

AQUATIC INVERTEBRATE COMMUNITY STRUCTURE IN THE NIOBRARA RIVER, AGATE FOSSIL BEDS NATIONAL MONUMENT, NEBRASKA, 1996–2009

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ABSTRACT—Aquatic invertebrates were sampled annually in the Niobrara River, Nebraska, during the period 1996–2009 using Hester-Dendy multiplate samplers. Collections indicated the invertebrate community in the river has shifted from one dominated by Ephemeroptera, Plecoptera, and Trichoptera (EPT) taxa to one dominated by Chironomidae and Amphipoda. Generally, EPT richness and percentage abundance of EPT of the total community, as well as percentage abundance of Heptageniidae and Leptophlebiidae, has declined across the years. During that same period, percentage abundance of Amphipoda and Chironomidae, taxa evenness, Shannon's Index, and the Hilsenhoff Biotic Index have increased. Stream discharge decreased significantly during the 15-year period when invertebrates were collected (Mann-Kendall trend test, $P = 0.04$). Water-surface elevation of the river measured with staff gages also gradually increased over time, although the trends were not significant ($P = 0.15$). Although not analyzed statistically, water temperature ($^{\circ}\text{C}$), conductivity ($\mu\text{S}/\text{cm}$), and pH gradually increased over time while dissolved oxygen concentration (mg/liter) decreased over time. Although other factors cannot be ruled out, a proposed reason for the observed changes in invertebrate community structure may be related to changes in the physical habitat condition in the Niobrara River associated with encroachment of the nonnative and invasive emergent aquatic plant, yellow flag (*Iris pseudacorus* L.). This weed has expanded into the stream channel, where it blocks streamflow.

LATE HOLOCENE ACTIVATION HISTORY OF THE STANTON DUNES, NORTHEASTERN NEBRASKA

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ABSTRACT—The Nebraska Sandhills have been an important resource for better understanding dune activation and the nature of prehistoric Great Plains drought events. However, until recently, few studies have focused on documenting the activation histories of smaller dunefields found along the Great Plains' eastern margin. This study focuses on the Stanton dune field, which lies about 145 km east of the Nebraska Sandhills on an alluvial terrace of the Elkhorn River in northeastern Nebraska. Sediments in the Stanton Dunes were dated with optically stimulated luminescence (OSL) to determine when these dunes were active. The ages indicate three activation periods that cluster into the following time periods: ~5,800–3,800, 960–630, and 510–410 years ago. The ages that fall into our two older clusters closely agree with dune activation records from the Nebraska Sandhills and other major central Great Plains dune fields, suggesting that these large-scale droughts also impacted eastern Nebraska. However, our youngest cluster of ages occurs at a time when the Nebraska Sandhills were thought to be largely inactive, suggesting that the Stanton Dunes may have been activated by a locally important drought event that had a more limited impact on dunes found to the west.

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RELATIVE ABUNDANCE OF NORTHERN FLYING SQUIRRELS AND RED SQUIRRELS IN DIFFERENT FOREST TYPES, BLACK HILLS, SOUTH DAKOTA

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ABSTRACT—Northern flying squirrels (*Glaucomys sabrinus*) and red squirrels (*Tamiasciurus hudsonicus*) in the Black Hills National Forest (BHNF) of South Dakota represent isolated populations. Because data on both species in the region are limited, and because the northern flying squirrel in South Dakota and the Black Hills National Forest has species of concern status, we trapped throughout BHNF to determine relative abundance in different forest types for both populations. For northern flying squirrels, capture rate was higher in the northern and western hills compared to the southern and eastern hills, whereas for red squirrels, capture rate was higher in the western hills, followed by the southern and eastern hills. The northern hills are classified as mesic coniferous forest transitioning to a dry coniferous forest in the southern hills. In addition, the northern hills is characterized by a mixed coniferous-deciduous forest, whereas the southern and eastern hills are characterized by even-aged managed coniferous stands. Understanding the abundance of these two isolated squirrel populations in the different forest types of the BHNF is important in intensively managed forests, because management decisions can impact isolated populations.

