18,000. Results suggest that model predictions of post-fire carbon accumulation are highly influenced by mortality and regeneration rates.
Keywords: Carbon, Wildfire, Disturbance, Sensitivity

286. Variability and persistence of post-fire biological legacies in jack pine-dominated ecosystems of northern Lower Michigan
Authors: Kashian, Daniel Kashian, Wayne State University; R. Gregory Corace, US Fish & Wildlife Service; Lindsey Shartell, Michgan Technological University; Deahn Donner, US Forest Service; Philip Huber, US Forest Service
Offered Presentations: Disturbance 3 - Wednesday (2011-04-06): 13:40 - 14:00 - Broadway 4
Abstract: Stand-replacing wildfires have historically shaped the forest structure of dry, sandy jack pine-dominated ecosystems at stand and landscape scales in northern Lower Michigan. Unique fire behavior during large wildfire events often preserves long strips of unburned trees arranged perpendicular to the direction of fire spread. These biological legacies create heterogeneity across the burned and otherwise homogenous landscape, providing diversity of forest structure, stand age, and wildlife habitat. Emulating this heterogeneity is therefore an important aspect for forest managers aiming to mimic natural disturbances on these landscapes. However, little information exists on the size, shape, proportion, or other aspects of landscape structure as it pertains to biological legacies, nor on their persistence over time, in a way that managers can emulate their natural occurrence. We examined the occurrence of biological legacies following stand-replacing wildfires in jack pine-dominated ecosystems of northern Lower Michigan using a chronosequence of aerial imagery for northern Lower Michigan over the last 50 years. Fire perimeters and the biological legacies that occurred following wildfire were digitized into a geographic information system and analyzed with landscape metrics. Preliminary analysis suggests that biological legacies have considerable variability in initial shape and size, likely due to the initial stand conditions, fuel loading, and fire behavior, and the longevity of these legacies differed considerably over our sampled sites. Forest management actions (primarily artificial regeneration of jack pine) following wildfire have generally been detrimental to the long-term maintenance of biological legacies.
Keywords: Jack pine, Biological legacies, Wildfire, Michigan

287. Spatial optimization of fuel management activities for dry forest restoration
Authors: Ager, Alan Ager, US Forest Service; Nicole Vaillant, US Forest Service; Mark Finney,
Offered Presentations: Disturbance 3 - Wednesday (2011-04-06): 14:00 - 14:20 - Broadway 4
Abstract: Dry forest restoration is a management priority for the U.S. Forest Service, especially in the interior west where decades of fire suppression efforts have resulted in an increased frequency of uncharacteristic wildfires. Designing restoration projects on dry forest landscapes is a complex problem, and spatial planning models are often used to prioritize and optimize investments in management activities. For instance, treatment locations can be optimized by identifying regular patterns of treatments that result in the greatest reduction in landscape fire spread rate per area treated. Algorithms to perform this type optimization have been incorporated into wildfire behavior programs (FlamMap). In this work, we developed a spatial optimization process tailored to dry forest restoration, where the long term goal is to create large landscapes where natural and planned ignitions that can be managed to sustain fire resilient forests. Here, the optimization problem is to create large â€œfire readyâ€ patches within which fire behavior does not exceed thresholds that either result in loss of ecological value (large trees), or trigger fire suppression, while minimizing the area treated, and maximizing the value of the resources within the patch. We present the results of this optimization approach on a 245,000 ha area within the Deschutes National Forest. The work expands the application of spatial optimization in fuel treatment planning to the problem of dry forest restoration.
Keywords: Spatial optimization, Forest restoration, Wildfire risk

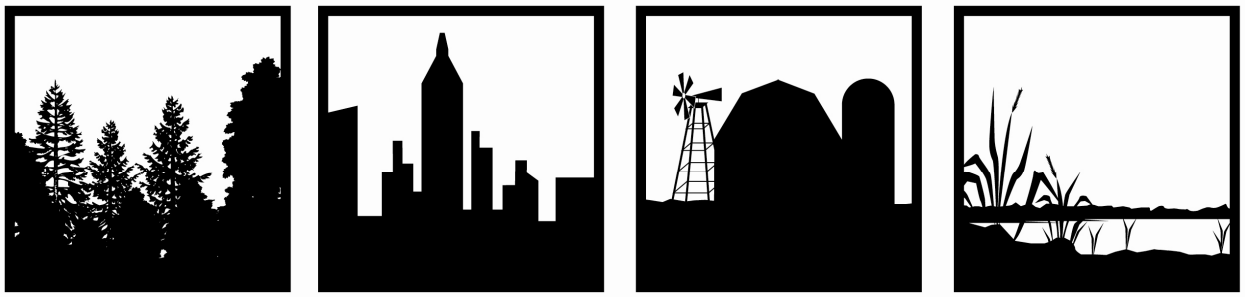

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TABLE OF CONTENTS

HOW TO USE THE INDEX

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