WHITEBARK PINE (PINUS ALBICAULIS) MORTALITY <u>MONITORING IN THE INYO</u> NATIONAL FOREST, SOUTHERN SIERRA NEVADA (<u>1D</u>) Marc D. Meyer¹, Beverly Bulaon², and Martin MacKenzie² ¹USDA Forest Service, Pacific Southwest Region ²USDA Forest Service, Forest Health Protection

Recent climate modeling projections and aerial-based tree mortality surveys have identified whitebark pine (Pinus albicaulis) populations in the southern Sierra Nevada as vulnerable to changes in climate and mountain pine beetle (MPB) outbreaks. We monitored whitebark pine populations in areas of recent (post-2005) and severe MPB-induced mortality to evaluate patterns of tree mortality, regeneration, and size class structure in whitebark pine dominated stands of the Inyo National Forest in the southern Sierra Nevada. Our monitoring sites focused on whitebark pine dominated stands and included June Mountain, White Wing Mountain, and Rock Creek-Hilton Creek (collectively 'Rock Creek'). We also monitored nearby undisturbed 'control' sites lacking evidence of recent MPB related mortality at June Mountain and Rock Creek. We established a total of 66 plots (each 0.05 ha) and recorded site attributes, tree attributes and health, vegetation and ground cover, and tree regeneration. Our results indicate significant and immediate loss of basal area and tree densities of whitebark pine in MPB-impacted stands. MPB-related mortality was greatest in larger diameter (>20 cm dbh) whitebark pine trees, but whitebark pine mortality was not contingent on the number of trees per cluster. In mortality plots from all sites, there was a shift in the size class distribution of whitebark pine to smaller diameter classes (<15 cm dbh) relative to control plots. Whitebark pine regeneration was greater in MPB-impacted plots than control plots at June Mountain and White Wing Mountain, but there was no such difference at Rock Creek. All three sites showed a relatively stable production of whitebark pine regeneration at least within the past 50 years, with a pulse of new seedlings in the past 2 to 4 years in MPB-impacted stands. Our results indicate that whitebark pine stands are heavily impacted by MPB outbreaks, indicating low resistance but potentially high resilience to initial attack. Long-term monitoring will be required to track future patterns of mortality and regeneration in whitebark pine populations of the southern Sierra Nevada.

Key words: Pinus albicaulis, mountain pine beetle, monitoring, tree mortality