University of Nebraska - Lincoln
DigitalCommons@University of Nebraska - Lincoln

Center for Grassland Studies Newsletters | Grassland Studies, Center for

10-1-1999

Center for Grassland Studies Newsletter, Fall 1999, Volume 5, No. 4

Follow this and additional works at: http://digitalcommons.unl.edu/grassland_newsletters

Part of the Other Plant Sciences Commons

"Center for Grassland Studies Newsletter, Fall 1999, Volume 5, No. 4" (1999). *Center for Grassland Studies Newsletters.* Paper 41.
http://digitalcommons.unl.edu/grassland_newsletters/41

This Article is brought to you for free and open access by the Grassland Studies, Center for at DigitalCommons@University of Nebraska - Lincoln. It has been accepted for inclusion in Center for Grassland Studies Newsletters by an authorized administrator of DigitalCommons@University of Nebraska - Lincoln.

University of Nebraska

Center for Grassland Studies Newsletter

Volume 5, No. 4
Fall 1999

From the Director

We read and hear much in the news today about our water supply and its quality. It is not uncommon to learn of a new problem with some kind of pollution almost every day. The recent hurricane Floyd has caused significant problems with water in many of the eastern seaboard states. These kinds of events help to highlight both the challenges and opportunities that confront us. The concentration of people, animals and crop production in today's modern society increases the chances of problems occurring.

One of the most effective ways of controlling pollution and thus maintaining or improving water quality is through the judicious use of grasses and the effective use of our grasslands. Grasses and grasslands are among the best ways that we are aware of to keep water in the place where it falls, slow down its flow and eroding power, and retain the soil and other solids in place.

The need for vegetation strips, primarily grasses, or buffer zones in and around our streams is growing steadily. These buffer strips need to be located in areas where they are more effective in slowing down water movement, reducing soil erosion, and minimizing or stopping the flow of nutrients, pesticides, pathogens, waste materials and other kinds of contaminants from the soil and into the streams. Both water quality and the habitat for aquatic forms of life can be improved by appropriate livestock management, using effective grazing practices on the grasses, using grassed waterways, and managing riparian zones for erosion control.

Likewise, the urban community has an important role to play in keeping contaminants from our streams. Home lawns account for a large portion of our urbanized watersheds. Each year there are hundreds of tons of fertilizer, pesticides and other similar products used on urban areas. Again, grasses are among the most effective ways of keeping these products on the areas where they are placed. Maintaining a dense vegetative cover on your home lawn is beneficial in many ways.

Why are grasses so effective in alleviating these problems? First, the leaf blades intercept the fall of water droplets and thus avoid the pounding and compacting of the soil. Second, the leaf blades and other above-ground parts impede the movement of water, reducing the eroding power and helping to deposit some of the sediments carried in the water. Thirdly, the fibrous root system of grasses holds the soil in place and improves water infiltration into the soil profile. The dead and decaying roots provide channels for the water to move through the soil, and growing roots open up compacted soils. Thus grass plants, including both the above- and below-ground parts, are particularly effective in preventing soil compaction, holding water in place, improving water intake, and preventing the movement of soil particles, plant nutrients, pesticides and other waste material, thereby reducing pollution and maintaining or improving water quality.

Farmers, ranchers, and homeowners all have a vital role to play in maintaining and improving our water quality along with restoring the natural environment.

End-of-Season Visual Obstruction after Summer Grazing in the Nebraska Sandhills

by Patrick Reece, Jerry Volesky, and Walter Schacht Department of Agronomy, University of Nebraska-Lincoln

Introduction

The relationship between livestock and wildlife habitat on rangelands is dynamic. Grazing managers affect grassland bird populations every year when making herbage allocation decisions. Management strategies that provide adequate cover for establishment of successful nest sites in early spring enhance fecundity of grassland birds. Early nest site selection and hatching provide critical time for the growth and maturity of young birds before summer heat stress and harsh fall weather. Additionally, mean clutch size for many grassland bird species declines when nesting date is delayed (Kantrud and Higgins 1992, Fredrickson 1996). Our objective was to quantify the effects of cumulative grazing pressure in June or July, precipitation, and the frequency of occurrence of selected plant species on visual obstruction (VO) after killing frost in September.

