

# SAFETY ALERT FOR WILDLAND FIREFIGHTERS: FUEL CONDITIONS IN SPRUCE-BEETLE-KILLED FORESTS OF ALASKA\*



Martin E. Alexander and Joseph C. Stam

The fire environment on Kenai Peninsula and in south-central Alaska has experienced significant changes due to the recent spruce beetle epidemic (Fastabend 2002). Firefighters and fire researchers do not have enough experience with wildland fires that occur in the dead-spruce/cured-grass fuel complexes to appraise potential fire behavior in these fuel types accurately. All firefighters, despite their general experience level, should use caution when approaching fire incidents in beetle-killed areas.

## Look Up, Look Down, Look Around—and Look Out!

The Fireline Safety Reference (NWCG 1993) lists “bug kill” as a fuel component indicator of potentially erratic fire behavior. When evaluating and suppressing a wildland fire in spruce-beetle-killed forests in Alaska, the LCES (look-outs, communications, escape routes, safety zones) checklist (Gleason 1991) must address the factors shown below. The factors are based on fuel and stand sampling in spruce-beetle-killed stands, observations of recent wildland fires in

similar fuel situations, experimental fires in other, similar insect-affected fuel types (Stocks 1987), and accepted fire behavior principles.

- Spruce beetle-killed forests are usually more flammable than live spruce forests. Therefore, they exhibit characteristics associated with extreme, difficult-to-predict fire behavior.
- The increase in grass fuels following a spruce beetle outbreak will predispose the dead and dying

forests to fires that rapidly spread in the spring before greenup. Spread rates and fire intensities are usually greater in beetle-killed areas than in healthy spruce stands.

- Candling, torching, and crown fires are common in spruce-beetle-killed areas, even under seemingly mild burning conditions.
- Prolific fire spotting and the potential for “mass fire” or area ignition are usual in spruce-beetle-killed areas.
  - Dead trees that have blown or fallen down in beetle-killed areas will impede fireline construction and hinder escape to safety zones. The combination of dead grass and large quantities of dead and down timber will severely limit fire shelter deployment opportunities.
  - Falling snags can be expected in spruce-beetle-killed areas during strong winds and along the fire perimeter after passage of an active flame front.



*Spruce-beetle-killed forest, Kenai Peninsula, AK, illustrating the dead-tree and cured-grass components of these fuel complexes. Photo: W. Wahrenbrock, Alaska Department of Natural Resources, Division of Forestry, Soldotna, AK, 1998.*



*Heavy accumulations of dead and down woody surface fuels associated with a Sitka spruce stand killed by the spruce beetle, Kenai Peninsula, AK. Note the individual (W. Wahrenbrock) in the background. Photo: W. Oja, USDA Forest Service, Chugach National Forest, Steward Ranger District, Steward, AK, 2002.*

*Marty Alexander is a senior fire behavior research officer, Canadian Forest Service, Northern Forestry Centre, Edmonton, Alberta, Canada; and Joe Stam is the chief of fire and aviation, Alaska Department of Natural Resources, Division of Forestry, Anchorage, AK.*

\* This article is based on a wildland fire safety message originally posted on the Alaska Fire Service Website at <<http://fire.ak.blm.gov>> in May 2001.

## References

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