# Monitoring long-term patterns of farmland bird communities in Nebraska

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## Introduction

Agroecosystems are key providers of ecosystem services. Farmland health is vital to ensure the continued provision of these services. As ecological and socio-economic parameters of agriculture shift, assessing and monitoring farmland is essential.

Farmland bird communities serve as one indicator of ecosystem health. Birds provide farmers and researchers an accurate and easy to use means to monitor the health of agroecosystems and can encourage the adoption of beneficial and sustainable farm practices by land-owners.

Building on partnerships formed with participating farmers and data currently being collected on twenty-seven organic farms, University researchers and farmers will continue to monitor on-farm bird diversity to develop a long-term monitoring program.

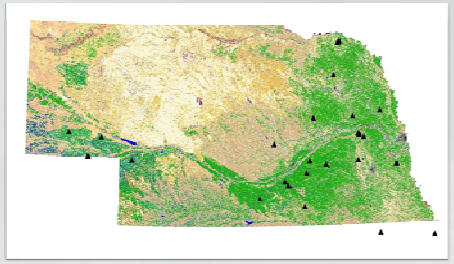
## Methodology

Farmers are provided with a Digital Field Recorder (images 1,2). Farmers move the recorder around their farm following sampling protocols established with researchers . Recorders are preprogrammed to awake and record bird vocalizations at select times throughout the day.

At the end of each sampling period, recordings stored on flash memory cards are sent through the mail to the University for collection and analysis. Cards are returned to the famer for the next sampling period .

Image 1. Wildlife Acoustics' Digital Field Recorder

## Image 3. Participating Farms



## Short-Term Goals

1) Provide an additional means for researchers to monitor the impacts of land-use and land-cover change on farmland bird diversity.
2) Provide recommendations to organic and sustainable farmers on enhancing on-farm planned and associated biodiversity.
3) Provide an indicator of the quality of local and regional ecosystem services.
4) Empower farmers through direct feedback.
5) Reduce the costs of on-farm research.

Image 2. Wildlife Acoustics' Digital Field Recorder

## Progress Through 2008

1) Twenty-eight farms (image 3) were sampled with recorders during summer breeding season of 2008.
2) Three farms were sampled throughout three full sampling periods. Additional recorders are being distributed for the full 2009 sampling periods.
3) Recordings were analyzed (figure 1) and are being compared with traditional count methods.
4) Recordings were distributed to participating farmers and the public at farm visits and during farm field days.
5) Songs are now available through the UNL SNR at http://organic.unl.edu/bsongs.shtml.

## Farm Sampling

## Long-Term Goals

1) Detect impacts of large-scale drivers, e.g. climate change, on biodiversity and ecosystem services.
2) Increase awareness of the value of farmland management as a biodiversity conservation tool.
3) Increase the motivation of farmers to employ sustainable agricultural practices through a greater understanding of the role of biodiversity.
4) Encourage people to consider links between the birds they watch and the food they eat.
5) Communicate the value of biodiversity to farmers, consumers, & policy makers.
6) Verify and improve the accuracy of UNL's Healthy Farm Index.

## The Healthy Farm Index

The goal of the Healthy Farm Index (HFI) is to provide a practical assessment tool to farmers, policy makers, and others interested in restoring ecosystem services on farms. The index assesses farm health based on measures of farm production, biodiversity, and associated ecosystem services that underpin rural landscapes.

Twelve indicators, including bird diversity, have been selected as initial metrics. With these metrics, the HFI demonstrates optimal land use and land cover patterns by modeling tradeoffs that result from farming choices. The structure allows further components to be added. The HFI, by integrating and communicating interdisciplinary data, reflects a vision of sustainable agriculture and provides guidance toward farm practices and policy that optimize food production, biodiversity, and ecosystem services. Ultimately the goal of this and associated projects is to provide a means to balance farm production and enhancement of biodiversity and ecosystem services.

For more information on the Healthy Farm Index visit http://organic.unl.edu

## Figure 1. Species Sonograms