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Analysis of Pseudoreplicants to Evaluate Natural Regeneration after Applying Prescribed Burns in a Temperate Forest of Mexico

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ABSTRACT

Although fire is one of the most important disturbing factors of forest in Mexico, little it is known on the effects of fire on the particular Mexican forest ecosystems. This is remarked for the fact that the effects of fires on vegetation vary among different types of forests. This lack of knowledge has constrained the use of fire, as a silvicultural tool. Therefore, the purpose of this project was to evaluate the effects of fire on regeneration, under burns. This work was carried out in a pine forest stand at Tapalpa Saw in Jalisco State, Mexico, dominated by Pinus michoacana and Pinus oocarpa. The study evaluated the effects of two techniques of prescribed burning: 1) backing, and 2) head fire. The sample plots were burned on 25 and 26 March 1991, before the rain season. One month before and 2 years after burning several measurements were made in order to evaluate the effect of fire on regeneration. Due to the limitations to work with "real" replicates (for treatments an control), original sample units (20 × 30 m) were divided into 5 × 5 m smaller sample units, which were considered as pseudoreplicants. Therefore, such analysis did not avoid introducing systematic error (bias) and minimize random error. Nevertheless, the variability within the pseudoreplicants was considerable in order to assume certain significance of the resulting estimations. Therefore, despite that this was a nonreplicated study; the results suggest strong ecological evidence that prescribed fire enhance natural regeneration of Pinus michoacana and Pinus oocarpa. In general, it is concluded that prescribed burning could be a valuable forest management tool in regions with similar conditions to the study area, in order to improve regeneration. However, further research is needed before prescribed fires can be applied with confidence in many Mexican forest conditions.

KEYWORDS

Nonreplicated Study; Fire Effect Pinus michoacana; Pinus oocarpa; Forest Fires

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