

ACCURACY ASSESSMENT OF FIRE ATLAS AND PHOTO-INTERPRETED DATA USED TO EVALUATE 20TH-CENTURY FIRE ROTATIONS IN THE UPPER SELWAY RIVER BASIN, IDAHO

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ABSTRACT

Fire extent, location, and frequency can be described continuously across landscapes by using archival information. Digital fire atlases (DFA) are compilations of mapped fire perimeters by year. Aerial photographs (PI) can be interpreted to yield this information as well as fire severity. In contrast to fire history at points (e.g., fire scars in trees and logs) or time-since-fire maps, these data allow description of fire regimes (e.g., frequency, rotation, spatial pattern, degree, and location of “reburns”) that are continuous and representative of all points on a landscape through time, at least for the larger fires. Such data have great potential for elucidating the relationships between fire, topography, vegetation, and fire management policies, but the accuracy of such data has not been assessed.

We contrasted three distinct eras of fire management: pre-modern suppression (1880–1934), suppression (1935–1974), and wildland fire use (1975 to present; formerly called the prescribed natural fire program). We compared and contrasted the fire rotations calculated by potential vegetation type (PVT), and evaluated how fire rotation and area burned in each of three fire severity classes (nonlethal, mixed, and stand-replacing) have changed through time and by PVT. Lastly, using dated fire scars and tree ages collected from elevational gradients throughout the study area, we assessed the relative accuracy of both data sets for quantifying fire regimes (area burned, area frequency, rotation, and severity).

Neither data set included every fire. Both commission and omission errors were fewer in high-severity than in mixed- and low-severity burns, and at high elevations and in mesic forest types where stand-replacing fires were more common. Fire rotations differed for the DFA and PI data sets, as expected, but the trends were similar through time. They disagreed more where fires were predominantly of non-lethal or mixed severity. Stand-replacing fires were more reliably mapped in both data sets. Fire perimeters were more convoluted and more unburned islands were mapped from the aerial photographs.

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