

Managing Mountain Pine Beetle After a Wildfire

7-9-12

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Recent wildfires throughout Colorado have raised a number of questions about managing post-fire forests. In this document I hope to address a number of issues that have come up concerning mountain pine beetle (MPB), including the impacts of wildfire on the beetles and which management activities may be appropriate post-fire. Given the diversity of burn severity and the range of impacts on individual trees throughout a burn area, all information provided will be general. Please contact me with specific questions and we at the CSFS will do our very best to assist you in making post-fire management decisions.

Direct Impacts of Recent Fires on Beetles:

- Recent fires have impacted large areas of our forests; however, the area impacted by MPB is much larger.
- Depending on the level of burn severity in an area, the direct impacts on beetle populations are highly varied within the fire area and along its boundaries.
- Some fires (High Park, Hewlett and others) have destroyed numerous trees that harbored this season's MPB population.
- There are also many unaffected trees within the burn areas which still harbor beetles.
- The increased stress on trees scorched by the fire will increase their susceptibility to MPB.
- Recent fires haven't stopped the MPB outbreak.

Other Beetle Issues:

- Douglas-fir beetle and Ips beetles typically show an increase in activity after a fire.
- Trees with scorched bark have an increased susceptibility to Ips and Douglas-fir beetle.
- We will likely see an increase in these beetles' activity in and around fire areas.

Impacts on Previously Applied Preventive Products:

- Chemical sprays exposed to high heat or directly to fire will have lost some, if not all, of their effectiveness.
 - We are not aware of any studies that have looked at the impacts of heat, smoke or fire on chemical preventive products for MPB.
 - Most chemicals degrade faster when exposed to heat; depending on levels of heat exposure, some preventive products may have a reduced efficacy after a fire.
 - Products applied directly to bark that has now burned have also been burned and are not likely to have any remaining efficacy.
- Pheromones exposed to high heat or directly to fire also will have lost some, if not all, of their effectiveness.
 - We are not aware of any studies that have looked at the impacts of heat, smoke or fire on pheromones.
 - Direct impacts of fire and extreme heat may have melted pheromone packets, making them ineffective.
 - Pheromones are chemicals, and increased rates of degradation would be expected with exposure to heat; depending on levels of heat exposure, pheromones may have a reduced efficacy after a fire.

- Considerations for Reapplication of Preventive Products:
 - Proper application of preventive products will remain key to their effectiveness.
 - Some trees impacted by the fire will survive, others will not. This is very difficult to predict and tree loss will not be apparent in many trees until next spring.
 - Trees that do not currently show any signs of beetle activity may be suitable for reapplication of a preventive product this year.
 - Preventive chemical sprays may adhere less effectively to scorched bark, due to presence of soot/ash/charred bark.
 - Pheromone packets can be reapplied without concern other than monetary costs.
 - With increased stress on trees in fire areas and fewer host trees available, all preventive products may have a reduced effectiveness.

- Future Seasons After a Fire
 - Post-fire bark beetle impacts will occur and change over several seasons.
 - Post-fire survival of trees will be dependent on each tree's adaptability to fire; for example, ponderosa pine is more fire resilient than lodgepole pine, and the conditions of the seasons following a fire event, including levels of precipitation and changes in soil condition, will vary for each location.
 - Management of MPB in forests and on individual trees in post-fire areas will remain important while MPB remains active on those landscapes.
 - Management of MPB will be dictated by each landowner's management objectives.

- Final Thoughts
 - Preventive treatment of remaining trees may be more important than ever over the next few seasons because in fire-impacted areas, the trees remaining represent a smaller selection of hosts and those remaining trees will likely have experienced additional stressors (and may be less success at defending themselves against MPB).
 - For 2012, the window of opportunity to reapply preventive products is rapidly closing. No products are currently proven effective in trees already impacted by MPB.
 - Efficacy of any preventive product will remain dependent on proper application, adequate coverage, correct dosage and good timing.