San Francisco Bay Area Network Fire Ecology and Fire Effects Program: 2010 Annual Report

Program Overview

The San Francisco Bay Area Network (SFBAN) Fire Ecology and Fire Effects Program provides ecology and monitoring support to Point Reyes National Seashore, Pinnacles National Monument, and Golden Gate National Recreation Area. During 2010, the SFBAN Fire Ecology and Fire Effects program worked closely with both Fire Management and Natural Resources Management on a number of projects aimed at natural resource benefit. At Golden Gate National Recreation Area, monitoring and treatment implementation was carried out for an NRPP project which explored the use of disturbance to restore habitat for the federally endangered mission blue butterfly. At Pinnacles National Monument, monitoring was focused on two prescribed burn projects aimed at yellow starthistle reduction. A Joint Fire Science grant was awarded to an interagency group lead by Pinnacles NM to study the Native American use of fire in the central coast region of California. At Point Reyes National Seashore, monitoring was carried out on several Scotch and French broom reduction fires.

The Fire Effects Crew monitored over 75 SFBAN plots. In addition, the crew assisted with fire effects monitoring efforts at Channel Islands National Park, Santa Monica Mountains National Recreation Area and Lassen Volcanic National Park. The Fire Effects Crew and Fire Ecologist assisted with prescribed burns at Golden Gate NRA, Pinnacles NM and Point Reyes NS.

Right: Fire Effects Monitoring Crew doing immediate post-burn monitoring at Pinnacles National Monument.

Mission Blue Butterfly Habitat Restoration

The focus of the Fire Ecology and Fire Effects program at Golden Gate NRA in 2010 was a project lead and funded by the Natural Resources Management division to restore habitat for the federally endangered Mission blue butterfly (*Icaricia icarioides missionensis*). This species is found in coastal prairie grasslands that occur primarily within Golden Gate National Recreation Area (GGNRA). The mission blue relies on a few species of disturbance associated lupine as host

plants. This project is focused at comparing the effects of various treatments (fire, mechanical disturbance and no treatment) on lupine regeneration and butterfly populations.

Fire and mechanical treatments took place on small experimental plots in the Marin headlands and at Milagra Ridge in San Mateo County. Monitoring plots used an FMH design modified to accommodate small treatment plots and project-specific monitoring questions. Fire treatments were implemented using 2.5m by 2.5m steel burn boxes. Year one post-burn monitoring will take place in the summer of 2011.

This project was covered extensively in the local media including an article in the Marin Independent Journal and a KQED public radio feature.

Above: Fire treatment implementation using burn boxes in the Marin headlands at Golden Gate National Recreation Area

Using Fire to Control Yellow Starthistle

Prescribed fire projects at Pinnacles National Monument in 2009 and 2010 have been focused on controlling yellow starthistle (*Centaurea solstitialis*) primarily on lands acquired by Pinnacles NM in 2006. The areas treated were dominated by yellow starthistle, mustard, and non-native annual grasses. Fire is being used in combination with mowing and/or herbicide application. Several small demonstration areas within the restoration area will be seeded with native species following treatment.

Initial monitoring results are highly variable and there was not a statistically significant change in starthistle cover or density in the first year following fire. However, fire is expected to stimulate germination from the starthistle seedbank and follow-up treatment using herbicide was implemented. Monitoring results from 2011 should be more indicative of project success. Informal observation suggests that *Leymus triticoides*, a native perennial grass, may have increased in cover and extent following the prescribed burn.

Exploring Native American Use of Fire in Central Coastal California

A collaborative project led by Pinnacles National Monument natural resource management staff, **Exploring the Traditional Use of Fire in the Coastal Mountains of Central California**, was recently funded by the Joint Fire Science Program. This project will bring together members of the Amah Mutsun Tribal Band, resource managers from the NPS and BLM, and academics to reconstruct anthropogenic fire regimes in central coastal California prior to European settlement. A new fire history methodology will be developed focusing on phytoliths, which are silica particles found in plant cells that remain in the soil for hundreds or thousands of years as records of fire. In addition, in the fall of 2011, fire will be reintroduced to a traditional gathering ground in Pinnacles National Monument in collaboration with the Amah Mutsun Tribal Band. This prescribed fire will be used to improve the quality of white root sedge and deergrass stands for basketry materials.

Left: Deergrass stand at Pinnacles National Monument; Right: Prescribed bun to control Scotch broom at Point Reyes National Seashore.

