



Grassroots

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Winter Reading List by Sandy Smart

During the holiday season, in between the fall and spring semesters, I like to take a short break from my duties as a professor and take advantage of the long winter nights to read for fun. I thought I would share a brief reading list of some of my favorite books about grassland management. I like reading novels, both fiction and nonfiction. The following is a list of nonfiction books and a brief overview of each. You can get all of these new or used through Amazon.

Tobey, R.C. 1981. *Saving the Prairies: The Life Cycle of the Founding School of American Plant Ecology, 1895-1955.* University of California Press, Berkeley, CA.

I first read this book in graduate school because it was required reading by my major professor. It describes the historical beginnings of the plant ecology discipline developed at the University of Nebraska. It goes into great detail about plant succession and how the range profession adopted this viewpoint from Clements. Of course I am biased here because my Ph.D. is from UNL. If you like history, this is a great book.

Manning, R. 1995. *Grassland: The History, Biology, Politics, and Promise of the American Prairie.* Penguin Books, New York, NY.

Barry Dunn suggested this book to me when I first came to SDSU in 2001. This is a fascinating tale of the evolution of the Great Plains prairies. Manning is a masterful story teller. You won't be disappointed.

Bingham, S. 1996. *The Last Ranch: A Colorado Community and the Coming Desert.* A Harvest Book, Harcourt Brace & Company, San Diego, CA.

This is another book suggested to me by Barry Dunn. This is a true story of a couple of brothers ranching in southcentral Colorado. Sam Bingham is another master story teller. This book has some neat twists and turns in it at the end!

Howell, J. 2008. *For the Love of Land: Global Case Studies of Grazing in Nature's Image, Self Published.* (can purchase on Amazon)

This book was suggested to me by a range professor at Texas A&M. Howell does a nice job bringing his real world perspective on how to manage different landscapes. In the first few chapters, he describes the brittle/ non-brittle environment concept better than Savory!

2016 Friend of the Prairie Award by Sandy Smart

Rod Baumberger and Dave Steffen received the 2016 Friend of the Prairie Award at the annual SDGC meeting in Chamberlain on Jan 5, 2017. Rod and Dave have had long careers with the NRCS and have played key roles in conserving grasslands in South Dakota. Rod and Dave were founding partners to help get the SDGC started nearly 20 years ago. Dave Steffen also has been instrumental in the formation of the SD Grazing School.

The SDGC created the Friend of the Prairie Award to recognize individuals for their conservation efforts. This award recognizes those working in public roles to ensure stewardship of the state's natural resources through sustainable and profitable management. The awardees are given a framed display featuring the pasque flower and western wheatgrass, the state flower and grass of South Dakota.



Rod Baumberger (left) and Dave Steffen (right) were honored for the dedicated service and received the 2016 Friend of the Prairie Award.

Membership Renewal

The Coalition is continuing their rather ambitious agenda for the upcoming year with plans to increase awareness and visibility throughout the state. We encourage your continued support of this organization to promote the environmental and economic preservation of South Dakota's grasslands.

MEMBERSHIP: The Coalition is made up of private landowners and grassroots organizations throughout South Dakota.

BENEFITS: Membership benefits include newsletters that keep you informed of the latest outreach activities throughout South Dakota, informative articles about Coalition sponsored programs, highlights of research and demonstration projects, producer spotlights covering innovative management strategies to improve grassland enterprises, and discounts to certain Coalition-sponsored events.

RENEWAL: Please visit our website (www.sdgrass.org) under the tab "Join SDGC" and click the Membership Brochure link to print off the application. It is time to renew your membership with the South Dakota Grassland Coalition.

The Green Side Up: Is Your Pasture Native? SDSU Takes a Comprehensive Look at Where Native Habitats Occur by Pete Bauman

SDSU Extension, in partnership with a variety of non-government, state, and federal agencies, has recently released a report on the status of native habitats in eastern South Dakota (links to the full report and data are provided below).

To the average citizen the importance of whether a pasture is native virgin sod is not obvious, and we must improve our efforts on this front. As I kid in grade school in the mid 1980s I felt like an expert on the global impacts of destroying the Amazon rain forest. As an adult in my 40's, I struggle to educate my own children on the perils to our grasslands in our own back yard. So the fact that the public doesn't fully grasp the issue, while frustrating, should not be surprising.

