

**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. 6 From 4/1/08 Through 6/30/08

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. Extension made substantial progress on the development of the LSHS BMPs "white paper" publication based on the PowerPoint educational program. TWRI and Extension continue to provide audiences around the state with information on the LSHS project and related work. This quarter, information on the project was included in presentations to audiences in Victoria, Bosque, McClennan, Hamilton, Coryell, Henderson, San Augustine, and Wharton counties at educational programs. In addition, the project website was visited by an average of 53 unique visitors per month this quarter, up from 51/mo. last quarter. GPS collars were installed on cattle from April 3 – May 2 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 556 cfu/100 ml above the ranch and 437 cfu/100 ml below the ranch, up substantially from last quarter. Shade structures were also constructed and delivered to the ranch at the end of June. At the Welder Wildlife Refuge, dry conditions continued this quarter. Grazing treatments were completed on sites WWR-2 and WWR-3 in April removing 56% of the vegetation from the moderately grazed site and 86% of the vegetation from the heavy grazed site, respectively. Four additional runoff events occurred at Riesel this quarter. The education program and results of the first year of BMP evaluation will be presented to the Steering Committee on September 29.

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 2nd Steering Committee Meeting has tentatively been scheduled for September 29 from 1:00-3:00 pm at the Galveston Island Convention Center in conjunction with the Annual State Meeting of Texas of Soil and Water Conservation District Directors.

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 2, Quarter 1 Progress Report on April 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 quarterly meeting between Extension, TSSWCB, and TWRI was held on May 19 from 2:00 – 4:00 pm to discuss project activities, status of tasks, and project timeline.
- b. The TWRI Project Manager and Extension Co-PI met on June 19th to discuss progress on each task and develop a plan for meeting project deadlines.
- c. The next meeting with project participants will be held on September 29th in conjunction with the Steering Committee Meeting.

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:

- a. TWRI visits regularly via telephone with the TSSWCB project manager to discuss project status and any issues as they arise.

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 May 31, 2008, \$123,253 or 30% of federal project funds had been expended.
- b. Progress of Allocations to each Department is as follows:
 - TWRI has expended 52% of their funds
 - SCSC has expended 32% of their funds
 - ESSM has expended 30% of their funds

30% 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:
 - 40 unique visitors in April 2008
 - 61 unique visitors in May 2008
 - 58 unique visitors in June 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 made substantial progress on the LSHS BMPs “white paper” publication based on the Power Point educational program. Once completed, it will be distributed via hard copy and the 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:

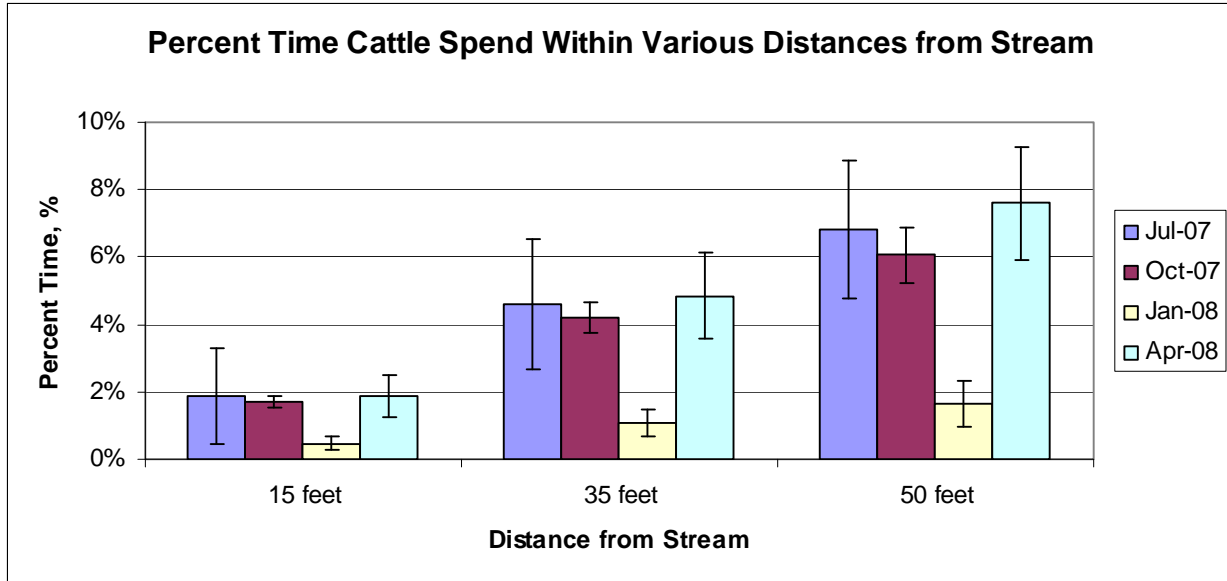
- a. Complete. No activity to report this quarter.

