NRCS Natural Resources Conservation Service

IOWA STATE UNIVERSITY

Grassland Bird Use of Iowa Filter Strips in Relation to Width, Planting Mixture, and Presence of Woody Plants

NRCS

Iowa riparian forest buffer

Conservation buffers have become a major component of the midwestern landscape

Conversion of grasslands to primarily agricultural purposes beginning in the mid 1800s has reduced their extent to less than 1 percent in intensive row crop agricultural regions of Minnesota and Iowa. Associated with this loss of habitat has been a dramatic decline in the diversity and abundance of grassland-dependent wildlife. Re-establishment of perennial cover on eroding cropland soils under the Conservation Reserve Program (CRP) had a positive effect on some grassland nesting birds (Heard et al. 2000). A variation of CRP created in 1996 supported the establishment of conservation buffers on eroding cropland soils to intercept agricultural contaminants before they left the field. Conservation buffers (grassed waterways, filter strips, riparian forest buffers, shelterbelts, and windbreaks) were actively promoted in the Midwest under the Buffers Initiative, which set a national goal of establishing 2 million miles (7 million acres) of buffers by 2002. Midwestern states led the nation in buffer implementation with more than 1.1 million acres of buffers established in Minnesota, Iowa, and Illinois.

John Henningsen

Researcher records vegetation measurements

Grassland bird use of filter strips assessed in relation to native versus nonnative planting mixtures and presence of woody vegetation

In support of NRCS Iowa and its conservation partners, the Wildlife Habitat Management Institute enlisted the assistance of Iowa State University (ISU) researchers, Dr. Louis Best and John Henningsen, to assess wildlife use of Iowa filter strips. Specifically, ISU researchers were asked to assess wildlife use of filter strips in relation to planting mixture and presence of woody vegetation. Researchers chose to study grassland birds because they are valuable indicators of ecosystem health and population declines associated with land use changes in the upper Midwest are well documented. In 2001 and 2002, ISU researchers surveyed 33 southeastern Iowa filter strips to determine if the occurrence and nesting success of birds were influenced by vegetation characteristics and presence of woody vegetation. Selected filter strips ranged in width from 25 to 120 feet (average 81 ft), and all were more than 3 years old. Twenty filter strips were planted with cool-season mixes of bromegrass (*Bromus inermis*), orchardgrass (*Dactylis glomerata*), timothy (*Phleum pratense*), alfalfa (*Medicago sativa*), or clover (*Trifolium* spp.). Switchgrass (*Panicum virgatum*) only was planted at 13 warm-season sites. Thirteen wooded sites had trees or shrubs taller than 6 feet along more than 90 percent of the streambank (width of wooded riparian zone <65 ft). Twenty sites were nonwooded. Vegetation characteristics of filter strips measured by researchers included vertical density; height of live and dead vegetation; canopy coverage of grass, forbs, standing dead vegetation, litter, and bare ground; and plant species richness.

(January 2007)

John Henningsen

NRCS

***Top*: Filter strips with cool-season plantings; *Bottom*: Filter strips with warm-season plantings**

Vegetation characteristics of filter strips differed between cool- and warm-season plantings

Eighteen species of grasses and 56 forb species were recorded in filter strips. Bromegrass had the greatest coverage (39%) in cool-season plantings; warm-season plantings were dominated by switchgrass (40%). Invasive reed canarygrass was not planted in filter strips but had 12 percent coverage. Alfalfa (4%) and red clover (*Trifolium pratense*, 3%) were the only forb species with more than 1 percent canopy coverage in cool-season filter strips. Goldenrod (*Solidago* spp., 3%), horseweed (*Erigeron canadensis*, 2%), and red clover (2%) were the most abundant forb species in warm-season filter strips.

Researchers observed several differences in vegetation characteristics between cool-season and warm-season plantings. Compared to cool-season sites, warm-season sites had greater vertical density of live vegetation, taller residual dead vegetation, greater forb and standing dead vegetation coverage, and greater plant species richness. Grass coverage was greater on cool-season plantings.