Materials and Methods

The study was conducted in cooperation with personnel from the Nebraska National Forest on sands range sites in good to excellent condition at the University of Nebraska Gudmundsen Sandhills Laboratory located near Whitman, Nebraska. Prairie sandreed, sand bluestem, and little bluestem were co-dominant species on these sites (Great Plains Flora Association 1986).

Experimental units were individual 1.0-ha pastures. Twenty-one pastures were separated into three blocks based on frequency of occurrence of hairy grama, little bluestem, prairie sandreed, and sand bluestem in May 1995. Grazing treatments consisted of a single, 5- to 7-day, mid-month grazing period in June or July at 16, 32, or 48 animal unit days (AUD) ha-1, representing light, moderate, and heavy seasonal stocking rates. Grazing treatments were applied to the same pastures each summer from 1995 through 1997.

Before grazing treatments were applied, current-year standing herbage was estimated by clipping all palatable vegetation at ground level in 10, 25 x 100-cm randomly located quadrats per pasture. Palatable herbage was oven dried at 60oC to a constant weight. Grazing pressure was expressed as AUDs per metric ton of current-year palatable herbage (AUD Mg-1) measured at the beginning of grazing periods.

Visual obstruction was measured in late September at a randomly selected point within 48 uniformly spaced areas in each pasture. Equipment used to measure VO was similar in design to that used by Robel et al. (1970). The reading pole was painted in 36 alternating 2.54-cm wide bands of gray and white, numbered in ascending order with 1 at the bottom. The number of the lowest band not fully obstructed by vegetation was recorded. Means of two VO readings taken on the contour from opposite sides of each sample point were used for analysis.

Results and Discussion

End-of-season VO in June-grazed pastures declined by about 0.4 cm per 10 AUD Mg-1 increase in cumulative grazing pressure. In contrast, VO declined 2.6 times more rapidly after grazing in July, with little change after 40 AUD ha-1. Grazing pressure accounted for 34% of the variability in VO among June-grazed pastures. When grazing was delayed 30 days to mid-July, cumulative grazing pressure accounted for 62% of the variability in VO among pastures, indicating a measurable decline in plant growth and an increasing dependence of end-of-season VO on the amount of standing herbage remaining when grazing ended. The

predictability of VO based on the collective effects of grazing pressure, precipitation, and the frequency of occurrence of plant species was measurably higher after July (R2 = .81) compared to June grazing (R2 = .46). Differences in plant species accounted for 27, 17, and 4% of the variation in VO among pastures in ungrazed, June-grazed, and July-grazed pastures, respectively.

In addition to higher than average VO, it has been suggested that sharp-tailed grouse select nesting sites with low frequencies of low-cover patches. Frequency of low-cover patches (< 5 cm) within pastures was highly correlated (R2 = .94), with mean VO declining by about 10 percentage points for each 1.0-cm increase in VO up to 12 cm, after which VO was > 5 cm at 98% of the sample points. The interdependence of low-cover patches and mean VO in our study indicate that either one of these habitat characteristics could be the primary selection criterion.

About 90% of the VO values for June-grazed pastures met or exceeded the minimum cover standard (6.9 cm) selected for sustaining sharp-tailed grouse populations at the Samuel R. McKelvie National Forest, 60 km northeast of our study site. High levels of cumulative grazing pressure in June resulted in near complete use of palatable current-year herbage within the physical limits of livestock herbivory. Use of light (16 AUD ha-1) or moderate (32 AUD ha-1) stocking rates in June would enhance average daily gain of cattle and provide adequate cover for sharp-tailed grouse. Deferring grazing to August or later in the year after June grazing will help maintain vigor in prairie sandreed and avoid jeopardizing nesting success (Reece et al. 1996). In July, only light stocking consistently produced acceptable end-of-season cover. Increased amounts of residual standing herbage from periodic years of rest may allow pastures to be grazed at moderate stocking rates in July and still provide adequate levels of nesting cover the following spring.

Literature Cited

Fredrickson, L. 1996. Prairie grouse nesting, nest vegetation, and roost vegetation, 1986-1988. S.D. Dept. Game, Fish, and Parks. Wildl. Div. Completion Report No. 96-03.

Great Plains Flora Association. 1986. Atlas of the flora of the Great Plains. T. M. Barkley (ed.). Iowa State Univ. Press. Ames, Iowa.

