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Abstracts

- **Kaw River Valley Scenes Revisited After 130 Years.**

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The Fall 1998 *Transactions* included an article using 1867 photographs by Alexander Gardner along the Smoky Hill River, in comparison and contrast to recent repeat photographs of the same views, to illustrate physical changes in the landscape after 130 years. The descriptive context of the article related the image pairs to various topics of the region's environmental history. These

topics included channel migration of the Smoky Hill River, natural and human-induced erosion in Dakota sandstone and Cretaceous limestone landmarks, and changes in groundcover on the High Plains. This article similarly compares and contrasts old and new images of locations in the Kansas River corridor, including major cities along the Kaw. The relevant topics in these paired images to changes in that region's environment involve major urban impacts upon the river and its corridor. These include ever increasing areas of concrete urban infrastructure, a flood-control system of the entire river valley by the U.S. Corps of Engineers, natural and cultivated riparian growth and other flora of the region. These regional topics are introduced as a descriptive context for the pairs of compared and contrasted photographs to evoke further varied interpretive observations and discussions by readers.

- **The Modern Riparian Vegetational Community at Winfield, Cowley County, Kansas: A Blend of New Species and Old.**

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Preliminary survey of a riparian ecosystem along the Walnut River at Winfield, Cowley County, Kansas, revealed a woodland community whose canopy is dominated by hackberries, bitternut hickory, pecan red mulberry, and two species of oaks. This association contrasts with the regional assemblage dominated by oak, walnut, and elm predicted for the Walnut River based on taxa recorded by the public land surveys of 1870-1871. Cowley County is near the distributional limit of a number of plants, and reorganization of the riverine community in part may be a result of natural changes in the distributions and abundances of some species in response to climatic fluctuation. Any natural change, however, is obscured by impacts of human land and resource use patterns and cultivar escapes. Natural and historical factors are causing unique new assemblages of plants to emerge in the region, which will have important implications for the conservation of native communities of plants and animals.

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- **The Effects of Estradiol Treatment on the Blood Viscosity of the Bullfrog *Rana catesbeiana*.**

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Increased levels of certain plasma proteins, particularly fibrinogen, immunoglobulins, and lipoproteins, result in increased blood viscosity. Upon estrogen exposure, amphibians release an additional protein into the plasma, the yolk protein vitellogenin. The purpose of this study was to investigate the effect of estrogen exposure on the blood viscosity of the bullfrog (*Rana catesbeiana*) as a result of increased plasma vitellogenin levels.

Mean plasma total protein concentrations were nearly three times higher in estradiol treated frogs (30.52 ± 10.50 mg/ml) than in control animals (11.98 ± 3.50 mg/ml), likely because of increased vitellogenin levels. Mean plasma viscosity also was significantly greater in the estradiol treated animals (2.02 ± 0.41 cP) as compared to the control group (1.35 ± 0.06 cP). However, there was no significant difference in apparent (whole) blood viscosity at packed cell volumes of 10, 30, or 50% at any of the shear rates tested. Relative blood viscosity in the estradiol treated frogs was not significantly different from control animals. These results suggest that estradiol treatment had no effect on red blood cell deformability and that vitellogenin, unlike other lipoproteins, may not be involved in the aggregation of red blood cells. Such a lack of aggregation would be beneficial in maintaining normal blood viscosity in the face of high plasma vitellogenin concentrations, thereby maintaining ease of blood flow during the egg developing season.

- **Capturing Lesser Prairie-Chickens on Leks During Fall.**

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Trapping Lesser Prairie-Chickens (*Tympanuchus pallidicinctus*) other than in spring on leks has been problematical. We required Lesser Prairie-Chickens for research during fall and captured them on leks. Trapping success in fall (0.66 birds per trap-morning) was less than in spring (2.27 birds per trap-morning) but provided the needed birds. Fall trapping on leks may be applicable to capturing other lekking grouse in North America.

- **Survival of Deep Trunk Burial in Baldcypress (*Taxodium distichum*).**

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The formation of adventitious roots near the soil surface was investigated in a baldcypress (*Taxodium distichum*) tree nearly a century after the lower trunk was buried in soil 10 m deep as a result of nearby construction. Numerous large and small roots proliferated from the underground trunk near the soil surface to a depth of at least 2 meters (the maximum depth excavated), a location formerly 10 m high on the aerial portion of the tree. The importance of survival of this floodplain species after deep trunk burial and subsequent production of numerous adventitious roots is considered an adaptation to surviving the accumulation of large amounts of sediment at the base of the tree during flooding.

