Working Summary for Burning Issues Symposium II January 13-14, 2015

Sections:

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1. Overview of Symposium

The ***Burning Issues Symposium*** was a day-and half symposium held at Ft. Custer Training Center, Augusta, MI on January 13-14, 2015. The intent of the symposium was to give land managers, researchers, and fire practitioners an opportunity to hear from different areas of expertise in a format to help us find solutions to issues that complicate our fire work, such as competing objectives. ("When seeking information, researchers preferred communicating via published literature, but managers and administrators reported a preference for in-person communication.")

Day One included five topic sessions, with a lead speaker and panel members for each topic session. Topics included: invasive species and fire, herpetofauna and fire, insects and fire, oak restoration with fire, and fire operations: constraints and barriers to implementation. Seventy minutes was allotted per topic session (main speaker, panel shorts, and questions = 30 minutes, 10 minutes, and 20 minutes).

Day Two was a half day of facilitated and directed breakout groups with a 15-minute-per-group wrap up session. We had three breakout groups: oak restoration and fire, invasive species and fire, and a rare species and fire; we combined those interested in insects and herpetofauna into one group to have a critical mass for discussion. We intentionally did not do a breakout group for the Fire Operations Topic, since the implementation of fire is core to each of the other topic areas.

We had an AAR with planning committee Day Two to assess and improve. A symposium summary is in development, which will be linked with PDF's of the presentations, recordings of the five topic lead presentations, and contact lists and action items specific to the breakout groups. Symposium proceedings may be published in Natural Area Journal (Notes), Ecological Restoration (Notes), or similar format.

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2. Attendees Summary

Number of Attendees Day One: 95

Different Agencies and Groups Day One:

- Bureau of Indian Affairs
- Conservation Districts (4 different Districts)
- Consultants and Contractors (5 different Consultants/Contractors)
- County Parks (1)
- Environmental Private Foundations (2 different Foundations)
- Fire Science Consortium (2 Consortia – LSFSC and TPOS)
- Land Conservancy's (4 different Land Conservancy's)
- Municipalities (1)
- Michigan Department of Natural Resources
- Michigan Department of Environmental Quality
- Michigan National Guard
- Natural Resource Conservation Services
- Nature Centers (4 different Nature Centers)
- The Stewardship Network
- Tribes and/or Bands (2 different Tribes)
- Universities and Colleges (5 different MI Universities)
- USDI Fish and Wildlife Service
- USDA Forest Service
- Zoo's (1)

Total: 19 different organizational categories, 40 different groups

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3. Evaluation Summary

95 attendees; 32 evaluations forms submitted

Prior Interaction with either TPOS or LSFSC (check all that apply)

email newsletter	10
conference	14
field event	7
webinar	1
Interaction with Consortia Management Team or Advisory Board	15
First Interaction	8

What is your affiliation? (check all that apply)

Private landowner	2
Federal	5
State	10
Consultant	2
Non-profit	7
Academia	3
Local Govt/County/Township, etc.	5

How many acres do you manage?

none listed	17
Not Applicable	2
1 - 100	1
101-500	4
501-1000	
1001-10,000	4
10,001-50,000	1
50,001-100,00	1
>100,001	2

Please tell us whether or not each of the following areas describe your involvement with fire

Involvement	**Yes**	**No**
Fire Suppression/Volunteer Fire Department	7	25
Wildlife Habitat Management	32	0
Forage/Rangeland Management	8	24
Silviculture/Timber Management	12	20
Supervision/Planning	22	10
Burn Boss	9	23
Crew Member	21	11
Outreach/Education	19	13
Volunteer	13	19
Research/Monitoring	16	16

	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	N/A
I gained knowledge today that I will use to change how I apply prescribed fire.	10	12	3	2	0	5
I gained knowledge today that I will use to alter my objectives for prescribed fire.	7	13	3	4	1	4

I gained knowledge today that I will use to change how I monitor the outcomes of prescribed fire management.	8	9	8	3	0	4
I plan to stay in touch with at least one fellow participant to exchange ideas and knowledge.	15	10	5	2	0	0
Based on this event, I will seek information from the fire science consortia in the future.	18	10	2	1	1	0
Based on this event, I am interested in co-hosting an event with the consortia and prescribed fire council.	3	6	9	2	5	7

What other topics would you like to see covered in a format like this in the future?
(Similar comments were condensed and placed under headings)

Species/Habitat/Weather/Smoke Topics:

