

2013 Progress Report for Evaluation Monitoring – US Forest Service

Title: Implement Interagency Whitebark Pine Monitoring for the Greater Yellowstone Ecosystem

Location: Beaverhead-Deerlodge NF, Bridger-Teton NF, Custer NF, Caribou-Targhee NF, Gallatin NF, Shoshone NF, National Elk Refuge, Red Rock Lake NWR, Grand Teton NP, Yellowstone NP

Duration: 2012-2014

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Project Objectives: Our primary objectives are to: 1) conduct a third visit to transects established in 2004-2007 as part of the Interagency Whitebark Pine Monitoring Protocol (IWPMMP) for the Greater Yellowstone Ecosystem (GYE), visits will occur to ¼ of transects each year from 2012-2014; and 2) revisit burned/unburned paired plot surveys conducted in 2009 for two seasons during 2012-2013.

Progress Report: This summer marked year two of the second revisit to sites established for long-term monitoring of the health and status of whitebark pine in the GYE. In 2013 surveys were completed in all 89 transects in panels 2 and 4 to record tree status (alive, recently dead, dead) and presence/absence of white pine blister rust infection and mountain pine beetle. Observers also recorded several other site and tree-specific characteristics and conditions, including evidence of fire activity. This is approximately half of the 176 permanently established transects as described in the *Interagency Whitebark Pine Long-Term Monitoring Protocol* (GYWPMWG 2011), and surveyed in 2013 according to their assigned panel scheduled. Data collected from 2004 through 2013 indicate that fire activity has affected 13 of the 176 transect during that period.

Six of the 89 transects surveyed in 2013 were burned since the previous survey. Transect 6061-1 burned in the 2011 Norton Point Fire near Dubois, Wyoming. Upon revisit to this site, no trees remained and the only vegetative species returning to this area were *Epilobium angustifolium*, *Arnica cordifolia*, *Lupinus argenteus*, and *carex geyeri*. Four transects (1172-1, 1172-2, 1345-1, 1345-2) were burned during the Millie Fire on the Gallatin National Forest in August of 2012. No living trees remained on any of these sites. Returning vegetation was sparse and dominated by *Erythronium grandiflorum*, with *Claytonia lanceolata* and *Arnica cordifolia* as minor understory components. While not surveyed in

2013, transect 1424-1 that was visited in 2012 prior to the Millie Fire also appears to have completely burned. The sixth transect, 5125-1, partially burned in the Dewdrop Fire that occurred in Yellowstone National Park in 2012. Of the 14 trees that were previously alive during the last visit to this site in 2011, only 2 were documented as alive in 2013 although both were scorched by the fire and exhibited fading crowns. The other 12 trees in that transect were completely burned.

The 2013 fire season in the GYE was relatively mild until August when several wildfires burned throughout the GYE. The overall consequences of the 2013 fire season on the health and survival of trees on the 176 monitoring transects seem minimal, since no known transects were located either within or in close proximity to mapped fire boundaries. As the Interagency Whitebark Pine Long-Term Monitoring Program proceeds we will continue to assess fire effects at a transect level throughout the GYE. This will include using burn severity maps when available from the Monitoring Trends in Burn Severity (MTBS) project (<http://www.mtbs.gov/index.html>) and/or local fire mapping to better understand potential fire effects on whitebark pine recruitment. Figure 1 shows an example of monitoring transects 214-1 and 251-2 overlaid on a burn severity map for the Wicked Creek Complex (2007).

Of the three pairs of burned/unburned paired monitoring sites targeted for surveys in 2013, one was completed in early September and the other two will be visited in late September. Following the objectives specified for this effort, these paired sites associated with the Mountain Ash Creek Fire, Coyote Fire, and the Corral Creek Fire, are surveyed, photographed, and monumented. This fall, data from these surveys will be entered and analyzed to document the presence and possible effects on whitebark pine regeneration and of different disturbance agents, including mountain pine beetle, blister rust, and fire. An initial assessment of data from the sites surveyed in early September indicate that complete analysis of data from all three site pairs in combination with the three sites visited last year will yield valuable information about regeneration dynamics, including establishment, survivorship, growth, and disturbance interactions.

