

## Site-specific implementation of practices that alter the spatial/temporal distribution of grazing cattle to improve water quality of pasture streams in the Rathbun Lake watershed

**Abstract:** This study examined how pasture size and composition can affect cattle distribution in and around streams, and influence the risk of pollutants stemming from cattle congregating in a small area.

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*Do the physical characteristics of a pasture influence the effectiveness of practices intended to reduce the risk of nonpoint source pollution of pasture streams caused by congregation of cattle in and near streams? The major factors affecting congregation of cattle in and near pasture streams were the size and shape of the pasture.*



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### What was done and why?

The objective of this project was to evaluate and demonstrate the effectiveness of site-specific Midwest management practices that alter the spatial/temporal distribution of grazing cattle in reducing the risk of nonpoint source pollution of streams in pastures with varying size, shape and shade distribution.

### What did we learn?

The major project conclusion is that the size and shape of pastures is the primary factor controlling the congregation of cattle in and near pasture streams, and the smaller the pasture, the greater the need for more intense management. The effects of pasture size and shape on cow distribution supersede other possible factors such as shade distribution or the proportion of tall fescue in the pastures. As congregation of cattle will increase the percentage of bare and manure-covered ground while reducing forage height, the risks of nonpoint source pollution of pastures is considerably greater in small, narrow pastures than in large, wide pastures. Therefore, more restrictive management practices that use fencing (i.e., vegetative buffers or riparian paddocks) will be more effective at reducing the risks of nonpoint source pollution of streams in small pastures than large pastures. This experiment highlighted the effects of restricting stream access to stabilized crossings. These restrictions reduced the time that cattle were present in the stream and riparian zones in both large and small pastures by comparable proportions. However, the cattle spent much more time in the stream and riparian zones in small pastures than large pastures when provided unrestricted stream access, resulting in greater impacts of restricted access in small pastures.

While some studies in the literature have shown that providing water off-stream would reduce congregation of cattle near pasture streams, this practice proved ineffective in altering distribution of grazing cattle in either large or small pastures. While the reasons for the lack of efficacy in this experiment are unclear, the fact that providing off-stream water was ineffective in altering distribution of grazing cattle means that this practice might be effective only under specific conditions. It likely should not be recommended for altering cow distribution unless it can be combined with another restrictive practice, such as riparian buffers or rotational grazing.