:

- a. Now that the education program has been developed, Extension is now beginning to work to establish a continuing education component.

0% Complete

Subtask 3.5: Extension will develop and provide a certificate of completion, or other mechanism enabling individuals to take credit for participation in education program.

The following actions have been completed during this reporting period:

- a. Now that the education program has been developed, Extension is now beginning to work to develop a certificate of completion for participation in the education program.

0% Complete

TASK 4: Education Program Testing and Delivery

Subtask 4.1: Extension will test the educational program in a pilot watershed selected with input from the Project Steering Committee. Extension will coordinate with local SWCDs and others, such as the NRCS, to deliver and evaluate the educational program.

The following actions have been completed during this reporting period:

- a. On January 11, Extension made the LSHS presentation to the Texas Pasture and Forage Work Group and the Texas Beef Workers at the Annual Staff Conference (31 attended).
- b. On January 21, Extension introduced the LSHS concept and bacteria issue at a Jackson County educational program (61 attended).
- c. On January 26, Extension introduced the LSHS concept and bacteria issue at a Bell County educational program (413 attended).
- d. On January 27, Extension introduced the LSHS concept and bacteria issue at the National Cattlemen's Beef Association annual meeting in San Antonio (246 attended).
- e. On January 29, Extension presented the LSHS program in Burleson County (269 attended).
- f. On February 9, Extension introduced the LSHS concept and bacteria issue at the Blackland Income Growth educational program (71 attended).
- g. On February 18, Extension introduced the LSHS concept and bacteria issue at a Williamson County educational program (176 attended).
- h. On March 30, Extension introduced the LSHS concept and bacteria issue at the AgriLife Pasture & Livestock Management Program for Novices educational program (66 attended).
- i. The LSHS presentation will be offered in Caldwell County on April 27 of next quarter.

89% Complete

Subtask 4.2: To increase Program availability, Web-based and related local "on-demand" program delivery tools (i.e., CD, videos, worksheets) will be developed for both core and CEU components.

The following actions have been completed during this reporting period:

- a. No activity to report this quarter.

0% Complete

Subtask 4.3: Evaluate changes in producer knowledge and awareness of important production and environmental issues.

The following actions have been completed during this reporting period:

- a. No activity to report this quarter.

0% Complete

Subtask 4.4: Utilizing participants surveys, identify and address any barriers to producer participation and successful implementation of the program.

The following actions have been completed during this reporting period:

- a. No activity to report this quarter.

0% Complete

Subtask 4.5: Make appropriate modifications to the program to facilitate greater producer participation and adoption of recommended BMPs.

The following actions have been completed during this reporting period:

- a. The program has been well received by all programs to date. Minor modifications will be made as new material becomes available; however, the program is essentially complete.

95% Complete

TASK 5: Evaluate And Demonstrate Value-Added BMPs To Reduce Bacteria Contamination Of Streams And Water Bodies From Grazing Lands

Subtask 5.1: TWRI will develop a Quality Assurance Project Plan (QAPP) that will detail project goals and objectives, the data needs to fulfill those objectives, lists field and laboratory methods, procedures and schedules to be followed, and specify a data management structure and quality assurance protocols. The QAPP will be developed using guidelines in EPA QA/R-5, "EPA Requirements for Quality Assurance Project Plans".

The following actions have been completed during this reporting period:

- a. The QAPP was approved on September 24, 2007.

100% Complete

Subtask 5.2: TWRI will provide annual revisions to the QAPP and amendments, as necessary, to the TSSWCB and EPA.

The following actions have been completed during this reporting period:

- a. The first annual revision was submitted on September 23, 2008 and approved on November 20, 2008.
- b. The second and final annual revision was submitted to TSSWCB on November 13, 2009 and approved on February 1, 2010.

100% Complete

Subtask 5.3: TWRI and Extension will identify a cooperator to conduct the BMP demonstration/evaluation with assistance of the Steering Committee, local SWCD, NRCS, TWRI, and Extension agents.

The following actions have been completed during this reporting period:

- a. Complete. No activity to report this quarter.

100% Complete

Subtask 5.4: TWRI and Extension will assess cattle and other animal behavior to determine the amount of time spent in the stream and riparian area before and after BMP implementation. GPS tracking will be utilized.

The following actions have been completed during this reporting period:

- a. This task has been completed. The GPS collar data collected indicated a 48-53% reduction in the percent time that cattle spend near the stream as a result of the implementation of alternative water.

100% Complete

*Subtask 5.5: TWRI and Extension will assess water quality before and after BMP implementation. Bacteria (*E. coli*) will be the focus of this effort and will be monitored bi-monthly (enumeration only). Water quality will be assessed for 12 months prior to implementation and then 12 months following implementation.*

The following actions have been completed during this reporting period:

- a. 2S Ranch (100% complete)
 - Water sampling at the 2S Ranch was completed in July 2009.
- b. Welder Wildlife Refuge (91% complete; 29/32 mos.)
 - Equipment maintenance was performed on January 7, February 5, and March 30.
 - No grazing was conducted this quarter, but is planned for next quarter.
 - Runoff occurred on January 15, February 5, and February 11. To date, the site mean *E. coli* level at the ungrazed site (WWR1) is 5575 cfu/100 ml while the site mean *E. coli* level at the moderately grazed site (WWR2) is 6329 cfu/100 ml).
 - Berm failure has occurred at the heavy grazed site (site WWR2). Repair of this berm is scheduled for next quarter.
- c. Riesel (89% complete; 32/36 mos.)
 - Runoff occurred on January 16 and 29; February 5, 9, and 11; and March 9, 21, and 25. Since monitoring was initiated in July 2007, the site mean *E. coli* level at the ungrazed site (SW12) has been 6,501 cfu/100 ml and 22,813 cfu/100 ml at the moderately grazed site (SW17).

93% Complete

Subtask 5.6: In order to gain a more complete picture of the impacts of BMP implementation on stream bank stability and specific sources of bacteria, stream cross-sections will be performed at all stream sites before and after BMP implementation and Bacteroidales PCR (library-independent BST) will be assessed at runoff evaluation sites by TWRI, Extension, and AgriLife Research.

The following actions have been completed during this reporting period:

- a. No activity to report this quarter. Work will continue next quarter to develop a standard curve for the *Bacteroidales* analysis using Realtime PCR. Once the *Bacteroidales* DNA standard curve is developed, analysis of all samples collected to date can proceed.
- b. Evaluation of changes in bank stability or stream morphology at the 2S Ranch has been completed. Most observed differences in the profiles resulted from the manual surveying technique employed rather than actual bank erosion or stream degradation. Thus, it is concluded that no significant changes occurred.

50% Complete

Subtask 5.7: TWRI and Extension will provide funding to cooperating ranch to implement BMPs to reduce bacteria and other NPS runoff from grazing lands.

The following actions have been completed during this reporting period:

- a. Task complete. Funding was provided to the 2S Ranch for grazing management on their creek pasture for 2 years. Four portable shade facilities were also installed on the 2S Ranch in June 2008 and removed in May 2009 following the final removal of the GPS collars. GPS collar data collected over this 2 year period indicated that the cattle at the 2S Ranch did not utilize the structures provided.

100% Complete

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

- N/A

IV. Projected Work for Next Quarter

- Prepare and submit Year 4, Quarter 1 Progress Report on April 13.
- Work to establish a continuing education component
- Develop a certificate of completion for participants in the education program
- Deliver LSHS programs statewide
- Conduct grazing treatments as conditions allow
- Repair berm at site WWR2
- Continue monitoring runoff at Riesel and the Welder Wildlife Refuge
- Continue work on *Bacteroidales*