

Burning Issues Workshop 2021 – Fire History Session Registrant Questions

1. **Fire Regime / Climate** - With changing climate conditions or predictions:
 - a. How does the paleorecord and/ or wetland record guide us for the future of fire-dependent ecosystems in the Great Lakes Region?
 - b. The historic fire regimes and historical record of natural fire activity were part of a certain climate condition(s). How does fire fit into our climate future?

2. **“General” Ecosystem / Frequency / Effects / Seasonality**
 - a. Prescribed fires differ from historic fire regimes and in the changes in variability or heterogeneity in terms of size, ecological intensity, ecological severity and seasons of repeated fires. To help restore and maintain Lake States fire-dependent systems - Pine, Oak, Boreal, Wetland, Prairie, etc. - based on historical info, how much should we be burning (acres /size), and at what frequency, size, seasons, and combination of intensity versus severity? (We know it differs by the mosaic of fire-dependent systems / natural communities....)
 - i. How much of the Lake States fire-dependent systems were formed by stand-replacement versus non-stand-replacement fires, or a combination?
 - ii. How important was season of fire versus frequency and intensity or severity of fire?
 - iii. Does fire history research capture low intensity surface fires – or how do we account for fires that may have left little in the way of scars or other evidence?
 - iv. To what extent do you think the long-term fire history of an area is still relevant for making management decisions today?

3. **Indigenous / Native American**
 - a. Does indigenous culture/knowledge/history come up often when describing fire history? Are indigenous researchers’ part of this research work? How do you coordinate your activities w/ cultural resource management and tribal reviews?
 - b. Could you characterize how fire frequency and seasonality shifted through time (post-glaciation until present), and how related that was to both the changes in population density and the cultural differences (both between tribes and tribal groups and Native vs. European Americans)? From the paleo & tree-ring & peatland/organic data, can you interpret what might have been the use, in frequency and seasonality, of “prescribed fire” by Indigenous peoples in the Lake States region?

Below: ALL Questions received through 02/01/2021 1730 Central Time

Fire Regime and Climate Questions:

1. Are changes being witnessed in fire activity compared to the historical record of natural fire activity due to climate changes?

2. With changing climate conditions, historic fire regimes might not be compatible with current conditions. How does fire fit into the future?
3. Over what time scales and distances do we think tree species migrated or shifted given climatic and fire-related changes?
4. What is the historic return interval for various types of forest types? Or is “return interval” even a pertinent way to talk about current forest conditions.
5. Considering changing climate predictions, what do paleorecords have to tell us about where the fire regime in the Great Lakes is potentially headed?
6. What are some good online tools or resources for understanding historic fire regimes and return intervals in the Great Lakes region (MN)?
7. How well does LANDFIRE Remap BpS data represent historical fire regimes for your areas of interest? What could be improved?

“General” Ecosystem Questions:

8. What are the repercussions of not being able to implement fire in the region? Conversely, what are the implications of only being able to implement fire on small portions of the landscape or implementing fire infrequently enough that its long term effects are marginalized?
9. How extensive is the fire history record in our grasslands (number and distribution of sites)? What indicators are used to determine fire history? How fine is the resolution (fire frequency at a given site)?
10. What are the current priority fire history science needs in the Mixed Laurentian and Great Lakes islands systems?
11. A lot of us have been taught that pre-logging era, northern MI was historically one expansive old growth white pine forest. There's this myth that a squirrel could cross from Lake Michigan to Lake Huron without ever touching the ground. How accurate is the idea that everything was old growth white pine, given what we know about the historical fire record and white pine's intolerance for fire (at least when it's young)?
12. What were the likely ignition sources for historic fires -- lightning or native American? Lightning starts are rare today, and it took a while for Native Americans to colonize interior Northern MI (other than the main river corridors), so how were the fires getting started?

13. I don't have a specific question but this is a topic I have always wanted to know more about. I'm interested in typical fire size and pattern in southern Michigan in the pre-settlement era. I am also interested in how fire post settlement influenced the landscape we have today. would also like to hear what is known about causes of fire starts (lightning, native americans, etc.) as well as typical seasonality and frequency by natural community.
14. How can fire history best inform efforts moving forward.
15. Has Michigan seen large fires in its history or have they mostly been relatively small?
16. To what extent do you think the long-term fire history of an area is still relevant for making management decisions today? For example, when should woodlands that are quite a ways down the mesophication pathway, with red maples and other sensitive species occupying significant portions of the canopy and understory, just be allowed to continue down that pathway versus heavy handed measures to "restore" habitat that used to exist in that area?
17. Is there any fire history near Door County?
18. What do we know about the time of year and frequency of fires before and at the time of European settlement?
19. Were most fires in the Midwest set by humans, rather than caused by lightening?
20. Is there any evidence for lightening caused fires?

