GLENWOOD PRESERVE MONITORING REPORT - YEAR 3

Scotts Valley, Santa Cruz County California

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EXECUTIVE SUMMARY

This Year 3 Annual Monitoring Report describes the management and monitoring activities conducted on the Glenwood Preserve ("Preserve"). Monitoring is conducted according to the guidelines set forth in the final Open Space Management Plan ("OSMP") for the Preserve (WRA 2003).

Monitoring of the federally endangered Ohlone tiger beetle (*Cicindela ohlone*, OTB) was performed between January and November of 2006. A total of 98 adults were observed throughout 2006, compared to 78 during 2005, 239 in 2004, and 372 in 2003. During the June 2006 monitoring of larval burrows, 271 active larvae were inventoried in the Glenwood Preserve. A total of 167 active larval burrows were observed in 2005 during the July larval burrow survey visit, 347 were observed during the June 2004 survey, and 556 in 2003. The observed increase in the number of larval burrows and occupied area between 2005 and 2006 may be due to increased grazing in the OTB habitat in addition to the creation of man-made bare ground from shovel scraping. High rainfall in the winter and spring of 2005-2006 may have contributed to larval beetle mortality due to excess soil saturation. This above-average rainfall also allowed the growth of significantly more vegetation which reduces the amount of suitable adult beetle habitat. Suitable soil conditions for the OTB still appear to be limited to a rather small portion of the Preserve, so continued grazing there to maintain bare and sparsely-vegetated areas of ground for the OTB is imperative. Continued monitoring of the OTB population in future years will demonstrate whether the grazed and human modified habitat allows the OTB to extend its distribution within the Preserve.

Point counts of adult Opler's longhorn moth (*Adela oplerella*, OLM), a Federal Species of Concern, continued in 2006 at the seven patches of its larval food plant, cream cups (*Platystemon californicus*), which had been previously identified within the Preserve. These counts were performed on the same dates as the transect counts for the OTB. A total of 16 adults of the OLM were observed in 2006, down from 37 individuals observed in 2005. All observations were made at the same patch of its food plant as in 2004 and 2005, which is located on the slope south of the pond, while no OLMs were observed at any of the other six patches. Manual introduction of the moths to other patches of its food plant may be warranted if they do not naturally colonize these other areas on their own, however this should not be attempted until the populations numbers have increased.

Population monitoring of the federally endangered Scotts Valley spineflower (*Chorizanthe robusta* var. *hartwegii*) was conducted on the Preserve in May 2006. A total of 10,742 individuals were counted at nine sites. All but one of the sites had supported fewer plants in 2006 than in 2005. Although fewer plants were observed in 2006, individual plants were considerably more robust with more flowering stalks and flower clusters per plant than observed in previous years. This suggests that while the seed germination conditions may not have been ideal, late season climatic conditions allowed the plants to grow larger than in past years. No adverse environmental site conditions were noted during the spring 2006 field surveys, and there was no evidence of erosion, over-grazing or trampling in the majority of spineflower habitat. One exotic species, narrow-leafed clover (*Trifolium angustifolium*), with high cover in 2005 had dramatically less cover in 2006, while a different non-native, smooth cat's ear (*Hypochaeris glabra*), increased in cover by over 20 percent in 2006 from 2005 in spineflower population C-128. It is recommended that grazing continue to occur in the

spineflower habitat, particularly at those sites where no spineflower was observed in 2004-2006.

The Preserve grazing program implemented in 2004 to monitor the horses' grazing patterns and coordinate the horse grazing rotation plan was continued in 2006. Minor improvements to pasture infrastructure were made in 2006, including modifying the horse trough water supply lines, adding a quick coupler to the water line adjacent to the temporary horse corral, and repairing breaks along the pasture fencing. Monitoring and management of the grazing program in 2006 included reconnaissance surveys, coordination of the grazing rotation program, photo documentation, and end of the season measurements of grazing utilization, which are determined by measuring residual dry matter (RDM). The forage consumption averaged about 2,000 lb/acre which is on target with the minimum RDM measurements for the Preserve. Horse numbers varied between 16 and 19 horses for the majority of the 2005-2006 growing season. Two additional horses are scheduled to arrive in January, 2007, which will bring the number of horses currently in the Preserve up to 18, but based on RDM measurements and observation of utilization the target number of horses for 2006-2007 is 20. The grazing rotation program was adjusted in 2006 to improve horse access to the beetle pasture, which successfully increased the amount of bare ground for the Ohlone Tiger Beetles. Differences in beliefs regarding the grazing management strategy by the horse owners somewhat complicates implementing the grazing program, however the addition of a third party grazing manager to the Preserve late this year will hopefully resolve these conflicts. This report includes a Pasture Rotation Program for the Glenwood Preserve revised for 2007 based on adjusted rangeland production values and usage.