- **Vascular Plants New to Three States in the Central United States.**

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Recent floristic studies in the central United States resulted in the discovery of seven species of vascular plants previously undocumented in three states. First reports are provided for *Alopecurus arundinaceus* Poir. and *Aristida longespica* Poir. Var. *geniculata* (Raf.) Fernald from Colorado; *Erysimum hieracifolium* L. and *Trifolium fragiferum* L. from Iowa; and *Eichhornia crassipes* (Martius) Solms-Laub., *Pistia stratiotes* L., and *Quercus havardii* Rydb. from Kansas.

- **New Records of a Porcupine and Armadillo in Riley County, Kansas.**

Jan F. Kamler¹ and Philip S. Gipson. Kansas Cooperative Fish and Wildlife Research Unit, Division of Biology, Kansas State University, Manhattan, Kansas 66506. E-mail: jkamler@ttacs.ttu.edu

Specimens of a porcupine (*Erethizon dorsatum*) and a nine-banded armadillo (*Dasypus novemcinctus*) were collected recently in Riley County, Kansas. Both specimens represent the first documentation of the species in the county. These specimens help fill in distributional gaps and are near the range limits for both species in the central United States.

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- **Weed Management on Military Artillery Ranges.**

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Various commercial chemicals were tested to control visually obstructive weed populations abundant in the target zones on the Fort Riley Military Reservation. With the use of the integrated pest management concept, several herbicides applied at lower amounts than the historical treatment were effective in reducing tall weedy plants by at least 90%. A change in these chemicals thus would help to meet the United States Department of Defense directive to reduce pesticide usage.

- **Gastroliths Associated with Plesiosaur Remains in the Sharon Springs Member of the Pierre Shale (Late Cretaceous), Western Kansas.**

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Field work conducted in 1991 and 1998 recovered 47 gastroliths in association with the incomplete and disarticulated remains of a large plesiosaur (KUPV 129744). The specimen was discovered in the upper Sharon Springs Member of the Pierre Shale (Late Cretaceous), Logan County, Kansas. The gastroliths are unusually large in size when compared to those documented from other plesiosaur remains, and larger than those associated with the giant sauropod, *Seismosaurus*. The shapes of the gastroliths are consistent with similar sized stones that occur in river gravel. This specimen provides new data in regard to the range of sizes and the occurrence of gastroliths in these extinct marine reptiles.

- **Horseshoe Crabs (Arthropoda: Xiphosurida) from the Pennsylvanian of Kansas and Elsewhere.**

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Pennsylvanian strata of Kansas have yielded two species of xiphosurids (horseshoe crabs). The exceptionally preserved fossils are from inferred coastal (estuarine or tidal flat) paleoenvironments. One species, the euproopid *Euproops danae* (Meek and Worthen), occurs in the Lawrence Formation (Upper Pennsylvanian: Virgilian) in Douglas County, Kansas. Siderite concretions in the Lawrence Formation preserve organisms similar to those from Braidwood-type assemblages of the Mazon Creek biota of Illinois. This occurrence of *E. danae* in the Virgilian Stage (North American usage) is one of the few stratigraphically above the Desmoinesian Stage of North America of the Westphalian D. Series of Europe.

Another xiphosurid, the limuline *Paleolimulus signatus* (Beecher), occurs in the Pony Creek Shale Member of the Wood Siding Formation (Upper Pennsylvanian: Virgilian) in Wabaunsee County, Kansas. This occurrence extends the known stratigraphic range of *P. signatus* downward from the Permian into the Pennsylvanian. Another specimen that is here referred to *P. signatus*, and which was collected from the Mazon Creek biota of Illinois, shows that the species ranges downward to the Desmoinesian Stage (of North American usage).