Frequency and Effects and Seasonality Questions:

21. Do you feel newer fires are more severe than fires of the past? I am asking about ecological severity (Severity measured by ecological damage and intensity, rather than loss of life or property).
22. Do modern oak forests in the Great Lakes lack a historical antecedent? That is, how common were closed-canopy forests dominated by oaks regionally?
23. To help maintain the Pine/Oak forest roughly how many acres per year should we be burning?
24. How frequent were most fires in our region? And in what season?
25. Prescribed fires might differ from historic fire regimes in terms of size, intensity, and timing; what are some methods to use in conjunction with prescribed fire to replicate the ecological impact of historic fire regimes more closely?

26. Fire history is often portrayed as changes in mean fire frequency or mean fire return interval across space or time. However, many systems arise from changes in variability or heterogeneity of fire frequency (e.g., oaks establish between periods of frequent fire). Are you aware of research into historical fire variance or heterogeneity (in space or in time)?
 27. Do we have any tree ring data for Michigan as far as fire frequency? I have seen some out of Illinois and Missouri.
 28. Frequency of large landscape, stand replacing fires?
 29. How does fire history studies capture low intensity fires in which tree char did not occur?
 30. How did timing play a role in the result of fire effectiveness in improving habitat? It seems that a natural fire is one in late summer at a very dry time, most prescribed fires in Michigan are done in the spring with more moisture and less fuel.
 31. Do the data suggest which season(s) fires were most common?
 32. I have been asked by former Indiana Div. of Nature Preserves regional ecologist to discover research about growing season fires in our region (pre-settlement history of) and their effects on the ecosystem (plants and animals). He believes we need more scientific proof (documented research) that these are indeed good management strategies before we promote growing season fires.
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Indigenous / Native American questions:

33. Does indigenous culture/knowledge/history come up often when describing the fire history? Are there lessons and guidance that are relevant now and looking to the future, that might be incorporated in a respectful, meaningful way?
34. How do you coordinate your activities w/ cultural resource management and tribal reviews? What are some of the more common CR/tribal issues/concerns that you encounter?
35. What can you tell us about the use of prescribed fire by native Americans in Michigan and the great lakes region?
36. How often and widespread did natives burn in northern lower peninsula?
37. What do we know about indigenous seasonality of fire?
38. Could you characterize how fire frequency shifted through time (post-glaciation until present), and how related that was to both the population density and the cultural differences (both between tribes and tribal groups and Native vs. European Americans)?

39. Are indigenous researchers' part of this this work? If not, why?

Wetland Fire History Questions:

40. What is the history of wetland fires in Michigan and the Great Lakes?

41. Were fires in peatlands associated with drought years?

42. How do you have a way of knowing if a fire has made its way underground?

Tangential fire "history" questions - Human impacts, NON-Fire Scar History questions, or "other" questions:

43. Effects of Peshtigo Fire and Great Chicago Fire October 1871

44. How can military installations collaborate with local tribes and/or universities to tap into traditional ecological knowledge in the areas of prescribed fire and forest/plant ecology? Are there any examples of this? How can military installations enter into fire agreements (MOU or MOA) with tribes?

45. What information do we have about burning by Native Americans... direct or indirect? Any information on the First Nation uses of fire on Walpole Island?

46. I have always wondered what was used as a "firing devise" by indigenous peoples of the great lakes, or how fire was carried over longer distances.

47. How can we increase our understanding of indigenous peoples' prescribed fire practices? How can we use what is known to refine what we are doing?

48. Are there many fires conducted with tribal lands in particular? What about in the UP?

49. Have we done a good enough job of engaging tribes with our fire work, or reached out to modern tribes regarding traditional ecological knowledge related to fire?

50. Are burns bad for the environment?

1) I've been told that a prairie sequesters more CO₂ than an equivalent sized mature hardwood forest. Three questions:

2) Is that true?

3) Percentage wise, how much of the CO₂ is sequestered underground and how much is above ground?

4) How much of the above ground CO₂ is released during a burn?

51. How did the history of logging in the region effect fire?

52. Boundary waters and Quetico have a significant fire history - what is happening with fire occurrence in that area as it seems to be minimal fire occurrence? (maybe I am out on my geography).
53. Does Michigan have a fire fuel mitigation process in place to protect at-risk communities?
54. How has prescribed burning been viewed, in general in this area? By the public or regulating agencies? (I am coming from 20 years in California where it was exceedingly difficult to get any done)
55. What do you feel are the most significant impacts or changes to the Great Lakes ecosystem that aggressive wildland fire suppression has had over the past 80 years or so?
56. How has fire suppression impacted native plant communities and wildlife?
57. How do we increase the public's awareness of fire history and frequency in the region, ultimately leading to more fire acceptance?
58. How do we increase prescribed fire in the boreal forest by agencies and private landowners? How can we promote the use of "good fire" in this region and increase the public's willingness to accept fire?
59. Details of recent historical locations of highly destructive wildfires (and ignition source) in SW MI? Same question for SE MI? How many acres (and what) burned in these fires?
60. Fire shaped Michigan's forest communities..... How/where is fire actively being used to create old-growth community structure today?