Long-term vegetation monitoring on the Preserve continued in 2006 by conducting surveys along fifteen permanent transects previously established throughout the Preserve in different habitat types. Native species cover and the amount of vegetated ground both decreased approximately 10% on the preserve in 2006. This is likely due to a combination of factors including annual weather patterns and effective grazing management that promotes the exposure of bare ground. Overall plant species diversity decreased slightly on the preserve, however this doesn't appear significant as on average there was only one less species amongst the transects. Four species of known exotic invasive plants persist on the preserve. Many individuals of Blackwood acacia (*Acacia melanoxylon*) were cut in the preserve in 2006, however, the population along the water district road is re-sprouting from roots and stumps and should be chemically treated. Large patches of Italian thistle (*Carduus pycnocephalus*) were observed in the valleys of Pastures B and C in the spring which a landscape contractor mowed in early summer. Isolated individuals of bull thistle (*Cirsium vulgare*) were also cut during that site visit but both thistles may re-sprout from their roots and should be monitored. Grazing management has not effectively controlled pennyroyal (*Mentha pulegium*), an invasive wetland plant in Pasture A, and alternate removal options should be considered.

Monitoring of several other special status plant species continued in the Preserve in 2006. Two new patches of Mt. Diablo cottonweed (*Micropus amphibolus*), a CNPS List 3 plant, were mapped in Pasture C and previously known patches continue to thrive in Pastures B, C, and D. Surveys for Choris's popcorn flower (*Plagiobothrys chorisianus* var. *chorisianus*), conducted during the wetland transect monitoring in July were likely after the blooming of this short lived annual as none were observed. Surveys for these species will continue as part of the annual monitoring program.

A copy of this report is being provided to The City of Scotts Valley, the Land Trust of Santa Cruz County, the Department of Fish and Game, and the US Fish and Wildlife Service.

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1.0 INTRODUCTION

This document presents results and recommendations of the third year (2005-2006) of monitoring activities conducted on the Glenwood Open Space Preserve (Preserve) in Scotts Valley, Santa Cruz County, California. The 160-acre Preserve was dedicated in 2003 to the City of Scotts Valley by American Dream / Glenwood, L.P. as a condition of approval for development of forty-four single-family residences on the remainder of the 195-acre Glenwood property.

1.1 PRESERVE DESCRIPTION

The Preserve is located on either side of Glenwood Drive, north and east of Scotts Valley High School in the City of Scotts Valley, Santa Cruz County. The Preserve is included in the Felton and Laurel Quadrangles (USGS 7.5 minute series topographic maps). Adjacent land uses are rural-density residences to the north, Scotts Valley High School and undeveloped parcels to the west, medium-density residential housing to the east, and Vine Hill School and existing homes and Siltanen Park to the south.

Approximately 60 percent of the Preserve is non-native annual grassland with the remainder consisting of wetlands, willow riparian, native grassland, coyote bush scrub, and oak and redwood forest. Soils in the valleys are primarily of Danville loams, which are deep, well-drained soils with slow permeability (USDA 1980). Slopes are moderate with elevations of 750 to 860 feet. Soil on the slopes and ridges is Bonnydoon loam, which is a shallow, somewhat excessively drained soil with moderate permeability and outcrops of sandstone and mudstone provide habitat for a diversity of common and special status species.

Two federally listed species occur in the Preserve. The southeast corner of the Preserve is one of fifteen currently known locations of the endangered Ohlone tiger beetle (*Cicindela ohlone*, sometimes referred to as OTB) (USFWS 2001, DFG 2002). Portions of grassland in the Preserve also support the endangered Scotts Valley spineflower (*Chorizanthe robusta* var. *hartwegii*, SVSF), and the Preserve is part of designated critical habitat for the species (USFWS 2002).

Several additional special status species are known to occur within the Preserve. The Opler's longhorn moth (*Adela oplerella*, sometimes referred to as OLM), a Federal Species of Concern, has been observed in the southeastern portion of the Preserve. Mount Diablo cottonweed (*Micropus amphibolus*), included on the California Native Plant Society's ("CNPS") List 3, has been observed in grassland throughout the Preserve.

1.2 BACKGROUND

Prior to 2004, sensitive species or habitats were not managed or monitored on the Glenwood property. The property east of Glenwood Drive was fenced as a single pasture and grazed by horses at above its calculated carrying capacity. Horses had year round access to sensitive habitats, including Ohlone tiger beetle habitat, and concentrated in sensitive native grasslands, wetlands, and riparian areas in the dry season. In contrast, the property west of Glenwood Drive had not been grazed for many years. In the absence of grazing, growth of non-native annual grasses is dense and

native shrubs have become established. The conditions within those portions of the site containing native grassland, Scotts Valley spineflower and other sensitive plant species habitat had not been monitored.

