

Abstract

# Reliable Post-Fire Regeneration of *Pinus sabiniana* (Gray Pine)

†

Buddhika Madurapperuma\*, David Greene, Cody Leviloff

<sup>1</sup> Forestry & Wildland Resources, Humboldt State University, Arcata, CA, 95521, USA

\* Correspondence: bdm280@humboldt.edu

† Presented at the title, place, and date.

**Abstract:** *Pinus sabiniana* (grey pine), an endemic tree species in California, has been little-studied because of its limited commercial value. This study seeks to understand whether grey pine is capable of behaving as a serotinous species; i.e. one that reliably has viable seeds on hand any time a fire might occur. Repeated field surveys were conducted along HWY 299 to Redding to observe the cone production and scale opening and to estimate post-fire seedling density. We found that (a) the minimum diameter for producing the first cone was about 16 cm (diameter at breast height), and that subsequently trees always initiate cones each year; (b) how by germinating seeds from burned cones in the greenhouse, the flexure is insufficient to release the bulk of their seeds; (c) lacking this protection, all but 8% of the seeds died during passage of the flaming front, as we show by germinating seeds from burned cones in the greenhouse; (d) the wind rather than rodents abscise the burned cones; (e) once on the ground, rodents cache the seeds; (f) the great majority of recruits are found within 20 m of a burnt gray pine, averaging about two regenerating stems per tree; and (g) there is little mortality for a regenerating cohort after the first post-fire summer. We conclude that gray pine reliably self-replaces following fire. While it is possible that all recruits observed in the field represent seeds cached prior to the fire, we think it more likely that the small fraction of seeds surviving the flames are the source of the regeneration.

**Keywords:** Grey pine; facultative serotiny; cone scale; post-fire; germinants; fire; dispersal

**Citation:** Lastname, F.; Lastname, F.;  
Lastname, F. Title. *Environ. Sci. Proc.*  
**2021**, *3*, x. <https://doi.org/10.3390/xxxxx>

Published: date

**Publisher's Note:** MDPI stays neutral with regard to jurisdictional claims in published maps and institutional affiliations.



**Copyright:** © 2021 by the authors. Submitted for possible open access publication under the terms and conditions of the Creative Commons Attribution (CC BY) license (<https://creativecommons.org/licenses/by/4.0/>).