

THE RELATIVE EFFECTIVENESS OF PRESCRIBED BURNING AND HERBICIDE APPLICATION FOR CONTROLLING FENNEL ON SANTA CRUZ ISLAND, CALIFORNIA

Robert C. Klinger

The Nature Conservancy, 213 Stearns Wharf, Santa Barbara, CA 93101

Bob Brenton

2648 Brannon Way, West Sacramento, CA 95691

ABSTRACT

Fennel (*Foeniculum vulgare*), an invasive exotic herb from the Mediterranean, has occurred on Santa Cruz Island for >100 years. As a result of several interacting factors, fennel underwent a dramatic increase in distribution and abundance in the early 1990's, and now occurs across 10% of the island. Because of its tendency to displace native plant species, we began a series of experiments to test different ways to control it.

One of these experiments tested the null hypothesis that there would be no difference in the relative effectiveness of fire and herbicide (triclopyr) as control methods. Using a nested design, we established 4 experimental conditions (burned and unsprayed, unburned and sprayed, burned and sprayed, and unburned and unsprayed) in 8 0.40-hectare plots. We collected data on the cover and height of fennel, and of all other plants occurring with fennel, from spring 1993 (pretreatment) to spring 1997. Fennel was virtually eliminated in areas that were burned and sprayed, and there was a significant increase in the mean cover and number of native herbaceous species. Fennel cover was drastically reduced in areas that were sprayed and unburned, but there was no significant change in the cover or number of native species. Alien herbaceous species dominated the cover and species richness in both burned and sprayed and the unburned and sprayed areas after the fennel cover was reduced. Relative to the unburned and unsprayed areas, there was virtually no change in the species composition or structure in burned and unsprayed plots. These results indicate that fire alone will not reduce fennel cover, but it is an effective way to enhance the action of triclopyr. The results also show that the removal of an exotic plant species alone will not necessarily lead to communities dominated by native species. In many, if not most, situations, other management actions that manipulate succession patterns will be needed beyond initial control programs.

Citation: Klinger, R.C., and B. Brenton. 2000. The relative effectiveness of prescribed burning and herbicide application for controlling fennel on Santa Cruz Island, California. Page 137 in W. Keith Moser and Cynthia F. Moser (eds.). Fire and forest ecology: innovative silviculture and vegetation management. Tall Timbers Fire Ecology Conference Proceedings, No. 21. Tall Timbers Research Station, Tallahassee, FL.