The City of Scotts Valley, in approving the Environmental Impact Report, Mitigation and Monitoring Reporting Program (MMRP) for the Glenwood Project, required the preparation of an Open Space Management Plan ("OSMP" or "Plan") (WRA 2003). The Plan was developed after several public hearings and input from resource agencies, environmental groups and the public. The OSMP provides guidance on maintaining the existing condition of the sensitive habitats (wetland, riparian, and native grassland) and of the grassland habitat that is home to the rare insect and plant species. Restoration and enhancement of sensitive habitats are not required by the project conditions and the MMRP. The U.S. Fish and Wildlife Service and the California Department of Fish and Game reviewed and approved the vegetation management practices recommended in the Plan.

The primary goals of the Open Space Management Plan are to:

1) Maintain, at a minimum, the existing habitat conditions in order to preserve the suitability of the grassland habitats of sensitive species, including: the Ohlone tiger beetle, Scott's Valley spineflower, Opler's longhorn moth, and Mount Diablo cottonweed;
2) Preserve and maintain the existing condition of sensitive habitats including wetland, riparian, and native grassland.

The Plan provides specific management objectives for each of the sensitive species and habitats and includes a monitoring program. The Plan objectives are based on qualitative knowledge of existing habitat conditions and site history and the current knowledge of the life histories and habitat requirements for each of the sensitive species. Thus far, there have been few quantitative surveys of the sensitive species on the Preserve, and no quantitative data exists on characteristics of the grassland habitat of the sensitive species. Therefore, it is stated in the Plan that initial data from the monitoring program is to be used as baseline data, and baseline data will need to continue to be developed as the Plan is implemented.

This monitoring report presents results of the third year of baseline data collection. Baseline data may require several years of monitoring to allow differentiation between normal fluctuations in population numbers and habitat from responses to management actions as well as variations in climatic and other natural conditions (amount and timing of rainfall, temperature, etc.). Once sufficient baseline data on distribution and populations are developed, thresholds can be established which alert the preserve manager when population or habitat changes occur that are outside the natural variability expected. The manager will consider short and long term habitat and population data, as well as the influence of climatic conditions in making adjustments to baselines, thresholds and management activities. This adaptive management approach will allow the Plan to evolve as habitat or regulatory conditions change, and as more information is gained about the site and the species through annual monitoring. Future annual monitoring reports will recommend appropriate changes in habitat management practices based on the monitoring results, revision of preliminary baselines, and refinement of thresholds.

2.0 OHLONE TIGER BEETLE

Prepared by: Richard A. Arnold, Ph.D., Entomological Consulting Services, Ltd. This section summarizes the findings of the 2006 monitoring activities on the endangered Ohlone Tiger beetle (OTB). Comparisons to findings from 2003, 2004, and 2005 surveys are also provided.

2.1 METHODS

Surveys were conducted during 2006 to monitor adult and larval life stages of the OTB. This section describes the monitoring methods and data analysis methods used to monitor the life stages of this insect.

Since OTB population numbers had declined dramatically during the past couple of years, I had recommended that the grazing intensity be increased to open up more bare ground for beetle usage. In addition, Phil Greer and David Amme cleared the vegetation from six small plots adjacent to the trail system to see if we could attract OTB life stages. These plots, identified as S-1 through S-6 in Figure 2-a, each measured approximately $1m^2$ in size and were cleared using a shovel. During site visits, any usage of the cleared plots by OTB life stages were documented.

