

NEW RECORDS OF CARRION BEETLES IN NEBRASKA REVEAL INCREASED PRESENCE OF THE AMERICAN BURYING BEETLE, *NICROPHORUS AMERICANUS* OLIVIER (COLEOPTERA: SILPHIDAE)

Jessica Jurzenski

*Department of Entomology
202 Entomology Hall
University of Nebraska–Lincoln
Lincoln, NE 68583-0816
jurzenskij@alumni.unk.edu*

Daniel G. Snethen

*Science Department
Little Wound High School
P.O. Box 500
Kyle, SD 57752*

Mathew L. Brust

*Department of Biology
Chadron State College
1000 Main Street
Chadron, NE 69337*

and

W. Wyatt Hoback

*Department of Biology
905 West 25th Street
University of Nebraska at Kearney
Kearney, NE 68849
hobackww@unk.edu*

ABSTRACT—Surveys for the American burying beetle, *Nicrophorus americanus* Olivier (Silphidae), between 2001 and 2010 in Nebraska resulted in 11 new county records for this endangered species and 465 new county records for 14 other silphid species. A total of 5,212 American burying beetles were captured in more than 1,500 different locations. Using mark-recapture data, we estimated the population size of the American burying beetle (ABB) for six counties in the Sandhills. Blaine County (2003) had the largest population, with an estimated 56 ABBs per km² (1,338 ± 272 ABBs). The remaining estimates were between 2 and 36 ABBs per km², which were calculated for Loup (2010) and Holt (2010) Counties, respectively. We calculated movement distances, finding that some American burying beetles moved as far as 7.24 km in a single night. This new information greatly contributes to efforts to conserve the American burying beetle in the Great Plains and provides knowledge about other silphid species distributions, which may play a role in recovery of the American burying beetle.

Key Words: American burying beetle, carrion beetles, conservation, endangered species, Nebraska, Silphidae

SURVEILLANCE OF SELECTED DISEASES IN FREE-RANGING ELK (*CERVUS ELAPHUS NELSONI*) IN NEBRASKA, 1995–2009

Michael A. Cover, Scott E. Hygnstrom, Scott R. Groepper

*School of Natural Resources
University of Nebraska–Lincoln
Lincoln, NE 68583-0819
scott.groepper@yahoo.com*

David W. Oates

*Genetics and Forensics Analysis Laboratory
Wildlife Research Section
Nebraska Game and Parks Commission
Lincoln, NE 68503-0370*

Kit M. Hams

*Wildlife Division
Nebraska Game and Parks Commission
Lincoln, NE 68503-0370*

and

Kurt C. VerCauteren

*USDA-APHIS-WS-National Wildlife Research Center
Fort Collins, CO 80521-2154*

ABSTRACT—Sera samples were collected from 21 free-ranging, captured female elk (*Cervus elaphus nelsoni*) in 1995–96, and tissue and sera samples were collected from 415 hunter-harvested elk from 1995 to 2006 and tested for selected diseases. Titers for *Anaplasma marginale* were detected in 81 of 436 (19%) elk. Occurrence of antibodies to anaplasmosis increased from 4 to 40 elk from 2002 to 2006. Titers for bovine viral diarrhea virus (BVDV) were detected in 18 of 346 (5%) samples. Titers for *Leptospira interrogans* serovars were detected in 21 of 289 (7%) of samples from 1995 to 2004. Titers for bluetongue virus (BTV) and epizootic hemorrhagic disease virus (EHDV) were detected in 65 of 370 (18%) sampled elk during 1995–2006. Biologists collected obex tissues from 566 elk from 1997 to 2009 and found evidence of chronic wasting disease (CWD) in one elk in 2009. No brucellosis was detected. Due to the prevalence of several diseases in elk in Nebraska, we recommend that surveillance efforts continue.

