



North Central Climate Adaptation Science Center

Informing adaptive grassland management in the North Central region where winds are strong, the grazers are good-looking, and the temperature... is above average.



Prairie Climate Companion: Invasive Species

The Issue

In grassland ecosystems, herbaceous invasive species **decrease** native species **diversity**, **reduce forage** quality and quantity for animals, **alter habitat** structure, and **affect nutrient** cycling and **availability**.

Plant communities become more susceptible to invasion following disturbances, which can be directly (drought, flood) or indirectly (land-use practices) influenced by climate change. These disturbances can create a pulse of resources that herbaceous invasives are able to exploit.

Many of the most pervasive and widespread herbaceous invasive species were planted extensively as livestock forage and have only recently been recognized as threats to native grasslands. These include the species pictured to the right.



**Crested
Wheatgrass**
Agropyron cristatum (L.)
Gaertn.
Image: Russell Pfau



Yellow Bluestem
*Bothriochloa
ischaemum* (L.) Keng
Image: Billy Warrick



Smooth Brome
Bromus inermis Leyss.
Image: Ohio State
Weed Lab, The Ohio
State University,
Bugwood.org



Sweetclover
Melilotus officinalis (L.)
Lam.
Image: Wendy VanDyk
Evans, Bugwood.org



**Kentucky
Bluegrass**
Poa pratensis L.
Image: Wikimedia
Commons



Tall Fescue
*Schedonorus
arundinaceus*
(Schreb.) Dumort.
Image: James H. Miller
& Ted Bodner,
Southern Weed
Science Society,
Bugwood.org

Implications for Grasslands Management

Which species are important to watch for in the North Central region? Given their low palatability to domestic livestock and wildlife, and their ability to invade even cheatgrass-infested areas, **medusahead and ventenata are high priorities** for early detection and eradication. Working with partners to the south will help anticipate other invasive species that may move northward in a changing climate.

Maintaining **high diversity** of native species in all parts of the food web **will help to reduce invasibility** as the climate changes by occupying all available environmental niches. Unlike the more arid west, fire in North Central grasslands tends to have either neutral or negative effects on herbaceous invasive species. **Climate change effects** that reduce managers' ability to conduct prescribed fires will likely exacerbate invasions in these ecoregions.



This photo of Scotts Bluff National Monument shows the extent of cheatgrass and Japanese (field) brome invasion, which is visible as the purple and tan areas in the otherwise green vegetation. Image: Amy Symstad, USGS

Climate and carbon dioxide fertilization effects on the efficacy of chemical and biological control tools suggest that **greater stress on early detection** of new threats will be critical, as will flexibility and rapid adoption of new management strategies.

Selected Resources

[USGS Invasive Species Habitat Tool \(INHABIT\)](#) provides downloadable maps and tabular summaries of invasion risk for plant species.

[North American Invasive Species Management Association \(NAISMA\)](#) supports invasive species management professionals through trainings, outreach, and networking.

[North Central Regional Invasive Species and Climate Change \(RISCC\) Network](#) addresses invasives in a changing climate.

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Check out the
synthesis report
here!



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