Abstracts for Burning Issues 2 Symposium

January 13-14, 2015

# Fire and Invasive Species

## Fire and Invasive Plants

Ellen Jacquart

Fire can impact invasive plants, and invasive plants can impact fire. The specifics of those impacts depend on a lot of factors; the timing and intensity of fire, as well as the growth stage (dormant or actively growing) and the growth habit of plants (annuals and biennials, herbaceous perennials, or woody perennials). Those factors determine impacts to plants whether they are native or invasive and will be discussed using several case studies.

## Spotted Knapweed Responses to Fire: Experimental Evidence from Greenhouse and Field Studies

Neil MacDonald

The presentation will provide a brief overview of greenhouse and field research into the effects of fire on spotted knapweed in restored plant communities comprised of native grasses or containing a mixture of native forbs and grasses. In greenhouse studies, knapweed seed germination was reduced by heating for various times at 200 °C or greater. Knapweed seedling establishment also was decreased by pre-germination burning, with greater effects from post-germination burns. In field studies of native grass communities with abundant fuel, mid-spring burning quickly suppressed knapweed and favored native warm-season grasses. In field studies of more diverse restored native plant communities, however, burning effects have been more subtle, with negative effects on knapweed beginning to develop only when relative cover of native grasses increases to greater than about 50%.

## Best Management Practices for Prescribed Burning and Assisting EDRR using the MISIN

Phyllis Higman, Michigan Natural Features Inventory

This presentation will provide a brief overview of management practices intended to keep undesired invasive species out of the burn site and minimize their spread to other areas. In addition, the Midwest Invasive Species Information System (MISIN) will be introduced so that participants can learn how to report new occurrences of priority species.

# Wildlife A: Herps

## Minimizing Impacts of Prescribed Fire on Eastern Box Turtles

Alicia Ihnken, Michigan Department of Natural Resources - Parks and Recreation Division

Prescribed fire is an effective management tool frequently used to alter, maintain, and restore vegetative communities throughout Michigan. It is also a tool that can negatively impact Eastern box turtle populations. There are several natural history and behavioral conflicts that make reducing the negative effects of prescribed fire on box turtles challenging. Box turtles are slow-moving, their active season overlaps the burning season, they tend to hide in high fuel loads, and their movement patterns are variable and uncoordinated. Evaluating and utilizing the strengths and weaknesses of your site (such as water sources and available nesting areas), rotating burns between seasons, and using the longest burn interval possible (ideally 5+years) will be important in reducing the negative impacts of prescribed fire on box turtles.

## Massasaugas and prescribed fire

Matthew Cross, Doctoral candidate, Bowling Green State University

A brief review of the research on this topic: what we know and future directions.

## MISSING - SARGENT

# Wildlife B: Insects

## The effects of wildland fire on conservative insects in prairie and savanna remnant habitats

Karl Gnaedinger, Project Manager, Indian Boundary Prairies

Conservative insect species inhabit many remnant habitats that need periodic fire and could be at risk by some management burning practices. Research from 1995 - 2006 by Panzer et al. examined species composition and the distribution of species richness within fire-managed and fire-excluded reserve systems, and examined post-fire insect population response and recovery within small, isolated tallgrass prairie remnants in northern Illinois, northwest Indiana, and southeast Wisconsin. Most species (93%) were found to respond consistently to fires. Post-fire responses ranged from fire-positive (26%) to fire-negative (40%) for 151 species representing 33 families and seven orders. Among negatively impacted populations, 68% were found to recover within one year; all 163 populations tracked to recovery did so in two years or less. Fire-excluded sites did not support greater species richness, greater mean population densities, nor were large number of species absent from fire-managed sites. Insect recovery for an extreme fire event impacting an entire site shows severe burns of entire habitats may result in the loss of species. Consecutive season burning of habitats shows increased negative effects for duff-inhabiting insect species. The judicious use of rotational cool season burning is compatible with the conservation of insect biodiversity within highly fragmented systems.

## Butterflies as Barometers: A monitoring tool for land managers

Ashley Anne Wick, Biological Research Director, Kalamazoo Nature Center

Land managers/stewards often manage hundreds, if not thousands, of acres and are charged with many tasks. While many note the importance of monitoring biodiversity to see how management is progressing, monitoring dollars are often hard to come by.

Butterflies are natural ecosystem bio-indicators – they are easy to identify, charismatic, and sensitive to changes in habitat. The Michigan Butterfly Network, which is entering its fifth year, harnesses the talent, time, and motivation of citizen scientists to monitor how butterfly populations are changing in our state. After receiving training from experts, our citizen scientists visit a set census route six or more times throughout the summer. By examining long-term changes in butterfly populations, land managers can answer questions such as “How long does it take a particular butterfly species to rebound after a prescribed fire?” Our current partnerships have allowed land managers to see the response of species to restoration practices in Kalamazoo County. Land managers with whom we work can receive data, and need to do little more than offer our citizen scientists access to their properties. These monitors have a high fidelity to the preserve that they monitor and often become more involved with preserve monitoring and restoration.

Links for the Michigan, Iowa, and Illinois monitoring networks:

Michigan: www.michiganbutterfly.org

Iowa: http://www.reimangardens.com/collections/insects/iowa-butterfly-survey-network/

Illinois: http://www.bfly.org/

## MISSING - EH

# Oak Restoration

## Oak savanna restoration: an overview and state of the science

Lead speaker: Lars Brudvig, Assistant Professor of Plant Ecology at Michigan State University, Department of Plant Biology

Panel Members: Steven Woods, Oak Openings Program Manager, The Nature Conservancy, Ohio; Daniel Zay, NRCS State Biologist

Moderator: Jen Howell, Stewardship Manager, Pierce Cedar Creek Institute

Oak ecosystems, including savannas, were historically prevalent throughout southern lower Michigan, forming part of broad transition zone between Eastern deciduous forests and the Great Plains. Today, oak savannas are exceedingly rare throughout the Midwest and, where remnant savannas remain, fire suppression and resulting woody encroachment have led to dramatic alterations to these systems' structure and biodiversity. Restoration of fire suppressed oak savannas generally involves the reintroduction of fire, but questions remain regarding the necessity and impact of additional restoration techniques. This talk provides an overview of oak savannas, their threats, and restoration and then considers three main questions: 1) What are the impacts of prescribed fire and other management actions in oak savannas? 2) What leads to variability and heterogeneity in restoration outcomes? 3) What major questions remain for oak savanna restoration practitioners and researchers? To address these questions, I will draw on findings from my own research and research conducted by others, considering impacts on groundlayer vegetation, ecosystem structure, animal communities (e.g., arthropods, birds), and other system attributes.

# Fire Management

## Challenges to Implementing Prescribed Fires

Paul Charland

Lee Osterland

Chris Peterson

Ryan Koziatek

While fire is an essential process in most of our terrestrial ecosystems, applying fire safely and effectively is increasingly challenging. Challenges come from both internal and external sources, including operational, ecological and social. Fire is a specialized field and operations require a high level of training. Encroachment of people and their dwellings on wildlands provides an increasing number challenges from risk of escape, damage to values and smoke impacts. Further, fire is very visible and generates strong emotional reactions often requiring proactive mitigation. Finally, fire operations are subject to a suite of administrative and planning requirements at multiple scales which create additional demands and constraints on our fire fighters.