- fire effects on other animal species (birds, bats, snakes)
- comparison of fire effects between habitat types (forested versus savanna, wetland versus upland types)
- Fire use in wetlands restoration (fens, marshes, sedge meadows, etc.)
- Monitoring
- Climate change
- Fire effects on aquatic ecosystems
- Rare plants
- Continue invasive species and fire discussion; what invasive species are fire-adapted versus not fire-adapted.
- Carbon and air pollution results from fire and smoke; compare air pollution from fires versus industry
- Old Field restoration – how can fire work to extend management into adjacent old fields. Outcomes may not be "high quality" habitat but be additive to biodiversity
- What are fire researchers doing in other parts of country (SE US, long leaf pine, seems more info available on invasive's). Use the knowledge from the South to compare/contrast with gaps in knowledge in North. Maybe invite speakers from southern fire councils, or southern researchers, do one session tract o comparison of habitats and species and fire south to north?

Fire Operations and Fire Planning Topics:

- Specific examples of how ecological objectives can be incorporated into burn plans (versus what a goal is), and then discussion of specific weather, season, ignition patterns, fire spread patterns that would accomplish these objectives. Case studies/examples
- New or innovative ignition methods
- Overview of types of burn breaks and combinations
- Wildland urban interface – burning in the urban environment versus rural

- Comparison of how practical/feasible fire operations help and hurt meeting certain objectives
- History of non-human fire frequency – how did species evolve pre-human fire
- How to manage fire but keep large down woody debris in habitat
- Discussion/training on how to support local land managers without technical expertise in how to plan and initiate fire restoration projects

Do you have additional comments or suggestions?
(Similar comments were condensed and placed under headings)

Symposium Content:

- Liked multiple speakers for each topic, and keeping on schedule
- Topics brought up new ways of thinking/awareness
- Excellent coverage of "burning issues"
- Allow speakers equal time slots; 10 minutes too short for some good information transfer
- benefited from the diversity of practical topics and knowledgeable speakers
- Great Job! Nice Format, Good Speakers!
- This was great for me a) from an environmental educator's perspective (always good to gather more information), and b) because it harkened back to college days and classes. Good Stuff!
- Before establishing a new database or places to collect knowledge, first we need to know what sources exist versus what actually needs to be created. Could the Consortia develop that comparison of the different sources of info that already exist?
- It appeared the participant list was heavy on managers and fire practitioners; we need to continue to make connections with other groups, like endangered species and other species specialists. Target these non-fire managers and specialists for next meeting; use the managers who attended BI2 to help recruit the individuals they think would benefit from attending/presenting.
- Seemed to have overlap with MPFC annual meeting; coordinate with MPFC so that the 2 meetings compliment rather than compete.
- Really liked the breakout groups Day Two
- Excellent topics (really liked integrating wildlife, and oak restoration, and fire operations. Great selection of speakers (Lars was a standout for oaks).
- Encourage any researchers who are presenting to clearly articulate any applications or "lessons learned"; avoid too much discussion of site-specific data, focus on the general lessons learned and how to apply to other sites
- Great overview for a "newbie"; presentations well organized and understandable to those with not a lot of technical expertise

Facility/Food/Directions:

- Auditorium was a little cool, but rest of facility was excellent
- Provide reminder information a day or two before event, including driving directions and map, and the extra time to pass through security
- Make sure the cost of lodging is accurate in next year's flyer and announcements

- Please have water available next meeting
- Food: too much sugar/processed carbs; how about more fruit and raw vegies

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4. Notecards Summary

Miscellaneous from Notecards:

Future Topics or General Questions:

- Potential future topics: smoke mgmt. in MI, Nat'l Weather Service, lake effect winds, air quality
- How to get unpublished data available?
- Sharing/collaborating on training:
  - Include times/dates/locations of face-to-face meetings
  - Include collection of canned PowerPoints/videos that support/replace face-to-face (this can reduce staff time spent managing/training volunteers, which is barrier to implementation)
  - Develop training videos!
  - Provide links to good online training videos and PowerPoints
- Human use of fire in N. America:
  - If humans set fire last 10,000 years, what was fire influence pre-homo sapiens? Lightning?
  - Has fire management looked at frequency of lightning strikes and fire starts in MI and Midwest? Graph it by decades?

On Rare Species:

- Discussion on refugia size; sounds like for insects in general 4 to 8 m^2 is adequate for survival and recolonization by fire sensitive species in 2 years – would like a research brief/synthesis developed that makes this info easily accessible
- Research that backs up that butterfly diversity is higher in burned areas – linked with vegetation diversity increase? Studies that show this?
- More information regarding fire effects and conservation of pollinators, and general insect reintroduction potential?

