

# The '88 Fires: Yellowstone and Beyond Conference Proceedings

## The '88 FIRES Yellowstone and Beyond



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## THE ECOLOGICAL NECESSITY OF SEVERE FIRE: AN EDUCATION MESSAGE STILL NOT HEARD

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### ABSTRACT

**Question:** Is the black-backed woodpecker relatively restricted in its distribution to severely burned forest conditions?

**Background:** Insight into the importance of severe fire in any ecosystem can be gained through careful consideration of the ecology of plant and animal species that are restricted in their habitat distribution to severely burned conditions. After the fire of 1988, I compiled published bird survey data available from studies conducted within a limited number of vegetation types and found that one bird species, the black-backed woodpecker (*Picoides arcticus*), was relatively restricted to burned forest conditions. However, these data were derived from a literature-based meta-analysis of studies that differed in duration and survey methodology, and that were conducted across a relatively small number of vegetation types. Some 13 years later, the U.S. Forest Service Northern Region Landbird Monitoring Program has amassed one of the largest bird point-count databases of its kind, with sample locations drawn from a wide range of unburned vegetation types across northern Idaho and western Montana. By combining those data with data collected from additional locations distributed across >50 fires that had burned in western Montana during the past 20 years, I was able to ask whether the black-backed woodpecker is relatively restricted to burned forest conditions and, if so, whether its probability of occurrence also varies significantly with fire severity.

**Location:** Northern Idaho, western Montana, and Yellowstone and Grand Teton national parks, USA.

**Methods:** Bird survey points were spaced 250 m apart and were distributed along 10-point transects that were themselves distributed in a geographically stratified manner. Field observers visited a total of 16,465 locations across a wide range of unburned and burned vegetation types. The sample included 3,128 points distributed within 50 different recently burned forests. Bird surveys were conducted using a standard 10-minute point-count protocol. Fire severity surrounding points was determined from the proportion of trees that were green-needed, brown-needed, and blackened within 50 m of the survey point.

**Results:** After summarizing 20 years of data systematically collected from >13,000 survey locations distributed across nearly every vegetation type occurring in the Northern Rockies, it is clear that the restricted distribution pattern is not an artifact of problems with the earlier meta-analysis. The black-backed woodpecker is generally restricted in its habitat distribution to burned forest conditions. Moreover, within burned forest perimeters, the woodpecker was absent most of the time from unburned portions, and it became more common as fire severity increased. Finally, the woodpecker was significantly less likely to occur in forests that were recently harvested either before or after fire. The probability of occurrence decreased incrementally with intensity of harvest.

**Conclusions:** These restricted distribution patterns have profound implications because they bring into question the hypothesis that the severe fires we see burning in many, if not most, western forests are “unnatural” or “unhealthy” and suggest instead that severely burned forest conditions across a broad range of forest types (not just in Yellowstone but elsewhere throughout the West) must have occurred naturally for millennia. Not only does this woodpecker occur in more severely burned forests, but it is also significantly less abundant in forests that have been recently harvested either before or after fire. For obvious (and perhaps some not-so-obvious) reasons, this story has yet to reach politicians, public land managers, and the public-at-large, most of whom continue to view such fires as catastrophic events, and feel the need to conduct management activities that are clearly incompatible with the needs of post-fire specialists like the black-backed woodpecker.

**keywords:** black-backed woodpecker, fire history, fire regime, mixed-conifer forest, severe fire.

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