



# Mission Blue Butterfly Habitat Restoration in the Golden Gate National Recreation Area



Above: Mission blue butterfly habitat dotted with lupines in the Marin Headlands. Left: Mission blue butterflies on silver lupine, their favored host plant.

**Importance:** *Maintaining healthy grassland ecosystems is critical to the continued survival of the federally endangered mission blue butterfly in the Golden Gate National Recreation Area (GGNRA).*

Mission blue butterfly habitat consists of coastal grassland or a mix of coastal grassland and scrub where silver lupine (*Lupinus albifrons* var. *collinus*), summer lupine (*Lupinus formosus*) or varied lupine (*Lupinus variicolor*) are present. These three species are the only plants that mission blue caterpillars can eat, though silver lupine is the mission blue's preferred host plant. Adult butterflies must lay their eggs on one of these lupines so they cannot stray far.

Unfortunately, vast portions of mission blue habitat have already been lost to development. The grassland fragments that remain include parts of the GGNRA, Twin Peaks, San Bruno Mountain, and the San Francisco Peninsula Watershed. These habitat patches are threatened by invasions of non-native trees and

other plants and by a lack of natural disturbances such as historic elk grazing and wildfires that would normally prevent scrubland from taking over.

French broom, (*Genista monspessulana*), Pampas grass (*Cortaderia jubata* and *C. pampas*), Cape ivy (*Delairea odorata*), and thoroughwort (*Ageratina adenophora*) are some of the invasive plants that commonly threaten mission blue habitat in the GGNRA. Introduced from other parts of the world such as Africa and the Mediterranean, in the Bay Area they often reproduce rapidly and outcompete native plants like lupines. Non-native trees such as blue gum (*Eucalyptus globulus*), Monterey cypress (*Cupressus macrocarpa*) and Monterey pine (*Pinus radiata*) also reduce and fragment mission blue habitat. Since mission blues are weak fliers, taller invasive plants can prevent butterflies from moving between patches of healthy habitat.



Some of the invasive species threatening mission blue habitat include, clockwise from the top left: thoroughwort, Pampas grass, Cape ivy, Monterey pines, and French broom.

**The Projects:** *The National Park Service and the Golden Gate National Parks Conservancy have been undertaking projects to restore mission blue butterfly habitat for many years.*

Projects led by the National Park Service's Habitat Restoration Team and the Conservancy's Park Stewardship Program to restore and protect mission blue butterfly habitat have been taking place throughout the GGNRA

since the 1980s. These projects have included:

- Tree and Pampas grass removal on the slopes around Black Sands Beach
- French broom, Pampas grass, Cape ivy, Chilean jessamine (*Cestrum parqui*) and thoroughwort removal around Kirby Cove
- Tree removal and grassland restoration at Hawk Hill and Slacker Ridge (continuing)
- French broom/other weed removal at Wolfback Ridge and Fort Baker (continuing)
- Weed removal at Alta Avenue, Oakwood Valley and Milagra Ridge (continuing)
- Tree removal at Oakwood Valley
- Removal of unsanctioned “social trails,” and installation of fencing and signage around sensitive habitat (continuing)
- Experimental burning and scraping of plots in Marin and San Mateo to study the effects of disturbance on lupines (continuing)



Jessica Weinberg

**A female mission blue butterfly (notice the brown on her wings, rather than the solid blue coloring of a male) drinks nectar from a coast buckwheat flower. Coast buckwheat is both a native of California’s coastal grasslands and a favorite nectar plant for mission blue adults.**

The Hawk Hill project is a prime example of mission blue habitat restoration. In 2000 around 500 non-native trees such as Monterey pine and cypresses covered more than 15 acres of Hawk Hill. They grew from seeds brought in accidentally by the military during construction of Battery 129 on Hawk Hill in the 1940s. The trees both reduced butterfly habitat and prevented movement of butterflies between habitat patches. In 2001-2002, 150 trees were removed from 8 acres of Hawk Hill with the help of a helicopter. In their place 3,525 native grassland plants, such as purple needle grass (*Nassella pulchra*) and coast buckwheat (*Eriogonum latifolium*) were planted. Also among the plantings were 605 of the mission blues’ favorite host plant, the silver lupine.



**The Results:** *Mission blue butterfly habitat is improving at Hawk Hill and other restoration sites in the GGNRA.*

At Hawk Hill, 85 percent or more of the non-lupine grassland plantings were still alive and well in 2004. Of the lupine plantings, 33 percent survived. The lupines flowered and seeded in their new home, and new lupine patches have appeared and expanded in areas where the tree removal occurred. In 2007 an adult mission blue was found in this new habitat for the first time. There are plans to remove the rest of the trees at Hawk Hill in the near future and to continue other projects to restore and maintain mission blue habitat across the GGNRA.



### **Additional Resources:**

To learn more about mission blue habitat restoration in the Golden Gate National Recreation Area visit [http://www.sfnps.org/mission\\_blues](http://www.sfnps.org/mission_blues) or contact Maria Alvarez, Golden Gate National Recreation Area Plant Ecologist, at [Maria\\_Alvarez@nps.gov](mailto:Maria_Alvarez@nps.gov). Summary written by Jessica Weinberg.

**Top: Removing trees from Hawk Hill by helicopter in 2001-2002.**

**Bottom: A volunteer removes French broom from Wolfback Ridge.**