Fire Ecology Chats: A Podcast Series by the Association for Fire Ecology

Transcript of Episode 1 - Prescribed fire science: the case for a refined research agenda

Bob Keane: Hello everyone, my name is Bob Keane and I am the host of the Fire Ecology Chats and also the editor of Fire Ecology. What we are doing is creating a podcast so that people will come and read some of the valuable articles that we have in Fire Ecology. Today we have noted fire scientist Morgan Varner talking about a paper, an opinion piece, that we just had and a synthesis of very important science. The name of the paper is *Prescribed fire science: the case for a refined research agenda*. Hello, Morgan.

Morgan Varner: Hey, Bob.

Bob Keane: Could you tell us who you are and your role in this particular paper please?

Morgan Varner: I'm the Director of Fire Research and a Senior Scientist at Tall Timbers Research Station in Tallahassee, Florida. Before that, I was a Research Scientist with the Pacific Northwest Research Station with the Forest Service and a professor for 12 years before that.

I'm a co-author on this paper along with a long list of scientists from Forest Service R&D, from a number of universities and land management agencies. The authors are all part of a group of scientists and managers that are called the Prescribed Fire Science Consortium, and they're folks who were generally upset with where the state of science prescribed fire was and is, and we're committed to moving it forward.

Bob Keane: Were there specific objectives or goals for writing this paper?

Morgan Varner: A few of us were involved in a strategic planning session for Tall Timbers, ironically. It was when I was a professor and others were in different jobs. We all came together to serve on a strategic planning workshop. What we noticed, as we were trying to describe what Tall Timbers was, what their science was, that there was something that was undescribed in the literature and really not appreciated in science and that was the science of prescribed fire or prescribed fire science.

For each of us, I think each author would have a different story. For me, as a professor for 12 years, I would introduce and teach the innards of fire behavior models, fire effects models, how we think about meteorology and plume movement, smoke modeling. And my students would always figure out that what they what we were learning, what I was teaching them, was applicable to wildfires, but really didn't apply very well in a prescribed fire context. And there's only so many times that you can nod and say yes, let's just move on, that's a good point. And so that was what really drove me to be more involved in it, was trying to get to better decision support tools and really to appreciate and understand the science of prescribed fire.

Bob Keane: Great. Why don't you give us the elevator speech on just exactly what in this paper that people would want to read?

Morgan Varner: As a little bit of background, before we jumped into it, we wanted to make the case that it's understudied, rather than 18 people thinking that no one listens to us. We did a review of Fire Ecology and

the International Journal of Wildland Fire for a little bit more than a decade, and we found that the majority of the papers were not on prescribed fire. They were indeed on wildfire, in spite of wildfire covering more acres annually than wildfire typically does, despite the fact that managers have to make planning decisions and decisions on the fly related to prescribed fire application. The funding agencies also follow that same pattern—the Joint Fire Science Program, and others overwhelmingly fund wildfire related projects. It wasn't just our feeling of inadequacy; it was true in the literature and true in funding decisions.

What we did was we broke down the different ways that prescribed fire differs from wildfire from a science standpoint, focusing on fire behavior, that maybe is the most graphic difference. Wildfires are modeled and studied based on point ignition or single line ignitions, often with backfiring operations that take place. But prescribed fires always have really complex ignition patterns, whether they're dots sprinkled across the landscape in a series or they're lines that are meant to converge. Those differences in ignition patterns are really difficult to model in the traditional models. It really calls for a concerted effort to get to complex ignition patterns and how that affects fire behavior. From that, similarly on smoke and emissions, prescribed fire is igniting, almost always, with some sort of smoke management, whether it's rudimentary or somewhat complex, in that you're trying to evacuate smoke, keep smoke away from neighboring communities, etc. But the models that we use are much more coarse, and they're built for you know, where will smoke be tomorrow in a wildfire rather than where will it be at 1:30 when our ignitions are all a go.

We also address the topic of fire effects. The journal and most of the authors are focused on fire ecology, and so fire effects is our central area. And many of us have been frustrated for a while that fire effects research tends to be at a really coarse scale, whether it's looking at fire severity with Landsat pixels or describing large burned areas in coarse categories of severity. When the questions that we have, whether it's tree survival that a few of the scientists and I are interested in, we're interested in why individual trees die and not a percentage of trees that die across the landscape. It highlights the disconnect between these scales that we think about when we investigate with wildfires versus prescribed fires. We also discuss a little bit about the fuels in the same sort of way. Fuels that are really small scale matter for a prescribed fire, whereas wildfires tend to be described in fuel models or other coarse aggregations of fuels. We lose a lot of the complexity in our ability to model small scale phenomena.

Lastly, we address the issues related to the social science of prescribed fire science. I think this is this can be summed up in, prescribed fire is fundamentally asking society permission, and wildfires and how society interacts is really asking for forgiveness. It's already an act that's occurred, in a lot of ways it's an act of God. Whereas prescribed fire, you're definitely asking permission and you're in a long-term relationship with those local communities. It's a much different dynamic that deserves specific attention, that's not just hapless wildland fire interact with society.

Bob Keane: Very good. I see in the paper you also cover the topic have managed wildfires or wildfires managed for resource benefits. How are those different from prescribed fires and wildfires?

Morgan Varner: I presented at Fire Congress a few years ago and an unintended meaning that some people took from the from the talk was that this was we were trying to pit ourselves against wildfire. So, you know, prescribed fire never gets any love, and they thought we were trying to say that wildfire didn't matter. What we were trying to say was that that prescribed fire mattered also and in thinking about the potential discoveries and the increased emphasis on prescribed fire science, there are a lot of ways that the study of wildfires benefit. The most clear connection between those somewhat disparate fields is managing wildfires, that have been called in the past prescribed natural fire and all the other names that have been given to

them. They are interventions clearly with diverse ignition patterns, where fire effects are often primary, where if the fire is doing ecological good, it affects other subsequent decisions. We see that as a really neat bridge between science developed for wildfire, science developed for prescribed fire. There's a really cool nexus between those two and that nexus is managed wildfires.

Bob Keane: Great, let's do the closing comments here. Can you give us a soundbite, the take home message from this paper?

Morgan Varner: The take home is, in some ways we took the charge that the editors gave us to be bold, and I think what the central idea of a forum article is to stimulate conversation and thought. And we proposed, in some ways, we proposed a new branch of science. In reality, this is this kind of science has been going on for a long time and this gives it a home. I think we also lay out a nice research agenda. It's not exhaustive, but I think it shows that there are a lot of avenues that deserve a lot of research attention and maybe this provides the scaffolding for that sort of work to move forward in a thoughtful way rather than in a somewhat haphazard way. It's nice to put a name, put a moniker, on something because it gives the scaffolding for how we do our work, where it fits in. It's nice to know where your work fits in and who it matters to, and I think putting a name on it with a research agenda like we put forth, will really help prescribed fire science to move forward.

Bob Keane: And your funding agencies? Where there funds used to publish this?

Morgan Varner: The Prescribed Fire Science Consortium really was responsible for the bulk of it; it was really just getting scientists together and we've done that over four or five large prescribed fire events across the country--Montana, Utah, Georgia, and Florida. That's been funded by the Joint Fire Science Program and the National Fire Plan. And a lot of it has been funded by individual R&D branches and universities who know that this is an exciting new frontier and they're willing to invest in moving this forward.

Bob Keane: Well, thank you very much, Morgan. We really appreciate you coming in and having this podcast. I'd like to thank you and the other 19 authors for a wonderful paper. It is very important. I encourage people to read it. Thank you again, Morgan.

Morgan Varner: Thanks, Bob.