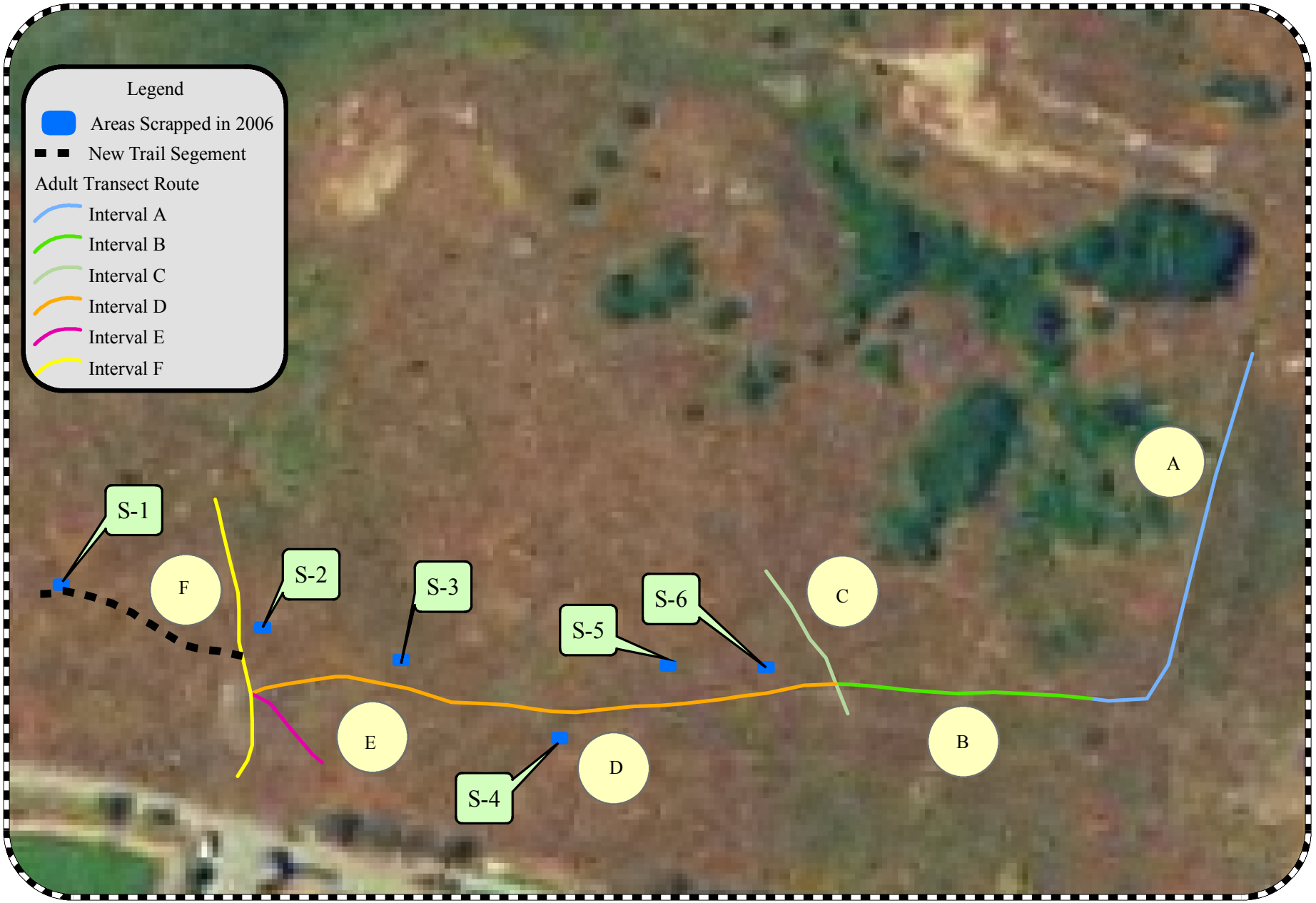
2.1.1 Adult OTB Counts

Adults of the OTB can be active from mid-January to mid-May, although annual variation occurs in the duration of adult activity period, as well as starting and ending dates. In 2004, a transect route was established along existing trails in the southeastern portion of the Glenwood study site to monitor adult OTBs. The transect route was divided into six segments or intervals (A-F in Figure 2-a) based on landmarks or prominent vegetation in the field. Total length of the transect route is 1,105 feet, with interval A measuring 254 feet, B 156 feet, C 101 feet, D 360 feet, E 61 feet, and F 173 feet.

The entire transect route was walked once daily on each of 15 survey dates, which spanned from the beginning to the end of the 2006 adult season. As OTB adults were observed within 15 feet on either side of the centerline of the trail (i.e., a 30 ft. wide belt transect), the location of each individual was obtained using a hand held global positioning system (GPS), and information about each individual's sex and observed behavior was recorded. The tally of all observed adults along the transect route on a particular survey date comprised the daily transect count.

The transect counts along this route establish the starting and ending dates of the OTB's adult season, plus the magnitude and shape of the seasonal population curve for the transect route. When the counts are plotted against the day number of the adult activity season, the seasonal population curve of OTB numbers is illustrated. This seasonal population curve can be described mathematically by fitting a curve to the count data.

Figure 2-a. 2006 Ohlone Tiger Beetle Study
Scotts Valley - Glenwood Site
(Adult transect route and intervals (A - F) and areas scrapped to attract adult beetles)



Prepared August 29, 2006
by Entomological Consulting Services, Ltd.

2.1.2 OTB Larval Burrows

The same trails that were used for the adult surveys were checked for egg, larval, and adult emergence burrows throughout the 2006 survey period. In addition, surveys of barren or sparsely vegetated areas within the adjacent grasslands were also checked for burrows. All burrows observed during 2006 were located within the trails or immediately adjacent to them.