- **Digestive Proteinases of Alfalfa Weevil, *Hypera postica*, (Gyllenhal) (Coleoptera: Curculionidae).**

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The alfalfa weevil, *Hypera postica* (Gyllenhal), is a serious economical pest of alfalfa in the State of Kansas. To identify potential insecticidal proteins that may be incorporated into transgenic alfalfa to enhance resistance to the weevil, the digestive proteinases of larval stages of *H. postica* were characterized. Seven caseinolytic proteinase activities from both serine and cysteine subclasses were identified. Five of the activities tentatively were stimulated by thio-reducing reagents and were identified as cysteine proteinases. Substrate and inhibitor analysis identified the other two activities as chymotrypsin-like enzymes. These results suggest that genes encoding inhibitors of cysteine proteinases and serine proteinases, especially those that inhibit chymotrypsin-like enzymes, could be used to transform alfalfa and reduce damage by weevils.

- **Imazamox and Diphenylether Herbicide Interactions in Soybean (*Glycine max*).**

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The effect of three diphenylether herbicides on the control of green foxtail, kochia, velvetleaf, and ivyleaf morningglory with imazamox in soybean was evaluated in a field study conducted near Manhattan, Kansas in 1997 and 1998. Herbicide treatments were: imazamox at 26 and 44 g ai/ha; acifluorfen and fomesafen each at 140 and 280 g ai/ha; lactofen at 70 and 140 g ai/ha; and tank mixtures of imazamox at both rates with both rates of acifluorfen, fomesafen, and lactofen. Tank mixtures of 26 g/ha imazamox with either rate of acifluorfen, or fomesafen were antagonistic on kochia control, as was 44 g/ha imazamox with 280 g/ha acifluorfen 4 weeks after treatment. Tank mixtures of 26 g/ha imazamox and 280 g/ha acifluorfen or fomesafen were antagonistic on velvet leaf control. The only tank mixture that resulted in reduced ivyleaf morningglory control was 26 g/ha imazamox plus 70 g/ha lactofen. The tank mixture of 26 g/ha imazamox plus 280 g/ha fomesafen was antagonistic for green foxtail. When a diphenylether herbicide was applied with imazamox, 44 g/ha imazamox resulted in fewer antagonistic interactions than mixtures with 26 g/ha.

- **Modeling Biophysical Factors for Grasslands in Eastern Kansas Using Landsat TM Data.**

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Objective of this study was to evaluate the relationships between grassland biophysical factors and spectral reflectance patterns recorded by the Landsat Thematic Mapper (TM) in eastern Kansas. Grasslands were stratified by cool and warm season life-forms, as well as grazed, hayed, and Conservation Reserve Program (CRP) management practices. Strength of the relations was examined by using the raw TM reflectance values, and various vegetation indices (i.e., Normalized Difference Vegetation Index, brightness, vegetation greenness, wetness). Results indicated significant relationships between

aboveground biomass and spectral variables and between plant moisture and spectral variables. Aboveground biomass also was correlated highly with plant moisture ($r = 0.76$). Total vegetation cover was correlated highly with spectral data ($r < 0.55$). The relative cover by grasses was uncorrelated whereas forb cover was correlated with spectra data suggesting that variation in forb composition among grassland types is a significant factor affecting spectral reflectance. Regression analysis results suggest that TM data are better predictor of aboveground biomass than any other biophysical factors (adjusted $R^2 = 0.77$). Relationships between the spectral variables and many of the biophysical factors were improved significantly when the models were developed for the individual grasslands types. The use of the TM vegetation indices did not significantly improve the ability to predict biophysical factors.

- **Assessment of Avian Populations in Kansas Tallgrass Prairie Landscape: Two Survey Methods Compared.**

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Avian populations in the Flint Hills region of Kansas were assessed during summer and winter using point counts and line-transect surveys. Total numbers of birds counted with both methods were 2,264 in summer and 2,422 during winter. The two techniques characterized the avian populations similarly in terms of (1) species richness, (2) bird abundance, and (3) species composition. Point counts are less time-consuming than line-transect surveys and, therefore, are advantageous for assessing avian populations in grassland habitats if time is limited.

