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## ***Prescribed Fire for Fuel Reduction in Northern Mixed-Grass Prairie: Influence on Habitat and Populations of Indigenous Wildlife and Future Forest Flammability***

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### **Purpose of this opinion piece**

*Manager's Viewpoint* is an opinion piece written by a fire or land manager based on information in a JFSP final report and other supporting documents. This is our way of helping managers interpret science findings. If readers have differing viewpoints, we encourage further dialogue through additional opinions. Please contact Tim Swedberg to submit input ([timothy\\_swedberg@nifc.blm.gov](mailto:timothy_swedberg@nifc.blm.gov)). Our intent is to start conversations about what works and what doesn't.

### **Problem**

The northern mixed-grass prairie is a dynamic, disturbance-based ecosystem. We have learned that rest or lack of periodic disturbance of these grasslands is currently our biggest enemy on public lands. Some of our public lands, such as the U.S. Fish and Wildlife Service's Waterfowl Production Areas, have sometimes been rested for periods of 10 years or more. These rested areas usually have extensive invasions of smooth brome or Kentucky bluegrass.

Managers have known for many years that smooth brome and Kentucky bluegrass can cause prairie to quickly change from a species-diverse ecosystem to a monotypic site dominated by one or both of these introduced grasses. Reduction of fuels, especially litter, is essential to native prairie restoration and to reduce fuels in wildland-urban interfaces. Invasion by non-native woody species due to lack of fire is another area of concern to many managers.

Another obstacle to management of prairie has been a lack of science-based research on the effects of these invasives on our northern mixed-grass prairie remnants. Further, a need still exists for more study on the effects of grazing and fire frequency on indigenous species. For instance, as managers, we often see the short-term disturbance of waterfowl and other grassland nesting birds due to fire, but we know little of how long it could take for species to recover from this disturbance.

### **Application for Land Managers: The Need for Fire as a Management Tool**

This study helps managers answers many of the questions surrounding short-term and some long-term effects of fire on the cool-season dominated (needlegrass-wheatgrass) grasslands of the northern mixed-grass prairie and the migratory birds that use these areas. Such studies

are needed when management is tasked with justifying the need for fire as a management tool. Currently, some members of the public believe that fires should be suppressed due to the wildlife-urban interface. However, in actuality, more prescribed fires are needed to reduce fuel loads. Therefore, studies such as this help managers justify management decisions in habitat management plans based on science—not just casual observations.

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Few studies incorporate the effects of fire on migratory birds, especially grassland songbirds and small mammals, as comprehensively as this study. This helps managers see the short-term and long-term effects of fire on grassland-dependant birds and reduces the time needed to incorporate data from other studies. The study's finding that bird pairs and species richness returned to preburn levels 2–3 growing seasons following a burn, coupled with the finding that nest survival appears to be unaffected (and actually increased for gadwall and mallard), is an important finding that helps wildlife managers justify fire on the landscape as a management tool.

This study also provides managers with insights into how smooth brome and Kentucky bluegrass respond to management treatments. For example, the authors find that for August-September burns conducted at the J. Clark Salyer National Wildlife Refuge: "Among major introduced grass species, fire probably reduces the frequency of Kentucky bluegrass, but smooth brome may be unaffected or slightly decrease with fire." On the other hand, long-term burns conducted in spring and fall at Des Lacs Refuge showed some reduction in smooth brome.

This study also illuminates the fact that Kentucky bluegrass was the dominant invader on private lands due to season-long grazing, while smooth brome was the dominant invader on many public lands that have been subject to rest. Such findings add weight to a manager's decision to target particular units for prescribed fire versus prescribed grazing. For instance, these revelations can support burning on public lands that have a dominance of Kentucky bluegrass, and a combination of grazing and burning on units that have a dominance of smooth brome.

### **Follow-up Questions and Concerns**

While this study helps us answer some of our management questions, most wildlife managers are also interested in the effects of fire used in combination with grazing as a management treatment—particularly for smooth brome control—and the cumulative effects on native flora and fauna.

In addition, managers might find it helpful—either for duplication of the study or interpretation of the results—to know more about the application of prescribed fire. For instance, were the prescribed burns in these studies lit primarily as head fires (which move faster and leave more fuels)? Or, were they mostly lit as backing fires (which move slowly and consume more soil litter and fuels)?

### **Manager's Dilemma**

Maintaining the biological integrity, diversity, and environmental health of protected lands are fundamental concepts widely recognized as basic to modern scientific resource management, and mandated by the 1997 Refuge Improvement Act. According to Young (2007), there has

been a 40 percent increase in native prairie conversion. As the mixed-grass prairie is being converted to croplands, land managers are challenged with managing these remnant tracks of native lands that are becoming ecological islands. Few long-term studies have explored determining if native prairie can be restored to pre-European settlement. In addition, abiotic factors such as drought and global warming might also affect native prairie restoration. Due to the invasion of current native prairie, land management decisions made today can have a great impact on species survival in the future.

Tallgrass prairie remnants in Iowa and Minnesota currently are important ecological treasures for restoration of tallgrass prairie. If current conversion rates of prairie continue, it is not inconceivable for the landscape of the northern mixed-grass prairie in the Dakotas to have the same fate as the tallgrass prairie in Minnesota and Iowa.

To save our remnant prairies, we must rely on more than just casual observation. For years, many of the U.S. Fish and Wildlife Service offices have not had biologists dedicated to studying the conditions of our lands. If land managers, biologists, and researchers work together to better understand the complex relationships of biotic and abiotic factors in the prairies and make management decisions based on science, we stand a better chance at saving this national treasure for future generations.

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### **Literature Cited**

Samson, Fred B. and Fritz L. Knopf. 1996. Prairie Conservation: Preserving North America's Most Endangered Ecosystem. Island Press. 339 p.

Young, Don 2007. Native Prairie: A Disappearing National Treasure. Ducks Unlimited News. Nov. 1, 2007. <http://www.ducks.org/news/archive/2007/index.html>

### **Manager Profile**

Sandra Uecker is a Refuge Manager for the U.S. Fish and Wildlife Service at the Huron Wetland Management District in South Dakota. She currently manages an eight-county management district, comprised of 62 Waterfowl Production Areas and 268,313 acres of wetland and grassland easements. Each year, more grassland and wetland management easements are continually added to her district.



She earned her BS in Wildlife Management from Colorado State University at Fort Collins, CO. She has also been a manager at Lake Andes National Wildlife Refuge in Lake Andes, SD, Lacreek National Wildlife Refuge in Martin, SD, and the Madison Wetland Management District in Madison, SD. She is interested in the protection and appreciation of the valuable wetland and grassland resources in the Prairie Pothole Region.

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