In prior monitoring at Glenwood egg and larval burrows were marked with pre-numbered, aluminum tree tags by nailing them to the ground near the burrow. Because vandals have removed my tags during each of the past two years, no burrows were marked in 2006. Also, horse owners have expressed concerns about potential injury to their horses. Instead the position of every active larval burrow was mapped in June 2006 using a mapping grade GPS manufactured by Trimble. Coordinates for all burrows were differentially corrected to improve their positional accuracy. The diameter of the mouth of every larval burrow was also measured to determine the instar of any larvae associated with each burrow.

2.2 RESULTS

2.2.1 Adult OTB Counts

In 2006, the first adult OTBs were observed on February 3rd at Glenwood, or about four days later than when the first adult beetles were observed in 2005. Adult counts were performed while walking along the transect route, as illustrated in Figure 1, on 15 days between February 3rd and May 28th. The transect route was the same as was used in 2003, 2004, and 2005 to facilitate comparison of seasonal adult counts. No adults were observed on the last survey date. The additional 13 survey dates in 2006 included, February 18th and 26th, March 4th, 12th, 19th, and 26th, April 2nd, 8th, 16th, 22nd, and 27th, plus May 6th, 12th, and 28th. These dates were selected because weather conditions were suitable for adult OTBs to be active, i.e., sunny and temperatures $\geq 62^{o}$ F.

Table 2-a summarizes the numbers of adult OTBs that were observed on each survey date throughout 2006 by transect interval. Figure 2-b illustrates the portions of the transect route where adults and/or larvae were observed in 2006. Areas where adults or larvae were not observed have generally become overgrown by herbaceous vegetation.

A total of 98 adult observations occurred throughout 2006, compared to 78 adults in 2005, 239 adults in 2004, and 372 adults during 2003. Average numbers of OTB adults observed per site visit was 6.5/survey date in 2006, compared to 5.1 in 2005, 19.9 in 2004, and 24.8 in 2003. Although the numbers of OTB adults observed in 2006 increased about 25% compared to 2005, they are still down nearly 74% from the numbers observed in 2003.

The duration of the adult activity period was about 99 days in 2006, compared to 71 days in 2005, 60 days in 2004 and about 70 days in 2003. The longer activity period may have been due to the heavy winter rains and later spring season. The population peak occurred on day 52 (March 26th), compared to day 38 (March 8th) in 2005, day 27 (March 7th) in 2004, and day 37 (March 5th) in 2003.

Table 2-a. Summary of Adult OTBs Observed in 2006 at Glenwood							
Transect Survey Date	**OTB Numbers by Transect Interval (A-F, see Figure X)**						**Daily Transect Totals**
	A	**B**	**C**	**D**	**E**	**F**	
3 Feb.	0	0	0	0	0	2	**2**
18 Feb.	0	0	0	0	1	3	**4**
26 Feb.	0	0	0	0	1	3	**4**
4 March	0	0	0	0	1	2	**3**
12 March	0	0	0	1	2	4	**7**
19 March	0	0	1	5	1	4	**11**
26 March	0	1	0	6	4	7	**18**
2 April	0	1	1	4	2	2	**10**
8 April	0	0	1	5	1	7	**14**
16 April	0	0	1	4	1	5	**11**
22 April	0	0	0	3	1	3	**7**
27 April	0	0	0	1	0	2	**3**
6 May	0	0	0	1	0	1	**2**
12 May	0	0	0	1	0	1	**2**
28 May	0	0	0	0	0	0	**0**
Seasonal Totals	**0**	**2**	**4**	**31**	**15**	**46**	**98**

Throughout the 2006 adult season, 31 of the 98 beetle observations (31.6%) were on the six new patches of bare soil. Adults began visiting the new bare patches as soon as they were created on March 16th and continued to do so throughout the remainder of the adult season. No adult OTBs were observed at patch S-1, but between 3 and 11 beetles were observed at each of the five other created bare patches. Of the 31 adult OTBs observed along transect interval D, 23 adults were observed on patches S-3 to S-6 while only 8 adults were actually observed along the trail. Thus, this simple habitat manipulation experiment resulted in rapid and intensive usage of the small, created patches of bare ground by OTB adults. Clearly, it would be desirable to expand the area of bare or sparsely vegetated soil at the Glenwood site.

Observed behaviors of OTB adults included basking (n = 60), foraging (n =6), running (n = 1), flying (n = 10), mating (n = 18), and ovipositing (n = 4). A total of 64 males and 34 females were observed. Since beetles were not marked, captured, or otherwise handled to permit individual recognition, it is possible some individuals were observed more than once on a particular survey date or on different survey dates during the 2006 adult season.

