Environmental Management of Grazing Lands
TSSWCB Agreement No. 06-14-07-14

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

I. Abstract

Work this quarter focused on (1) completing installation of fences to control grazing at the Welder Wildlife Refuge; (2) bi-monthly water sampling at the 2S Ranch; (3) analyzing runoff from Riesel; (4) conducting quarterly monitoring of cattle movement at the 2S Ranch using GPS collars; (5) analyzing the GPS collar data; and (6) delivering information on the project to ag groups around the state. Work next quarter will focus on (1) performing grazing treatments at the Welder Wildlife Refuge; (2) monitoring at the 2S Ranch, Welder Wildlife Refuge, and Riesel and (3) installing equipment and constructing fence at the Texas A&M Farm at College Station.

II. Overall Progress and Results by Task

TASK 1: Project Coordination and Administration

Subtask 1.1: TWRI will prepare electronic quarterly reports for submission to the TSSWCB.

The following actions have been completed during this reporting period:

a. TWRI submitted Year 1, Quarter 4 Progress Report on January 15, 2008.

75% Complete

Subtask 1.2: TWRI will participate in meetings and teleconferences with the TSSWCB project manager, 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.
b. TWRI attended the March 19th State Board Meeting in Temple.

75% Complete

Subtask 1.3: 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 January 31, 2008, $83,771.80 of federal project funds had been expended.

84% Complete

Subtask 1.4: TWRI will coordinate this project with the Lone Star Healthy Streams project and related USDA-ARS efforts at Riesel.

The following actions have been completed during this reporting period:

a. TWRI coordinates very closely with Dr. Larry Redmon, who leads the *Lone Star Healthy Streams* project, and Dr. Daren Harmel, who oversees USDA-ARS efforts at Riesel. Both help oversee all research activities conducted through this project.

75% Complete

Subtask 1.5: TWRI will prepare a final report for submission to the TSSWCB summarizing the existing information on environmental management of grazing lands and describing results of the first year of the evaluation.

The following actions have been completed during this reporting period:

a. No activity to report this quarter.

0% Complete

TASK 2: Compile Existing Information

*Subtask 2.1**:** TCE and TWRI will coordinate a review of literature of the state of current knowledge regarding environmental management of grazing lands.*

The following actions have been completed during this reporting period:

a. The Texas AgriLife Extension Service Extension Assistant continues to review the existing literature regarding BMPs that help reduce livestock bacteria levels in water bodies.

75% Complete

TASK 3: Evaluation of Proper Grazing Management

*Subtask 3.1**:** Purchase equipment as outlined in budget.*

The following actions have been completed during this reporting period:

a. Most purchasing has been completed; however batteries and housing for the ISCO samplers that will be installed at the A&M Farm, as well as fencing material for the three sites are still needed. Additional lab supplies will be purchased as funding allows.

90% Complete

*Subtask 3.2**:** Refurbish and equip three small (1-2 acres) watershed sites on the Welder Wildlife Refuge to measure runoff and collect E. coli samples from three different treatments: (1) no grazing, (2) prescribed grazing, and (3) heavy grazing.*

The following actions have been completed during this reporting period:

a. Fence construction around each watershed was completed on February 13, 2008. Site WWR-1 will serve as the ungrazed site. Site WWR-2 will serve as the heavy grazed site. Finally, site WWR-3 will serve as the moderately grazed site.
b. Sites WWR-2 and WWR-3 were lightly grazed up until February 13.
c. From April 19-26, WWR-2 will be stocked with 10 heifers and WWR-3 will be stocked with 4 heifers.

75% Complete

Subtask 3.3: Select ranch for evaluation of grazing management and complementary practices.

The following actions have been completed during this reporting period:

a. Grazing management will be evaluated at the Welder Wildlife Refuge, Texas A&M Farm, and USDA-ARS Center at Riesel. Alternative water supplies and shade facilities will be evaluated at the 2S Ranch.

100% Complete

Subtask 3.4: Install sampling equipment on selected ranch needed to measure runoff and collect E. coli samples. On the private ranch selected, the effects of grazing management and complementary practices will be assessed over a three year period through the Lone Star Healthy Streams Project.

The following actions have been completed during this reporting period:

a. Installation of the monitoring equipment is not needed at the 2S Ranch. Grab samples are collected every 1st and 3rd Thursday of each month for analysis of *E. coli*. Flow is estimated from flow depth in a 3 foot corrugated steel culvert on the ranch and estimated using Manning's Equation.
b. Monitoring equipment is already in place at Riesel.
c. Sampling equipment will be installed on the Texas A&M Farm to evaluate grazing management on irrigated Tifton 85.

75% Complete

Subtask 3.5: Collect runoff, rainfall, and E. coli data from Welder Wildlife Refuge and selected ranch.

The following actions have been completed during this reporting period:

a. Water samples were collected above and below the 2S Ranch on January 3rd and 17th, February 7th and 21st, and March 6th and 20th 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.
b. Water samples are scheduled to be collected at the 2S Ranch on April 3rd and 17th, May 1st and 15th, and June 5th and 19th.
c. Sampling was initiated at the Welder Wildlife Refuge on October 30, 2007. Since installation, rainfall amounts have not been sufficient for producing runoff.

75% Complete

Subtask 3.6: Obtain data collected by USDA-ARS at Riesel on (1) ungrazed native prairie and (2) grazed improved pasture.

The following actions have been completed during this reporting period:

a. Four runoff events occurred at Riesel 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*.

75% Complete

Subtask 3.7: Compare data collected at Riesel, Welder Wildlife Refuge, and selected ranch to identify regional differences and effects of grazing.

