

VELDTGRASS MONITORING PROGRAM

Annual Report – 1999

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INTRODUCTION

This report summarizes the Nature Reserve of Orange County's (NROC) 1999 veldtgrass (*Ehrharta calycina*) control efforts in the San Joaquin Hills portion of the Coastal Orange County NCCP Subregion. Funding for this year's control effort was provided through a California Department of Fish and Game (CDFG) NCCP grant. The CDFG grant agreement requires a yearly reporting of expenditures and status reports. The \$26,257.00 CDFG grant was awarded to the County of Orange in 1999 for this project, which is to be completed over a three year period.

Veldtgrass was first documented in 1992 in the vicinity of Emerald and Moro Canyons in the Coastal Orange County NCCP Subregion. At this time, it covered approximately three acres. The 1993 Laguna Canyon fire enhanced conditions for this species, which has increased its coverage from three to approximately 30 acres in the past six years. It is spreading rapidly and is forming a near monoculture, out-competing the recovering, diverse coastal sage scrub (CSS) species as well as native bunch grasses. This is the only documented location of this invasive species in the Coastal-Central Orange County NCCP Subregion.

The NROC's veldtgrass control efforts for 1999 began during the active growing season for this species (March-April). This represents the first year of control efforts in this area.

In 1999, \$13,996.90, or roughly half of the CDFG grant, was directed at the control of the veldtgrass. Natures Image, Inc. conducted the control efforts under the direction of John Caruana.

BACKGROUND

Veldtgrass is an exotic, warm season perennial grass that is typically restricted to areas with sandy soils. It was introduced into Australia from South Africa from where it eventually was brought to California for experiments conducted by the University of California-Davis. This grass was introduced for varied purposes including range reseeding, revegetation of disturbed areas, livestock forage, and slope stabilization. In Orange County, preliminary seeding trials of veldtgrass were documented in the 1940's and 1950's (Sampson et al, 1951). In the coastal areas of San Diego and Santa Barbara counties, it has quickly established within natural communities, out-competing native shrub and herb species (Fred Roberts, personal communication). In 1992, veldtgrass was first documented by The Nature Conservancy in upper Emerald and Moro Canyons of the Coastal Orange County NCCP Subregion (Trish Smith, personal communication).

METHODS

Veldtgrass spraying was conducted during the active growing season for this species (March – April). Control efforts involved a three percent foliar application of the herbicide Fusillade II. A surfactant and Blazon, a blue dye, were also added to the mix. Because veldtgrass was growing among native shrubs, the blue marking dye was used to keep track of areas that were sprayed and to ensure adequate coverage. Fusillade II was selected as the herbicide of choice because it is a grass-selective herbicide that will not harm adjacent CSS shrubs. Fusillade has been used successfully for the control of veldtgrass in other natural areas of California including Fort Ord, Nipomo Dunes, and Montana de Oro State Park. It is unknown how many years of treatment is needed to effectively control veldtgrass.

MONITORING

The Nature Conservancy established three 20x20 meter vegetation data collection plots in upper Emerald Canyon prior to treatment in 1999 (see map). Five 20 meter transects were established along the baseline of each plot at 0, 5, 10, 15 and 20 meters. Plant cover data were collected from five one-meter quadrats placed along each transect at five-meter intervals. Ocular estimates were made for total percent relative cover of veldtgrass, other plant species, bare ground, rock, and litter occurring within each quadrat. Photos were taken from the baseline for each transect. Post-treatment monitoring will be conducted annually for three years.

RESULTS

Baseline data are summarized in Table 1. Data collected in April 1999 indicated that veldtgrass dominated all plots sampled. After spraying efforts in May 1999, kill-time for the veldtgrass appeared to be approximately two months.

Other exotic species identified within these three monitoring plots included common ripgut brome (*Bromus diandrus*), long-beaked filaree (*Erodium botrys*), soft chess (*Bromus mollis*), and foxtail fescue (*Vulpia myuros*).