Key Words: anaplasmosis, bluetongue virus, bovine viral diarrhea virus, brucellosis, chronic wasting disease, elk, epizootic hemorrhagic disease virus, leptospirosis

GPR 21 (FALL 2011):145–51

HISTORICAL BIOGEOGRAPHY OF NEBRASKA PRONGHORNS (*ANTILOCAPRA AMERICANA*)

Justin D. Hoffman

*Department of Biological and Health Sciences
McNeese State University
Lake Charles, LA 70609
jhoffman@mcneese.edu*

Hugh H. Genoways

*University of Nebraska State Museum
University of Nebraska–Lincoln
Lincoln, NE 68588
h.h.genoways@gmail.com*

and

Rachel R. Jones

*School of Natural Resources
University of Nebraska–Lincoln
Lincoln, NE 68583*

ABSTRACT—Archeological and paleontological records indicate that the pronghorn (*Antilocapra americana*) have a history of at least 20,000 years of occurrence within the current boundaries of Nebraska. Pronghorns occurred throughout the state for much of its history. With the evidence at hand we concluded that the eastern boundary of the geographic distribution of the pronghorn south of the Niobrara River in Nebraska at the beginning of the 19th century was along the western perimeter of the eastern deciduous forest and tallgrass prairie. This excluded most of the easternmost tier of counties in the state. This geographic arrangement persisted throughout most of the Holocene. The boundary, however, was never a straight line, but a dynamic system of fluctuating distribution. By the early 20th century, the pronghorn was nearly extirpated from Nebraska, with only scattered herds in the western panhandle. With a ban on hunting beginning in 1907 and management by the Nebraska Game and Parks Commission, the population in the panhandle had increased to the point that a hunting season was reinstated in 1953. To establish herds of pronghorns in previously occupied areas beyond the panhandle, 1,106 individuals were translocated between 1958 and 1962 primarily to the Sandhills region of Nebraska. Currently, the pronghorn possess stable populations throughout nearly half of Nebraska, including the panhandle and most of the Sandhills.

Key Words: *Antilocapra americana*, distribution, historical biogeography, Nebraska, pronghorn

GPR 21 (FALL 2011):153–73

NATIVE AND EUROPEAN HAPLOTYPES OF *PHRAGMITES AUSTRALIS* (COMMON REED) IN THE CENTRAL PLATTE RIVER, NEBRASKA

Diane L. Larson

*U.S. Geological Survey
Northern Prairie Wildlife Research Center
1561 Lindig Street
St. Paul, MN 55108
dlarson@usgs.gov*

Susan M. Galatowitsch and Jennifer L. Larson

*Department of Horticultural Science
University of Minnesota
St. Paul, MN 55108*

ABSTRACT—*Phragmites australis* (common reed) is known to have occurred along the Platte River historically, but recent rapid increases in both distribution and density have begun to impact habitat for migrating sandhill cranes and nesting piping plovers and least terns. Invasiveness in *Phragmites* has been associated with the incursion of a European genotype (haplotype M) in other areas; determining the genotype of *Phragmites* along the central Platte River has implications for proper management of the river system. In 2008 we sampled *Phragmites* patches along the central Platte River from Lexington to Chapman, NE, stratified by bridge segments, to determine the current distribution of haplotype E (native) and haplotype M genotypes. In addition, we did a retrospective analysis of historical *Phragmites* collections from the central Platte watershed (1902–2006) at the Bessey Herbarium. Fresh tissue from the 2008 survey and dried tissue from the herbarium specimens were classified as haplotype M or E using the restriction fragment length polymorphism procedure. The European haplotype was predominant in the 2008 samples: only 14 *Phragmites* shoots were identified as native haplotype E; 224 were non-native haplotype M. The retrospective analysis revealed primarily native haplotype individuals. Only collections made in Lancaster County, near Lincoln, NE, were haplotype M, and the earliest of these was collected in 1973.