Surprisingly, the term 'native' can have several interpretations, with some persons assuming a former crop field planted to native grasses should be qualified as native. However, our study relied on an ecological definition of the term, quantifying lands as potentially native only if there was no evidence of historic soil disturbance from farming, development, or other human causes. If historic soil disturbance was confirmed, those acres were removed. For example, a gravel pit, cattle feedlot, golf course, or small town would all be removed, as would a grass hayfield, CRP, or other habitat on a previously cropped field, regardless of how long ago the farming occurred.

Our study takes a comprehensive look at eastern South Dakota using a different set of tools and techniques. While others have analyzed how much overall grassland conversion has occurred in recent years, we attempted to measure how much actual native grassland and woodland habitat remains. To do this, we used Farm Service Agency cropland history data, aerial imagery, and a systematic analysis of the landscape.

Native grasslands and woodlands are an incredible asset to South Dakota's agricultural and natural resources heritage and the industries that rely on them, including but not limited to grazing, hunting, tourism, and recreation. In addition, the importance of these lands to wildlife, water, and soil quality cannot be overstated. Our data sets a comparative benchmark that has been lacking in previous reports, allowing future analysis to determine actual rates of loss of native grasslands. Understanding this critical component of South Dakota's grassland communities is important as native grasslands, once converted, can never be truly restored to their full suite of ecological functions.



Dotted gayfeather (Photo by P. Bauman, 2015).

The Green Side Up: Native Pastures

by Pete Bauman

Overall, we identified 5,488,025 acres that are still potentially native, representing about 24% of the entire 22.6 million-acre eastern South Dakota landscape. About 200,000 of these acres may have had a tillage history, but there was not enough historical evidence for a clear determination. Conversely, nearly 73% of eastern South Dakota land has been manipulated from its native state at some point. About 15 million acres, or close to 66%, of eastern South Dakota land has a recorded tillage history, with an additional approximately 7% of the land having been disturbed for other human uses. The remaining 3% was determined to be comprised of large water bodies over 40 acres in size.

Of the approximately 5.5 million acres of native land remaining in eastern South Dakota, over 5.4 million acres are native grasslands, with about 100,000 acres categorized as woodlands. Because of the sensitive nature of these native plant communities, we also gathered information on the overall level of permanent protection afforded to these lands under various types of conservation ownerships or programs.

Overall, when the total of fee title ownership and permanent protections, such as conservation easements, were assessed, it was determined that only 962,734 acres of native habitats (about 17.5%) had any type of permanent protection from future conversion to cropland or other uses. In total, the amount of land in eastern South Dakota that is both native and under some level of permanent protection, represents only 4.3% of the entire 22.6 million-acre eastern South Dakota landscape.

Current and historic management of native grasslands is the primary factor in how those lands function for private and public goods and services. Well managed native grasslands provide superior grazing and recreational opportunities, in addition to public services associated with air, water, and soil quality. Wildlife habitat is also a critical component, and well managed native grasslands are key resources for declining grassland-obligate birds, mammals, reptiles, pollinator plants, and insects.

Conversely, poorly managed native habitats subject to intensive continuous grazing, over application of chemicals or fertilizers, or general neglect, do not often provide the long-term ecological stability or profit potential that well-managed tracts do.

In this study, SDSU was not able to determine the overall quality of the remaining tracts of native habitats. We believe, however that most remaining tracts, if subject to improved management, would likely provide improved return on investments to landowners and the public, through improved grazing systems, reduced chemical costs and other inputs, improved water retention and productivity, and improved wildlife habitat.

To view the full report: <http://igrow.org/up/resources/07-2001-2016.pdf>

To access all data, GIS layers, Geodatabases, report, charts, and maps: http://openprairie.sdstate.edu/data_land-easternSD/1/

The Green Side Up: Let it Blow???

by Pete Bauman

We were blessed with a great fall, and now we're getting what is more typical of a South Dakota winter with record setting cold coupled with typical snow and our famous South Dakota wind. These conditions are challenging, especially for livestock producers, and I do not mean to make light of the real challenges of making a living in our harsh climate. However, as grassland managers, we can capture benefits of what is given freely by God and mother nature in the form of snow and wind by taking simple steps to work with nature instead of against it.



Snow on the Prairie Coteau of eastern South Dakota
(Photo by P. Bauman, 2015).

