

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

Quarter no. 5 From 1/1/08 Through 3/31/08

**I. Abstract**

Texas AgriLife Extension Service (Extension) continued to review the existing literature regarding BMPs and transform this information into PowerPoint presentations for dissemination to the public. As this is nearing completion, Extension has initiated development of a LSHS BMPs publication based on the PowerPoint educational program for distribution via hard copy and web. TWRI and Extension continue to provide audiences around the state with information on the LSHS project and related work including the Texas Ag Industries Association, Texas Farm Bureau, Southern Branch of the American Society of Agronomy, Texas and Southwestern Cattle Raisers Association, and attendees of the Houston Livestock Show and Rodeo. In addition, the project website was visited by an average of 51 unique visitors per month this quarter, up from 26/mo. last quarter. GPS collars were installed on cattle from January 10 to February 7 at the 2S Ranch to evaluate the percent time they spend in the riparian area when no alternative water is present. Analysis of the data collected to date indicates that the cattle on the 2S Ranch spend 6% of less of their time within 50 feet of the stream. Water samples were also collected at the 2S Ranch bi-monthly throughout the quarter. During this quarter, *E. coli* levels averaged 122 cfu/100 ml above the ranch and 180 cfu/100 ml below the ranch, up somewhat from last quarter. Stream cross-sections were also surveyed at two locations on the 2S Ranch to monitor stream stability. These sites will be surveyed again in July and every 6 months thereafter to assess bank stability. Installation of automated samplers at the Welder Wildlife Refuge was completed this quarter and the samplers activated on October 30<sup>th</sup>. Unfortunately, rainfall has not been sufficient at the Welder to produce runoff. Despite this, grazing treatments will proceed next quarter. Finally, four runoff events occurred at Riesel this quarter on March 3, 6, 10, and 18. Data from these events are still being evaluated.

**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 second Steering Committee Meeting has tentatively been scheduled to meet in conjunction with the next NRCS State Technical Committee Meeting.

**50% 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 1, Quarter 4 Progress Report on January 15, 2008.

**45% 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. The TWRI Project Manager, Extension Co-PI, and Extension Assistant met on February 19<sup>th</sup> to discuss progress on each task and develop a strategy for ensuring timely completion of all tasks.
- b. On February 26, TSSWCB, Extension, and TWRI met to discuss project activities and schedule.
- c. The next quarterly meeting between Extension, TSSWCB, and TWRI is scheduled for May 19 from 2:00 – 4:00 pm.

**50% 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:

- b. TWRI visits regularly via telephone with the TSSWCB project manager to discuss project status and any issues as they arise.
- c. TWRI attended the March 19<sup>th</sup> State Board Meeting in Temple.

**50% 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 February 29, 2008, \$113,485.50 or 28% of federal project funds had been expended.

**28% 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:
  - 41 unique visitors in January 2008
  - 62 unique visitors in February 2008
  - 51 unique visitors in March 2008
- c. The website will be continually updated as new data and information are obtained.

**50% 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. The Extension Assistant continues to review the existing literature regarding BMPs that help reduce livestock bacteria levels in water bodies.

**75% 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. The Extension Assistant continues to transform information collected in subtask 2.3 into PowerPoint presentations for dissemination to the public in future educational programs.
- b. Extension initiated development of the LSHS BMPs publication based on PowerPoint educational program for distribution via hard copy and web (Forages and TWRI web sites).

**50% 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.

**35% 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.

**17% 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.

**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.

**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. No activity to report this quarter.

**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. No activity this quarter. The first annual revision is due September 24, 2008.