On Invasive Species:

- Best Management Practice for incorporating invasive's management into fire management:
  1. Survey invasive's prior to burn, map/make map available to fire planners
  2. Consider types and placements of firebreaks through invasive patches, or as vectors for invasion
  3. Minimize soil disturbance where possible
  4. Clean equipment before the burn offsite at a staging area
  5. Limit entry after burn (how long, what types entry, how do you then monitor post-fire effects??)

6. Monitor known locations invasive's post-burn (how do you limit entry and still monitor post-burn…contradictory practice!)
7. Make sure invasive's treatments are budgeted for along with fire and other management techniques – link the treatments and funding
8. Include invasive's issues into any fire training – awareness is first step to implementation
9. Put the invasive's map into the burn plan!

- Is there a form or forum available to do inventory on invasive's?
    1. How do we monitor progress on natives and invasive plant and animals?
    2. Can MISIN be overlaid or linked into a Manager's existing GIS layer map?

<u>Oak Savanna/Barrens Restoration:</u>

- For studies looking at burning with and without thinning [in oak savannas], how much of the increase in species richness is from native versus non-native species?
- Compare girdling/chemical basal treatment [leave standing dead] versus cutting and dropping – are we not blocking plants from growing up, and what are the different fire effects from burning more fuel from cut-and-drop versus risk of dead standing.
- What are the long-term control, benefits, and cost of using herbicide instead of fire? Would like to see a longer session on real world comparisons of cost effectiveness per acre versus increase/decrease on diversity or target species.
- More information on *Rubus* spp. And savanna restoration. What burn regimes would tend to promote *Rubus* recruitment? What can reduce recruitment?

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5. Oak Breakout Group Summary

January 14, 2015
Oak Savanna Break Out Group at the Burning Issues Symposium, Fort Custer
(Notes from Ashley Wick)

<u>Participants (22)</u>
Jack McGowan-Stinski
Susan Benson
Tina Stevens
Keith Killing
Stuart Turner
Lars Brudvig
Mark Mackay (DNR)
Nate Simons, John B., Phil B. (Blue Heron Ministries)
Dan Zay
Don Bonnette
Rob Hamilton
Steve Allen
Ashley Wick
Ryan Koziatek

Ben Wagner
Mitch Lettow
Matt Demmon
Jesse Bramer
Steve Woods
Gary Siegrist

Brainstorming Session:

How to we capsulize information to make it widely available?

Start from scratch from a fallow field vs. trying to rehabilitate a degraded savanna - are these some of the bigger issues about getting savanna back onto the landscape? (Steve Allen)

Keith K. - Yes, but maintenance is also a big deal.

Do we need to define the difference between oak openings/savanna vs oak barrens?

Looking at pre-settlement maps to make sure we are putting savanna on the landscape?

What is the end-goal of savanna restoration/management?

KNC - microbial study on reconstruction and adjacent remnant - microbial

Lars - You can restore a house to so it looks exactly the same (one approach to restoration) the other approach - restore functionality, get it working

Brief discussion of compost tea/slurry of microbial communities for restoring soil (prairies, savannas)

Mitch - Property with restoration for 15 years with a lot of people doing small restoration activities (rogue botanists planting leadplant - conservative)

Kankakee Sands (IN/IL border TNC preserve) planted 450 species inn their mix but got less than half of

What is the end point of restoration? - Matt D.

Client with 50 acres says "burn this" but t hen it's planted with pin oaks and conifers...

Koz - soil structure is an important goal... Maybe hold off on fire and

How were they formed originally? Oaks probably established (depends on species) - what is the relevant human time scale?

Long-term burning study from MN - long-term burning that will open up the canopy will also prevents oak regeneration - Must remember that fire is a disturbance and will disturb.

Historically - we had recolonization after disturbances because savannas were connected across the landscape and not island

Clients think in terms of human time scales - and fire dependent ecosystems involve human interaction. It's hard to get people to think on ecological time scale (except people who have clients like Firekeepers who are good at thinking in the long-term)

Dan Zay - Sometimes has trouble with some of the terminology that is used. For example, succession - hard to communicate with foresters. Some folk's minds - succession is linear - and it's not good. The closer you look at systems as dynamic places, succession goes out the window. Some old oak savannas have all trees that are the same age... Is that because of a lack of human intervention?