Figure 2-b. 2006 Ohlone Tiger Beetle Study
Scotts Valley - Glenwood Site
Area of Study Site Where Burrows Were Identified in June 2006

0 70 140 280 Feet

Prepared August 30, 2006
by Entomological Consulting Services, Ltd.

2.2.2 OTB Larval Burrows

A total of 271 active larval burrows were observed during my June 2006 mapping of the burrows. As detailed in Table 2-b, most of these burrows (n = 226) supported mature, third instar larvae of the OTB, with burrow diameters ranging in size from 3.6 to 6.0 mm. Most of these larvae remained active through the September and October site visits. However, showers and rains in November caused any remaining larvae to plug their burrows. The remaining 35 larvae in burrows were first (n = 7) or second instars (n = 38), measuring <3.6 mm in Table 2-b). The correlations between burrow size and larval instar number were determined by lab rearing studies by Dr. Kinsley and reported in Kinsley and Arnold (2004, Biology and conservation of *Cincidela ohlone*, the Ohlone Tiger Beetle. Final report to U.S. Fish & Wildlife Service).

Table 2-b. Comparison of Numbers of OTB Burrows by Larval Instar in 2003 and 2004 at Glenwood

Larval Survey Year	Observed Numbers by Larval Instar			
	1.5-2.3 mm 1st Instar	2.4-3.5 mm 2nd Instar	3.6-6.0 mm 3rd Instar	Totals
2003 (July)	3	21	532	556
2004 (June)	2	57	288	347
2005 (July)	2	23	142	167
2006 (June)	7	38	226	271

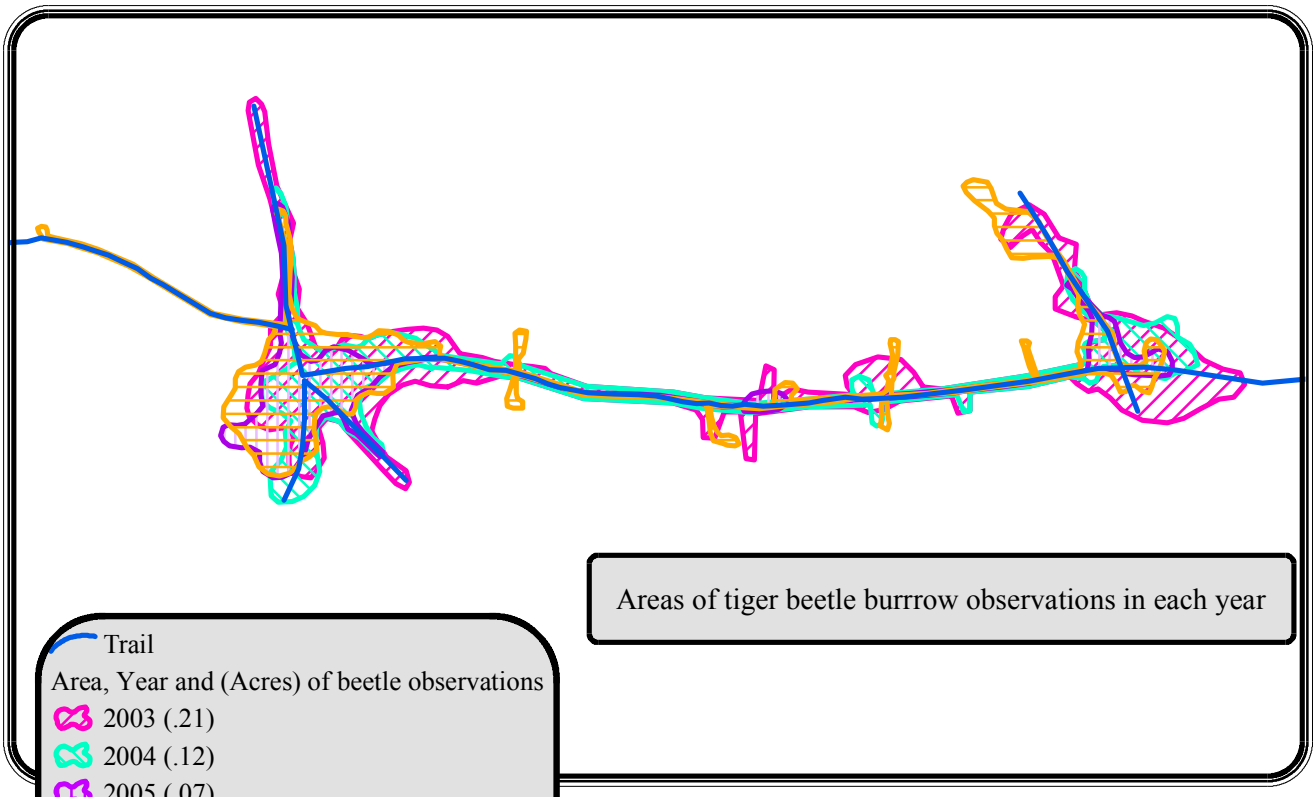
Although the numbers of larval burrows declined 70% between 2003 and 2005, burrow numbers increased about 62% in 2006. Figure 2-c illustrates the locations of all larval burrows at the Glenwood site in 2003, 2004, 2005, and 2006. Note that the occupied area was substantially greater in 2003 than 2005, but expanded again in 2006. Six of the larval burrows were observed on five of the scraped plots.