Both native shrubs and herbs were identified within these plots. Native shrubs documented in the plots included (in decreasing order of cover) California buckwheat (*Eriogonum fasciculatum*), coastal deerweed (*Lotus scoparius*), coastal sagebrush (*Artemisia californica*), laurel sumac (*Malosma laurina*), black sage (*Salvia mellifera*), Douglas' nightshade (*Solanum douglasii*), and coastal prickly pear (*Opuntia littoralis*). Native herbs included doveweed (*Eremocarpus setiger*), collar lupine (*Lupinus truncatus*), and rattlesnake weed (*Daucus pusillus*).

Year 2000 spray efforts will begin as soon as adequate rainfall occurs to initiate re-sprouting and re-seeding of the veldtgrass. In one of the treatment study plots, NROC

will experiment with hand removal of veldtgrass thatch to determine if it enhances CSS recovery.

Table 1
Relative Cover Values
Emerald Canyon
1999 Baseline Cover before Fusillade II Treatment

	Veldtgrass Cover	Other Exotic Cover	Native Cover	Bare Ground/ Rock /Litter Cover
Plot 1	45%	43%	7%	5%
Plot 2	64%	4%	26%	6%
Plot 3	62%	5%	28%	8%

Reference

Sampson, A.W., A. Chase and D.W. Hedrick. 1951. *California Grasslands and Range Forage Grasses*. Berkeley: University of California College of Agriculture, California Agricultural Experiment Station, Bulletin 724. 131 pp.

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Laguna Coast Wilderness Park at top of Emerald Canyon: Veldtgrass Plot 2, Transect 4



Laguna Coast Wilderness Park at top of Emerald Canyon: Veldtgrass Plot 3, Transect 4