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 April 3rd and removed May 2nd.
- b. Data collected to date indicate that the cattle at the 2S Ranch spend only a small percentage of their time near the creek (see below). With the exception of January 2008, when the water troughs were turned on to treat sick cattle, the percent times have remained consistent.
- c. Since one full year of water sampling has been completed at the 2S ranch, the water troughs have been turned back on. It will be interesting to see if the percent time drops back down next quarter like it did in January.



- d. GPS collars are tentatively scheduled to be placed on cattle at the 2S Ranch on July 22nd and removed on August 14th.

50% 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 April 3rd and 17th, May 1st and 15th, and June 5th and 19th to evaluate bacteria levels prior to implementation of alternative water supplies.
- During this quarter, *E. coli* levels averaged 556 cfu/100 ml above the ranch and 437 cfu/100 ml below the ranch.
- Water samples are scheduled to be collected at the 2S Ranch on July 2nd and 17th, August 7th and 21st, and September 4th and 18th.

b. Welder Wildlife Refuge

- Refurbishment of the watershed sites on the Welder Wildlife Refuge has been completed. Site WWR-1 serves as the ungrazed site. Site WWR-2 serves as the heavy grazed site. Site WWR-3 serves as the moderately grazed site.
- Sites WWR-2 and WWR-3 were lightly grazed from December 1, 2007 until February 13, 2008.
- From April 18-25, WWR-2 was stocked with 10 heifers. To date, WWR-2 has received grazing for 89 animal unit days (AUD). The target grazing for the year for WWR-2 is 156 AUD. This will be completed later this summer or in the fall depending on rainfall and forage availability.

- WWR-3 was stocked with 4 heifers from April 18-28. To date this site has received grazing for 66 AUD. The target grazing for the year is 78 AUD. This will be completed later this summer or in the fall.
 - Forage clippings conducted on May 5 following the grazing treatment showed that approximately 56% of the forage had been removed from the moderately grazed WWR-3 site and 86% of the forage had been removed from the heavily grazed site. Our target was to remove 50% from the moderately grazed site and at least 75% from the heavy grazed site. These targets were met.
 - Since installation of automated samplers was completed in October 2007, rainfall amounts have not been sufficient for producing runoff. There was 2.5 inches of rain in April and 0.73 inches in May. June rainfall data has not been assessed.
- c. Riesel
- Four runoff events occurred at Riesel on April 10 and 18 and May 14 and 15.
 - Samples from each event were analyzed for turbidity and *E. coli* and filtered for future analysis of *Bacteroidales*.
 - The amount of runoff was also measured and will be used to calculate total loadings for each site for each event.

45% 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 were collected from Riesel on April 10 and 18 and May 14 and 15 and were preserved for *Bacteroidales* analysis. However, no runoff samples have been collected from the Welder Wildlife Refuge as a result of below average rainfall.
- b. Stream cross-sections will be surveyed in July and every 6 months thereafter to evaluate impacts of BMP installation on bank stability.

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. Extension has constructed 4 portable shade facilities (see photo on following page) and installed them on the 2S Ranch in June 2008. The impacts of the installation of these structures will be evaluated using GPS collar data collected.
- b. In addition, funding has been provided to the 2S Ranch for grazing management on their creek pasture for year 1 of the project.

50% Complete



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

- During the February 26th 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 audiences in Victoria, Bosque, McClennan, Hamilton, Coryell, Henderson, San Augustine, and Wharton counties at educational programs.

IV. Projected Work for Next Quarter

- The second meeting of the Lone Star Healthy Streams Steering Committee will be scheduled and held on September 29.
- TWRI will prepare and submit Year 2, Quarter 2 Progress Report on July 15th.
- TWRI will coordinate a meeting with project participants on September 29 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 continue development of land/grazing management education PowerPoint presentation addressing bacteria contamination of 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 with landowners via educational programs
- Runoff monitoring will be conducted at Riesel and the Welder Wildlife Refuge.
- Grazing treatments at the Welder will be conducted as necessary.
- GPS tracking of cattle on the 2S Ranch will be conducted July 22 – August 14.
- GPS collar data analysis will continue next quarter.
- Bi-monthly sampling will continue on the 2S Ranch.