- **Effects of Passive Integrated Transponders on Ring-necked Pheasant Chicks.**

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We evaluated the effects of passive-integrated transponder (PIT) tags on body mass, survival, and tag retention of 7-day old (Study I) and 8-day old (Study II) ring-necked pheasant (*Phasianus colchicus*) chicks. Mean body masses of PIT-tagged and control chicks did not differ at the end of 40 days (Study I) or 6 days (Study II). Rate of body mass gain was significantly greater ($P=0.0001$) for control than PIT tagged birds in Study I. No birds died in study I or during 16 days following removal of PIT tags, but in Study II 8 PIT-tagged chicks and 6 control chicks died. Two PIT-tagged individuals were cannibalized in Study II, but none of the controls were. One of eight PIT-tagged chicks lost its tag in Study I; one of the 25 birds in Study II lost their PIT tags. PIT tags may have potential as markers of hatchling birds, but reduced rate of body mass gains, retention, and pecking mortality issues should be addressed.

- **Preservation of Historic Graffiti Using Ethyl Silicate: The Signature of W.F. Cody in Ellsworth County, Kansas.**

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A laboratory examination of the effect of ethyl silicate solutions (Conservare OH and Conservare H) on red Dakota sandstone (Cretaceous) cores from Red Rock Canyon, Kanopolis Lake, Ellsworth County, showed the treatments improved the compressive strength and freeze-thaw resistance of the stone without sealing the pore system or causing discoloration. The solution then was applied to the signature of W.F. Cody in order to prolong the lifetime of this important historical graffiti.

- **Molecular Differentiation of White Perch and Yellow Bass.**

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We used the technique of Randomly Amplified Polymorphic DNA (RAPD) to produce DNA fingerprints of white perch (*Morone Americana*) and yellow bass (*Morone mississippiensis*), which recently have invaded and are sympatric in Browning Oxbow, Kansas/Missouri. Total DNA isolated from liver of 20 specimens of each species resulted in similar RAPD amplification patterns with the exception of a 300 base pair DNA band unique to white perch. The incidence of natural hybridization between *Morone* species leads to concern about possible genetic introgression with native white bass (*Morone chrysops*).

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- **Records and Status of the Bullhead Minnow (*Pimephales vigilax*) and Emerald Shiner (*Notropis atherinoides*) in Streams in Central Kansas.**

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We document range extensions for the bullhead minnow (*Pimephales vigilax*) within the Kansas River Basin and confirm its continued presence in the Arkansas River in central Kansas during 1996-1998. We also discuss the status of the emerald shiner (*Notropis atherinoides*) in the Solomon River Basin during 1996-1997. These records supplement distribution maps compiled earlier.

- **Occurrence of Polychlorinated Biphenyls in Fish and Sediment of the Arkansas River Basin, Kansas.**

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Polychlorinated biphenyls (PCBs) are persistent organochlorine compounds that are abundant contaminants in many aquatic environments. Few studies have been conducted in the Arkansas River basin to evaluate the presence of PCBs. The current study evaluated fish and sediment from the Arkansas River and its tributaries for PCB contamination. PCBs occur in sediment samples at 9 of 20 sites and ranged in concentration from 14 to 120 µg/kg. Sediment samples containing PCBs were primarily from areas with urban land uses. PCBs occur in fish tissues at 12 of 15 sites and ranged in concentration from 7 to 47 µg/kg. The rate of PCB occurrence in fish was similar for areas with agricultural and urban usage. PCBs were in either sediment or fish in all but three sites. Little correlation was noted, however, between occurrence of PCBs in fish and sediment from the same sampling site. Presence of PCBs can threaten environmental and human health; however, in this study, no samples exceed levels that are likely to pose an environmental or human health risk.

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- **Rediscovery of Woolly Milkweed, *Asclepias Lanuginosa* Nutt. (Asclepiadaceae), Saline County, and Management Considerations.**

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Woolly milkweed (*Asclepias languinosa* Nutt., Asclepiadaceae) is a critically imperiled plant in Kansas, and until recently the only known extant population in the state was located in Republic County. On 25 May 1999, four specimens of woolly milkweed were collected at the Kansas Regional Training Center Range (KRTCR) in Saline County. Little published information exists that describes the life history aspects of woolly milkweed, and there is no information about the effects of land management activities on this species. However, published information about the effects of burning and haying on the federally threatened Mead's milkweed (*Asclepias meadii* Torr. ex A. Gray) can contribute to the development of management plans for KRTCR that should not adversely impact woolly milkweed.