The Interagency Whitebark Pine Monitoring Workgroup completed the 2012 annual report (GYWBPWG 2013; http://science.nature.nps.gov/im/units/gryn/monitor/whitebark_pine.cfm). This report examines the presence of 'health status' indicators for dead trees. By the end of 2012 approximately 1,134 tagged trees have died since transect establishment. Figure 2 presents health status indicators (fire, mountain pine beetle, white pine blister rust, a combination of the three, or other) that were recorded for each dead tagged tree by DBH size class (<2.5 cm, >2.5-10 cm, >10-30 cm, and >30 cm). We are completing a step-trend analysis for the data collected from 2004 to 2011. All presentations, posters, and other products related to these monitoring efforts in 2013 will acknowledge the USFS Forest Health Protection Program for their generous support.

In summary, we achieved the objectives identified for the 2013 field season and look forward to continuing the project in 2014 when one full panel will be visited as part of the long-term monitoring program, analyzing these data and the data from the paired sites, and preparing the final report.

Figure 1. Greater Yellowstone Network long-term interagency whitebark pine monitoring transects 214-1 and 251-2 overlaid on the Wicked Creek Complex burn severity map. Example of how this information can be used in future analysis and understanding of regeneration of whitebark pine post wildland fire.

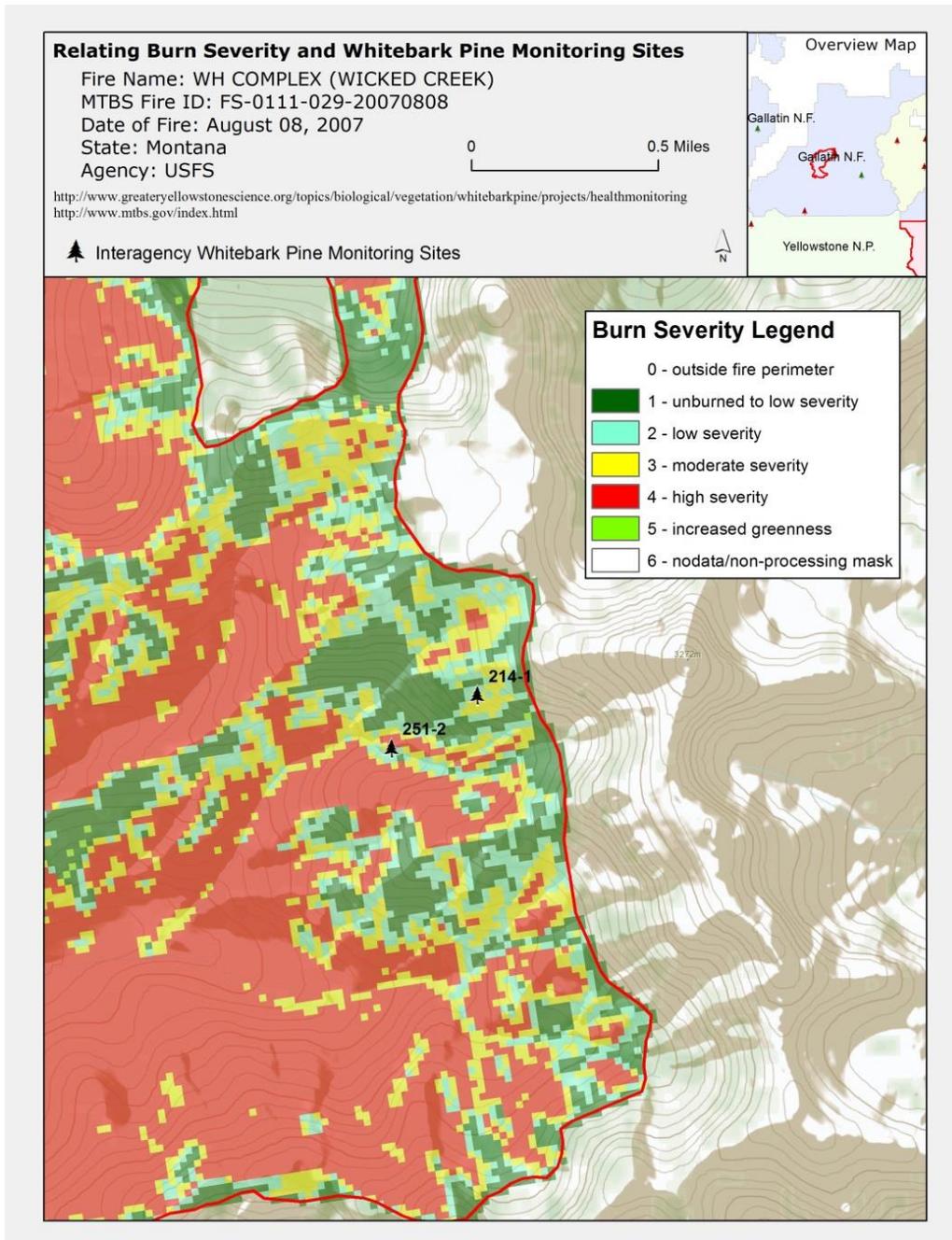
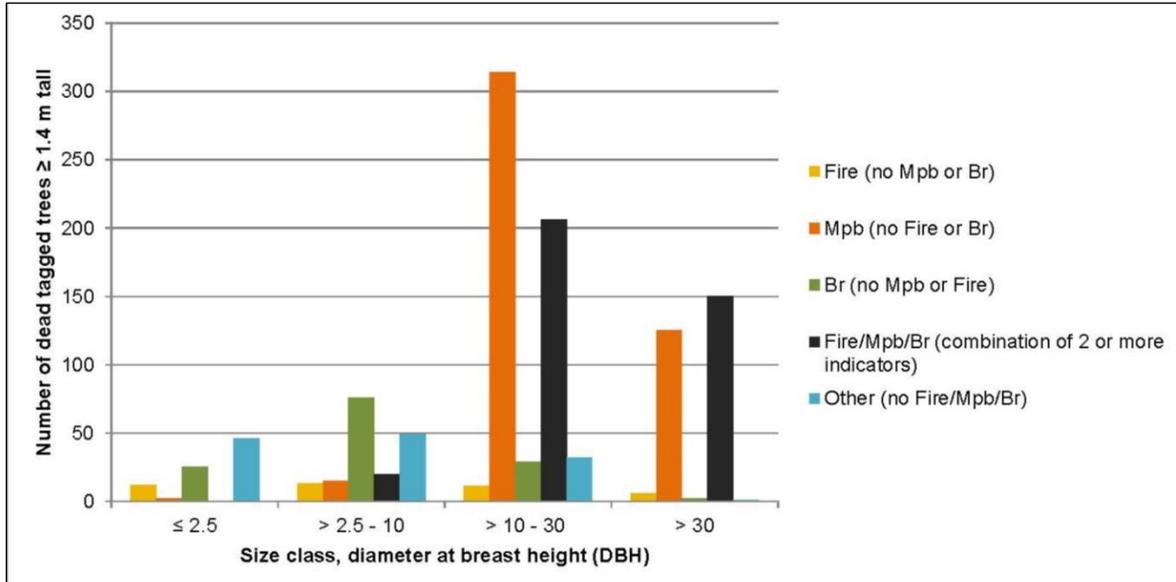


Figure 2. Mortality of tagged trees from 2008 through 2012 with associated potential causes of mortality. Evidence of fire, mountain pine beetle [Mpb], white pine blister rust [Br], a combination of the three, or other were recorded for each dead tagged tree by DBH size class (≤ 2.5 cm, $>2.5-10$ cm, $>10-30$ cm, and >30 cm).



References

Greater Yellowstone Whitebark Pine Monitoring Working Group. 2013. Monitoring whitebark pine in the Greater Yellowstone Ecosystem: 2012 annual report. Natural Resource Data Series NPS/GRYN/NRDS—2013/498. National Park Service, Fort Collins, Colorado.

Greater Yellowstone Whitebark Pine Monitoring Working Group. 2011. Interagency Whitebark Pine Monitoring Protocol for the Greater Yellowstone Ecosystem, Version 1.1. Greater Yellowstone Coordinating Committee, Bozeman, MT.