Kantrud, H. A. and K. F. Higgins. 1992. Nest and nest site characteristics of some ground-nesting, non-passerine birds of northern grasslands. Prairie Nat. 24:67-84.

Reece, P. E., J. E. Brummer, R. K. Engel, B. K. Northup, and J. T. Nichols. 1996. Grazing date and frequency effects on prairie sandreed and sand bluestem. J. Range Manage. 49:112-116.

Robel, R. J., J. N. Briggs, A. D. Dayton, and L. L. Hulbert. 1970. Relationships between visual obstruction measurements and weight of grassland vegetation. J. Range Manage. 23:295-297.

Global Change: Implications for Great Plains and Midwest Grasslands

by David Wedin, School of Natural Resource Sciences, University of Nebraska-Lincoln

We live in a period of unprecedented global environmental change. A recent meeting of the Nebraska Section of the Society for Range Management (October 21, 1999, Kearney, Nebraska) discussed global change and its implications for grasslands. The first speaker, Herman Mayeux (USDA-ARS, El Reno, OK), emphasized that global change goes far beyond the contentious issue of global warming. Other components of global change include changes in atmospheric chemistry, declining biodiversity, and altered land use. Grassland ecosystems

play an important but unclear role in this global picture of climate and atmospheric change. Shifts in productivity, forage quality, and species composition in response to global change may affect both the economic viability and ecological functioning of grasslands. These changes may, in turn, alter the role that grasslands, including their herbivores, play in the global carbon (C) budget and the fluxes of greenhouse gases.

Few people realize that terrestrial ecosystems release 11 times as much carbon dioxide (CO2) each year as world-wide fossil fuel combustion. For the most part, however, the CO2 lost by ecosystems is offset by photosynthesis. When one considers the vast areas covered by terrestrial ecosystems, such as the grasslands of the Great Plains, even small changes in the balance of photosynthesis and decomposition can affect the rate at which atmospheric CO2 concentrations increase. The recent Kyoto protocol on greenhouse gas emissions proposed that C credits should be issued for C sinks. Carbon sinks are ecosystems that show a net storage of C in biomass and soils. Ken Vogel (USDA-ARS, Lincoln, NE) predicted that these C credits will soon be traded as a commodity at the Chicago Board of Trade as various industries purchase credits to offset their CO2 emissions. Most of the discussion at Kyoto regarding C credits focused on forest regrowth and tree planting. What about grasslands? Several of the talks at the Kearney meeting showed that well managed grasslands may be an important C sink, but, according to Mayeux, much remains to be done to measure, understand, and predict the dynamics of C in grasslands.

Mayeux said that in contrast to planting trees, perennial grasses may be the best way to store C in the Great Plains. By restoring grassland to millions of acres, the Conservation Reserve Program (CRP) may be storing as much as one-third of the C currently released by U.S. agriculture (including the fossil fuels burned to produce nitrogen fertilizer). Most of this C is stored as soil organic matter. Recent research suggests that, on average, 20% of the soil organic matter lost during a half century of row crop agriculture is restored during a decade of CRP management. Mayeux estimated that U.S. agriculture has been a net carbon sink, rather than source, since the mid-1980s because of minimum-till agriculture and CRP.

Ken Vogel presented a dramatic number to show the changing role of grasslands in the U.S. carbon budget. According to the 1954 Census of Agriculture, 80 million grassland acres used for forage production were no longer needed when tractors (and fossil fuels) replaced horses. Can we go back to the future? Can we use those grasslands again as an energy source, reducing our needs for fossil fuels? Vogel and colleagues at the University of Nebraska have been working with the U.S. Department of Energy on developing switchgrass as a biomass fuel. With the right microbes, switchgrass can be converted to ethanol by industrial fermentation. Initial trials suggest that 79 gallons of ethanol can be produced per dry ton of switchgrass. This yield is comparable to ethanol production from corn, a much more expensive crop both economically and environmentally. Switchgrass production trials are now underway in several states.

The sensitivity of grassland ecosystems to different components of global change was seen in results from four experimental studies. Richard Alward (University of Nebraska) showed that warming has occurred in the northern Great Plains over the last 50 years. This warming, however, appears to be favoring cool-season grasses over warm-season grasses, such as blue grama, in the shortgrass prairie. How did Alward explain this surprising result? Daily minimum temperatures are increasing much faster than maximum temperatures, leading to warmer nights, earlier springs, and longer growing seasons. In other words, the climate of the northern Great Plains appears to be getting warmer, but not hotter.

