



# Bringing Back the Fire: Pioneering new approaches to using prescriptive fires to restore Ohio's native landscapes.

## Impact Statement 2019

### INVESTIGATORS

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### SUMMARY

Ohio's native oak-hickory forests, prairies and peatland depend on fire to maintain their health and presence on the landscape. The absence of fire has led to the near disappearance of many of these ecosystems. SENR faculty are working to better understand how fire can be used as part of broader ecosystem management and restoration programs. While fire enhances biodiversity and reduces invasive species, use of fire will require addressing public perceptions about the risks and benefits of fire.

### SITUATION

Prior to European settlement, forests, prairies and peatlands occupied over 28 million acres in Ohio. Land development and historical fire suppression have diminished these ecosystems by 71%, 90% and 98%, respectively. These ecosystem losses have had negative effects on forest industries and wildlife. The lack of fire and associated encroachment of non-native plants continue to threaten these valuable ecosystems. While the managed use of fire can contribute to restoration, understanding fire behavior and the risks prescribed fire poses to human communities is critical. Despite these risks, residents have indicated cautious acceptance of prescribed fire when they understand the rationale for its use and know that it will be implemented safely and effectively. Fire managers have many decision support tools available to help them balance risks and benefits of fire. The information these tools provide can help guide tactical decisions such as the placement of particular fire resources.



## RESPONSE

SENR faculty are leaders in research and innovation, combining expertise in ecology and human dimensions to determine how fire can be used to protect and restore Ohio's native ecosystems, focusing on how:

- (a) prescribed burning can be used as an ecosystem restoration tool in grasslands and forests
- (b) variation in fire regimes influences the structure and function of prairie and oak forest ecosystems
- (c) fire shapes the balance between invasive and native species
- (d) artificial intelligence can provide fire managers with real-time fire behavior data

In examining the human response, SENR faculty are:

- (a) developing effective public programs and strategies for fire preparedness on private property
- (b) studying factors that shape community wildfire protection planning processes and management decision-making, and the dynamics of incident management teams that affect decision-making
- (c) examining how and when decision support tools are used by fire managers



## IMPACT

Our work has provided state resource managers **vital information** to guide their use of prescribed fire to restore oak-hickory, prairie and peatland ecosystems. We have also included expanded information about the use of fire in our courses, where the **next generation** of resource managers received information and certification that meet Federal ICS-100, S-110, S-130 and S-190 requirements for wildland firefighter (red card) certification. Students who completed our program have taken seasonal and permanent positions in fire crews and are regularly employed by organizations that use prescribed fire as part of their ecosystem management. Our collaborations with the College of Engineering have also produced a mission planning platform that uses drones for **monitoring** and **predicting** fire behavior in real-time. SENR faculty have also provided **critical leadership** and guidance to the Lake States Fire Science Consortium, which coordinates fire planning efforts in the region, by producing factsheets, courses for academic credit, workshops, and field tours and hosted a webinar series. Our research on trade-offs among management objectives in fire-prone forests **discovered opportunities** to increase the scale and effectiveness of prescribed fire. Our research has led to **recommendations** to facilitate the use of risk-based decision support tools by assessing their reliability under climate change and encouraging familiarity and trust between members of the incident management team.

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## CONTACT

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