

## Texas Water Resources Institute

### Evaluation and Demonstration of BMPs for Cattle on Grazing Lands for the Lone Star Healthy Streams Program State General Revenue Nonpoint Source Grant Program FY2010 Workplan 10-52

Quarter no. 2 From 9/1/10 Through 11/30/10

#### I. Abstract

TWRI and SCSC participated in numerous public meetings and programs to communicate project goals, activities and findings including a TSSWCB Work Session and Board Meeting, the October Ag Council Meeting, the Annual Meeting of Texas SWCD Directors, 1 TMDL Meeting (Carters Creek), the LSHS Steering Committee Meeting, 3 county programs (Travis, Burnet, and Comanche), 2 field days (McGregor Research Center Field Day and Luling Foundation Water Field Day) and the 4-day Ranch Management University at College Station. Evaluations of grazing management at the Welder Wildlife Refuge, Beef Cattle Systems Center, and USDA-ARS at Riesel continued this quarter with grazing being conducted at both the Beef Cattle Systems Center and Welder Wildlife Refuge. Unfortunately, no runoff occurred this quarter. Finally, a prefab shade structure was assembled at McGregor on October 4 and assessed October 7-28. Data from this first assessment will be analyzed and presented next quarter.

#### II. Overall Progress and Results by Task

##### TASK 1: Project Administration and Coordination

*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 December, March, June, and September. QPRs shall be posted to the project website and distributed to all project partners.*

The following actions have been completed during this reporting period:

- a. TWRI submitted the Year 1, Quarter 1 Progress Report on September 15, 2010.

**14% 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. The first invoice, in the amount of \$217.64, was submitted on August 31, 2010.
- b. The second invoice will be submitted on November 30, 2010 or soon thereafter.
- c. As of December 2, 2010, \$26,655 or 16% of project funds had been expended.

d. Progress of Allocations to each Department is as follows:

- TWRI has expended 28% of their funds
- SCSC has expended 16% of their funds
- SAML has expended 3% of their funds
- ESSM has expended 19% of their funds

**16% Complete**

*Subtask 1.3: TWRI will host coordination meetings, conference calls, or TTVN meetings with the TSSWCB and SCSC, and include as appropriate SAML, ESSM, and USDA-ARS, approximately quarterly 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. These coordination meetings may be held concurrently with TSSWCB project 09-06 coordination meetings.*

The following actions have been completed during this reporting period:

- a. On September 28, AgriLife Extension, TSSWCB, and TWRI met to discuss project activities and status following the LSHS Program Development Committee Meeting.

**25% Complete**

*Subtask 1.4: TWRI and/or SCSC will attend and participate in 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, the Annual Meeting of Texas SWCD Directors, the TSCRA Annual Convention and various leadership meetings, the TFB Annual Convention and various leadership meetings, Clean Rivers Program Basin Steering Committee meetings, and watershed stakeholder meetings for certain TMDLs and WPPs.*

The following actions have been completed during this reporting period:

- a. TWRI attended the following meetings this quarter:
- TSSWCB Work Session on September 15
  - Ag Council Meeting on October 19
  - Annual Meeting of Texas SWCD Directors on October 25-27
  - Carters Creek TMDL Natural Resources Workgroup Meeting on November 9
  - TSSWCB Board Meeting on November 10
- b. Next quarter, TWRI will attend:
- TFB Annual Convention on December 5-6
  - Copano Bay TMDL Ag Work Group on December 14
  - Carters Creek TMDL Natural Resource Workgroup Meeting on December 15
  - TSSWCB Board Meeting on January 27

**25% Complete**

*Subtask 1.5: TWRI and SCSC will develop and disseminate project informational materials, including, but not limited to flyers, brochures, news releases, and other appropriate promotional publications. As appropriate, TWRI will include information about the project, as appropriate, in the tx H2O, New Waves e-letter, AgriLife News, USDA-ARS News, and livestock industry trade publications.*

*TSSWCB will be provided such informational materials and publications developed by TWRI and SCSC for review prior to distribution.*

The following actions have been completed during this reporting period:

- a. No progress to report this quarter.

**0% Complete**

*Subtask 1.6: TWRI will continue to host and maintain an internet website <http://grazinglands-wq.tamu.edu/> for the dissemination of information.*

The following actions have been completed during this reporting period:

- a. This quarter, the website (<http://grazinglands-wq.tamu.edu/>) was viewed by 39 unique visitors (14 in September 2010, 16 in October 2010, and 9 in November 2010).