2.3 CONCLUSIONS AND RECOMMENDATIONS

The observed increase in OTB adult and larval numbers in 2006 is encouraging, however the beetle population is still far below the numbers observed in 2003. Also, the area of occupation is still smaller than in 2003. Nonetheless, the Glenwood site is one of the few OTB populations to actually experience an increase in beetle numbers in recent years, so the habitat management appears to be having a positive effect.

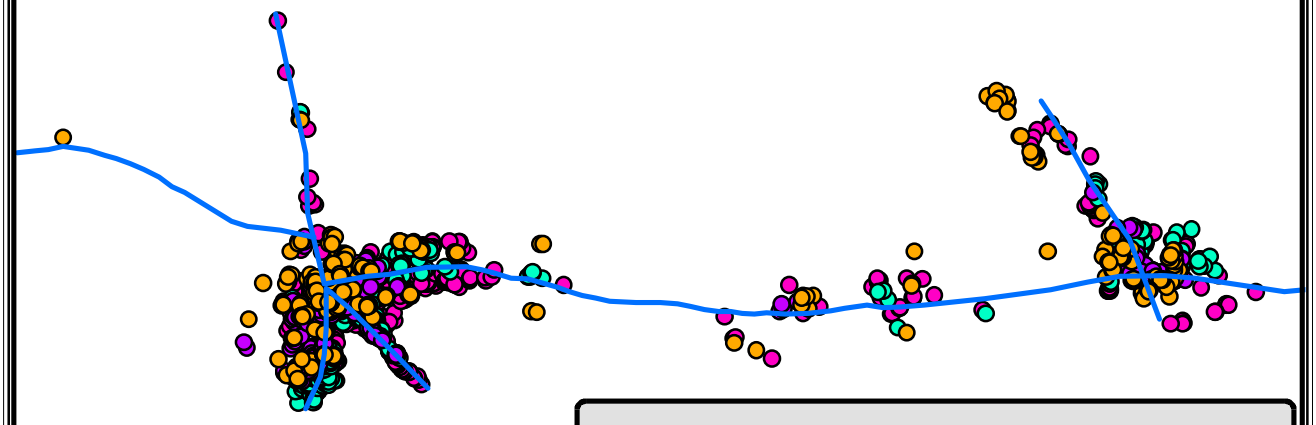
The substantial usage of five of the six cleared plots by OTB adults and larvae underscores the beetle's requirement for bare ground. Even though overall habitat conditions are more favorable for the OTB, we still need to create substantially more bare ground and sparsely-vegetated ground, especially in the beetle pasture to provide more suitable areas of habitat to support greater numbers of OTBs. The OTB population at Glenwood is currently restricted to only 0.12 acre. Until this area can be expanded substantially, the long term survival of the beetle will continue to be questionable. Thus we need to not only continue the grazing and hoof trampling by the horses, but also explore other ways to increase and maintain the cover of bare ground.

Figure 2-c. 2006 Ohlone Tiger Beetle Study
Scotts Valley - Glenwood Site
Comparison of Burrow Locations 2003 - 2006



Areas of tiger beetle burrrow observations in each year

Trail
Area, Year and (Acres) of beetle observations
2003 (.21)
2004 (.12)
2005 (.07)
2006 (.12)
Burrows, Year and (Number) Observed
2003 (556)
2004 (364)
2005 (167)
2006 (271)



Location of tiger beetle burrrows identified in each year

0 50 100 200 Feet

Prepared August 29, 2006
by Entomological Consulting Services, Ltd.

3.0 OPLER'S LONGHORN MOTH

Prepared by: Richard A. Arnold, Ph.D., Entomological Consulting Services, Ltd. This report summarizes the findings of the 2006 monitoring activities on the rare Opler's Longhorn Moth (OPM).

3.1 METHODS

Point counts of the numbers of observed OLM adults were performed at the seven patches of its larval food plant, cream cups (*Platystemon californicus*) which grow at the Glenwood study site. These counts were performed on the same dates as the transect counts for the OTB. Point counts were used because the seven patches of the food plant are very small in size and area.

