



Effects of wildland fires on buff-breasted flycatchers and other forest birds in southeastern Arizona

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Problem

Long-term fire suppression in Southwestern forests is thought to have influenced the distribution and abundance of many bird species, including rare species such as the buff-breasted flycatcher. Few studies have examined the effect of fire on forest birds in the Southwest, despite the historical importance of wildfires in shaping these forest ecosystems, and the recent increase of wild and prescribed fires in the region. The 2002 – 2004 wildfire seasons and subsequent prescribed burns in the region provided a unique opportunity to collect post-burn data and critically evaluate the role of fire in influencing the distribution and abundance of buff-breasted flycatchers and other forest bird species in southeastern Arizona.

Approach

This study evaluated the effects of recent wild and prescribed fires on populations of buff-breasted flycatchers and other forest bird species by repeating surveys on established bird survey routes (both burned routes and unburned control routes) in 2003 and 2004. It also compared post-burn data of presence and abundance with pre-burn data collected on these survey routes in 2000. Fire-scarred tree samples were collected in forests with and without buff-breasted flycatchers to examine the role of fire history in influencing the current distribution of flycatchers in southeastern Arizona.

Project Findings

Research found that most forest bird species were negatively associated with recently burned areas, and showed stronger responses (either positive or negative) to areas affected by severe as opposed to less-severe fires. Recent wildfires appeared to have little immediate effect on the distribution and relative abundance of buff-breasted flycatchers in southeastern Arizona. However, evidence (based on fire-scar records) suggested that buff-breasted flycatchers prefer forests that have been burned more frequently within the last 30 years, over adjacent forests that have burned less frequently. In addition, the number of buff-breasted flycatchers has increased from 2 to 5 birds (including a mated pair) in the Rincon Mountains since 2000. These detections represent the first records of buff-breasted flycatchers in this mountain range since 1911, suggesting that this rare species has re-colonized a portion of its historical breeding range. It is suspected that the recent colonization and population increase in the Rincon Mountains by buff-breasted flycatchers is due, in part, to a recent increase in the frequency of fires within this mountain range. The results of this study add to a growing body of correlative and anecdotal evidence supporting the hypothesis that fire suppression has been responsible, in part, for the range contraction and population declines of buff-breasted flycatchers in the southwestern U.S. during the 20th century. Furthermore, results also indicate that buff-breasted flycatchers may ultimately benefit from recent wildfires in southeastern Arizona (and elsewhere in the state) as

forest succession transforms recently burned areas into potential buff-breasted flycatcher habitat.

Application by Land Managers

This study provides recommendations and justifications on habitat management for buff-breasted flycatchers and other avian species in the Southwestern montane forest. Results from this study provide managers with information that can be used to make and test predictions about the effects of future wild and prescribed fires (of varying severities). High-severity surface and crown fires are burn severity classes shown to be positively correlated with buff-breasted flycatchers abundance (Conway and Kirkpatrick 2007) and the burn-severity classes that may have the best potential to create habitat characteristics preferred by buff-breasted flycatchers (an open canopy of pines with an open understory of oaks). The Burn Severity Index refined during this study may provide a useful method for the rapid assessment of burn severities during future bird surveys.

The Santa Catalina Mountains of southeastern Arizona seem especially well-suited for colonization by buff-breasted flycatchers because the mountain range is part of the species' historical range and contains several broad canyons and ridges with pine forest or pine-oak woodland that were burned during recent wildfires. Continued monitoring of buff-breasted flycatcher populations is warranted given the small population size and restricted geographic range of this rare species.

Deliverables and Technology Transfer

Publications were easily accessible through the project website or the FS Library.

Final report:

[JFSP Final report](#). Kirkpatrick, C., C.J. Conway, and D. LaRouche. 2006. [Effects of wildland fires on buff-breasted flycatchers and other forest birds in southeastern Arizona. Wildlife Research Report #2006-05](#). U.S. Geological Survey, Arizona Cooperative Fish and Wildlife Research Unit, Tucson, AZ.

Publications

Kirkpatrick, C., C.J. Conway, and D. LaRoche. 2007. [Range expansion of the buff-breasted flycatcher \(*Empidonax fulvifrons*\) into the Rincon Mountains, Arizona](#). *Southwestern Naturalist*, Volume 52, Issue 1, pp. 149-152.

Conway, C.J., and C. Kirkpatrick. 2007. Forest fire suppression as a cause of population decline in buff-breasted flycatcher. *Journal of Wildlife Management*, Volume 71, Issue 2, pp. 445-457.

Both of above publications are available electronically through the [FS Library](#).

Presentations:

Kirkpatrick C.; LaRoche, D.; Conway, C.J. 2005. Range expansion of the buff-breasted flycatcher (*Empidonax fulvifrons*) into the Rincon Mountains, Arizona: a response to recent fire? Presentation given to staff and volunteers at Saguaro National Park, Arizona.

LaRoche, D.; Kirkpatrick, C.; Conway, C.J. 2005. Proposed evaluation of methods for measuring burn severity in forests during avian surveys. 4th USFS Wildland Fire Sciences Workshop, Tucson, Arizona. Poster presentation.

Website:

[Project website](#). Click on “Research” on left side of screen and then links to project numbers 2 and 13. Publications produced by this project are also available by clicking on “publications” on left side of screen. The website also contains research related to the effect of fire on other montane bird species and Yuma Clapper Rails and California Black Rails.

Reference

Conway, C.J.; Kirkpatrick, C. 2007. Forest fire suppression as a cause of population decline in buff-breasted flycatcher. *Journal of Wildlife Management*. 71: 445-457.