APPENDIX A

1999 DATA COLLECTION SHEETS

**NATURE RESERVE OF ORANGE COUNTY
VELDTGRASS MONITORING
% COVER VALUES (1999)**

EMERALD CANYON PLOT 1										
Transect 1	Quadrat Number	Slope Gradient	Aspect	EHCA Cover	Native Cover	Exotic Cover	Bare Ground/ Rock	Litter	Other Cover	Total Cover
	1	0-10%	NE	75.0%	5.0%	0.0%	20.0%	0.0%	0.0%	100.0%
	2	0-10%	NE	60.0%	0.0%	15.0%	25.0%	0.0%	0.0%	100.0%
	3	0-10%	NE	90.0%	0.0%	5.0%	5.0%	0.0%	0.0%	100.0%
	4	0-10%	NE	60.0%	0.0%	30.0%	0.0%	10.0%	0.0%	100.0%
	5	0-10%	NE	30.0%	0.0%	55.0%	0.0%	15.0%	0.0%	100.0%
Total Average Cover (T1)				63.0%	1.0%	21.0%	10.0%	5.0%	0.0%	100.0%
Transect 2	Quadrat Number	Slope Gradient	Aspect	EHCA Cover	Native Cover	Exotic Cover	Bare Ground/ Rock	Litter	Other Cover	Total Cover
	1	0-10%	NE	45.0%	45.0%	0.0%	10.0%	0.0%	0.0%	100.0%
	2	0-10%	NE	50.0%	15.0%	20.0%	15.0%	0.0%	0.0%	100.0%
	3	0-10%	NE	15.0%	5.0%	80.0%	0.0%	0.0%	0.0%	100.0%
	4	0-10%	NE	45.0%	5.0%	50.0%	0.0%	0.0%	0.0%	100.0%
	5	0-10%	NE	0.0%	0.0%	100.0%	0.0%	0.0%	0.0%	100.0%
Total Average Cover (T2)				31.0%	14.0%	50.0%	5.0%	0.0%	0.0%	100.0%
Transect 3	Quadrat Number	Slope Gradient	Aspect	EHCA Cover	Native Cover	Exotic Cover	Bare Ground/ Rock	Litter	Other Cover	Total Cover
	1	0-10%	NE	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%
	2	0-10%	NE	10.0%	90.0%	0.0%	0.0%	0.0%	0.0%	100.0%
	3	0-10%	NE	65.0%	0.0%	35.0%	0.0%	0.0%	0.0%	100.0%
	4	0-10%	NE	15.0%	0.0%	85.0%	0.0%	0.0%	0.0%	100.0%
	5	0-10%	NE	5.0%	0.0%	95.0%	0.0%	0.0%	0.0%	100.0%
Total Average Cover (T3)				39.0%	18.0%	43.0%	0.0%	0.0%	0.0%	100.0%
Transect 4	Quadrat Number	Slope Gradient	Aspect	EHCA Cover	Native Cover	Exotic Cover	Bare Ground/ Rock	Litter	Other Cover	Total Cover
	1	0-10%	NE	95.0%	5.0%	0.0%	0.0%	0.0%	0.0%	100.0%
	2	0-10%	NE	60.0%	0.0%	40.0%	0.0%	0.0%	0.0%	100.0%
	3	0-10%	NE	5.0%	0.0%	95.0%	0.0%	0.0%	0.0%	100.0%
	4	0-10%	NE	80.0%	0.0%	20.0%	0.0%	0.0%	0.0%	100.0%
	5	0-10%	NE	40.0%	5.0%	55.0%	0.0%	0.0%	0.0%	100.0%
Total Average Cover (T4)				56.0%	2.0%	42.0%	0.0%	0.0%	0.0%	100.0%
Transect 5	Quadrat Number	Slope Gradient	Aspect	EHCA Cover	Native Cover	Exotic Cover	Bare Ground/ Rock	Litter	Other Cover	Total Cover
	1	0-10%	NE	80.0%	0.0%	0.0%	0.0%	20.0%	0.0%	100.0%
	2	0-10%	NE	55.0%	0.0%	45.0%	0.0%	0.0%	0.0%	100.0%
	3	0-10%	NE	5.0%	0.0%	100.0%	0.0%	0.0%	0.0%	105.0%
	4	0-10%	NE	45.0%	0.0%	55.0%	0.0%	0.0%	0.0%	100.0%
	5	0-10%	NE	0.0%	0.0%	100.0%	0.0%	0.0%	0.0%	100.0%
Total Average Cover (T5)				37.0%	0.0%	60.0%	0.0%	4.0%	0.0%	101.0%
TOTAL AVERAGE COVER (T1-T5)				45.2%	7.0%	43.2%	3.0%	1.8%	0.0%	100.2%

**NATURE RESERVE OF ORANGE COUNTY
VELDTGRASS MONITORING
% COVER VALUES (1999)**

EMERALD CANYON PLOT 2

Transect 1	Quadrat Number	Slope Gradient	Aspect	EHCA Cover	Native Cover	Exotic Cover	Bare Ground/ Rock	Litter	Other Cover	Total Cover
	1	0-10%	NE	95.0%	10.0%	0.0%	0.0%	0.0%	0.0%	105.0%
	2	0-10%	NE	45.0%	55.0%	0.0%	0.0%	0.0%	0.0%	100.0%
	3	0-10%	NE	73.0%	25.0%	2.0%	0.0%	0.0%	0.0%	100.0%
	4	0-10%	NE	80.0%	10.0%	10.0%	0.0%	0.0%	0.0%	100.0%
	5	0-10%	NE	90.0%	10.0%	0.0%	0.0%	0.0%	0.0%	100.0%
Total Average Cover (T1)				76.6%	22.0%	2.4%	0.0%	0.0%	0.0%	101.0%

Transect 2	Quadrat Number	Slope Gradient	Aspect	EHCA Cover	Native Cover	Exotic Cover	Bare Ground/ Rock	Litter	Other Cover	Total Cover
	1	0-10%	NE	93.0%	2.0%	5.0%	0.0%	0.0%	0.0%	100.0%
	2	0-10%	NE	35.0%	65.0%	0.0%	0.0%	0.0%	0.0%	100.0%
	3	0-10%	NE	35.0%	60.0%	0.0%	5.0%	0.0%	0.0%	100.0%
	4	0-10%	NE	78.0%	22.0%	0.0%	0.0%	0.0%	0.0%	100.0%
	5	0-10%	NE	99.0%	0.0%	1.0%	0.0%	0.0%	0.0%	100.0%
Total Average Cover (T2)				68.0%	29.8%	1.2%	1.0%	0.0%	0.0%	100.0%

