

**Black Hills Area Botanist & Ecologist Workshop  
(BHABEW X)  
March 8, 2012**

Posters – up all day

- Sarah Burnette, Amy Symstad, Roger Gates & Wes Newton – Saltcedar in the Great Plains: Seed Ecology Considerations
- Jack Butler, Lan Xu, & Eric Boyda – Vegetation Heterogeneity within and among Prairie Dog Colonies on Northern Great Plains Grasslands
- Beth Gastineau & David Hartnett – Patterns and Processes of Invasion of the Exotic Plant *Marrubium vulgare* (Horehound) in a Mixed Grass Prairie

8:30 – 9:00      Coffee's On!

This would be a good time to peruse the posters and ask the authors questions.

9:00 – 9:10      Welcome and Introductions

9:10 – 10:30    Presentations and Discussion

- Nancy Drilling – Small Owl Migratory Banding Stations in the Black Hills (20 minutes)
- David Drons & Paul Johnson – Cute, Fuzzy and Understudied: An Inventory of Native Bees of the Black Hills (25 minutes)
- Hugh Quinn, Holly Quinn, Alessandra Higa – Overview of the South Dakota Box Turtle Ecology Project with Emphasis on Reproduction and Growth (20 minutes)
- Erica Jankovits – Exploring Variation in the Red Elderberry (*Sambucus racemosa*) Complex in the Black Hills (15 minutes)

10:30 – 10:40    Break

10:40 – 12:00    Presentations and Discussion

- Steve Rolfmeier – Gulf Coastal Disjuncts in the Nebraska Sandhills Flora: Implications for Great Plains Biogeography (30 minutes)
- Chelsea Vollmer – Black Hills National Forest Botany Program 2012 Update (10 minutes)
- Blaine Cook – Black Hills National Forest Silviculture Studies (25 minutes)
- Seth Ex & Frederick Smith – Wood Production in Structurally Complex Black Hills Ponderosa Pine Stands (15 minutes)

12:00 – 1:15     Lunch (on your own)

**Walking Tour of the Outdoor Part of the Outdoor Campus (12:30-1:15):** Matt Fridell, landscape architect for the Outdoor Campus, will give a walking tour of the campus.

1:15 – 2:35      Presentations and Discussion

- Isabel Ashton, Michael Bynum, Michael Prowatzke & Kara Paintner-Green (presenter) – Long-term Monitoring of Forest Health, Structures, and Fuels in National Park Units of the Black Hills (20 minutes)
- Chris Stover – Prescribed Fire from the Fire Manager's Perspective (20 minutes)

- Dan Swanson – Changes in Forest Community Structure and Fuel Loading Following the American Elk Prescribed Fire at Wind Cave National Park (20 minutes)
- Amy Symstad, Dan Swanson & Wes Newton – Where to Look for Invasive Plants Following Prescribed Fire in Black Hills NPS Units (20 minutes)

2:35 – 2:45      Break

2:45 – 4:10      Presentations and Discussion

- Stefanie Wacker & Jack Butler – Understory Vegetation Changes Following Logging on the Black Hills National Forest, South Dakota (20 minutes)
- Eugene Bolka – Invasives of the Black Hills (20 minutes)
- Beth Burkhart – Wind Cave Canyon Rehabilitation Project: In Search of the Elusive Desired Condition for Vegetation (20 minutes)
- Daryl Mergen – Preliminary Results of Residual Vegetation in the Northern Black Hills, South Dakota (20 minutes)
- Roger Gates – A Land Management Advisors Group (5 minutes)

4:10              Wrap-up

4:15-4:45      Post-Workshop Meeting

**Organizational Meeting for a Land Management Advisors Group:** Several agencies (including, but not limited to, NRCS, SD GF&P, US FWS, SDSU Extension, County Weed & Pest Boards and NGO's like Ducks Unlimited, Pheasants Forever, Wild Turkey Foundation, Rocky Mountain Elk Foundation) may offer technical assistance and/or financial incentives for SD landowners and operators. Advisors may or may not be aware of or informed about options available from other sources. Developing a working group to enhance communication among advisors may enhance awareness and improve delivery with an ultimate aim to improve grasslands conservation.

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## Presentation Descriptions

### Posters

Sarah Burnette (USGS NPWRC & SDSU, Rapid City, SD), Amy Symstad (USGS NPWRC, Hot Springs, SD), Roger Gates (SDSU West River Ag Center, Rapid City, SD) & Wes Newton (USGS NPWRC, Jamestown, ND) – **Saltcedar in the Great Plains: Seed ecology considerations.** A controlled greenhouse experiment examined the success of saltcedar emergence from seed in three different treatments (moisture levels, soil sterilization, and vegetation cover) while considering two seed sources and two soil types. We also monitored saltcedar seedling emergence and survival rates with respect to topsoil moisture for one growing season in two western South Dakota field sites.