Capturing snow on pastures should be a goal of every holistic grazing management plan. Those who practice winter grazing have an obvious head-start in this arena, since they rely on stockpiled winter forage, thus retaining the vegetation structure to advantageously capture blowing snow. But what about the rest of us who do not winter graze, how do we accomplish snow capture, and why should we care?

Let's start with the why. Leaving leaf and stem structure on the plants going into winter can be very important to catching snow. Snow catch can be critical to replenishing pasture water resources, but also of significance is the function of snow as an insulation layer that can protect plants and prevent deep freezing which can keep active soil biology of your pasture functioning throughout the winter. Since this is South Dakota, we know the wind is going to blow. It is hard enough to catch snow with vegetation, but it is nearly impossible to catch snow without it! Also, plant residue from last season will help protect the soil from erosion, precipitation impacts, and heat next season.

Diversity of mature native plants can be a great asset for managing pastures over winter. Warm season grasses, if not overgrazed, often retain a seed stalk and basal leaves that stand up well to wind. Further, native forbs and shrubs such as clovers, sunflowers, and legumes such as leadplant can assist in snow catch and retention. Even native goldenrods and buckbrush have their place in pasture ecology in relation to snow catch and wildlife habitat. I do a fair amount of pheasant and deer hunting in December, and I'm always reminded of the value of vegetation for capturing and retaining snow when I walk through a cattail or cordgrass slough or through a stand of warm season grasses in a CRP planting. While it is true that the snow is generally deeper in areas with standing vegetation, these areas also tend to form less crust and the snow stays 'fluffy' underneath allowing easier access to livestock for grazing and to birds and small mammals for cover. Comparatively, heavily grazed pastures often have little to no snow cover and offer little in the way of grazing or over-winter habitat.

Pete Bauman is an Extension Range Field Specialist in Watertown, SD.

How's the Weather at Your Place? by Garnet Perman

“How much rain did you get?” It’s probably the most common question asked in South Dakota every year. Now there’s a way to answer that question and more.

A good drought plan is an important tool in a grass manager’s toolbox. Knowing the triggers to implement a drought plan is crucial to making an operation drought proof. Accessing the meteorological data in a given location in terms of rainfall data, soil moisture and soil temperature can help a producer decide when to implement his drought plan in a timely manner. In much of the state, the nearest weather station data can be miles away from a given operation and conditions may differ drastically within that distance.

The technology to use data, specific to a given location, is available through an automated weather station that feeds data to a local computer or cell phone. A partnership between the SDGC and the NRCS is offering that opportunity on a limited basis.

The Davis Instruments weather station measures precipitation, wind speed and direction, relative humidity, barometric pressure, soil moisture and soil temperature. The current system does not measure snow. A software program delivers real time data from solar powered sensors placed on the property directly to the user’s computer. Different modules within the program can help predict the optimal days for various activities such as planting corn. A Smart Phone app is also available that delivers data every 15 minutes. The data is charted over a three day period. The same app enables the user to look at everyone else’s data through Davis Instruments Weatherlink program.

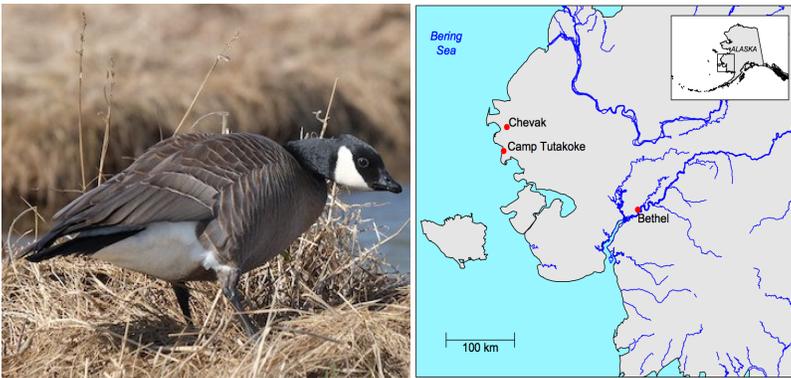
The Grassland Coalition and SD NRCS teamed up to encourage producers to use this type of data to improve their grazing management. Participants pay \$200 of the \$2000 installment cost plus \$179/year for remote cellular connection. They must agree to develop a drought plan and write a report at the end of the year. Ten stations were approved for cost share installation last spring. Five were installed late last summer and fall in different sections of the state. The remaining five have a waiting list. Adam Roth, Highmore, had the first one installed last spring. He has been pleasantly surprised at the range of the station. Dave Steffen, Burke, had one installed last fall. Both are happy with the data that feeds directly to their home computers. The cell phone app has been more troublesome, but the data eventually all shows up.

