

**Texas A&M AgriLife  
Texas Water Resources Institute**

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

Quarter no. 8 From 10/1/08 Through 12/31/08

**I. Abstract**

Texas AgriLife Extension Service (Extension) continued work on a PowerPoint presentation and white paper for dissemination to the public. Extension provided a copy of the PowerPoint presentation to the LSHS Steering Committee on October 27 when the Committee met for the 2<sup>nd</sup> time. Extension introduced the LSHS concept in county extension meetings Bryan, Franklin, Gonzales, and West. In addition, Extension also introduced the LSHS concept at a day-long grazing school conducted jointly by Extension, NRCS, and GLCI in Beeville, as well as the ASA Meetings in Houston. The project website was visited by an average of 40 unique visitors per month this quarter, down slightly from 41/mo. last quarter. GPS collars were installed on cattle September 18-October 10 and November 6-December 12 at the 2S Ranch to evaluate the percent time they spend in the riparian area now that alternative water is present. Water samples were also collected at the 2S Ranch bi-monthly throughout the quarter when flow was present. During this quarter, *E. coli* levels averaged 184 cfu/100 ml above the ranch and 473 cfu/100 ml below the ranch. At the Welder Wildlife Refuge and Riesel, dry conditions continued and no runoff was collected as a result.

**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. The 2<sup>nd</sup> Lone Star Healthy Streams Steering Committee Meeting was held on October 27 from 1:00-3:00 pm at the Hyatt Regency Lost Pines Resort And Spa near Bastrop in conjunction with the Annual State Meeting of Texas of Soil and Water Conservation District Directors. There were 16 in attendance for the meeting. Discussions focused on the LSHS Education Program, BMP Evaluation results to date, and Water Quality Standards revisions.

- b. Once TCEQ releases the next round of proposed revisions to the Texas Water Quality Standards, a conference call may be scheduled if TSSWCB feels it is appropriate.
- c. The 3<sup>rd</sup> LSHS Steering Committee Meeting is tentatively planned for next spring.

**75% 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 2, Quarter 3 Progress Report on October 15, 2008.

**60% 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 October 17, TWRI met with ARS to discuss the data collected to date.
- b. On October 27<sup>th</sup>, TWRI and TSSWCB met in conjunction with the Steering Committee Meeting / Annual Meeting of Texas Soil and Water Conservation District Directors in Bastrop to discuss the status of the project, findings to date, and future activities planned.
- c. On November 13, TWRI and Extension met to discuss project activities.

**75% 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.

**75% Complete**

*Subtask 1.5: TWRI will submit appropriate Reimbursement Forms.*

The following actions have been completed during this reporting period:

- a. As of the last billing period which ended on November 30, 2008, \$214,217 or 53% of federal project funds had been expended.

- b. Progress of Allocations to each Department is as follows:
- TWRI has expended 61% of their funds
  - SCSC has expended 51% of their funds
  - ESSM has expended 34% of their funds

**53% 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 the Lone Star Healthy Streams project and related projects. It can be found at <http://grazinglands-wq.tamu.edu/index.php>
- b. The website was viewed by:
- 31 unique visitors in October 2008
  - 45 unique visitors in November 2008
  - 43 unique visitors in December 2008
  - A grand total of 661 unique visitors since September 2007
- c. The website will be continually updated as new data and information are obtained.

**75% 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. Garrett Norman was hired as the Lone Star Healthy Streams 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. Extension continues to review existing literature regarding information on BMPs that help reduce livestock bacteria levels in water bodies.

**80% 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. Extension delivered a DRAFT version of the PowerPoint presentation to the LSHS Steering Committee on October 27 and requested comments from the Committee. To date, no comments have been received.
- b. Extension also continues work on the LSHS BMPs “white paper” publication. This white paper is based on the PowerPoint presentation and cannot be completed until the PowerPoint is done. Once completed, the white paper will be distributed via hard copy and the Forages and TWRI web sites.

**75% 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. Extension has begun development of an educational program for Lone Star Healthy Streams as outlined in subtask 3.1.

**75% 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. No activity to report this quarter; however, LSHS will be integrated into future printings of the Texas Watershed Steward program.

**50% 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. No activity to report this quarter.

**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. No activity to report this quarter.

**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. No activity to report this quarter. Activity will be initiated upon completion of Task 3.

**0% 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. Activity will be initiated upon completion of Task 3.

**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. Activity will be initiated upon completion of Task 3.

**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. Activity will be initiated upon completion of Task 3.

**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. No activity to report this quarter. Activity will be initiated upon completion of Subtask 4.3 and 4.4.

**0% 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. Another revision will not be needed unless a no-cost extension to the project is granted.