Justin Derner (USDA-ARS, Temple, TX) and colleagues are modifying atmospheric CO2 concentrations above a plot of Texas grassland. While many recent studies have increased CO2 levels from current-day concentrations (365 ppm) to levels expected in the next century (600 ppm), Derner's group is also lowering CO2 levels to levels seen in the last century (280 ppm) and 12,000 years ago at the peak of the last ice age (200 ppm). When measured across the full gradient (200 - 600 ppm), grassland productivity increased 55% with elevated CO2. In addition, plants lost less water through transpiration in a high CO2 environment. These results suggest that the direct effects of elevated CO2 on grassland productivity might be more important than

the effects of climate change associated with global warming.

Changing atmospheric chemistry is affecting grasslands in other ways as well. Dave Wedin (University of Nebraska) showed that N deposition from air pollution is continuing to increase in the Midwest and Northeast. Ammonium deposition in eastern Nebraska has increased dramatically in just the last five years. Nitrogen deposition rates of more than 10 pounds of N per acre are now found throughout the Midwest. While this extra N may help crop production, Wedin and colleagues have shown that chronic N inputs to native grasslands, such as tallgrass prairie, can disrupt the N cycle and cause the loss of dominant warm-season grasses such as big bluestem and little bluestem.

Jerry Schuman (USDA-ARS, Cheyenne, WY) and colleagues measured total C storage in a 12-year-old grazing study on shortgrass prairie. They were surprised to find that the grazed plots had stored 240 pounds of C per acre per year beyond that seen in the ungrazed plots. The result is explained by the dominance of native grasses, such as blue grama, in the grazed plots compared to greater forb dominance in the ungrazed plots. This reinforces the point that healthy stands of native grasses can have a significant positive impact on C storage in the Great Plains and Midwest.

These four studies also reinforced a point raised by Mayeaux in the opening presentation. Studying the components of global change such as CO2 enrichment, land use, and climate change is not enough; we also need to understand how these factors interact in natural and managed grasslands.

On the Green with the Environment

[The following article is reprinted with permission from the June/July, 1999 issue of Conservation Voices, published by the Soil and Water Conservation Society. The author is Gillian Klucas, a freelance writer based out of Denver, Colorado.]

These days, golfers are seeing a lot more eagles and birdies. No, golf courses aren't becoming easier to play; they're becoming "greener." While many people see the nation's 16,000 golf courses as acres of sterile, manicured lawns loaded with chemicals and inhospitable to wildlife, those in the golf industry say they have become stewards of the environment, designing and maintaining courses as habitats for native plants and wildlife.

The trend toward greener courses has been building for the past 15 years. Now, as golf surges in popularity and towns scramble to build more courses, golf organizations are eager to let people know that golf courses if done right can benefit the environment. According to the U.S. Golf Association, golf courses provide the same environmental benefits as other green spaces. Acres of fairways act as filters, absorbing pollutants, giving off oxygen, and cooling the atmosphere. They also reduce erosion and absorb noise and sun glare. Not all golf courses are designed and operated with the environment in mind, but Mike Kenna of the USGA says golf course designers and managers are increasingly making environmental concerns a top priority. "Superintendents understand that part of their job is protecting the environment as well as maintaining good playing surfaces," Kenna says. "There's going to be more and more pressure on them to do both jobs well." That pressure comes, in large part, from public opinion. Environmental awareness has influenced not only people within the golf industry, but also those that regulate the industry. In most areas, before a golf course can even be built, it must meet certain environmental regulations. "Where we've come the farthest," Kenna says, "is where right at the front end, people say, 'Okay, you can build your golf course, but you have to show us that it's going to be environmentally friendly.' And they build a wonderful course."

Building a better golf course

Conscientious designers go beyond the legal requirements, says Bill Love, Chicago, Illinois, golf course architect and chairman of the environmental committee of the American Society of Golf Course Architects. "We take advantage of a lot of opportunities for not only enhancing existing wildlife, but even introducing wildlife that may have long since been gone from the area."