Key Words: braided river, common reed, Great Plains, invasive plants, *Phragmites australis*, Platte River, RFLP

GPR 21 (FALL 2011):175–80

EFFECTS OF HERBICIDES AND GRAZING ON FLORISTIC QUALITY OF NATIVE TALLGRASS PASTURES IN EASTERN SOUTH DAKOTA AND SOUTHWESTERN MINNESOTA

Alexander J. Smart

*Department of Animal and Range Sciences
Box 2170
South Dakota State University
Brookings, SD 57007
alexander.smart@sdstate.edu*

Matthew J. Nelson

*Department of Animal and Range Sciences
Box 2170
South Dakota State University
Brookings, SD 57007*

Peter J. Bauman

*The Nature Conservancy
Clear Lake, SD 57226*

and

Gary E. Larson

*Department of Biology and Microbiology
Box 2207B
South Dakota State University
Brookings, SD 57007*

ABSTRACT—Historic herbicide use and grazing have influenced natural diversity and quality of native pasturelands in the Great Plains. Floristic quality assessments are useful to assist agencies in prioritizing conservation practices to enhance native grasslands. The objective of this study was to determine the effects of past land-use practices on the floristic quality of remnant native pastures in eastern South Dakota and southwestern Minnesota. Floristic quality assessments were conducted on 30 native pastures and categorized by past management practices (herbicide application and grazing intensity). Mean coefficient of conservatism (\bar{C}) and floristic quality index (FQI) were calculated for each site. Results showed that increased herbicide use and grazing intensity resulted in a lower species richness, forb \bar{C} , and FQI. However, grass and grasslike plants were minimally affected. Pastures that were infrequently sprayed with herbicides and lightly grazed consistently had the highest species richness, \bar{C} , and FQI. Pastures with no grazing produced similar values to those with moderate grazing. Pastures managed as preserves or wildlife habitat areas had higher FQI than those managed for livestock grazing. The implications of this study should further help ecologists and managers understand the positive and negative effects of grazing practices and herbicide application on tallgrass prairie remnants.

Key Words: tallgrass prairie, floristic quality, species richness, grasses, forbs, grazing, herbicides

GPR 21 (FALL 2011):18–89

PERSISTENT PLACE-BASED INCOME INEQUALITY IN RURAL NEBRASKA, 1979–2009

David J. Peters

*304 East Hall
Iowa State University
Ames, IA 50011-1070
dpeters@iastate.edu*

ABSTRACT—This article addresses a current gap in the inequality literature by identifying demographic and economic factors that best explain persistent income inequality across $N = 817$ nonmetropolitan block groups in Nebraska between 1979 and 2009. Over one-half of rural places in Nebraska have average levels of income inequality, one-quarter have persistently low inequality, and one-fifth of places have persistently high levels of income inequality. Results of multinomial logistic regression suggest that persistently high-inequality places in rural Nebraska tend to be smaller, more urbanized, more ethnically diverse, more wealthy, more specialized in high-skill and low-skill industries, and have experienced fast growth in urbanization, incomes, and professional services. By contrast, low-inequality places tend to be larger, less urban, less diverse, less well educated, less wealthy, less engaged in the labor force, and have experienced population declines and slower growth in urbanization, educational attainment, and incomes.

Key Words: income inequality, regional economics, rural development, subcounty geographies, economic restructuring

GPR 21 (FALL 2011):191–201

FUTURE PARTICIPATION IN THE CONSERVATION RESERVE PROGRAM IN NORTH DAKOTA

Lorilie M. Atkinson

*Natural Resources Conservation Service
U.S. Department of Agriculture
Center, ND 58530*

and

Rebecca J. Romsdahl and Michael J. Hill

*Department of Earth System Science and Policy
University of North Dakota
4149 University Avenue
Grand Forks, ND 58202-9011
rebecca.romsdahl@und.edu*

ABSTRACT—The purpose of this study was to gauge the impact of agriculture and energy policies on conservation practices through a survey of conservation reserve program (CRP) contract holders in a selected Prairie Pothole Region of North Dakota—Burleigh, Kidder, and Stutsman Counties. The survey results showed that 48% of respondents are considering returning CRP acres to annual crop production once the contract expires. The largest influence on post-CRP land use was the market prices for production of annual crops. Respondents also identified lack of knowledge of conservation programs as a large hurdle to participation. This may indicate a need for improved communication from program information sources such as the Farm Service Agency and the Natural Resource Conservation Service, from where most contract holders get their information. These findings also provide interesting insight into the motivation and decision-making process surrounding conservation programs, in particular continued participation in the CRP. By understanding the main motivation and considerations for conservation participation (market prices, cost-sharing opportunities, and expected cost of production), federal conservation programs will be able to maximize conservation efforts, which will benefit landowners and resources alike.

