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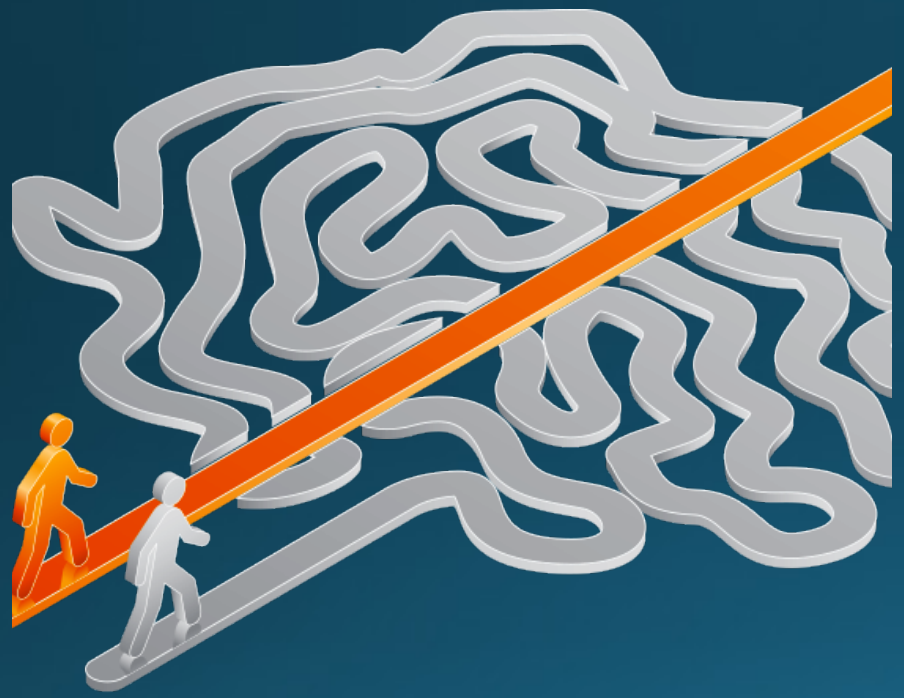

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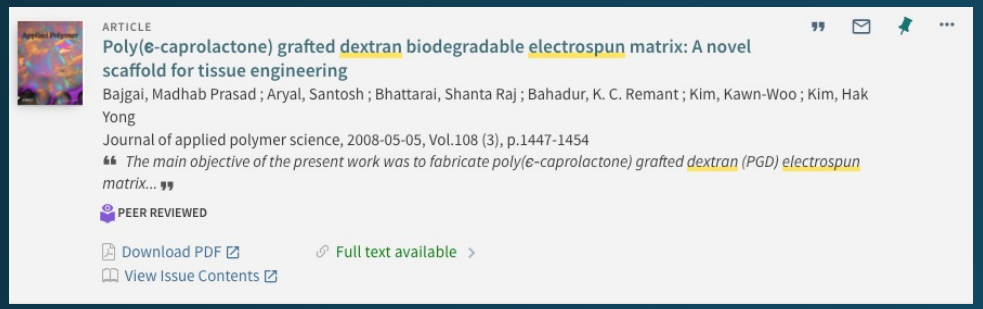

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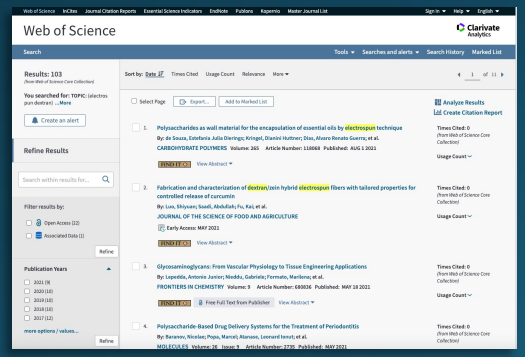

Databases

Journal of Wildlife Management 74(2):265–273; 2010; DOI: 10.2193/2009-020

Management and Conservation Article

From Wiens to Robel: A Review of Grassland-Bird Habitat Selection

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ABSTRACT Efforts to stabilize or increase grassland bird populations require identification of suitable habitat as a first step. Although the number of studies examining grassland-bird habitat selection has increased substantially in recent years, much uncertainty exists regarding local-scale habitat variables that researchers should consider. We reviewed 57 studies and identified important vegetation features correlated with grassland bird abundance, density, occurrence, and nest and territory selection. Our objectives were to 1) guide future studies of grassland-bird habitat use by providing a reduced set of relevant vegetation characteristics, 2) challenge researchers to critically think about what variables to consider, and 3) highlight the need to include consistent definitions of terms used to describe grassland bird habitat. We identified 9 variables that were important predictors of habitat use by grassland birds: coverage of bare ground (important in 50% of the instances where it was included), grass (34% of instances), dead vegetation (33% of instances), forbs (31% of instances), and litter (29% of instances), along with an index of vegetation density (19% of instances) and volume (19% of instances), litter depth (16% of instances), and vegetation height (41% of instances). Only 25% of studies provided information on effects sizes and measures of variance. Furthermore, definitions of measured habitat variables were not consistent among studies. We provide definitions of the 9 important variables and implore authors to report effect size and measures of variance. Standardization of terms and reporting of meaningful results will facilitate replication of wildlife research and enhance our ability to recognize general patterns that emerge from observational studies of habitat use.

