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

Transcript of Episode 3 – Whitebark Pine Encroachment

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Link to Full Article in Fire Ecology: https://fireecology.springeropen.com/articles/10.1186/s42408-019-0057-5

Bob Keane: Hello, my name is Bob Keane and I am the editor of the AFE journal, *Fire Ecology*, and the host of this Fire Ecology Chat. Today, we are very delighted to have an important speaker with us, a senior author that just published a major paper in Fire Ecology, Sarah Flanary. Sarah, you want to tell us about yourself?

Sarah Flanary: Yes, hello. Hi, Bob. Thank you for having me. My name is Sarah Flanary and I am a forester at the Rocky Mountain Research Station, Fire Science Laboratory in Missoula, Montana. I've been working at the lab since 2010, doing a multitude of studies predominantly on whitebark pine, but some fuel and fire ecology studies as well. And I finished my Master's in Forestry at the University of Montana, in Missoula here as well. And I'm currently working towards a little bit more of the tech side of things with some 3D fire modeling projects that we have.

Bob Keane: Great. Everyone, Sarah's paper is called "Whitebark pine encroachment into lower-elevation sagebrush grasslands in southwest Montana, USA." It is a Field Note that was submitted and very well received. As you know, Sarah, whitebark pine is my passion and my drive and my muse, so can you tell us why a person should read this paper?

Sarah Flanary: I can tell you that. So whitebark pine, as everybody is probably aware of, is having severe decrease in its healthy populations. A lot of work has gone into modeling for the future viability of it and where we can expect it. And a lot of models talk about, oh whitebark pine because of changing climate might be pushed to higher elevations with the continuation of cold temperatures and moisture. And that's kind of what we were expecting to see. But this paper actually goes against that and it talks about and records encroachment, so in these areas that we're actually seeing whitebark pine growing lower in elevation and going into these formerly and current sagebrush grasslands.

Bob Keane: It's very fascinating that the sagebrush grasslands actually have less precip and higher temperatures, and yet they are actually encroaching into these. What do you think the drivers are for the whitebark pine actually getting into the sagebrush grasslands.

Sarah Flanary: You know, it's a really interesting thing because it doesn't, you know, no where really in much of the literature have we identified sagebrush grasslands as an area in which we would expect whitebark pine to flourish frankly. And you know, normally we think about areas that whitebark pine would go, it's got that mutualistic relationship with the Clark's nutcracker and it usually comes in quite quickly after burns. But sagebrush especially in the southwest Montana area used to have a much shorter fire interval than it has. But

because people have kind of affected that interval we have, there has been a decline of fire on the landscape there, which might have opened up an area that we didn't really think about before as potential.

Bob Keane: So you're saying it's a fire suppression gradient and that the whitebark pine are actually there now because of the lack of fire due to the fire suppression era. Is that correct?

Sarah Flanary: That is a thought. That's what we're thinking though is like maybe you know, because of the changing fire regimes that is potential for it to have gone downward in elevation. But at the same time, we saw like absolutely no seedlings and saplings were measured above these mature stands that we were looking at. So the areas that we would think they would be encroaching in which more of the subalpine fir, England spruce fir, high elevation sites had no signs of it at all.

Bob Keane: So that is odd, right? Is that the climate change conventional thought would be that whitebark pine will go up in elevation, but yet you're finding it down. Very interesting. I also read where it looks like these whitebark are flourishing and actually producing a lot of cones.

Sarah Flanary: They are. We actually, during the methods we did some just field coring and looking at the ages of these seedlings and saplings that we were seeing below the true stands, and we were seeing trees that were field dated to about 35 years having cones, which is great.

Bob Keane: Yeah, very often, you'd never see that in a mature stand in it's normal elevation. Very good, that's incredible. How many sites did you sample Sarah?

Sarah Flanary: You know, we only got three for this study. It was more of an opportunistic style. We kind of spent one summer driving around and checking sites out. But they were all pretty good, you know, pretty similar sites. They did have different aspects, but they all had that nice clean gradient where we could test above and below, as well as a really healthy whitebark pine population in the middle.

Bob Keane: Sarah, would you like to acknowledge any funding agency or any people that contributed to the study?

Sarah Flanary: I would, absolutely. So this study was funded and we worked alongside the Bureau of Land Management BLM office out of Dillon, Montana, particularly Emily Guiberson. As well we had access through some of the private lands from Hansen Livestock, which we greatly appreciate that. It much shortened the hiking that we would have to do.

Bob Keane: Okay, thank you. Well, I surely appreciate your time. If people want to hear about whitebark, the Clark's nutcracker, and its encroachment into sagebrush grasslands, please come and read the paper by Sarah in Fire Ecology. It's the only place that you will find it. Thank you very much, Sarah, appreciate your time.

Sarah Flanary: Thank you very much, Bob.