Using Fire to Control Scotch and French Broom

The Fire Effects and Fire Ecology program monitored Scotch and French broom reduction projects near Drake's Estero and in the Olema valley, respectively. Scotch broom monitoring was coordinated in collaboration with Point Reyes National Seashore natural resource management staff as part of an NRPP funded project using multiple techniques to control Scotch broom (*Cytisus scoparius*). Scotch broom is a highly invasive leguminous shrub which spreads quickly and can convert native grass and shrub habitat into dense broom monocultures. Prescribed fire can be an effective tool for Scotch broom treatment if the initial treatment is followed with subsequent treatments (fire, chemical or mechanical treatment). The initial treatment stimulates germination from the seedbank which requires initial follow up but decreases the amount of long term control effort needed. For this project, plots were installed in prescribed burn, mechanical, chemical and control treatment areas and a fall prescribed burn was successfully implemented.

Fire has been successfully used to reduce Scotch broom populations in the past at Point Reyes NS including a successful removal effort in Divide Meadow. Figure 1 depicts Scotch broom population levels before and after multiple prescribed fires on N Ranch near Drake's Estero.

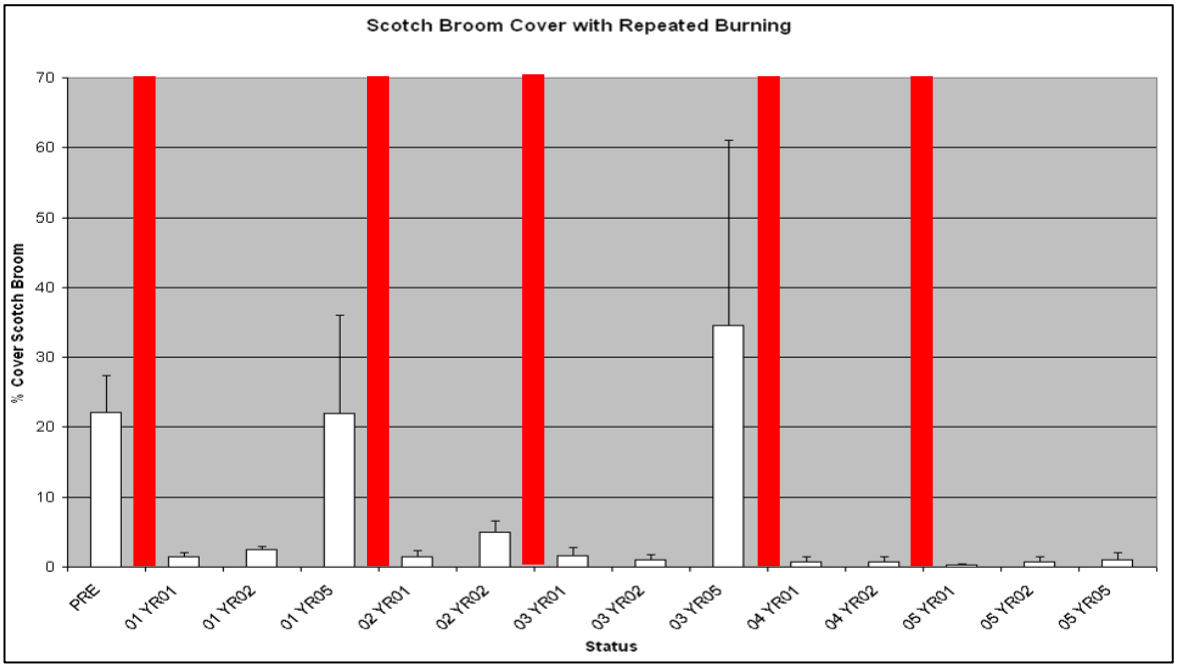

Figure 1. Scotch broom cover and prescribed fire. Red bars indicate individual fire events.

Prescribed fire has been used to reduce fuels and control French broom populations in Olema Valley since 1996. In 2010 the McCurdy and Strain Hill prescribed burn units were burned for the fifth and sixth times, respectively. Results from burning in French broom are shown in Figure 2 below.