John Henningsen

Fledgling red-winged blackbird

Iowa filter strips received high use by breeding grassland birds

Forty-six bird species were observed in southeastern Iowa filter strips. Red-winged blackbirds (*Agelaius phoeniceus*) were by far the most abundant species (54%) recorded using filter strips, followed by common yellowthroat (*Geothlypis trichas*, 11%), dickcissel (*Spiza americana*, 9%), and song sparrow (*Melospiza melodia*, 9%). Relative abundance of birds and nests were similar between cool- and warm-season plantings. More species were observed in cool-season filter-strips (41 spp.) than in warm-season sites (31 spp.), but mean species richness did not differ between planting mixtures. Red-winged blackbirds, dickcissels, song sparrows, and common yellowthroats were all more abundant in filter strips without woody vegetation than in those adjacent to wooded edge. Species richness also was greater in nonwooded than in wooded sites.

John Henningsen

Raccoon hunting along edge of filter strip

Nest success was generally low

Researchers found 634 nests of 11 species. Nest abundance in filter strips was similar in cool- and warm-season plantings, averaging 3.1 nests per acre (range, 0-10.4 nests/acre). Red-winged blackbirds and dickcissels strongly avoided filter strips with wooded edges, but no evidence of edge-type preference was detected in other species.

Only 27 percent of all nests were successful fledging young. Estimates of nest success for individual species were 9.6 to 15.6 percent for red-winged blackbirds, 11.3 percent for dickcissels, 5.4 to 24.7 percent for yellowthroats, and 7.5 to 28.4 percent for song sparrows. Researchers did not find any significant differences in daily nest survival between warm- and cool-season plantings or wooded and nonwooded sites. Causes of nest failure were depredation (62%), abandonment (6%), weather (5%), machinery (4%), and brown-headed cowbird parasitism (<1%).

U.S. Fish & Wildlife Service
Singing male dickcissel

Filter strips have potential to provide habitat for some species of conservation interest

Vegetation characteristics, buffer width, and presence of woody vegetation are important considerations for planners and managers seeking to optimize grassland bird use of filter strips. Grassland birds avoid filter strips with woody vegetation, so researchers recommended the control or removal of woody vegetation to maintain or enhance use of filter strips by grassland birds. Consistent with previous studies, native and nonnative plantings received similar use by breeding grassland birds. Individual species responded to vegetation characteristics differently, so establishment and maintenance of plantings with varied structure and composition is important for attracting a diversity of grassland birds. Bird responses to buffer width were not assessed in this study, but researchers suggested that added width would potentially increase nesting success and attractiveness of buffers for grassland birds, especially those with minimum area requirements (sedge wrens [*Cistothorus platensis*], eastern meadowlarks [*Sturnella magna*], and Savannah sparrow [*Passerculus sandwichensis*]). Researchers concluded that, "Although the most common birds using filter strips are generalists, filter strips also have potential to provide breeding habitat for some species of management concern." (Henningsen and Best 2005).

(Responses by shrub- and forest-nesting birds were not assessed in this study. The addition of an herbaceous buffer to an existing wooded riparian area may increase use and improve nesting success of forest and forest-edge species.)

References

Heard, L.P., A.W. Allen, L.B. Best, S.J. Brady, W. Burger, A.J. Esser, E. Hackett, D.H. Johnson, R.L. Pederson, R.E. Reynolds, C. Rewa, M.R. Ryan, R.T. Molleur, and P. Buck. 2000. A comprehensive review of Farm Bill contributions to wildlife conservation, 1985–2000, W.L. Hohman and D.J. Halloum, eds. USDA Natural Resources Conservation Service, Wildlife Habitat Management Institute Technical Report USDA/NRCS/WHMI–2000. 208 pp.

Henningsen, J.C., and L.B. Best. 2005. Grassland bird use of riparian filter strips in southeast Iowa. Journal of Wildlife Management 89:198–210.

Issued January 2007

Information in this technical note was adapted from graduate research conducted by **John Henningsen** under the supervision of **Dr. Louis B. Best** (retired), Department of Natural Resource Ecology and Management, Iowa State University. Funding was provided by the Leopold Center for Sustainable Agriculture and Natural Resources Conservation Service through the National Fish and Wildlife Foundation and Iowa Natural Heritage Foundation. Logistical assistance was provided by the NRCS IA state office and field staffs in Henry, Iowa, Jefferson, Keokuk, Louisa, and Washington counties. **Bill Hohman** and **Lynn Owens** assisted the researchers with development, layout, and editing of the document.

Contact information:

John C. Henningsen

Wyoming Game & Fish Department

420 North Cache

Jackson, WY 83001

Phone: (307) 733–2321

E-mail: John.Henningsen@wgf.state.wy.us