Stan Boltz, Rangeland Management Specialist with the NRCS would like to measure soil moisture over time and do simultaneous forage production clippings to build a data base that would be more accurate than just precipitation records. The station measures soil moisture in centibars with 0 being saturated to 200 being extreme drought. Cropland starts drought stress at 40-50 cb, while grassland starts experiencing drought stress from 50-80 cb. “Native plants have an amazing capacity to go beyond 80 cb,” Boltz said. Dave Steffen placed sensors on both sides of a fence. He looks forward to seeing if soil moisture and temperature changes with grazing. For the technologically savvy do-it-yourselfer, the weather station is available through the Davis Instruments website and Amazon.

Garnet Perman is a freelance writer and ranches with her husband, Lyle, near Lowry, SD.

SDSU Research Update: Grazing by geese in coastal grasslands of western Alaska by A. Joshua Leffler

For three years I have been part of a team of researchers examining goose grazing and climate change in the Yukon-Kuskokwim (YK) delta of western Alaska. This vast wetland, the terminus of two great rivers, is the summer home of millions of migratory shorebirds, geese, cranes, and swans. These birds migrate to the YK Delta to take advantage of the long summer days, abundant insects, and relatively few predators. Consequently, the arrival of so many birds is important for this ecosystem. In fact geese, are critical in maintaining this habitat.



Left: Pacific Black Brant, a goose that relies on the grasslands of western Alaska. Right: Study area at 'Camp Tutakote'.

We study goose grazing in this remote part of Alaska because our planet is warming most at high latitudes. Spring in parts of Alaska arrives up to three weeks earlier than it did in the 1970s. Consequently, graminoides (grasses, sedges, rushes, etc.) begin growing earlier now than in the past. Migratory geese, however, do not necessarily arrive any earlier. These animals have more constraints on their biology – they cannot fly faster to Alaska, and the time from laying eggs to hatch is biologically fixed. The future could yield a 'phenological mismatch', geese arriving into an ecosystem that is more 'mature' with taller

grass and more biomass when goslings hatch and begin foraging on their own. While more forage may seem beneficial, geese avoid taller grasses in favor of 'grazing lawns' – areas that were grazed by geese in previous growing seasons. Grazing lawns are dominated by a growth form of sedge that is typically only 1 inch or less. As these graminoides go ungrazed, they revert to taller forms and geese avoid them in the future. While a warming Alaska may result in greater biomass, it does not necessarily result in more habitat for geese.

Our research team of faculty, graduate students, and post-docs from Utah State University, University of Alaska-Anchorage, and South Dakota State University, travel to western Alaska in April and set-up a remote camp on the edge of the Bering Sea for the summer. We haul our science gear, shelter, food, and fuel for nearly five months of work using snowmobiles stored in the nearest Native Alaskan village. After chipping tent platforms out of the ice, packing totes with snow for fresh water, and setting up community and sleep tents, we set about examining what happens to plant growth, carbon uptake, and nitrogen cycling when we experimentally alter the timing of green-up and grazing in the system.

We have found that delaying goose arrival relative to green-up results in considerable growth and carbon uptake – at least initially. Results also suggest that removing grazing from the system can also slow growth and carbon uptake in the long-term. When geese fail to graze, the taller grasses contain considerable dead material, which shades the rapidly growing young tissue and older green tissue is less productive. If the timing of green-up and goose arrival diverges too much, geese may find the YK Delta a less hospitable summer home.

Josh Leffler is an assistant professor and grassland ecologist in the department of Natural Resource Management at SDSU.



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Calendar of Events

Event	Date	Location	Contact Person	Phone
Northern Plains Sustainable Ag Society Winter Meeting	Jan 26-28	Aberdeen	www.eacdev.com/npsas/	
Ag Fest	Feb 7	Pierre	Judge Jessop	605-280-0127
Ag Day at Washington Pavilion	Mar17-18	Sioux Falls	Judge Jessop	605-280-0127

Please remit any comments, suggestions, or topics deemed necessary for further review to: Sandy Smart, SDSU Box 2170, Brookings, SD 57007, alexander.smart@sdstate.edu, (605) 688-4017