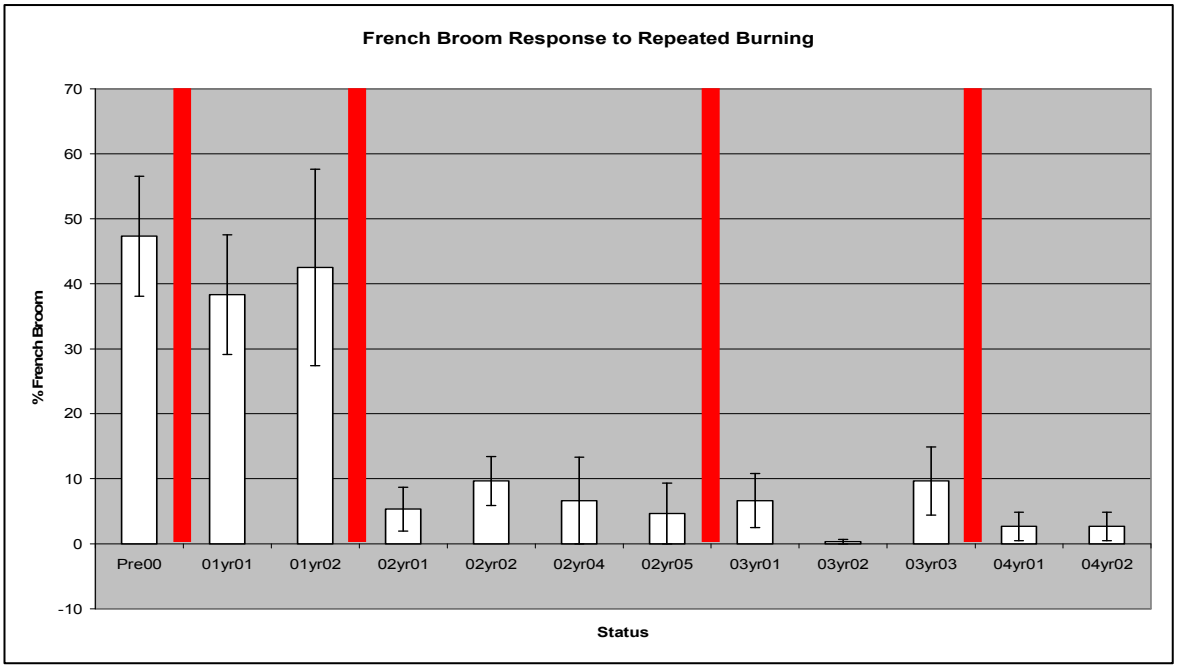

Figure 2. French broom cover and prescribed fire. Red bars indicate individual fire events.

Fire Effects on Native Coastal Prairie

In 2008, Point Reyes National Seashore carried out a prescribed burn in mixed coastal prairie, coyote brush habitat along Limantour Road. The burn was part of a fuel break being maintained along Limantour Road. Natural resource managers were concerned about the impacts of fire on non-native species invasion into coastal prairie, so the fire effects monitoring program established plots in *Deschampsia* prairie in the burn unit. Results from the first two years of monitoring indicate that in burn plots, non-native forb cover increased at the expense of native perennial grass cover. Figure 3 shows changes in overall native species cover in burn versus control plots.

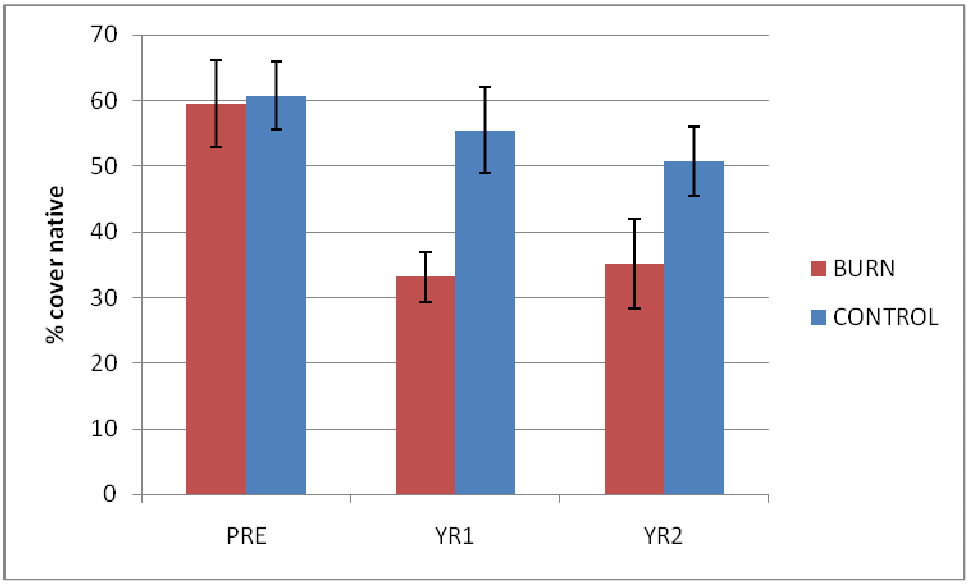

Figure 3. Change in percent cover of native species in burn versus control plots.

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