

ABSTRACT

ALIF AGHNI ALFADIL, 2025. ANALYSIS OF THE IMPACT OF FIRE ON THE HABITAT OF EDELWEISS (*Anaphalis* spp.) IN THE TEGAL ALUN AREA, MOUNT PAPANDAYAN, AS BIOLOGY LEARNING MATERIAL.

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*This study aims to analyze the impact of wildfire on the habitat of Edelweiss (*Anaphalis* spp.) in Tegal Alun, Mount Papandayan, and to explore its potential use as contextual biological learning material. The research was conducted at two stations using the belt transect method with ten 5 × 5 m plots at each location. Observed parameters included microclimatic conditions, soil pH, and soil physical properties such as bulk density, particle density, and porosity. The Edelweiss population was analyzed using Morisita's Index, Chi-square tests, and a 95% confidence interval. The findings indicate that microclimatic conditions at both stations were generally similar, with only minor, non-significant variations in temperature and humidity. However, the physical properties of the soil showed signs of structural degradation in the burned area. Bulk density was higher (0.51–0.74 g/cm³) than in the unburned area (0.42–0.55 g/cm³), indicating a tendency toward soil compaction. Soil porosity in the burned area was lower (21.99–59.29%) compared to the unburned area (35.68–67.89%), reflecting reduced pore space that may limit soil aeration and water retention capacity. Particle density also exhibited greater variation in the burned area (0.67–1.82 g/cm³), suggesting heterogeneous soil composition after the fire. Edelweiss density decreased from 1,680 individuals/ha in the unburned area to 960 individuals/ha in the burned area, with both locations exhibiting a clumped distribution pattern ($I_d = 1.25–1.38$; $X^2 > 19.023$). These results demonstrate that wildfire contributes to declines in soil physical quality and slows the natural regeneration of Edelweiss. This study further highlights the potential of integrating these findings into contextual biology teaching materials to enhance students' understanding of ecosystem dynamics and environmental conservation.*

Keywords: *Anaphalis* spp., biology learning material, distribution, forest fire, soil physical properties