Key Words: Conservation Reserve Program, Prairie Pothole Region, North Dakota, agriculture policy

GPR 21 (FALL 2011):203–14

A MODEL OF HUMAN SCALE TESTED ON RURAL LANDSCAPE SCENES

Richard K. Sutton

*Department of Agronomy and Horticulture and the Program in Landscape Architecture
University of Nebraska–Lincoln
Lincoln, NE 68583-0915
rsutton1@unl.edu*

ABSTRACT—Landscapes such as the Great Plains have been described as lacking human scale. This study developed a quantitative model of human scale and compared it with viewers' perceptions of visual structure. Visual structure was selected from the physical features of Otoe County, NE, forming boundaries, found as ground textures, vegetative screens, and topographic breaks and was depicted in photographs of landscape scenes. The model used and tested nine classes of scale based on grain and extent of the photos rated by viewers against those from the model. Viewers identified boundaries representing grain and extent that were synthesized into a viewer-perceived scale class. Good agreement with the proposed model occurred at four smaller scales but deteriorated as scale increased. Larger-scale scenes appear to offer more opportunities for the viewer to select closer or farther visual boundaries, thus changing their interpretation of scale.

Key Words: grain, extent, visual structure, landscape structure, visual assessment

GPR 21 (FALL 2011):215–30

ECOREGIONAL DIFFERENCES IN LATE-20TH-CENTURY LAND-USE AND LAND-COVER CHANGE IN THE U.S. NORTHERN GREAT PLAINS

Roger F. Auch and Kristi L. Sayler

*U.S. Geological Survey
Earth Resources and Observation Science Center (EROS)
47914 252nd Street
Sioux Falls, SD 57198
auch@usgs.gov*

Darrell E. Napton

*South Dakota State University
Geography Department
Box 504, Scobey Hall SSB232
Brookings, SD 57007*

Janis L. Taylor

*SGT, Contractor to the U.S. Geological Survey
Earth Resources and Observation Science Center (EROS)
47914 252d St.
Sioux Falls, SD 57198*

and

Mark S. Brooks

*U.S. Geological Survey
Eastern Geographic Science Center
12201 Sunrise Valley Drive
Reston, VA 20192*

ABSTRACT—Land-cover and land-use change usually results from a combination of anthropogenic drivers and biophysical conditions found across multiple scales, ranging from parcel to regional levels. A group of four Level III ecoregions located in the U.S. northern Great Plains is used to demonstrate the similarities and differences in land change during nearly a 30-year period (1973–2000) using results from the U.S. Geological Survey’s Land Cover Trends project. There were changes to major suites of land-cover; the transitions between agriculture and grassland/shrubland and the transitions among wetland, water, agriculture, and grassland/shrubland were affected by different factors. Anthropogenic drivers affected the land-use tension (or land-use competition) between agriculture and grassland/shrubland land-covers, whereas changes between wetland and water land-covers, and their relationship to agriculture and grassland/shrubland land-covers, were mostly affected by regional weather cycles. More land-use tension between agriculture and grassland/shrubland land-covers occurred in ecoregions with greater amounts of economically marginal cropland. Land-cover change associated with weather variability occurred in ecoregions that had large concentrations of wetlands and water impoundments, such as the Missouri River reservoirs. The Northwestern Glaciated Plains ecoregion had the highest overall estimated percentage of change because it had both land-use tension between agriculture and grassland/shrubland land-covers and wetland-water changes.

Key Words: Northern Great Plains, land cover, land-use change, land-use tension, weather variability