**25% Complete**

*Subtask 1.7: TWRI and SCSC will continue to utilize the LSHS Project Steering Committee organized through TSSWCB project 06-05. At a minimum, membership shall be composed of TSSWCB, certain SWCDs, AgriLife Extension, AgriLife Research, TWRI, USDA-NRCS, USDA-ARS, TDA, GLCI, TFB, TSCRA, ICA, and TCFA. This LSHS Project Steering Committee will provide input on the evaluation of BMP effectiveness, identification of demonstration sites, modifications to the LSHS curriculum, and general project coordination. This LSHS Project Steering Committee will meet as frequently as needed, likely annually. This Project Steering Committee may meet concurrently with the Program Steering Committee established through TSSWCB project 09-06.*

The following actions have been completed during this reporting period:

- a. TWRI and SCSC met with members of the LSHS Project Steering Committee on October 19 in conjunction with the Ag Council Meeting and on October 25 in conjunction with the Annual Meeting of Texas SWCD Directors.
- b. TWRI met with Wilson Scaling, member of the LSHS Project Steering Committee on November 29.

**25% Complete**

*Subtask 1.8: TWRI, in collaboration with SCSC and SAML, will develop and submit a Final Report at the culmination of the project. This Final Report will document project performance related to each project goal, measure of success, and task. A draft of this Final Report will be submitted to TSSWCB for review prior to finalizing the document. This Final Report, and any associated project Technical Reports, will be permanently housed in the TWRI online Reports Database.*

The following actions have been completed during this reporting period:

- a. No progress to report this quarter.

**0% Complete**

## **TASK 2: Quality Assurance**

*Subtask 2.1: TWRI will develop a QAPP for activities in Task 3 consistent with 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. The QAPP was approved by the TSSWCB on September 30, 2010.

**100% Complete**

*Subtask 2.2: TWRI will submit revisions and necessary amendments to the QAPP as needed.*

The following actions have been completed during this reporting period:

- a. No activity to report. The first revision is due September 2011.

**0% Complete**

## **TASK 3: Evaluate and Demonstrate BMPs To Reduce Fecal and Bacteria Loading From Cattle on Grazing Lands**

*Subtask 3.1: SCSC, with assistance from TWRI, will continue the evaluation of grazing management and stocking rates/densities at the Brazos Bottom (BB1, BB2, BB3), Welder Wildlife Refuge (WWR1, WWR2, WWR3) and Riesel (SW12, W10) demonstration sites. Runoff samples from three grazing treatments [no grazing, moderate grazing, and heavy grazing (2 x moderate grazing)] will be evaluated at the Brazos Bottom and Welder Wildlife Refuge and from two grazing treatments [no grazing and moderate grazing] will be evaluated at Riesel. ISCO automated samplers will be used to collect flow integrated samples and data on runoff quality and quantity and rainfall amounts and intensity. E. coli and other bacteria (i.e., Enterococcus, fecal coliform) levels in runoff will be measured and bacteria loadings will be determined. SAML will analyze all samples using EPA-approved methods as outlined in the QAPP. SAML is NELAC certified for E. coli and will use EPA-approved methods for analysis of all samples.*

The following actions have been completed during this reporting period:

- a. Beef Cattle Systems Center
  - Equipment maintenance was performed on September 17, October 8, October 27, and November 30.
  - Sites BB2 and BB3 were grazed September 7 - 9, November 2 - 8, and November 16 -18.
  - No runoff occurred this quarter.
- b. Welder Wildlife Refuge
  - Equipment maintenance was performed on September 6, September 13, September 20, September 23, September 27, October 25, and November 29.
  - WWR-3 was grazed September 1-11 and WWR-2 was grazed September 11-30.
  - No runoff occurred this quarter.
- c. Riesel
  - No runoff occurred this quarter.

**25% Complete**

*Subtask 3.2: SCSC, with assistance from TWRI and ESSM, will evaluate the effectiveness of certain structural BMPs in modifying cattle movement to change fecal deposition patterns and reducing bacteria runoff. BMPs that have been identified as needing evaluation include (1) portable shade facilities/structures, (2) protected stream access points or stream crossing, (3) rip-rap application designed to limit cattle access to riparian areas, and (4) alternative water supplies designed to draw cattle away from waterbodies. Changes in cattle movement will be evaluated using GPS collars as described in Subtask 3.5. Reductions in bacteria contributions will be calculated based on the reduced time cattle spend in the stream and riparian area. Evaluation of protected stream access points or stream crossings will be dependent on finding a suitable cooperator where USDA-NRCS is designing and constructing this practice.*

The following actions have been completed during this reporting period:

- a. The shade structure was erected on October 4 and evaluated October 7-28.

**10% Complete**

*Subtask 3.3: SCSC will continue to gather information from the growing body of literature on 1) bacteria fate and transport, 2) effects of grazing cattle on bacterial levels in waterbodies, and 3) effect of BMPs designed to minimize grazing cattle impacts on riparian areas and bacteria loading. A compendium of this literature will be posted on the project website.*

The following actions have been completed during this reporting period:

- a. SCSC continues to gather information and post it on the Lone Star Healthy Streams website as follows: <http://lshstest.tamu.edu/research/bibliography> .