Jack Butler (USFS RMRS, Rapid City, SD), Lan Xu, & Eric Boyda (SDSU, Brookings, SD) – **Vegetation heterogeneity within and among prairie dog colonies on northern Great Plains grasslands.** Prairie dog colonies contribute substantially to the biotic diversity of Northern Great Plains grassland ecosystems at a variety of spatial and temporal scales. The objective of this study was to contrast a variety of key vegetation characteristics within and among colonies on the Buffalo Gap

National Grassland in southwestern South Dakota. Seasonal and annual estimates of standing crop, plant species composition and cover, and percent bare ground were made on 13 colonies, including adjacent off-town sites, during the 2009 and 2010 growing seasons. Within colony variability was evaluated at the plot (0.25 m<sup>2</sup>) and transect (5 plots/transect) levels while among colony variability was evaluated at the transect (4 transects each for interior, edge, and off-town sample sites) and colony levels (13 colonies on 2 Ecological Sites). The amount of biomass produced at each study site and percent difference in standing crop between on- and off-colony sample areas varied considerably within and among colonies. Although mean percent bare ground was also highly variable, the amount of bare ground generally decreased from the interior of the colony through the edge to the off-colony sample sites. Outlier analysis (percent dissimilarity) was used to evaluate unusual combinations of species and species cover values within and among plots, transects, and colonies. With few exceptions, vegetation characteristics within and among sites generally demonstrated a gradient of varying strengths. Inter- and intra-site differences in vegetation attributes were likely the result of combination of interacting factors related to current and historical environmental conditions and land management activities.

Beth Gastineau & David Hartnett (Kansas State University, Manhattan, KS) – **Patterns and processes of invasion of the exotic plant *Marrubium vulgare* (horehound) in a mixed grass prairie.** The poster will highlight some of my thesis research on *Marrubium vulgare* (horehound) in Wind Cave National Park. *Marrubium vulgare* life history traits, population dynamics, and associations with vegetation and soils will be discussed.

## Talks

Nancy Drilling (Rocky Mountain Bird Observatory, Rapid City, SD) – **Small owl migratory banding stations in the Black Hills.** In fall 2011, we began a long-term project to monitor small owls that live and migrate through the Black Hills and western South Dakota. We banded 44 Northern Saw-whet Owls but did not catch any other owl species.

David Drons & Paul Johnson (SDSU, Brookings, SD) – **Cute, fuzzy and understudied: An inventory of native bees of the Black Hills.** Sampling over the past two years for the first inventory of native bees in the Black Hills region has been completed. This presentation will provide information on the importance of native bees, methods and current results.

Hugh Quinn, Holly Quinn, Alessandra Higa (Oglala Lakota College) – **Overview of the South Dakota Box Turtle Ecology Project with Emphasis on Reproduction and Growth.** The facets of the South Dakota box turtle ecology project will be discussed, with emphasis given to the reproductive biology and growth components.

Erica Jankovits (Chadron State College, Chadron, NE) – **Exploring variation in the red elderberry (*Sambucus racemosa*) complex in the Black Hills.** I will be discussing methods that will be used to investigate taxa within the *Sambucus racemosa complex* and the phylogenetic context of these taxa within the Order Dipsacales.

Steve Rolfsmeier (Chadron State College, Chadron, NE) – **Gulf Coastal disjuncts in the Nebraska Sandhills flora: Implications for Great Plains biogeography.** The recent discovery of the terrestrial carnivorous slender bladderwort (*Utricularia subulata*) suggests affinities of the Nebraska Sandhills to the disjunct coastal flora of the Great Lakes region. The presence of these species and

other southeastern plants in the northern Plains and Pacific Northwest suggest a post-Pleistocene east-west migration event which may explain some disjunct tall-grass prairie species in the Black Hills.

Chelsea Vollmer (BHNF SO, Custer, SD) – **Black Hills National Forest botany program 2012 update.** What's new in the Black Hills Botany Program? Over the last year we have helped with a re-inventory of Black Hills Montane Grasslands in SD (WY is set for FY12), confirmed a new species of Botrychium, welcomed new members to the botany cadre, and much more! This presentation will discuss the accomplishments of the last year and the projects planned for the upcoming field season.

Blaine Cook (BHNF SO, Custer, SD) – **Black Hills National Forest silviculture studies.** A brief summary of recent and on-going silvicultural studies on the Black Hills National Forest.