To do that, Love does a thorough environmental analysis of the site. Knowing where the sensitive areas are helps Love design a course that takes advantage of environmental features without affecting negatively on the surroundings. Using nature as a template also means preserving acres of out-of-play areas roughly 70 percent of a golf course for indigenous plants, which require less fertilizer, pesticide, and water and encourage wildlife to make a home.

Golf courses can also reclaim environmentally damaged land something Love says he's frequently asked to do. Covering landfills or mined areas, for example, challenges designers to transform the wasteland into an environmentally friendly and beautiful landscape.

The design can also solve specific problems of the area, like in Lansing Township, a suburb of Lansing, Michigan. Patrick Lindemann, the county drain commissioner, had to find a way to deal with stormwater runoff. Man-made wetlands turned out to be the innovative solution he was looking for. The traditional solution of piping the polluted water to a nearby river was not cost effective. Instead, Lindemann called upon an 11-acre park in Lansing and the adjacent Groesbeck Municipal Golf Course.

The City of Lansing agreed to turn the park and 19 acres of the 115-acre golf course into an urban wetland ecosystem that now handles 10 million gallons of stormwater runoff a day. The water is first channeled through a series of ponds in the park, where limestone, peat, microorganisms, and marsh grasses filter out the debris and pollutants. The water ends up in a pond near the golf course where it eventually evaporates or is pumped into another series of ponds on the course. The excess water is used to irrigate the course's fairways, saving irrigation costs.

John A. Johnson, superintendent of the Groesbeck golf course, says they continued the wetland theme by planting native grasses and wildflowers along pond and other out-of-play areas. Creating a wetland system not only solved a dilemma for the city, Johnson adds, but created a popular, more challenging golf course with an abundance of fish, waterfowl, shore birds, and amphibians.

It also saved the city money. The wetland's system cost only $6.2 million compared to the $20 million price tag of pumping dirty wastewater straight into the river. The change will also help Johnson reduce maintenance and fertilizer costs. "We hope we can see a benefit of taking nutrients right out of the stormwater and applying it to the turfgrass," Johnson explains, adding that the course will soon be able to test the plants to see which nutrients are lacking and apply only what is needed. Such fine-tuning will reduce the amount of fertilizer Johnson must apply.

Eco-maintenance

Golf courses have traditionally been viewed as polluters, dumping chemicals that run off into nearby water systems, fouling the water, and endangering wildlife.

But research conducted in the past decade at universities nationwide has shown that even courses that use pesticides and fertilizers don't pollute the environment. The chemicals if properly applied break down or are trapped in the grass-root system before the water leaves the golf course. According to the nonprofit Audubon International, which runs a golf course resource and certification program, water quality tests show that water frequently leaves the course less polluted than when it arrived as runoff from other sources.

Strategically designing slopes for proper drainage, creating buffers around waterways, carefully applying

chemicals, and regularly evaluating maintenance practices help to eliminate chemical runoff.

Johnson says he tries to use as many environmentally friendly products as possible, applying slow-release fertilizers with a low amount of nitrogen and only as much as soil tests recommend. He also practices integrated pest management, which means he treats only for the pests he sees rather than regularly blanketing the course with pesticides. To further reduce the need for chemicals, Johnson says his No. 1 method of weed control is mowing. "We keep our fairways and our roughs mowed at a height that weeds can't survive," he says, adding that one dose of herbicide a year suffices. The course's unique irrigation system allows for more frequent watering, which also keeps turfgrass healthy.

For operators, a major consideration affecting maintenance is their choice of turfgrass, says architect Love. Some areas, such as greens, require a high-maintenance grass, but he says he uses as much low-maintenance turfgrass as he can. "Of course, the more progress the researchers are making, the more we can employ these types of grasses," Love adds.

Developing disease-and insect-resistant turfgrasses that also require less water is a major focus of USGA-sponsored research, says USGA's Kenna. About 20 different turfgrass varieties have been developed in the past 10 years. But starting with better turfgrass is only one aspect of a low-maintenance lawn. Healthy turfgrass begins with thoughtful golf-course construction and continues by adhering to all available turfgrass management practices, he adds.

