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## Fire History of Conifer Forests of Cerro El Potosí, Nuevo León, Mexico

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### Abstract

Fire is one of the most important ecosystem processes contributing to biodiversity and health, so it is useful to study patterns and changes in fire regimes. The fire regime for the coniferous forests of Cerro El Potosí, located in the Sierra Madre Oriental mountain range in northeastern Mexico, was investigated using fire-scarred trees. The selected area for sampling was a part of the coniferous forests, between 2,900–3,450 m a.s.l., with a northeast aspect and a slope range of 22–38 %. The sampling area covered an area of  $\approx 2$  km. The forest in the sampling area was composed of species such as *Abies vejarii*, *Pinus strobiformis*, *Pinus greggii*, *Pinus hartwegii* and *Pseudotsuga menziesii*. To reconstruct the fire history in the area, we took samples from trees with at least one fire scar. We used chain saws to obtain the samples. We collected total and partial sections of stumps, logs, snags and living trees. In addition data were recorded for each tree such as diameter (DBH), status (live, snag, log and stump), slope, aspect and geographical coordinates. From the 22 collected samples, it was only possible to date 16, with a total of 35 fire scars. The samples used were of *Pinus strobiformis* and *Pinus hartwegii*. The oldest scar formed in 1807 and the most recent in 1998. The descriptive statistics calculated for the period of reliability (1888–2011) show that the Mean Fire Interval (MFI) for all fires was 11 years and 15.7 years for the larger fires or those that scarred  $\geq 25\%$  of all samples. The trees recorded fires from the late 19<sup>th</sup> century through the late 20<sup>th</sup> century. Most of the fires corresponded to the 20<sup>th</sup> century; the last fire recorded was in 1998. We observed shorter fire return periods until before 1955, with an increase in these intervals for subsequent fire events. There was no significant relationship between fire occurrence and climate variables (precipitation and ENSO), suggesting that for our study area fire occurrence is mostly influenced by anthropogenic activities.

**Keywords:** Cerro Potosí, ENSO, fire scar, forest fire