



Bark Beetles in the Rocky Mountains

FY 2009 President's Budget

ISSUES

Western bark beetles are active on lands of all ownerships. Large-scale tree death may lead to decreases in scenic beauty, shifts in recreation use, reductions in property values, and increases in sediments and nutrients in streams, which may take decades to recover. Rocky Mountain Research Station (RMRS) scientists can help managers understand the multiple factors influencing the current widespread outbreaks and the complex interactions among bark beetles and other disturbances such as fire and drought.

IMPORTANCE

Native bark beetles are one of the greatest forces of natural change in forested ecosystems. While western U.S. forests have experienced regular outbreaks throughout their history, the largest epidemic of native bark beetles in recorded history is currently occurring in several forest ecosystems. Bark beetles have collectively killed millions of trees across millions of acres in western North America since 1990. Current studies are being conducted in a diverse set of ecosystem types, dominated by conifer species, which are hosts to bark beetles (lodgepole, ponderosa, limber, and bristlecone pines, Douglas-fir, and Engelmann spruce)

FUTURE PLANS

RMRS wants to increase research on the entomology and economics of bark beetle epidemics in the Interior West, utilizing three experimental sites located within our study boundaries: Manitou Experimental Forest, Fraser Experimental Forest, and Glacier Lakes Ecosystem Experiments Site.

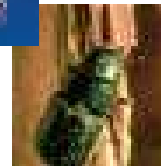
Entomology - This research would:

1) Develop stand-hazard rating systems.

- 2) Assess the effects of thinning on beetle populations.
- 3) Evaluate beetle response to climate change using environmental field data and recently developed models.
- 4) Model beetle movements across landscapes.
- 5) Conduct spatially referenced analyses of interactions between beetle mortality and stand and environmental conditions in lodgepole and spruce forests.
- 6) Quantify coarse woody debris accumulation associated with beetle kill and impacts on fire behavior.



Left: Mountain pine beetle
Below: Spruce beetle



Ecosystem Services and Economics - Proposed socioeconomic research would enable measurement of the effects of large-scale mortality in subalpine and montane forest tree species on resource values and benefits of public concern, and the public's preferences and priorities regarding agency responses to such mortality.

EXPECTED OUTCOMES

Greater understanding of the nature of the outbreaks, the management response, and their effects on watersheds would assist public and private land managers in protecting and sustaining upland, riparian, and aquatic ecosystem resources. RMRS science takes advantage of long-term data records gathered at multiple research sites, permitting rapid assessment of forest disturbance and watershed change due to bark beetles. Cooperative research on National Forest lands will allow effective delivery of RMRS findings and sound adaptive management strategies. Our primary goal is to produce science that contributes to land stewardship decisions, forest health, and increased public support for land management.