**25% Complete**

*Subtask 3.4: SCSC will identify cooperator(s) to conduct the BMP demonstration and evaluation with assistance of the LSHS Project Steering Committee, local SWCDs, USDA-NRCS, TWRI, and local AgriLife Extension agents. For the evaluation of protected stream access points or stream crossings, and possibly alternative water supplies, SCSC and TWRI will work closely with USDA-NRCS and local SWCDs to identify potential cooperators where these practices are being planned. Funding will be provided to the cooperator(s) as needed to implement BMPs and participate in the BMP demonstration and evaluation. SCSC and TWRI will encourage the cooperator(s) to obtain a certified WQMP from the TSSWCB.*

The following actions have been completed during this reporting period:

- a. The effectiveness of shade, rip-rap, and alternative water will be conducted at the McGregor Research Center. The stream crossing may also be evaluated at McGregor pending identification of a cooperator by the NRCS.

**75% Complete**

*Subtask 3.5: SCSC and ESSM will assess cattle behavior in response to BMPs to be evaluated in Subtask 3.2 utilizing Lotek GPS collars to determine the amount of time cattle spend in the stream and riparian areas before and after BMP implementation. TWRI will assist with GPS collar data analysis.*

The following actions have been completed during this reporting period:

- a. Shade was evaluated October 7-28.

### **10% Complete**

*Subtask 3.6: SCSC will transfer results from BMP effectiveness studies to landowners, natural resource agencies, and others through the LSHS Program and other publications in order to increase BMP adoption rates and participation in federal and state technical and financial assistance programs. SCSC, with assistance from TWRI and USDA-ARS and in cooperation with local SWCDs and local Extension and USDA-NRCS staff, will conduct at least 1 field day at a demonstration sites to highlight the BMP effectiveness studies and promote adoption of BMPs by ranchers.*

The following actions have been completed during this reporting period:

- a. The LSHS concept was introduced through presentations at the following dates and locals this quarter:
  - September 17 – Travis County
  - September 24 – McGregor Research Center Field Day – McLennan County
  - October 12-15 – Ranch Management University
  - October 21 – Burnet County
  - October 26 – Comanche County
- b. The full LSHS program was presented on October 29 at the Luling Foundation Water Field Day.

### **25% Complete**

*Subtask 3.7: In order to determine and document the synergistic effectiveness of BMPs prescribed in a WQMP in reducing bacteria loading from grazing cattle, a team consisting of SAML, USDA-ARS, SCSC TWRI, and others as appropriate, will design a water quality monitoring regime for evaluating whole-farm effect of implementing WQMPs on livestock operations. This team will work with the LSHS Project Steering Committee and other project partners to identify prospective cooperating ranches across an array of ecoregions and climatic zones. To the extent possible, the monitoring regime will be designed for watersheds with on-going WPP or TMDL development or implementation. The monitoring regime will be designed such that results are transferable to other watersheds. The monitoring regime will take advantage of all available and suitable methodologies, including Bacterial Source Tracking (BST). The monitoring regime will be incorporated into a proposed scope of work and budget.*

The following actions have been completed during this reporting period:

- a. No activity to report.

### **0% Complete**

*Subtask 3.8: Through TSSWCB project 09-50, USDA-ARS is developing an easy-to-use Texas BMP Evaluation Tool (TBET) to aid in science-based BMP selection on-farm and cost-effective conservation spending. Specifically, TBET is being designed to 1) assist land managers and agency planners in conservation practice decision-making related to on-farm (field-scale) alternatives and effectiveness, and 2) facilitate evaluation and reporting of agricultural nonpoint source load reductions from WQMP implementation. SCSC and TWRI will work with USDA-ARS to incorporate findings from the BMP evaluations in this project into TBET, to the extent practical.*

The following actions have been completed during this reporting period:

- a. No activity to report.

**0% Complete**

*Subtask 3.9: SCSC, with assistance from TWRI and TSSWCB, will work very closely with the USDA-NRCS to provide USDA-NRCS with the information they need to establish a practice standard for Livestock Shade Structure as a BMP to effect cattle movement and fecal deposition patterns and impact pollutant loading and water quality. Examples of this practice standard (717) exist in South Carolina, Georgia, Florida, and Virginia.*

The following actions have been completed during this reporting period:

- a. No activity to report.

**0% Complete**

*Subtask 3.10: SCSC, with assistance from TWRI, will develop technical reports, refereed journal articles, Extension Fact Sheets, and other publications as appropriate, summarizing the results of the demonstrations (grazing management treatments and structural BMP evaluation) and the analysis of the impacts of BMPs on bacteria runoff.*

The following actions have been completed during this reporting period:

- a. No activity to report.

**0% Complete**

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

- N/A

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

- Prepare and submit Year 1, Quarter 2 Progress Report on December 15.
- Submit invoice for second quarter.
- Host coordination meeting.
- Attend TFB Annual Convention on December 5-6
- Attend Copano Bay TMDL Ag Work Group on December 14
- Attend Carters Creek TMDL Natural Resource Workgroup Meeting on December 15
- Attend TSSWCB Board Meeting on January 27
- Continue monitoring runoff at Beef Cattle Systems Center, Welder Wildlife Refuge and Riesel
- Continue evaluation of BMPs at McGregor