

## CASE STUDY

# Rotational Grazing at Cheyenne Bottoms



Shorebirds in mowed site, notice the height of the unmowed vegetation in the background. *Photo credit: Robert Penner.*

**LOCATION:** Cheyenne Bottoms Preserve, Kansas, USA

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**LAND OWNERSHIP:** The 3,237 hectare (8,000 acre) preserve is owned and managed by the Kansas Chapter of The Nature Conservancy.

## Focal Habitats

» Uplands—grasslands

Shorebird habitat types within the Cheyenne Bottoms Preserve include ephemeral wetlands, semi-permanent wetlands, seasonally flooded wetlands, mud and alkali flats, wet meadows, shortgrass prairie, agricultural fields, and other shallow water sources such as ditches and stock ponds. Many of the shorebirds using Cheyenne Bottoms are opportunistic in their use of habitats and subsequently depend upon a large variety of wetland and habitat types. Most shorebirds use unvegetated, shallow ephemeral wetlands, semi-permanent basins, shallowly flooded mudflats and salt flats.

## Habitat Goal

The Cheyenne Bottoms Preserve within the Central Flyway is working to improve the quality of habitat presently managed for shorebirds by maintaining an appropriate configuration of wetland and grassland habitats, protecting water quality and availability, and increasing and improving monitoring of shorebird populations and habitat. Furthermore, The Nature Conservancy can use the preserve to increase the awareness and understanding of grasslands and wetlands within Kansas and their importance to shorebird populations. The Nature Conservancy works to create and improve shorebird habitat types to provide a wide range of habitats to attract many shorebird species. Here, we discuss the management actions taken to improve grassland habitats.

## Species Benefitted

All species of shorebirds that occur in the Central Flyway should benefit from this habitat management work. Upland species will benefit on a yearly basis, whereas the wetland species may only benefit during years of normal to above normal rainfall. Species that are more tolerant of vegetation such as Wilson's Phalaropes (*Phalaropus tricolor*) and Pectoral Sandpipers (*Calidris melanotos*) also use flooded grass, wet meadows, and agricultural fields. Small shorebirds such as White-rumped Sandpiper (*Calidris fuscicollis*), Baird's Sandpiper (*Calidris bairdii*) and Least Sandpipers (*Calidris minutilla*) use water depths of ~8 cm (3 inches) or less. Greater Yellowlegs (*Tringa melanoleuca*), Stilt Sandpipers (*Calidris himantopus*), American Avocets (*Recurvirostra americana*) and other longer-legged shorebirds use wetlands with water up to ~20 cm (8 inches). Cheyenne Bottoms also hosts species which primarily rely upon upland habitats during at least one portion of their life cycle, such as American Golden-Plover (*Pluvialis dominica*), Upland Sandpiper (*Bartramia longicauda*), Buff-breasted Sandpiper (*Calidris subruficollis*) and Killdeer (*Charadrius vociferus*). Such habitats include shortgrass prairie, abandoned agricultural fields, and grazed pastures. Visit <http://wetlandscenter.fhsu.edu/bird-watching/> for a complete shorebird species list.

## Threats to Shorebirds at Site

A significant challenge at Cheyenne Bottoms is the need to maintain appropriate vegetation structure on upland habitats while meeting the habitat needs of other wildlife. Other habitat management challenges, that are not described further here, include encroachment of vegetation (both native and introduced) into wetlands, complicated water issues such as securing and maintaining water rights, managing water levels to benefit invertebrates and to create dynamic hydro-periods, unpredictable precipitation patterns, increased siltation of wetlands, and lack of funding to support shorebird habitat management activities.

## Actions Taken to Improve Habitat for Shorebirds

Grasslands are the most abundant habitat on the preserve, and there is an opportunity and need to manage them as spring and fall stopover habitat for shorebirds. During wet periods, the grasslands contain thousands of ephemeral wetlands, which, although small, combine to contribute a significant amount of



Plovers in field that was mowed in the fall (October).  
Photo credit: Robert Penner.

habitat. In addition, there are several grassland dependent shorebirds that benefit from upland grassland habitats. Species such as American Golden-Plover, Buff-breasted Sandpiper, Upland Sandpiper, Long-billed Curlew (*Numenius americanus*), Baird's Sandpiper, and Killdeer benefit from short grass habitats in the spring and fall, while many other species of shorebirds benefit if those areas have standing water. Although the grasslands on the preserve can be dynamic and ephemeral in nature, they can provide important habitat if management practices are in place that target short, sparse vegetation structure during the northward migration period of mid-March through late May (northbound migration) and during the southward migration period of mid-July through mid-October (southbound migration).

Since grazing alone may not create the ideal type of habitat to benefit migrating shorebirds, three additional large-scale practices are implemented: 1. **Haying**, 2. **Mowing**, and 3. Prescribed burning. The first two are described here.

Summer **haying** (between July 15 and September 15) creates short height vegetative structure that shorebirds use in fall, while limiting negative impact on grassland nesting birds. Summer haying provides short term habitat that is available for southbound fall migrants but is not ideal for northbound spring migrants due to regrowth occurring between haying and spring migration. The preserve currently contains



about 121 hectares (300 acres) of permanent hay tracts. Tracts are managed in a Quarter Rotation system where half of each tract is hayed at a time: the north half is hayed one year, the east half the second year, and so on. This way, a quarter of the tract is hayed once a year and a second quarter is hayed two years in a row. This technique seems to favor Buff-breasted Sandpipers during the fall and nesting Upland Sandpipers in the spring.

To provide additional high-quality stopover habitat for shorebirds, **mowing** is used as an additional tool to increase needed short grass habitat on the preserve. Mowing has the disadvantage of leaving some litter on the ground and thus may be a little less desirable for shorebirds, but this type of habitat is preferable to having tall and dense vegetation. Mowing takes place after the cattle have been removed from the pasture at the end of October. Grazing also reduces vegetation which makes mowing less time consuming. Large tracts are mowed starting in November and mowed tracts are scattered across the entire preserve. The average size of the mowed tract ranges from 2 to 10 hectares (5 to 25 acres). Each mowed tract will usually include several ephemeral wetlands and one seasonal wetland, and the process of mowing keeps the vegetation low and provides habitat accessible to shorebirds. This management technique provides mowed tracts that are attractive to shorebirds during both dry and wet periods.

## Outcomes

Shorebird use of the mowed tracts increased the total number of shorebirds observed during International Shorebird Surveys. The first year of mowing resulted in an increase of 43% more shorebirds when compared to the previous high year ten years earlier. Large flocks of American Golden-Plovers have been recorded, and this species was not observed in such numbers on the preserve before mowing practices began. Other wetland and upland species have responded in a similar fashion, depending on whether the mowed sites were wet or dry. The number of nesting Upland Sandpipers has also increased.

## Advice/Precautions

Prescribed burning would be preferred over mowing to create the type of habitat shorebirds prefer, but we do not have the staff capacity or the equipment. For us, mowing is an effective and worthwhile alternative to burning. Mowing can also target smaller areas more easily than burning, so we would continue to use this technique even if a prescribed burning program were established.