Seth Ex & Frederick Smith (Colorado State University) – **Wood production in structurally complex Black Hills ponderosa pine stands.** We evaluated wood production efficiency in even and multi-aged Black Hills ponderosa pine stands. Despite relatively low efficiency of small trees in multi-aged stands, there was no indication of reduced stand-level productivity relative to even-aged stands.

Isabel Ashton, Michael Bynum, Michael Prowatzke & Kara Paintner-Green (NPS NGPN, Rapid City, SD) – **Long-term monitoring of forest health, structures, and fuels in national park units of the Black Hills.** The National Park Service began a long-term monitoring effort in 2010 to better understand forest condition, exotic plant prevalence, and fire and fuel dynamics in Black Hills park units. Our data reflect forest health and structure based on varied land-use histories and dramatically different fire histories.

Chris Stover (BHNF Mystic Ranger District, Rapid City, SD) – **Prescribed fire from the fire manager's perspective.** The importance of using fire as a resource management tool in fire-adapted ecosystems such as the Black Hills to lessen the severity of future fires as well as to provide a safer environment for firefighters and the public.

Dan Swanson (NPS NGP Fire Ecology Program, Hot Springs, SD) – **Changes in forest community structure and fuel loading following the American Elk prescribed fire at Wind Cave National Park.** On October 20-21, 2010, the American Elk prescribed fire was completed at Wind Cave National Park. At , 3,450 acres, this was the largest in park history. The primary objective for the fire was to restore fire back into the project area, where fire has been excluded since the Park's creation. Additional resource objectives included reducing overstory, midstory, and seedling densities as well as dead and down fuel loading.

Amy Symstad (USGS NPWRC, Hot Springs, SD), Dan Swanson (NPS NGP Fire Ecology Program, Hot Springs, SD) & Wes Newton (USGS NPWRC, Jamestown, ND) – **Where to look for invasive plants following prescribed fire in Black Hills NPS units.** Understanding where invasive plants are most likely to occur following prescribed fire will increase the efficiency of invasive plant control in recently burned areas. We present the results of the first post-fire year of a study aiming to determine which environmental and fire behavior characteristics best predict the occurrence and abundance of target invasive species.

Stefanie Wacker (USFS RMRS and SDSU) & Jack Butler (USFS RMRS) – **Understory vegetation changes following logging on the Black Hills National Forest, South Dakota.** Understanding vegetation changes resulting from logging activities is an important part of managing public lands. Understory vegetation was measured at 8 sites across the Black Hills National Forest; 127 permanent plots were sampled at 3 spatial scales, once pre-treatment and each year for 2 and 3 years post-

treatment. Multiple response permutation procedure was used to test differences ( $\alpha=0.05$ ) between time periods at each site for species cover and species occurrence. Indicator species analysis and non-metric multi-dimensional scaling were used to elucidate differences in species composition and associated environmental gradients. At the  $1\text{m}^2$ -scale, species composition and cover differed between all time periods at only 1 site, and differed between only 1 time period at 2 other sites. Species occurrence at the  $100\text{m}^2$ -scale differed at all time periods on only 1 site, and differed between one or more time periods at 4 other sites. At the  $1000\text{m}^2$ -scale, differences between all time periods occurred at 2 sites, and differences between 1 or more time periods occurred at 4 other sites. Overall, vegetation recovered quickly and with few compositional changes.

Eugene Bolka (BHNF Mystic Ranger District, Rapid City, SD) – **Invasives of the Black Hills.** A breakdown of invasives, both land and aquatic, as well as some new invasive species to watch for that are around South Dakota in neighboring states.

Beth Burkhart (Wind Cave National Park, Hot Springs, SD) – **Wind Cave Canyon rehabilitation project: In search of the elusive desired condition for vegetation.** Wind Cave Canyon in Wind Cave NP extends about 3 miles from Elk Mountain Campground southeast to the eastern boundary of the park's new/2011 addition property. Vegetation components and dynamics are diverse but highly affected in some areas by human activity (e.g., campground, picnic ground, cave entrance, visitor center, housing area). Five different sources were consulted for insights on current and desired conditions (NRCS Ecological Site Descriptions, US National Vegetation Classification/1999 Wind Cave Vegetation Mapping Products, LANDFIRE, Dr. Dan Uresk's Ecological Classification and Monitoring, and Wind Cave NP Cultural Landscape Report 2005). The resulting information set is interesting and informative. However, the next step of developing desired conditions for the canyon (by segments) is still very challenging.

Daryl Mergen (Mergen Ecological Delineations, Inc., Colorado Springs, CO) – **Preliminary results of residual vegetation in the Northern Black Hills, South Dakota.** Results of residual vegetation remaining on meadows measured using a modified Robel pole in 2010 will be presented.