But Kenna warns that creating a more environmentally friendly golf course can cost substantially more, depending on the land's condition. While pristine areas are already established, landfills and other abused areas can take decades to establish. And even creating natural areas on healthy land requires at least as much maintenance initially as mowed areas. "If you can create an environment that eventually takes care of itself, you're going to save money in the long run," Kenna says. "But on the front end, you just don't go out and plant all of that stuff and up pops the right species. To create the right habitat, you've got to work at it a long period."

Editor's Notes: The original article included an illustration of the new water filtration system, which is not reproduced here. Mike Kenna was a speaker in the Center for Grassland Studies Fall 1996 Seminar Series; some of the USGA-sponsored research he mentioned has been and continues to be developed by members of the University of Nebraska Turfgrass Science Team.

Special Publication on Grasslands at the Millenium

Great Plains Research, a biannual, multidisciplinary, international journal of sciences for the heartland published by the UNL Center for Great Plains Studies, features peer-reviewed articles on original research, creative syntheses of important new scientific advances, and reviews of books relevant to the Plains.

Volume 9:2 (Fall 1999) will be a special issue devoted to "Great Plains Grasslands at the Millennium." Most of the manuscripts are revisions of papers given at a February 1999 symposium of the same name. Topics include: grassland ecosystems, recovery from fire, restoration and management, invasive plant species, human alterations, grassland birds, livestock and bison grazing, stream vegetation, sustainability, grasslands as a resource, and the economic future of the rural Great Plains. The issue should be available in February 2000. Other special issues of Great Plains Research include: Climate Change (1991), Environmental Issues (1993), and Wetlands (1998). All single issues are $15 each. Several manuscripts dealing with grasslands are also available, including a feature article in 8:2 titled "Tallgrass Prairie: Remnants and Relicts."

For more information about obtaining Great Plains Research publications, the contents of the various special issues, or submitting articles for consideration, see http://www.unl.edu/plains/gpr.htm, or contact the editor, Dr. Svata Louda, 402-472-2763, slouda@unl.edu.

USDA Holds Land Conservation Forums and Summit

Private landowners care for about 75% of America's lands and natural resources. A growing world population is placing increasing demands on these lands for production of food, fiber, timber, recreation, drinking water, and other benefits. The public demands that there be a call for new public policies to successfully meet the challenges of the next century.

USDA organized a Conservation Forum Series and National Conservation Summit to help build a new conservation strategy that recognizes and values the important contributions of private lands conservation to our nation's environmental health, natural resource sustainability, and a sound economy.

Six regional forums held across the country (Portland, Denver, Sacramento, Syracuse, New York, Atlanta, and Amarillo) in October set the stage by identifying and assessing conservation issues and opportunities affecting America's private lands. The National Conservation Summit to be held December 14, 1999 in Ames, Iowa will focus the results of this dialogue to build the foundation for a new conservation strategy for the 21st Century.

The goal of these sessions is to raise public awareness of the value of private land conservation, highlight private landowners' tradition of stewardship of natural resources, and initiate a dialogue on national issues, such as:

- Value of open and natural spaces, including farms, ranches, forests, and wetlands.
- Advantages of urban and rural community partnerships to achieve mutual conservation goals, especially at the urban/rural interface.
- Role of public and private investments in conservation of natural resources on private lands.
- Critical role of natural resource sustainability on private lands for the Nation's well being.
- Importance of the USDA conservation delivery system in promoting sound private land stewardship.

For more information, contact Ann Carey (ann.carey@usda.gov) or Scott Hoag (scott.hoag@usda.gov).

CGS Associate News

Walter Schacht and Lowell Moser are the Principal Investigators of a new three-year grant to the Center for Grassland Studies for implementation of the new Grazing Livestock Systems major. Dennis Brink, Jim Gosey, and George Pfeiffer are working with Schacht and Moser on the project, which received $89,792 from the USDA Higher Education Challenge Grant Program. This project is currently recruiting a Ph.D. student to coordinate these activities. Applicant should have an M.S. degree in Agricultural Economics, Agronomy, Animal Science, Range Science or related field. Contact the CGS for more information.

In June Chris Calkins received the American Meat Association's oldest award, the Signal Service Award. His recent research is in the area of meat tenderness.

Tom Franti received the Nolan Mitchell Young Extension Worker Award at the American Society of Agricultural Engineers meeting in July.