Common conversation in the DNR (problem with terms and putting them to use in the real world) - preserve oaks but 100% canopy cover... Don't want to lose bur oaks but don't' want to take out cherries and maples in the understory. Fire in conjunction with thinning. What is immature stand? Old growth? How you define it and what does it mean once you define it.

What is the best use of our time here? Do we need to define savanna/barren in order to move ahead and have a conversation?

People who work with clients / land owners want a place to look a certain way. Changes scare people. People want a tallgrass prairie to look like a tallgrass prairie, but maybe that's not always what would naturally happen. Maybe not worth defining savanna because it's going to be different everywhere.

Jesse Bramer - interested in a support group for savannas. Collaboration and communication would help everyone.

Prioritizing sites

-Which sites have the most potential for achieving goals? Restorability
-Landscape scale - then prioritize landscape connectivity.
-Small remnants may house a lot of rare species but are there population viability issues? IF so is it worth it?
-Because of higher Ag prices, looking at less natural spaces
-Focusing on core areas must be balanced with connectivity
-We can make strategic decisions on where to restore based on a landscape approach

Share with group the Oak Fire Working Group contact? If it exists. Baby Oak Emotional Support Group?

Break into two groups?

We talked a lot about diversity and heterogeneity in management regimes. It seems that a lot of the questions we are asking are at all/multiple scales... Heterogeneity is important (point keeps coming up).

Who has restored how big a parcel from scratch? Ag field to savanna... It would be good to have a checklist of HOW TO MAKE A SAVANNA (Is there a handbook) (Do we have demo sites?)

Database of all Savannas/Barrens

SWMLC is talking about developing a database of all the oak savannas that are known.

Matt M. - would be happy to help with a database of existing oak savannas.

Many people agree that this database would be very helpful.

The public needs to know what we are talking about by having reference sites to go and stand in an oak savanna to go and stand in the middle and say "Oh, this is what a savanna feels like" to garner interest, educate.

Toolbox? We need a toolbox. Resource set. BMP of oak savanna restoration

Restoration practices guidelines can be found at oaksavannas.org

We need a forum? A network. A hub.

A database could help people like Lars give answers based on custom analysis of that data. Land managers hold the key to the disturbance in these ecosystems.

End goal will always end with maintenance.

How about a short list of younger and active academics to contact. Who you gonna call?

A registry for not only the savanna locations, but of which landowners are open to host research and experimental management.

Steve Woods struggles with there being so many networks.

Increased atmospheric deposition of N makes restoration a problem. Boo!

Action Steps / Priorities

1. Database of all oak savannas/barrens (in region/Michigan/Consortium?) and landowner info/land history/demo sites
2. List of names from all the fire people
3. BMPs

4. What's the deal with oak regeneration/restoration and timber harvest (more of a problem on mesic sites)?
5. Forum/network/listserv/Facebook group
6. Prioritizing sites based on site and landscape context
7. Needs assessment for savannas?
8. Defining end-goal of restoration/management / what is success? “Restoration ethos”
9. Identify / define demo sites

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6. Rare Species Breakout Group Summary

January 14, 2015
Rare Species and Fire Break Out Group
(Notes summarized by JMS)

Participants (no list?)

Brainstorming Ideas:

- Implementing fire without incidental take of rare species
- Identify key species that may help address other species (indicator or umbrella species)
- What are the things we need to think about as we plan a fire
- Are there minimum standards that should be implemented on all fires? 1/3rd of occupied habitat, 1/5th of occupied habitat; anything more than threshold needs justification
- Develop guidelines
- Monitoring
- Decision support tools
- Questions that should be asked prior to fire decision
- Awareness of rare species issues to fire practitioners
- Communication of current research to help with fire decisions
- Provide species or group-specific information to help with fire decisions
- Collect anecdotal information (it is Science!)
- Need an outlet for communication information on other management activities (mowing, chemical, etc.) often associated with fire or in combination with fire, or as alternatives = researchers + managers interaction
- Planning for diversity when creating fire-dependent habitat for rare species and wildlife in general (not just as a remnant)
- Help on HOW to DO education most effectively (for researchers and land managers)
- Recognize implications of different choices by agencies/organizations regarding fire (“do nothing” versus other options = fight the “do nothing” culture) (fight the internal inertia, and/or the paralysis by analysis)
- Institutional knowledge transferred to other staff
- Develop a collective knowledge for both intra- and inter- institutional

Priorities:

1. **Develop Guidelines and Standards**
2. **"Monitoring" (surveys/inventory/research, etc.)**
3. **Communication between researchers, land managers, fire managers**

1. **Develop Guidelines and Standards**
   - Relationship between intensity and refugia
   - How do we get present information/knowledge to broad array of land managers (State and Feds, Conservancies, etc.)
   - Size of unit (and amount burned) versus refugia size or amount and distribution
   - Species-specific guidelines that support doing "something" (population response, sensitivity/**red flag species at risk**)
   - Dormant, summer, fall fire effects and fire frequencies (the new or current fire frequencies that are needed to sustain or maintain fire-dependent systems)
   - "Natural" fire regimes – timing, intensity and severity
   - Combination with fire surrogates – mowing, herbicide, other mechanical, other treatments/techniques
   - Firebreak development – permanent versus seasonal (mineral soil, mowed, wet, fuel model change, planting /maintaining green breaks
   - A decision tree – objectives/site values
   - Ignition patterns – ring/perimeter, strip head, dot, what are differences?

2. **"Monitoring" (surveys/inventory/research, etc.)**

   - Land managers need help developing cost-effective strategies for monitoring the effects of their management activities (specific to fire and rare species)
   - Emphasize distinction between surveying, inventory, monitoring and research

   a) Communicate the need to survey prior to implementing management = develop a process follow when developing a monitoring project
   b) Connect land managers to researchers to help with survey and monitoring needs
   c) Help identify funding for monitoring
   d) Help identify both effective and cost-effective monitoring techniques for specific species or species groups
   e) Opportunistic monitoring – i.e. post-wildfire
   f) Educating "funders" on monitoring needs
   g) Identify and connect to volunteer monitoring opportunities and training

3. **Communication between researchers, land managers, fire managers**
   - Provide guidelines to all researchers on the types of fire data to collect, record, and PUBLISH (tie to funding)
     - Connecting researchers looking for a fire-related project to land managers with projects needed or opportunities
   - Breakdown the Language barrier between wildlife researchers and fire folks

    - Easy to understand, no or minimal scientific jargon (from both researchers and fire managers)
- Consortia websites for sharing wildlife research, on-going research, sharing "research needed" lists. Central housing on Consortia website and needs to be searchable (keywords)
    - EJournal: open access, peer-reviewed, housed by Consortia; would include land manager experiences, fire experiences, fire notes, wildlife experiences, notes from the field, but keep it all short (bullet points)
    - This may exist already? Natural Areas Journal Notes – but how to make Lake States focused
    - What about www.conservation.regsitry.org?

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7. Insects Breakout Group Summary

January 14, 2015
Invasive's and Fire Break Out Group
(Notes summarized by JMS)

Participants (no list provided…?)

Topics:

1. **Prefire/postfire monitoring**
4. **Integrated other techniques with fire**
5. **Equipment cleaning/spreading of invasive's**
6. **Writing specific objectives in burn plans for invasive's**
7. **Communication and education of landowner and land manager**

1. **Prefire/postfire monitoring**
    - How do we ensure effective and realistic pre- and post-monitoring
    - Documentation that is **usable**:
        - Efficient form
        - Provide range of levels of monitoring options to measure effectiveness
    - How do WE change?
    - Use of volunteers?
    - How to fund the poor step-child of management?

2. **Integrating techniques**
    - Alternatives need to be investigated
        - Public media
    - Deliberate stimulation of seed bank for follow-up treatment
    - Education around value and limitations of fire
        - True for all techniques
    - Timing: knowledge/charts

    - What has already been collected in other techniques

3. **Equipment cleaning/spreading of invasive's**
    - Simple steps
    - Fire equipment/cleanup tools
    - Education and enforcement – outreach
    - Staging area for cleanup – consistency in cleaning
    - Realistic plan
    - Our responsibility to stop the movement of invasive's on equipment
    - Include in burn plan clean-up step
    - Fire manager's responsibility
    - Levels of risk – MI document – new
    - Hygiene within site

4. **Writing specific objectives in burn plans for invasive's**
    - plant phenology important to include
    - creating environment for natives to gain footing
    - need research on fire and invasive's
    - How do we collect our knowledge?
        - Cannot wait for research only, need manager's expertise on adaptive management
        - publicize and link
    - Be realistic about what fire can do
    - Research is missing for growing season
        - most info on dormant season

5. **Communication and education of landowner and land manager**
    - Internet format/blog/other?

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8. Speaker Abstracts

Abstracts for Burning Issues II 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.

Massasauga's 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.