**75% 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:

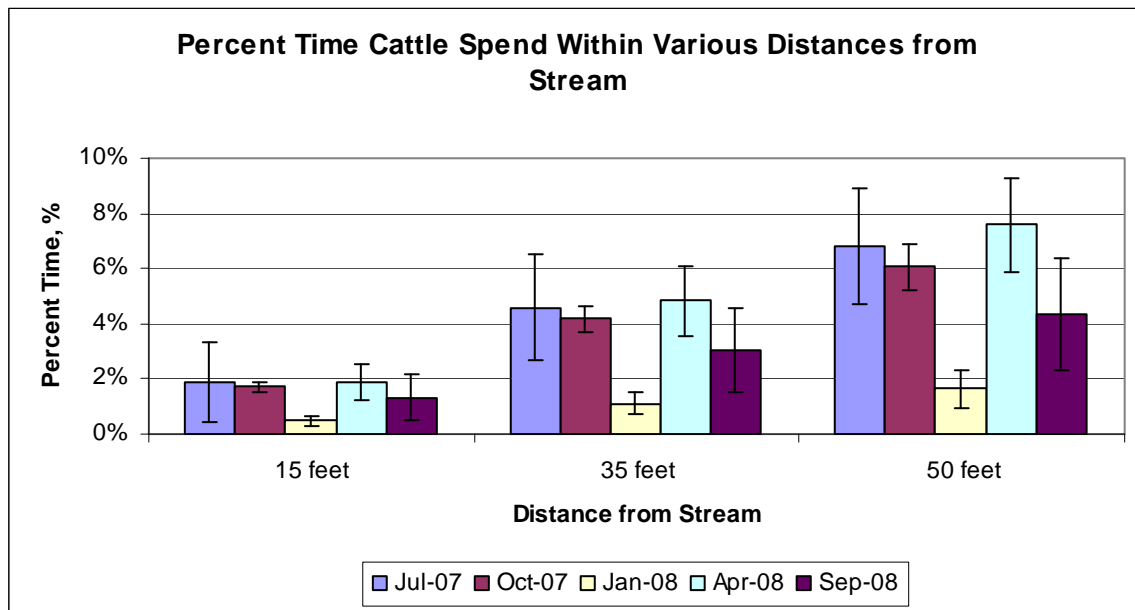
- a. Complete. No activity to report this quarter.

**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. GPS collars were placed on cattle at the 2S Ranch on September 18<sup>th</sup> and removed October 10<sup>th</sup>. The percent time cattle spent within 15, 35, and 50 feet of the stream during each monitoring period is plotted below.



- b. GPS collars were again placed on cattle at the 2S Ranch on November 6<sup>th</sup> and removed on December 12<sup>th</sup>. This data will be analyzed next quarter.

**75% 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
  - Water samples were collected above and below the 2S Ranch on November 6<sup>th</sup> and 20<sup>th</sup> and December 4<sup>th</sup> and 18<sup>th</sup> to evaluate bacteria levels following implementation of alternative water supplies and shade. No flow was present in the creek on October 2<sup>nd</sup> and 16<sup>th</sup>, thus no water samples were taken.

- During this quarter, *E. coli* levels averaged 184 cfu/100 ml above the ranch and 473 cfu/100 ml below the ranch.
  - Water samples are scheduled to be collected at the 2S Ranch on January 8<sup>th</sup> and 22<sup>nd</sup>, February 12<sup>th</sup> and 26<sup>th</sup>, and March 12<sup>th</sup> and 26<sup>th</sup>.
- b. Welder Wildlife Refuge
- Equipment maintenance was performed on October 20<sup>th</sup> and December 9<sup>th</sup>.
  - Grazing treatments were conducted at the Welder on October 20-26
  - No runoff has occurred since the ISCO automated samplers were activated on October 30, 2007. Rainfall during this period has been well below normal.
- c. Riesel
- No runoff has occurred at Riesel since May 15<sup>th</sup>.

**75% 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. Runoff samples collected from Riesel have been preserved for *Bacteroidales* analysis. It is anticipated that these samples will be analyzed next quarter.
- b. Stream cross-sections will again be surveyed on next quarter to evaluate any changes in bank stability or stream morphology.

**25% 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. Four portable shade facilities were installed on the 2S Ranch in June 2008.
- b. In addition, funding has been provided to the 2S Ranch for grazing management on their creek pasture for year 1 of the project.

**75% Complete**

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

- During the February 26<sup>th</sup> Project Meeting, it was discovered that Start and End Dates for the subtasks of Tasks 3-4 were out of sync with Task 2 and needed correction.
- Due to the lack of runoff, it may be necessary to extend the project and/or conduct rainfall simulation studies.
- Extension introduced the LSHS concept in county extension meetings in:
  - a. Bryan (10/3/08)
  - b. Franklin (10/27/08)
  - c. Gonzales (10/30/08)
  - d. West (11/10/08)



- Extension introduced the LSHS concept at a day-long grazing school conducted jointly by Extension, NRCS, and GLCI in Beeville on October 1<sup>st</sup>.
- Extension also presented a poster on LSHS at the ASA meetings in Houston on October 8<sup>th</sup>.
- TWRI provided a presentation on the LSHS project and results to date at the WCSC Meeting in Columbus on December 11<sup>th</sup>.

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

- Prepare and submit Year 2, Quarter 4 Progress Report on January 15<sup>th</sup>.
- Update the website
- Continue compilation of information on current knowledge regarding the effects of grazing animals on bacterial runoff and BMPs designed to minimize impacts
- Continue composition of land/grazing management education PowerPoint presentation addressing bacteria contamination of waterbodies
- Continue work on development of a white paper based on the PowerPoint educational program for distribution via hard copy and web
- Continue communication with landowners via educational programs
  - a) A 1-hr LSHS program will be provided to central Texas cattlemen at the Central Texas Cow-Calf Clinic in Milano on January 9<sup>th</sup>.
- Continue monitoring runoff at Riesel and the Welder Wildlife Refuge
- Conduct GPS tracking of cattle on the 2S Ranch from November 6 – December 2
- Analyze GPS collar data from November 2008
- Continue bi-monthly sampling on the 2S Ranch