The following actions have been completed during this reporting period:

a. No activity to report this quarter. This will be completed at the conclusion of the project during preparation of the final report.

0% Complete

TASK 4: Evaluation of Complementary Practices

Subtask 4.1: Install stream sampling equipment on ranch selected in Subtask 3.3 to measure stream flow and rainfall, and collect stream samples for E. coli analysis.

The following actions have been completed during this reporting period:

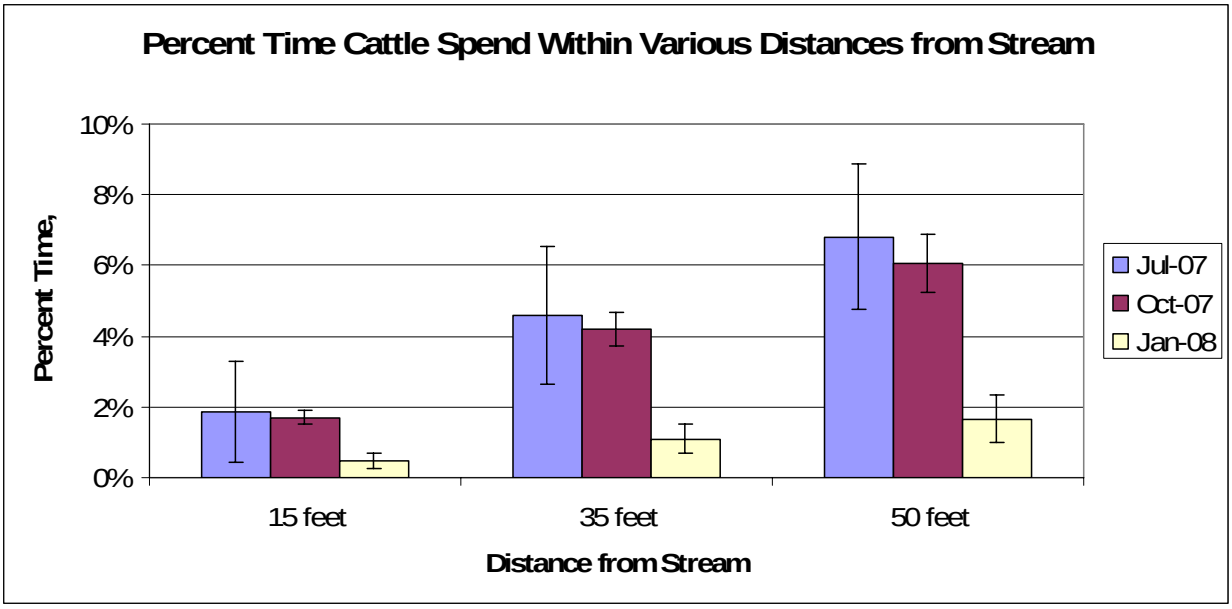
a. Bi-monthly sampling on the 2S Ranch is being utilized to evaluate alternative water sources and possibly other practices. Because no sampling equipment was needed at the 2S Ranch, additional sites are being established at the Texas A&M Farm near College Station and equipment installed to evaluate grazing management practices.

75% Complete

Subtask 4.2: Initiate stream sampling and evaluation of cattle behavior (using GPS collars) to assess background conditions prior to implementation of complementary practices (i.e. alternative water supplies, fencing, etc.) in years 2 and 3 of the evaluation funded through the Lone Star Healthy Streams Project.

The following actions have been completed during this reporting period:

a. Stream sampling conducted to date is described in Subtask 3.5 above.
b. GPS collars were placed on cattle at the 2S Ranch on January 10th and removed February 7th. Data collected to date indicate that the cattle at the 2S Ranch spend only a small percentage of their time near the creek (following page).



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.

75% Complete

TASK 5: Technical Transfer

Subtask 5.1: Extension and TWRI will coordinate with the TSSWCB, NRCS, local SWCDs and others to deliver current knowledge to landowners on production and environmental management of grazing lands and their associated watersheds to address water quality and other concerns in the state.

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" describing three ongoing projects evaluating bacteria BMPs and developing bacteria education programs. It can be found at the following address: http://grazinglands-wq.tamu.edu/index.php. The website was viewed by:
   - 41 unique visitors in January 2008
   - 62 unique visitors in February 2008
   - 51 unique visitors in March 2008
b. The website will be continually updated as new data and information are obtained.
c. Information on the project was included in presentations to the following groups:
   - Texas Ag Industries Association Annual Membership Conference – January 16th
   - 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 6th
   - Harris County Master Urban Rancher Series, Feb 15, Houston

- Texas and Southwestern Cattle Raisers Association Natural Resource Committee Meeting – March 15th

d. Fact sheets and a presentation are currently being developed to deliver information to landowners across the state.

75% Complete

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

- N/A.

IV. Projected Work for Next Quarter

- Prepare and submit Year 2, Quarter 1 Progress Report.
- A reimbursement form will be submitted covering the period of 2/1/08 – 4/30/08.
- Continue compiling existing information on bacteria runoff from grazing lands.
- Purchase housing for ISCO samplers to be installed at the A&M Farm.
- Perform grazing treatments at the Welder on April 19-26.
- Conduct bi-monthly sampling on the 2S Ranch.
- Evaluate cattle behavior on 2S Ranch using GPS collars from April 3-25, 2008.
- Collect and analyze runoff samples from the Welder Wildlife Refuge and Riesel.
- Update the Lone Star Healthy Streams Steering Committee on the project's status and findings to date