Transect 3	Quadrat Number	Slope Gradient	Aspect	EHCA Cover	Native Cover	Exotic Cover	Bare Ground/ Rock	Litter	Other Cover	Total Cover
	1	0-10%	NE	25.0%	40.0%	16.0%	9.0%	10.0%	0.0%	100.0%
	2	0-10%	NE	70.0%	30.0%	0.0%	0.0%	0.0%	0.0%	100.0%
	3	0-10%	NE	50.0%	50.0%	0.0%	0.0%	0.0%	0.0%	100.0%
	4	0-10%	NE	50.0%	20.0%	0.0%	0.0%	30.0%	0.0%	100.0%
	5	0-10%	NE	80.0%	20.0%	0.0%	0.0%	0.0%	0.0%	100.0%
Total Average Cover (T3)				55.0%	32.0%	3.2%	1.8%	8.0%	0.0%	100.0%

Transect 4	Quadrat Number	Slope Gradient	Aspect	EHCA Cover	Native Cover	Exotic Cover	Bare Ground/ Rock	Litter	Other Cover	Total Cover
	1	0-10%	NE	45.0%	40.0%	0.0%	0.0%	15.0%	0.0%	100.0%
	2	0-10%	NE	30.0%	65.0%	0.0%	10.0%	0.0%	0.0%	105.0%
	3	0-10%	NE	90.0%	5.0%	0.0%	0.0%	5.0%	0.0%	100.0%
	4	0-10%	NE	65.0%	21.0%	14.0%	0.0%	0.0%	0.0%	100.0%
	5	0-10%	NE	10.0%	10.0%	32.0%	0.0%	50.0%	0.0%	102.0%
Total Average Cover (T4)				48.0%	28.2%	9.2%	2.0%	14.0%	0.0%	101.4%

Transect 5	Quadrat Number	Slope Gradient	Aspect	EHCA Cover	Native Cover	Exotic Cover	Bare Ground/ Rock	Litter	Other Cover	Total Cover
	1	0-10%	NE	50.0%	45.0%	5.0%	0.0%	0.0%	0.0%	100.0%
	2	0-10%	NE	84.0%	6.0%	10.0%	0.0%	0.0%	0.0%	100.0%
	3	0-10%	NE	80.0%	10.0%	0.0%	0.0%	10.0%	0.0%	100.0%
	4	0-10%	NE	86.0%	14.0%	0.0%	0.0%	0.0%	0.0%	100.0%
	5	0-10%	NE	70.0%	25.0%	5.0%	0.0%	0.0%	0.0%	100.0%
Total Average Cover (T5)				74.0%	20.0%	4.0%	0.0%	2.0%	0.0%	100.0%

TOTAL AVERAGE COVER (T1-T5)				64.3%	26.4%	4.0%	1.0%	4.8%	0.0%	100.5%
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**NATURE RESERVE OF ORANGE COUNTY
VELDTGRASS MONITORING
% COVER VALUES (1999)**