Nebraska AgrAbility was selected by Nebraska Farmer magazine as the East division winner of the Nebraska Farmer Rural Health/Safety Award. Bobby Grisso is the co-director of the project.

John Fech was a state winner in the Publication category of the NACAA Communication Award division at

the 1999 National Association of Cooperative Agricultural Agents meeting in Omaha in September.

Resources

Proceedings of the 16th North American Prairie Conference. $30. Theme of this July 1998 event held in Kearney, Nebraska was The Central Nebraska Loess Hills Prairie. Topic areas included botany, ecology, entomology, physiology, zoology, soils, wetlands, history, restoration, education, sampling/monitoring, computer models, photography, and poetry, as well as fire and prairie ecosystems. Order from Dr. Joseph Springer, Biology Department, University of Nebraska at Kearney, Kearney, NE 68849-1140, springerj@unk.edu.

Water Quality: Federal Role in Addressing and Contributing to Nonpoint Source Pollution, 1999. First copy free, additional copies $2. Reports on federal programs that address nonpoint source pollution, recommends improvements on U.S. Environmental Protection Agency methods of assessing nonpoint source pollution abatement costs, and describes nonpoint source pollution produced by federal facilities, lands, activities and projects. Discusses a variety of pollution sources including timber harvesting, grazing, urban development and agriculture. U.S. General Accounting Office, PO Box 37050, Washington, DC 20013, p: 202-512-6000, f: 202-512-6061.

Status and Trends of the Nation's Biological Resources. $98. New two-volume report documents how biological diversity in the U.S. is declining dramatically. The U.S. Geological Survey assessment shows that land use changes, including urbanization, conversion of lands to agriculture, draining of wetlands and the fragmentation of forests, are the major factors leading to the loss of biodiversity. Available from U.S. Government Superintendent of Documents, p: 202-512-1800, f: 202-512-2250. The stock number to request is 024-001-03603-7. For more information on this report, e-mail the USGS Project Director at status_trends@usgs.gov.

Info Tufts

Loss of habitat, pressure from non-native species, and overharvesting have put one out of every eight plant species at risk of extinction, according to the World Conservation Union. For more information on worldwide loss of plant biodiversity, see http://www.worldwatch.org/alerts/990916.html.

Nine Environmental Assurance Program workshops sponsored by Nebraska Cooperative Extension are planned throughout the state in December and January. They will focus on current Nebraska livestock environmental regulations and how they apply to existing livestock operations. For details, contact the CGS.

Calendar

Contact the CGS for more information on these upcoming events:

Jan. 10-12: Nebraska Turfgrass Conference, Omaha, NE

Jan. 27: Nebraska Forage and Grassland Council Annual Meeting, Lincoln, NE

Feb. 13-18: Society for Range Management Annual Meeting, Boise, ID, http://srm.org/boisemeeting.html

Mar. 28-29: Global Sustainability Conference (incl. carbon sequestration and ecological practices in agriculture and forestry), Springfield, IL

Apr. 3-5: Monitoring for Ecosystem Health Conference, Regina, Saskatchewan, http://www.serm.gov.sk.ca /ecosystem/monitoringconference/index.php3

Apr. 6-8: Center for Great Plains Studies 24th Interdisciplinary Symposium Bison: The Past, Present, and Future of the Great Plains, Lincoln, NE, http://www.unl.edu/plains/2000symp.htm

Apr. 9-13: BES-ESA 2000: A Joint Symposium Meeting of the Ecological Society of America and the British Ecological Society, Orlando, FL, http://esa.sdsc.edu/bes-esa.htm

Apr. 15-19: Annual Symposium of U.S. Chapter of the International Association of Landscape Ecology, Fort Lauderdale, FL, http://www.ces.fau.edu/iale2000/

July 16-19: American Forage and Grassland Council and the North American Alfalfa Improvement Conference Annual Meeting, Madison, WI, http://www.forages.css.orst.edu/Organizations/Forage /AFGC/Conferences/#AFGC

Oct. 15-19: Bioenergy 2000: Moving Technology into the Marketplace, Buffalo, NY (abstracts due Jan. 30)

Note: Opinions expressed in this newsletter are those of the authors and do not necessarily represent the policy of the Center for Grassland Studies, the Institute of Agriculture and Natural Resources or the University of Nebraska.

Mail

Home