

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

Quarter no. 3 From 7/1/07 Through 9/30/07

I. Abstract

Work this quarter focused on installing automated samplers at the Welder Wildlife Refuge, initiating bi-monthly water sampling at the 2S Ranch, and conducting quarterly monitoring of cattle movement at the 2S Ranch using GPS collars. Installation of the automated sampling equipment at the Welder Wildlife Refuge will be completed next quarter and a “dry run” will be conducted if a runoff event occurs. However, implementation of grazing treatments will not begin until the berms are refurbished and the fences are constructed. A one-year extension was requested and received this quarter. In addition, a website went online this quarter titled “Improving Water Quality of Grazing Lands” that describes three ongoing projects evaluating BMPs and developing education programs. Additional educational materials are being developed to transfer the knowledge gained by this project to landowners across the state.

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 3 Progress Report on October 15, 2007.

60% 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.

60% Complete

Subtask 1.3: TWRI will submit appropriate Reimbursement Forms.

The following actions have been completed during this reporting period:

- a. TCE signed a contract amendment on 09/17/2007 to extend the project period of performance to September 30, 2008.

- b. A reimbursement form was submitted covering the period of 5/1/07 – 7/31/07. A total of 71% of the funds have been expended to date. A budget amendment may be needed to move some funds from the travel category to salary and from supplies to other to fund berm refurbishment and fencing.

71% 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 met with Dr. Redmon about project coordination on July 11th and September 10th.
- b. On August 7th, TWRI met with Dr. Harmel and discussed coordination with work at Riesel.

60% 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. No activity to report this quarter.

30% 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. GPS collars, lab supplies, ISCO samplers, bubble flow meters, rain gauges, 3 solar panels, 3 batteries, and 3 housing for the ISCOs have all been purchased and received.

- b. Three additional batteries, solar panels, and ISCO housing will be purchased for the 3 sites at the Texas A&M Farm.

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. Dr. Daren Harmel, USDA-ARS, provided training to TWRI on proper site setup on August 7, 2007.
- b. Trips were made to the Welder Wildlife Refuge on August 14-15, September 3-4, and September 25-26 to refurbish and equip the three watershed sites. Equipment should be fully installed and operational on October 30th. See attached pictures showing installation progress.
- c. TWRI and TCE are working with the Welder Wildlife Refuge to refurbish the three watershed sites. A dozer operator will be contracted to cut fence lines through the brush. Berms will also need to be refurbished. Welder staff will coordinate the dozer work and will be reimbursed by TAMU. TCE staff from Corpus Christi will assist with fence building.

30% 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.

60% 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. Collection of runoff, rainfall, and E. coli data from the Welder Wildlife Refuge will be initiated once equipment is installed.
- b. Samples for *E. coli* analysis were collected from the 2S Ranch on July 12 and 26, August 2 and 16, and September 6 and 20. On July 26, Clear Fork of Plum Creek was at flood stage (see attached pictures).
- c. TWRI received training from Dr. George DiGiovanni on analysis of *Bacteroides* on August 21-23 in El Paso.

30% 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. The TWRI and TCE are collaborating with Drs. Daren Harmel, Monty Dozier, and Scott Senseman to obtain runoff samples from Riesel.

10% 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.

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 will be 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.

60% 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 installed on five cows on the 2S Ranch on July 3rd and removed on August 2nd. The GPS collars collect a data point every 5 minutes allowing a detailed analysis of where cattle spend their time. The data has not been analyzed to date. However, it is anticipated that data analysis will be accomplished next quarter.

30% Complete

TASK 5: Technical Transfer

Subtask 5.1: TCE 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. A website has been established titled “Improving Water Quality of Grazing Lands.” This website describes three ongoing projects evaluating BMPs and developing education programs.
- b. Fact sheets and a presentation are currently being developed to deliver information to landowners across the state.

25% Complete

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

- N/A.

IV. Projected Work for Next Quarter

- Prepare and submit Year 1, Quarter 4 Progress Report.
- Attend the 67th Annual Meeting of Texas Soil and Water Conservation District Directors on October 22-23.
- A reimbursement form will be submitted covering the period of 8/1/07 – 10/31/07.
- A budget amendment request will be submitted.
- Continue compiling existing information on bacteria, nutrient, and sediment runoff from grazing lands.
- Finish installing the equipment at the Welder Wildlife Refuge.

- Refurbish the three watershed sites at the Welder and construct fences to control grazing on each site.
- Conduct bi-monthly sampling on the 2S Ranch on October 4 and 18, November 1 and 15, and December 6 and 20.
- Evaluate cattle behavior on 2S Ranch using GPS collars from October 2-25.
- Collect and analyze 1st runoff samples from the Welder Wildlife Refuge and Riesel.

Watershed site at the Welder Wildlife Refuge before and during refurbishment and equipment installation.



Clear Fork of Plum Creek at normal flow and at flood stage on July 26th. The group of trees behind the bridge on the left is the same group of trees as is seen on the right. The bridge is completely submerged.