KEY WORDS Dusbemmire, grassland passerines, habitat models, habitat use, litter depth, vegetation density, vegetation height, vegetation structure.

The widespread decline of grassland birds in North America has been referred to as an unfolding “conservation crisis” (Brennan and Kuvlesky 2005:1). The continent-wide nature of these declines suggests that the causes are not local isolated phenomena and likely involve the loss and degradation of grassland habitat (Vickery et al. 1999*b*, Vickery and Herkert 2001, Brennan and Kuvlesky 2005). Hence, efforts to stabilize or increase grassland bird populations require identification of remaining habitat as a first step (Vickery and Herkert 2001), followed by habitat management and restoration (Brennan and Kuvlesky 2005). Not surprisingly, the number of studies examining grassland-bird habitat selection has increased substantially in recent years.

Two important questions researchers must answer before conducting any type of habitat study are these: 1) what features of the habitat should be measured, and 2) what is the best method for measuring those features. Wiens (1969) contended that a description of bird habitat should provide sufficient detail to differentiate among habitats used by multiple species, yet be suitably flexible and precise to reduce the need to artificially classify and categorize habitat. Furthermore, researchers should consider those habitat features deemed important to the animals being studied (Wiens 1969). Stemming from these requirements, Wiens (1969) developed a protocol for quantifying grassland bird habitat based on structural vegetation characteristics such as density, height, and dispersion. The system is both efficient and easy to use in the field, making it one of the preferred methods for quantifying grassland bird habitat. Many of the structural characteristics included by Wiens (1969) are still perceived to be important for contemporary assessments of grassland-bird habitat use.

Although Wiens’ (1969:86) system included a set of carefully chosen variables, he suggested that “…it does not seem proper to restrict consideration, a priori, to a few readily-measurable habitat features which may or may not have any direct relevance to the activity of birds.” Numerous studies conducted since Wiens’ (1969) monograph have identified relevant vegetation features influencing habitat use that should aid researchers in defining a priori hypotheses regarding grassland-bird habitat selection. This approach would allow development of more robust habitat selection models that could be used to make informed decisions regarding habitat management. Even so, grassland bird researchers still conduct exploratory analyses because they are uncertain of important habitat variables. This is particularly apparent in the grassland-bird Breeding Biology Research and Monitoring Database (BBird) protocol where >40 vegetation parameters are measured at each nest (Martin et al. 1997). Continued use of exploratory analyses and measurement of all potentially important vegetation variables suggests that either no pattern regarding grassland-bird habitat relationships has emerged, or that apparent trends are not being recognized, or are being ignored.

We reviewed studies of habitat selection by grassland birds in North America to 1) summarize methods used by researchers for quantifying grassland bird habitat, and 2) identify patterns of grassland-bird vegetation associations. Our results are intended to 1) guide future studies of grassland-bird habitat use by providing a reduced set of relevant vegetation characteristics for researchers to consider, 2) challenge researchers to critically think about what variables to consider, and 3) highlight the need to include

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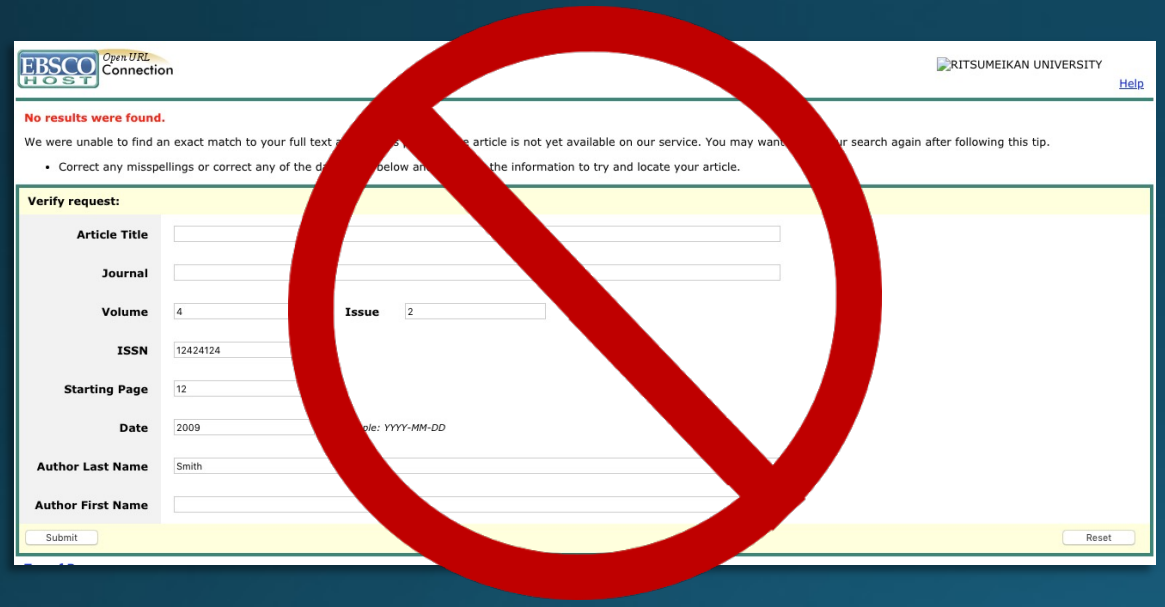

