Northwest Scientific Association 88th Annual Meeting

Plenary Session – "Mixed Severity Fire and the Effects on Biodiversity"

Thursday morning, March 30, 2017

MIXED SEVERITY ≠ MIXED SEVERITY ≠ MIXED SEVERITY. Carl Skinner, Pacific Southwest Field Station, Redding, CA; *rxfuego@gmail.com*

Mixed-conifer forests of the west are often described as being characterized by complex, mixed-severity fire regimes. This is due to most fires in the general type ending up neither completely low-intensity, surface-fires or stand-replacement, crown-fires. However, by itself, this label (mixed-severity) is essentially meaningless unless accompanied by descriptors (e.g., patch scales, proportions of severity levels, etc.) as by itself it is simply stating that burned areas lie somewhere on the gradient between being mostly dead and mostly alive following fire. Where on that gradient the landscape ends up is important. Forest types characterized by mixed-severity can be classified according to their more typical proportions of high to low severity patches, which increases from relatively dry to relatively mesic site conditions. For example, in the Klamath Mountains bioregion, though fires were largely quite heterogeneous, the central tendency of fire effects was for them to generally fall on the end of the gradient with mostly low-moderate-severity surface fires due to the long, dry summers coupled with variation influenced by topography resulting in a complex mosaic of fire effects. Geography (place) matters in terms of how influences such as climate and topography tend to affect the nature of mixed-severity fires.

INTEGRATING PYRODIVERSITY AND FIRE MANAGEMENT: WHAT HAPPENED TO BIODIVERSITY? Dominick A. DellaSala, Geos Institute, 84 - 4th St., Ashland, OR 97520; *dominick@geosinstitute.org*

Existing fire policy encourages maintenance of ecosystem integrity in fire management decisions, yet this is difficult to achieve on public lands managed for competing interests and for traditional fire management approaches that lack biodiversity perspectives. I discuss fire management for biodiversity in the Klamath and Sierra ecoregions, among the most biodiverse conifer forests in the world. I show how coarse-filter (landscape-level) and complementary fine-filter (species-level) approaches can be used to integrate forest management with conservation biology perspectives. At the coarse-filter level, mixed-severity fires create pyrodiversity associated with high levels of biodiversity that can be maintained in reserve networks. At the fine-filter level, focal species and species of conservation concern can be used to monitor efficacy of coarse filters and provide for species viability. Black-backed Woodpecker is an ideal focal species for monitoring ecological integrity of forests restored through mixed-severity fire, and California Spotted Owl, a species of conservation concern that uses post-fire mosaics, is particularly vulnerable to logging. I present a comprehensive approach for integrating wildland fire use for ecosystem integrity and biodiversity with strategic deployment of fire suppression and ecologically based restoration. The approach seeks to achieve broader recognition of fire-mediated biodiversity in fire management decisions.

BEYOND PATCH-SIZE DISTRIBUTIONS: AN EMERGENT PROPERTY OF MIXED-SEVERITY FIRE REGIMES. Christopher J. Dunn, 280 Peavy Hall, Oregon State University, Corvallis, OR 97331; *chris.dunn@oregonstate.edu*

Much of our scientific investigation surrounding mixed-severity fire regimes focus on patch-size distributions or proportions of burned area by severity class. Landscape patch-dynamics are but one of a multitude of ecological attributes influenced by fire, such that our focus on this attribute could be missing emergent properties associated with mixed-severity fire effects. In addition, dry-forest ecosystems have received the greatest attention for characterizing these fire regimes. Typically, these forests use dendroecology to infer disturbance processes from fire scars and age structure and composition because they missed one or more fire cycles. These methodologies prevent direct observation of fire effects on forest structure and the resultant ecosystem response. Fortunately, there are opportunities to investigate mixed-severity fire in the more mesic Douglas-fir/western hemlock (Douglas-fir) forests of the Pacific Northwest. We leveraged fires that burned 10 and 22 years prior to sampling in mature/old-growth Douglas-fir forests to quantify mixed-severity fire effects and the subsequent ecosystem response in forests burning within their historical fire return intervals. Here I present fire effects to these forests from the individual tree to the landscape, and report the discovery of an emergent property of moderate-severity fire that can lead to long-term forest resilience. Since most forests burn with mixed-severity at some spatial or temporal scale, I contend we must begin to look for emergent properties unique to the central tendency of burn severity at a specific fireshed or geographic location before characterizing it as having a particular fire regime.

RESTORING MIXED-SEVERITY FIRE-PRONE LANDSCAPES. John D. Bailey, OSU College of Forestry, Corvallis, OR, 97331; *john.bailey@oregonstate.edu*

Wildfire spatial extent and associated fire intensity has become unprecedented recently in the PNW, as with much of the inland West, and is likely to continue or worsen into the near future with projected climate change. Larger fires with higher percentages of stand-replacement are clearly linked to issues around: 1) fuel abundance and continuity in less-managed landscapes; 2) longer fire seasons and more extreme fire weather; and 3) how these interact to reduce the likelihood of early suppression and containment. Growing interests in fuel treatments, and in the context of active management and collaboration across ownerships, continues to be met by misguided preservation notions/actions that perpetuate the problem – preservation of high-biomass multi-story older forests for recreational and wildlife habitat, which also is good habitat for wildfire; preservation of high-biomass riparian buffers, which serve as fuel-rich conduits for wildfire; preservation of undisturbed scenic vistas, which burn as uniformly as they look; and finally reflex suppression, which preserves a fuel-rich landscape until conditions are such that suppress is impossible. All the while more humans move out and into the wildlands. This is a pathologic cycle that must be broken by thoughtful, active restoration combined with a more realistic understanding of and relationship with mixed-severity fire. Restoration of some semblance of historic structure and composition is only part of the solution; over time and space, we also must restore fire as a keystone ecological process to truly restore and maintain fire-prone landscapes. This approach translates into vastly larger areas tied to broad, active land management and inevitable wildfires. Indeed, large "box-and-burn" (PODs) approaches that blend prescribed fire and restoration of resilient landscapes with altered suppression strategies may be the only way to break out of the current pathology.