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Golden Gate NRA Fire Management

Restoration after Solstice Fire Reduces Fuel and Improves Grassland Health

View from Solstice Fire site at Fort Baker

Lupinus albifrons seedling planted in the fire area

Ecological restoration after a wildfire is supporting the goals of the National Fire Plan at Golden Gate National Recreation Area. Flammable non- native trees and grasses are being replaced by more fire resistant native vegetation, reducing the potential for loss in the wildland-urban interface. This restoration project, whose primary aim is to create a unique visitor experience at Fort Baker, is an outstanding example of adaptive management, and the ability to address multiple objectives simultaneously.

The Solstice Fire, which burned on June 21, 2004 at Fort Baker, near the City of Sausalito, was effectively suppressed at 5.5 acres. The fire threatened historic buildings, which a public-private partnership plans to transform into a conference center, serving the San Francisco Bay Area. Fortunately, no structural damage occurred.

The fire was caused by an international visitor who was camping under a stand of Monterey pines. These non- native pines had been planted by well- intentioned Boy Scouts in the 1960's, who did not realize the trees would create a fire hazard, and encroach on an already declining grassland.

The Monterey pines were among the 250 trees removed after the fire, most of which were within the area that burned. The cut trees were chipped, leaving several tons of material, which will be transported to an electric co- generation facility. Some of the chips will be used onsite to control cape ivy, an invasive weed.

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The tree cutting area was hand seeded with purple needle grass (*Nasella pulchra*), a hearty native perennial that has persisted through decades of human land use and currently grows throughout Fort Baker. Approximately 1 pound of purple needle grass seed was collected throughout the site during the fall seasons of 2004 and 2005. The seed was directly placed into the soil in 8 plots. Also planted were 400 lupine seedlings, grown at several plant nurseries from seed collected in the Marin Headlands nearby. This species of lupine, *(Lupinus albifrons ssp. collinus),* is one of three host plants used by the endangered Mission blue butterfly. Recent efforts to grow this lupine have been complicated by a fungal pathogen which is causing mortality in many seedlings. Lupine was planted in 5 plots. Both the lupine and purple needle grass are competing with Italian thistle and French broom, two invasive plants, which responded heavily to the fire, and 2 non- native species of rattlesnake grass, which dominated the area before the fire.

Planting lupine seedlings in an area that has recently burned may also provide new insight to the pathogen that is affecting the lupine. In some cases, fire destroys pathogens in soils, which may enhance lupine seedling survival in the Solstice Fire area. Other recent plantings in unburned areas at Fort Baker have had a low rate of survival. If seedling survival proves to be better after a fire, prescribed fire may be used in the future, prior to lupine plantings.

The purple needle grass and lupine growing in the burned area are thought to be remnants of a grassland that was once maintained with the use of prescribed fire by Native Americans. Mission blue butterflies and Tule elk, associated with this grassland, have both approached extinction due to habitat loss and other environmental pressures. Restoring Mission blue butterfly habitat is a primary resource management objective at Fort Baker. This grassland habitat has a much lighter fuel load than Monterey pine, or the shrubland that may eventually develop in the absence of fire.

The restoration project in the Solstice Fire area is currently funded through the Fee Demonstration Program which allocates a percentage of fees collected at parks to projects that will enhance visitor enjoyment. The number one goal of this project is to provide visitors with a rare opportunity to see Mission blue butterflies in their native habitat. At the same time, this project has improved fire safety at Fort Baker.

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