

# GPS GRAZING NEWS

THE NEWSLETTER OF THE UK BAE WQ 406 PROJECT

<http://www.bae.uky.edu/WQ406>

Fall 2002

## BAE projects aim at evaluating management practices to minimize impacts of grazing cattle on water quality

Kentucky is the largest beef producer east of the Mississippi River and ranks 5th in the nation in the number of farms with beef cattle. Cattle production is a prominent part of the state's agricultural base. Environmentally, Kentucky contains almost 90,000 miles of streams, which are generally accessible by cattle.



The goal of this project is to evaluate management practices that will enhance cattle production while addressing the water quality, nutrient management, and environmental requirements of a watershed.



To date several components of the project are either ongoing or have been completed at the UK Animal Research Center (ARC) in Woodford County. All of the pasture plots were electrically fenced using high tensile wire, stream crossings were constructed, heavy traffic areas around waterers were stabilized using geotextile pads, and a water system was developed and installed. Future plans include construction of alley ways to facilitate in the gathering and handling of cattle.

Three different treatments are being evaluated:

- (a) Limited access to the stream through a constructed crossing, plus an alternative water source.
- (b) Free access to the stream, plus an alternative water source.
- (c) Free access to the stream, and no alternative water source.

Cattle were released onto the six pasture plots in May 2002. Stocking rate was about 1,200 lb/acre. Pasture areas are between 5 and 8 acres. Stocking rates were reduced during summer as grazable forage became extremely limited due to dry weather conditions.

A companion project funded through the SB-271 Program includes collection of stream water samples that began in January 2002 on a bi-weekly basis. Water samples are analyzed for a variety of physical, chemical, and microbiological parameters. Erosion levels associated with treatments are

also evaluated. An initial survey of the streams was performed using a surveying quality Global Positioning System (GPS).

Permanent photo stations were established to digitally document changes to the pasture plots on a monthly basis, as shown in the pictures below.



Cattle water intake rates and water temperature have been monitored on a hourly basis since August 2002 using contact water meters and data loggers.

GPS tracking can provide researchers with efficient and

accurate information on cattle behavior. Recent advances in GPS technology have allowed the development of lightweight collar receivers suitable for monitoring animal position and activity (if grazing or not) at 5-min intervals. The GPS data can then be imported into a Geographic Information System (GIS) to assess animal behavior characteristics and pasture utilization.

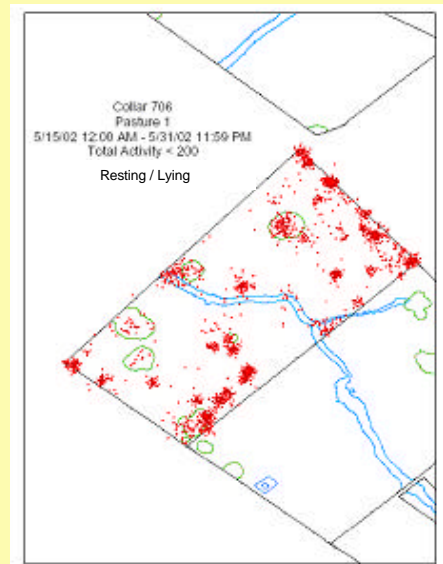
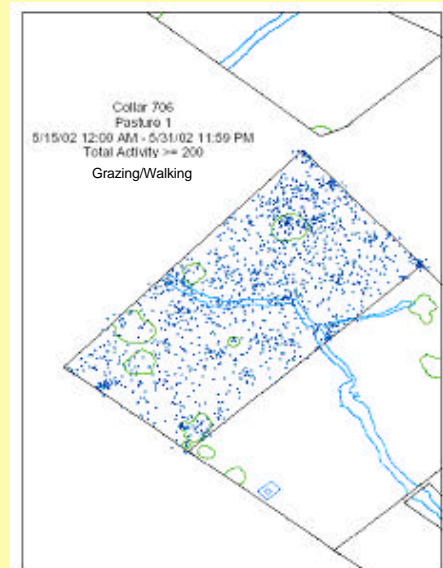
Sixteen cattle were fitted with GPS collars and released onto the ARC pasture plots.



GPS data are to be collected on a quarterly basis. The first data collection period was between May 14 and June 1, 2002. Grazing and non-grazing activity data was obtained for each plot. Examples are given in the next two figures for Pasture 1, where cattle have access to the stream at all times, and no alternative water source is available.

Rainfall, air temperature and relative humidity data are also being collected and will be used in combination with all other data to determine potential

effects of weather and BMPs on cattle behavior water intake.



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### Web site offers information

For information on personnel, updated photograph pages and interactive project map, go to  
<http://www.bae.uky.edu/WQ406>