EMERALD CANYON PLOT 3										
Transect 1	Quadrat Number	Slope Gradient	Aspect	EHCA Cover	Native Cover	Exotic Cover	Bare Ground/ Rock	Litter	Other Cover	Total Cover
	1	0-10%	NW	45.0%	30.0%	0.0%	0.0%	25.0%	0.0%	100.0%
	2	0-10%	NW	45.0%	0.0%	50.0%	5.0%	0.0%	0.0%	100.0%
	3	0-10%	NW	30.0%	45.0%	0.0%	0.0%	25.0%	0.0%	100.0%
	4	0-10%	NW	40.0%	50.0%	10.0%	0.0%	25.0%	0.0%	125.0%
	5	0-10%	NW	30.0%	65.0%	0.0%	0.0%	5.0%	0.0%	100.0%
Total Average Cover (T1)				38.0%	38.0%	12.0%	1.0%	16.0%	0.0%	105.0%
Transect 2	Quadrat Number	Slope Gradient	Aspect	EHCA Cover	Native Cover	Exotic Cover	Bare Ground/ Rock	Litter	Other Cover	Total Cover
	1	0-10%	NW	75.0%	25.0%	0.0%	0.0%	0.0%	0.0%	100.0%
	2	0-10%	NW	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%
	3	0-10%	NW	60.0%	40.0%	0.0%	0.0%	0.0%	0.0%	100.0%
	4	0-10%	NW	60.0%	25.0%	15.0%	0.0%	0.0%	0.0%	100.0%
	5	0-10%	NW	85.0%	0.0%	5.0%	0.0%	10.0%	0.0%	100.0%
Total Average Cover (T2)				76.0%	18.0%	4.0%	0.0%	2.0%	0.0%	100.0%
Transect 3	Quadrat Number	Slope Gradient	Aspect	EHCA Cover	Native Cover	Exotic Cover	Bare Ground/ Rock	Litter	Other Cover	Total Cover
	1	0-10%	NW	80.0%	0.0%	20.0%	0.0%	0.0%	0.0%	100.0%
	2	0-10%	NW	80.0%	10.0%	10.0%	0.0%	0.0%	0.0%	100.0%
	3	0-10%	NW	30.0%	70.0%	0.0%	0.0%	0.0%	0.0%	100.0%
	4	0-10%	NW	75.0%	25.0%	0.0%	0.0%	0.0%	0.0%	100.0%
	5	0-10%	NW	60.0%	10.0%	0.0%	0.0%	30.0%	0.0%	100.0%
Total Average Cover (T3)				65.0%	23.0%	6.0%	0.0%	6.0%	0.0%	100.0%
Transect 4	Quadrat Number	Slope Gradient	Aspect	EHCA Cover	Native Cover	Exotic Cover	Bare Ground/ Rock	Litter	Other Cover	Total Cover
	1	0-10%	NW	70.0%	0.0%	0.0%	0.0%	30.0%	0.0%	100.0%
	2	0-10%	NW	40.0%	60.0%	0.0%	0.0%	0.0%	0.0%	100.0%
	3	0-10%	NW	40.0%	75.0%	0.0%	0.0%	0.0%	0.0%	115.0%
	4	0-10%	NW	83.0%	17.0%	0.0%	0.0%	0.0%	0.0%	100.0%
	5	0-10%	NW	25.0%	60.0%	0.0%	0.0%	15.0%	0.0%	100.0%
Total Average Cover (T4)				51.6%	42.4%	0.0%	0.0%	9.0%	0.0%	103.0%
Transect 5	Quadrat Number	Slope Gradient	Aspect	EHCA Cover	Native Cover	Exotic Cover	Bare Ground/ Rock	Litter	Other Cover	Total Cover
	1	0-10%	NW	100.0%	2.0%	0.0%	0.0%	0.0%	0.0%	102.0%
	2	0-10%	NW	50.0%	50.0%	0.0%	0.0%	0.0%	0.0%	100.0%
	3	0-10%	NW	45.0%	20.0%	10.0%	0.0%	25.0%	0.0%	100.0%
	4	0-10%	NW	90.0%	10.0%	0.0%	0.0%	0.0%	0.0%	100.0%
	5	0-10%	NW	100.0%	20.0%	0.0%	0.0%	0.0%	0.0%	120.0%
Total Average Cover (T5)				77.0%	20.4%	2.0%	0.0%	5.0%	0.0%	104.4%
TOTAL AVERAGE COVER (T1-T5)				61.5%	28.4%	4.8%	0.2%	7.6%	0.0%	102.5%