

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

Quarter no. 2 From 4/1/07 Through 6/30/07

I. Abstract

Work this quarter primarily focused on purchasing sampling equipment, identifying cooperators for the BMP evaluation, publicizing the project, and developing the sampling protocol. Evaluation of grazing management will be conducted using runoff studies at the Welder Wildlife Refuge and Riesel. Additional sites near College Station are also being evaluated for conducting grazing management studies. The owners of the 2S Ranch near Lockhart have graciously agreed to allow the evaluation of alternative water supplies on their ranch. Preliminary stream samples were collected and analyzed from the 2S Ranch in May. In July, quarterly monitoring of cattle movement and bi-monthly water sampling on the 2S Ranch will be initiated. The ISCO samplers were received on June 15 and will be installed at the Welder next quarter. Fence construction around the watershed sites to control grazing will also be initiated next quarter. A story briefly discussing the project was published in the May issue of "The Cattleman" magazine.

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 2 Progress Report on July 16, 2007.

50% 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 weekly via telephone with the TSSWCB project manager to discuss project status and any issues as they arise.

50% Complete

Subtask 1.3: TWRI will submit appropriate Reimbursement Forms.

The following actions have been completed during this reporting period:

- a. At the request of TAMU Contract and Grants, a budget amendment was requested to transfer funding from the “Equipment” category to the “Other” category for the purchase of the ISCO samplers.

50% 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. On May 18, TWRI met with TAES and TCE regarding setting up the runoff studies and analysis of bacteria. Based on that discussion, it was proposed that both *E. coli* and *Bacteroides* be measured in the runoff samples from Riesel and the Welder; however, only *E. coli* will be measured in samples from the 2S Ranch.
- b. On May 23, TWRI met with TAES for additional discussions on analysis of *Bacteroides*. Analysis of *Bacteroides* from the Riesel and Welder sites will help develop use of that method for use to quantify loadings from cattle and wildlife.

25% 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.

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. TWRI has reviewed and briefly summarized 26 publications to date. TCE has also begun a literature search to complement the work completed by TWRI. Additional research is planned for next 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, and rain gauges have all been purchased and received.
- b. Solar Panels, batteries, and housing for the ISCOs remain to be purchased.

80% 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. TWRI and TCE are working with the Welder Wildlife Refuge to refurbish the three watershed sites (See attached picture). Fence lines will need to be cleared of brush before construction can begin. Berms may 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.

10% 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. The watershed sites at the Welder Wildlife Refuge and Riesel have been selected for use in evaluating grazing management on bacteria runoff.
- b. On April 19, TWRI met with TCE and the owners of the 2S Ranch, located near Lockhart in the Plum Creek watershed, to discuss the scope of the grazing management project and their interest in participating. The owners were interested because of their involvement with the Plum Creek Partnership and invited TWRI and TCE to come to their ranch.
- c. On May 14, TWRI and TCE visited the 2S Ranch to evaluate the stream and the ranch's suitability for the project and continue discussions with the landowners regarding participating. The stream is a small perennial spring fed stream (see attached photos). The 2S Ranch encompasses approximately a half-mile of the stream of which the landowner controls both sides of the stream. The 2S Ranch appears to be a suitable location for the assessment of alternative water supplies and the landowner has agreed to participate in the project.
- d. Additional sites on the TAMU land near College Station are being evaluated.

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. Bees currently inhabit all three sites at the Welder Wildlife Refuge. Welder staff will remove them so that installation of the monitoring equipment can begin.

5% 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.

0% 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 will collaborate 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.

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 evaluated near College Station for installation of equipment for additional grazing management studies and evaluation of complementary practices.

0% 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. On May 14, preliminary water samples were collected from three sites on the 2S Ranch and analyzed. Flow was estimated to be 0.9 cfs. *E. coli* levels were over 1000 cfu as the creek entered the ranch and were down to less than 300 cfu when the creek left the place. There was a considerable amount of aquatic vegetation in the creek which likely helped filter the water and remove some of the bacteria. In addition, cattle had access to water troughs and utilized the creek only minimally. The water troughs were turned off at the end of June prior to initiation of water sampling and evaluation of cattle movement.

10% 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 poster was submitted to the 15th National NPS Monitoring Workshop.
- b. On page 23 of the May 2007 Issue of *The Cattleman* magazine, the evaluation and demonstration of BMPs to be conducted by this project was briefly discussed. The article can be viewed at the following website:
<http://thecattlemanmagazine.com/issues/2007/0507/On%20the%20Ground.pdf>.
This has greatly increased the awareness of bacteria issues.

25% Complete

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

- A no-cost extension of the project is anticipated to be necessary to provide additional time to collect and analyze at least 6 months of data from the runoff studies for incorporation into the final report. This would greatly enhance the results reported and the usability of the final report submitted.

IV. Projected Work for Next Quarter

- Prepare and submit Year 1, Quarter 3 Progress Report.
- Submit a request for a 1 year no cost extension.
- Continue compiling existing information on bacteria, nutrient, and sediment runoff from grazing lands.
- Purchase solar panels, batteries, and housing for the ISCO samplers and install the equipment at the Welder Wildlife Refuge.
- Refurbish the three watershed sites at the Welder and construct fences to control grazing on each site.
- Initiate bi-monthly sampling on the 2S Ranch on July 12.
- Initiate evaluation of cattle behavior using GPS collars on July 3.
- Present poster at the 15th National NPS Monitoring Workshop in Austin on August 26-29.

Watershed site at the Welder Wildlife Refuge.



Clear Fork of Plum Creek as it flows through the 2S Ranch



Clear Fork of Plum Creek as it enters the 2S Ranch.