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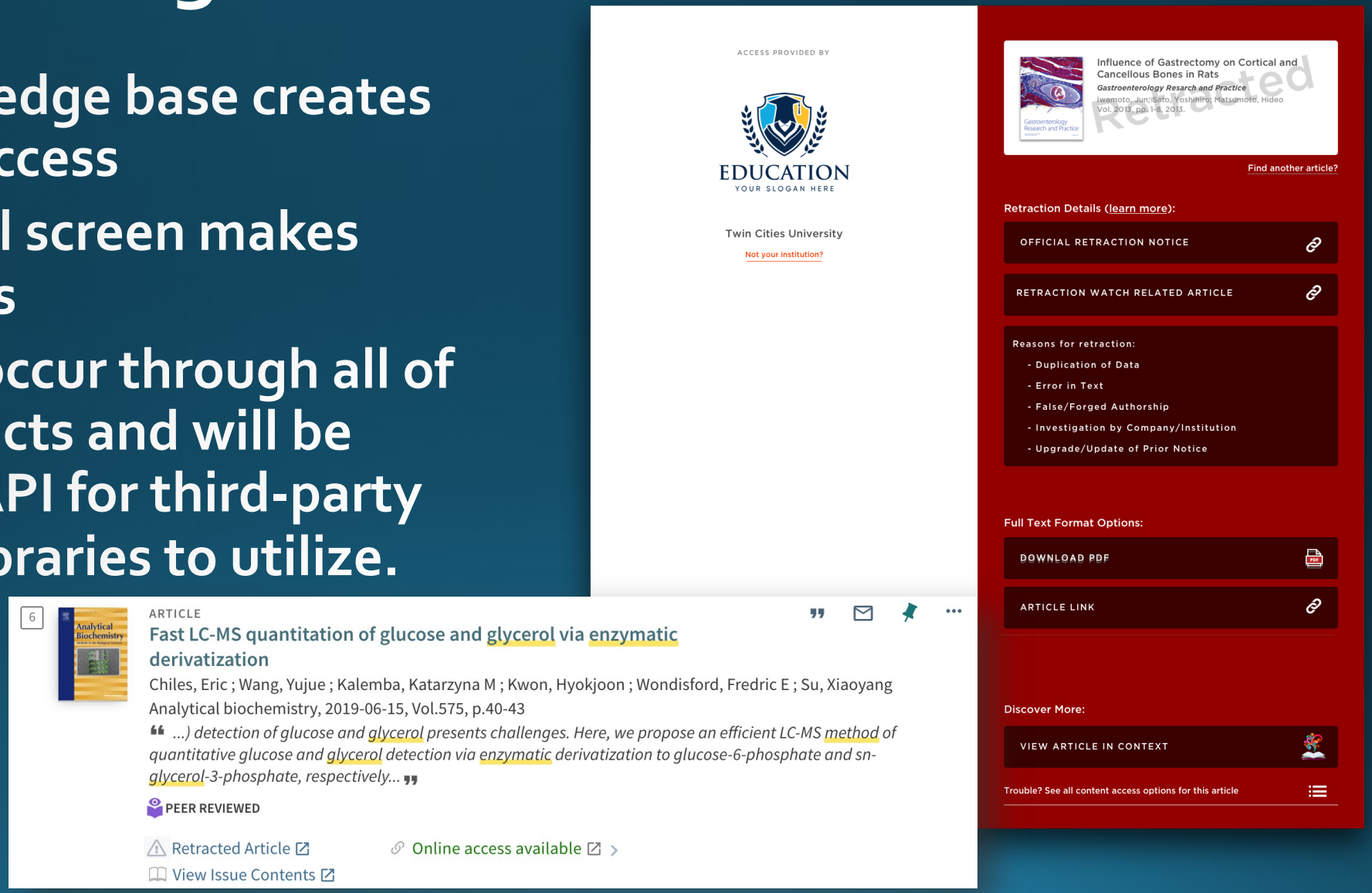

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Sustained Release of VEGF by Coaxial Electrospun Dextran/PLGA Fibrous Membranes in Vascular Tissue Engineering

Xiaoling Jia, Chenguang Zhao, +7 authors Y. Fan • Published 2011 • Materials Science, Medicine •
Journal of Biomaterials Science, Polymer Edition

VEGF-loaded core/shell fibrous membranes were prepared by coaxial electrospinning with dextran (DEX) as the core component and poly(lactide-co-glycolide) (PLGA) as the shell polymer, respectively. The electrospun DEX/PLGA fibers were observed by scanning electron microscopy, transmission electron microscopy and confocal microscopy to identify the core/shell fiber structure and the protein distribution. The results of tensile tests showed that the DEX/PLGA membranes possessed lower tensile... Expand

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Thank you!

Questions?

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