ACCURACY OF ANTLER METRICS IN PREDICTING AGE OF WHITE-TAILED DEER AND MULE DEER

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ABSTRACT—Electronic deer check systems offer state natural resource agencies alternatives to mandatory in-person check stations, resulting in potential savings in money and personnel. However, a reliable means for hunters to classify the age of harvested antlered deer must be established so that important management indices such as antlered yearling harvest can continue to be used to set future management goals. Therefore, we evaluated the use of six different antler metrics to predict age class of white-tailed and mule deer (1.5 and 2.5 years). We of deer correctly classified into each age class based on the antler metric with the greatest degree of separation for each species. Of those evaluated, main beam length and inside spread were the two most accurate measurements for both species. For white-tailed deer, 93% (114 of 123) of the 1.5-year age class and 93% (251 of 271) of the 2.5-year age class were correctly classified using main beam length with a cutoff of 364 mm. For mule deer, 100% (12 of 12) of the 1.5-year age class and 97% (35 of 36) of the 2.5-year age class were correctly classified using main beam length with a cutoff of 352 mm. Antler metrics of both deer species can be used to accurately classify age class while likely saving funds and personnel hours.

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REVIEW OF THE NEGATIVE INFLUENCES OF NON-NATIVE SALMONIDS ON NATIVE FISH SPECIES

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ABSTRACT—Non-native salmonids are often introduced into areas containing species of concern, yet a comprehensive overview of the short- and long-term consequences of these introductions is lacking in the Great Plains. Several authors have suggested that non-native salmonids negatively influence species of concern. The objective of this paper is to review known interactions between non-native salmonids and native fishes, with a focus on native species of concern. After an extensive search of the literature, it appears that in many cases non-native salmonids do negatively influence species of concern (e.g., reduce abundance and alter behavior) via different mechanisms (e.g., predation and competition). However, there are some instances in which introduced salmonids have had no perceived negative influence on native fishes. Unfortunately, the majority of the literature is circumstantial, and there is a need to experimentally manipulate these interactions.

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ROLES OF PERCEIVED CONTROL AND PLANNING IN RANCH DROUGHT PREPAREDNESS

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ABSTRACT—Ranchers in the Great Plains and across the United States face the threat of periodic drought. Though ranchers might minimize losses through drought-preparedness activities, many do not adequately prepare for drought, in part because of perceptions that the outcomes of drought management are not controllable. We explore how drought planning activities affect ranchers' perceptions of control and drought preparedness using the theories of planned behavior and goal attainment as guiding frameworks. Ten Great Plains ranchers who had engaged in drought management activities were interviewed about their plans. From the interviews, three activities emerged that appeared to increase ranchers' perceived control during drought: maximizing the health and flexibility of the ranch operation, monitoring precipitation and forage, and implementing "decision rules" as drought conditions became apparent and progressed. The actions supported greater perceived control in the face of drought by increasing the number of desirable options available to ranchers, increasing ranchers' confidence in predicting the effects of their actions, and providing "mental practice" for decision making during a drought event. This exploratory research demonstrates the value of incorporating theories of planned behavior and goal attainment into applied research on rangeland management and drought planning behavior, and suggests directions for future research and education.

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**TAKING THE MEASURE OF A MARK:
EXPLORATORY SIZE AND SHAPE ANALYSIS OF CUT MARKS**

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ABSTRACT—A database of 128 measured incised butchery marks (i.e., the classic cut mark) was the basis for exploratory statistical tests of length and width measurements from late Pleistocene mammoth localities and an early Holocene bison locality. The tests reveal several trends. The initial approach uses univariate descriptive statistics, regression, and ANOVA to examine differences in size and shape of marks. Significant differences are noted in length and width of marks based on location, element, and type. Length and width variables demonstrate low variability within incised marks. Results demonstrate a consistency in incised marks across the two taxa. Other consistencies are noted that indicate a regular or standardized way of producing marks in particular places on bones and on particular elements. Location or placement of marks appears to influence mark length, and in general, mark width is constrained. Mark orientation can at times influence mark length. Shape of mark ends may be related to the type of tool and size of tool bit. Using a morphometric approach (size and shape) removes some of the subjectivity in evaluating marks on a visual basis. While exploratory in nature, this morphometric approach crosscuts time and space boundaries and should be applicable to any bone assemblage.