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# Re-examining pre-management era fire severity relations: inferences from landscape patterns of forest structure

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Across three biogeoclimatic zones in eastern Washington State, USA containing mixed conifer forests, we randomly selected 10% of the subwatersheds, delineated patch boundaries, and photo-interpreted the vegetation attributes of every patch using the oldest available stereo aerial photography. We statistically reconstructed the vegetation of all patches showing evidence of early selective harvesting, and then classified them as to their most recent fire severity. Classification used published percent canopy mortality definitions and a dichotomized procedure that considered the overstory and understory canopy cover and size class attributes of a patch, and the fire tolerance of its cover type. Mixed severity fires were most prevalent in patches, regardless of forest type. The structure of mixed conifer patches, in particular, was formed by a mix of disturbance severities. In moist mixed conifer patches, stand replacement effects were more widespread than surface fire effects, while in dry mixed conifer, surface fire effects were more widespread by nearly 2:1. Evidence for the primary influence of low severity fires or of abundant old park-like patches was lacking in both the dry and moist mixed conifer forests. The relatively low abundance of old, park-like or similar forest patches, high abundance of young and intermediate-aged patches, and widespread evidence of partial stand and stand-replacing fire suggested that variable fire severity and non-equilibrium patch dynamics were primarily at work.