**0% 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.

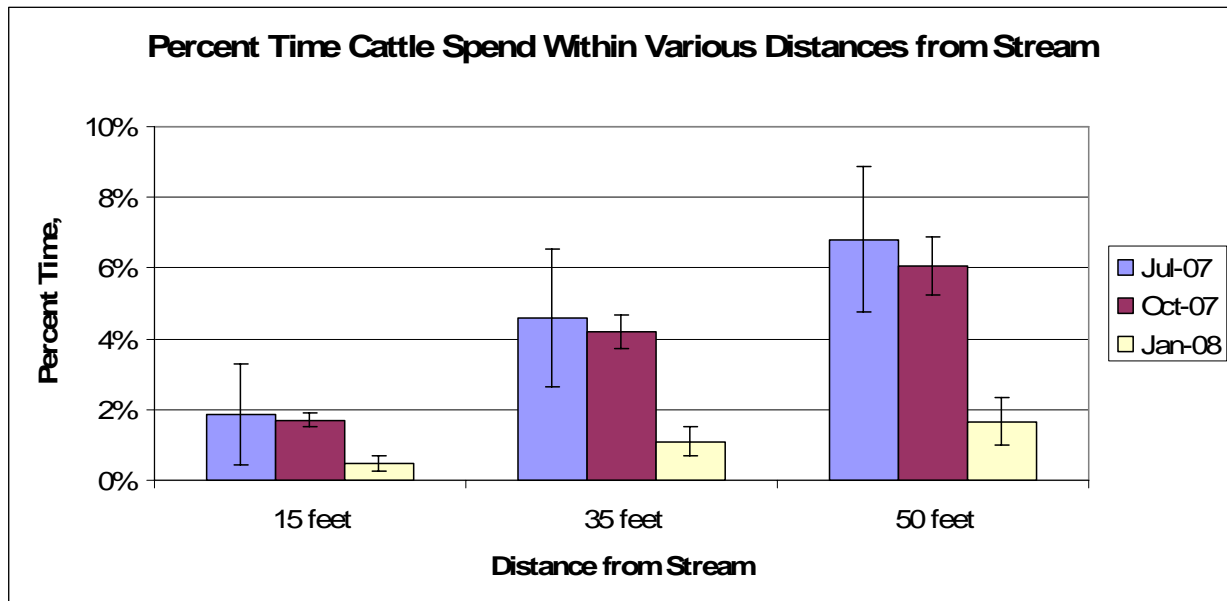
**100% Complete**

*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 January 10, 2008 and removed February 7, 2008.

- b. The data collected to date indicate that the cattle at the 2S Ranch spend only a small percentage of their time near the creek (below).



- c. GPS collars are scheduled to be placed on cattle at the 2S Ranch on April 3, 2008 and tentatively scheduled to be removed on April 25, 2008.

**38% 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 ranch on January 3<sup>rd</sup> and 17<sup>th</sup>, February 7<sup>th</sup> and 21<sup>st</sup>, and March 6<sup>th</sup> and 20<sup>th</sup> to evaluate bacteria levels prior to implementation of alternative water supplies.
  - During this quarter, *E. coli* levels averaged 122 cfu/100 ml above the ranch and 180 cfu/100 ml below the ranch.
  - Water samples are scheduled to be collected at the 2S Ranch on April 3<sup>rd</sup> and 17<sup>th</sup>, May 1<sup>st</sup> and 15<sup>th</sup>, and June 5<sup>th</sup> and 19<sup>th</sup>.
- b. Welder Wildlife Refuge
- Since installation of automated samplers was completed in October 2007, rainfall amounts have not been sufficient for producing runoff.
  - Fence construction was completed on February 13, 2008.
  - The next round of grazing treatments is scheduled for April 19-26.

- c. Riesel
- Four runoff events occurred this quarter on March 3, 6, 10, and 18.
  - Water samples were collected from sites SW12 (ungrazed prairie) and SW17 (moderately grazed pasture) during each event and analyzed for turbidity and *E. coli*.
  - The amount of runoff was also measured and will be used to calculate total loadings for each site for each event.

**33% 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. Five runoff samples were collected from Riesel between March 3 and 18 and have been preserved for *Bacteroidales* analysis. However, no runoff samples have been collected from the Welder Wildlife Refuge as a result of lower than normal rainfall.
- b. Stream cross-sections were surveyed at two sites on the 2S Ranch on March 6, one at a stream crossing actively used by cattle and the other at a point not used by the cattle for crossing. These sites will be surveyed again in July and every 6 months thereafter to evaluate impacts of BMP installation on bank stability.

**12% 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. Extension has developed draft drawings of portable shade facilities to be used to collect additional data regarding alteration of cattle behavior using shade. These structures are to be installed on the 2S Ranch in June 2008.

**20% Complete**

### **III. Related Issues/Current Problems and Favorable of 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.
- Information on the project was included in presentations to the following groups:
  - Texas Ag Industries Association Annual Membership Conference – January 16<sup>th</sup>
  - Farm Bureau Ag Leadership Conference, Jan 29, College Station
  - Annual Meeting of the Southern Branch of the American Society of Agronomy held in Dallas on February 3-5
  - Texas Farm Bureau AgLead Class VIII – February 6<sup>th</sup>



- Harris County Master Urban Rancher Series, Feb 15, Houston
- Houston Livestock Show and Rodeo (introduced concept 3/4/08)
- Leon County cattleman's group (3/7/08)
- Texas and Southwestern Cattle Raisers Association Natural Resource Committee Meeting – March 15<sup>th</sup>

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

- The second meeting of the Lone Star Healthy Streams Steering Committee will be scheduled.
- TWRI will prepare and submit Year 2, Quarter 1 Progress Report on April 15<sup>th</sup>.
- TWRI will coordinate a meeting with project participants on May 19 to discuss project activities.
- TWRI will continue to work to improve the website.
- Extension will continue development of a technical report describing information compiled on current knowledge regarding the effects of grazing animals on bacterial levels of riparian areas and BMPs designed to minimize impacts.
- Extension will complete development of land/grazing management education PowerPoint presentation addressing bacteria contamination of streams and waterbodies.
- Extension will continue work on development of the LSHS BMPs publication based on the PowerPoint educational program for distribution via hard copy and web
- Extension will continue communication of issues with landowners via educational programs
- Runoff monitoring will be conducted at Riesel and the Welder Wildlife Refuge.
- The first grazing treatments at the Welder will be conducted April 19-26.
- GPS tracking of cattle on the 2S Ranch will be conducted April 3 – 25.
- GPS collar data analysis will continue next quarter.
- Baseline bi-monthly sampling will continue on the 2S Ranch.