

Non-native Plant Control After Wildfire Protects Butterfly Habitat Golden Gate National Recreation Area, California National Fire Plan – Rehabilitation

The Lateral Fire, which started within Fort Baker, less than half a mile south of a residential area in Sausalito California, was successfully suppressed at 7 acres in August, 2004. Among the values threatened by the fire were historic buildings, a cultural landscape, and some of the last remaining habitat of the endangered Mission blue butterfly.

The Lateral Fire occurred within a 17-acre habitat restoration project and burned over six patches of the butterfly's host plant, *Lupinus albifrons*, a perennial lupine, where Mission blues lay their eggs each year. Approximately three-hundred lupine plants were affected by the fire. Although, prescribed fire has been suggested as a recovery strategy for the Mission blue butterfly, the effects of fire on the host plants and on the butterfly has been unknown.



Non-native French broom invaded the burn area, threatening habitat for an endangered butterfly and other native species.

Weed control in the burned area was a critical measure to protect the host plants, which were potentially threatened by post-fire invasions of non-native French broom and Italian thistle in both coastal scrub and grassland areas.

French broom in the coastal scrub areas required the most intensive treatment. Three types of treatment were used on the French broom seedlings –1) mulching with weed free rice straw; 2) flaming with a hand-held propane torch; and 3) dislodging or cutting with a hula hoe. Flaming proved to be the most effective treatment for French broom, and demonstrated 90% success when applied to seedlings within two months of germination. Due to the extensive French broom seed bank, multiple treatments were required. A new wave of French broom seedlings followed each of three flaming applications. A massive hand-pulling effort was done as a follow-up in June. Flaming proved less successful in treating Italian thistle, which was more effectively controlled by the combination of herbicide and hand pulling.

Emergency rehabilitation of the burned area also included installation of weed-free burlap straw wattles and weed-free straw mulch for erosion control, as well as hazard tree removal of burned trees overhanging Alexander Avenue.

Post-fire monitoring conducted during rehabilitation has revealed three especially significant observations regarding the effects of fire on Mission blue butterflies: 1) about half of the lupine plants which host the butterfly larvae survived the fire; 2) an increased number of lupine plants germinated following the fire; 3) caterpillars were found on the burned host plants. Based on what is known about

the lifecycle of the Mission blue butterfly, the eggs which the caterpillars developed from would have been laid before the fire, indicating the butterflies themselves, in their earliest larval stages, survived the Lateral Fire.

The Lateral Fire occurred under Red Flag conditions, involving especially hot, dry weather, with sustained winds. These conditions represent the highest potential for a fire to spread rapidly, and typically occur several days each year in the San Francisco Bay Area.

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