3.2 RESULTS

Adults of the OLM were observed at only one (OLM #1, as described in Arnold, R.A. 2000, Ohlone Tiger Beetle Report prepared for American Dream/Glenwood Limited Partners, 8 pp.) of the seven patches of its food plant, on a slope next to the man-made reservoir. A total of 16 adults were active between March 2nd and April 27th. No OLM were observed at any of the other six patches of its food plant (OLM #2 -#7 of prior reports). Observations of the OLM declined from 48 in 2004 to 37 in 2005, and only 16 in 2006.

3.3 CONCLUSIONS AND RECOMMENDATIONS

Implementation of the grazing program will hopefully increase the abundance of the OLM's larval food plant, which in turn should increase the population size of the moth. To-date, moth numbers have declined, but the unseasonably wet past couple of years may be at least partially responsible for the moth's decline. Once population numbers at the know OLM patch increase, we may want to consider introducing the moth to other patches of the food plant at the Glenwood site if natural colonization does not occur.

4.0 SCOTTS VALLEY SPINEFLOWER

Prepared by Kathy Lyons of Biotic Resources Group who monitored the distribution and population of the Scotts Valley spineflower in 2006 (Year 3).

4.1 METHODS

4.1.1 Quantitative Sampling of Vegetation within Spineflower Habitat Areas

The occupied spineflower and suitable habitat areas were quantitatively sampled on May 2 and May 3, 2006 by Kathleen Lyons and a field assistant to document baseline conditions of plant species composition and plant cover. Three transects (T6, T14 and T15, see map in Appendix A), that were established in Year 1 (2004) were re-sampled to document percent vegetative cover and plant species composition. The transects are located in and adjacent to occupied and suitable habitat areas. Within the three

transects, a total of forty-one quadrats were sampled (20 quadrats in T6, 8 quadrats in T14 and 13 quadrats in T15).

Data from the quadrats were analyzed to determine absolute plant cover, relative plant cover and the percentage of native species, non-native species, grass species and forbs (i.e., non-grass herbaceous species). Photography was utilized to document the spineflower habitat in May 2006. Permanent photo stations that were established at each transect in 2004 were re-shot to depict 2006 conditions; random photos were also taken of other occupied areas and suitable habitat areas.

4.1.2 Spineflower Population Counts

On May 18, 2006, at the height of plant growth and flowering of the Scotts Valley spineflower, a census was conducted. Kathleen Lyons and a field assistant counted the number of individual plants within each occupied site (locations of spineflower colonies are shown on the map in Appendix A). For colonies supporting less than 100 individuals, accuracy is to one individual. Colonies supporting between 100 and 1,000 individuals were counted to the nearest ten individuals. For colonies supporting greater than 1,000 individuals, accuracy is estimated to plus/minus 50 individuals. These data were compared to the population data from 1992, 2004, and 2005.

4.2 RESULTS

The 2006 Scotts Valley spineflower monitoring was conducted during a growing season with above normal total rainfall (63.41 inches for WY 2005/06, Appendix B). Rainfall data as recorded by the SVWD occurred between September 2005 and June 2006, with below normal rainfall occurring in October and November (cumulative rainfall of 3.03 inches as of November 30, 2005). December had above normal rainfall (21.73 inches); however, both January and February had below average rainfall, with 11.81 inches. Both March and April had above normal rainfall amounts (15.295 inches and 10.44 inches, respectively). Rainfall in May returned within the normal range (1.01 inch); rainfall was below average in June 0.01 inches).

4.2.1 Vegetation within Spineflower Habitat Areas

Data from the three transects (T6, T14, and T15; see Appendix C for raw data) revealed 86% of the plant cover within the occupied and suitable spineflower habitat areas were provided by non-native species. This is 30% increase than documented in 2004 wherein 55% of plant cover was by non-native species. The percentage of non-natives ranged from a high of 93% in T15 (an increase from 75% in 2005) to a low of 71% in T6 (an increase from 23% in 2005). T14 had 86% cover by non-natives in 2006 (an increase from 66% in 2005). In 2005, cover provided by narrow-leaved clover (*Trifolium angustifolium)* was higher than recorded in 2004, yet in 2006 this perennial non-native herb provided less than 5% cover. Cover by two annual hop clovers (*Trifolium dubium* and *T. campestre)* increased in 2006 (range of values between 20% and 44%). Cover by rattail fescue (*Vulpia myuros)* increased in T14 from 7.7% in 2005 to 14.7% in 2006. In T15, cover by rattail fescue increased to 27% in 2006 from 12.1% in 2005. Filaree (*Erodium botrys)* and cat's ear (*Hypochaeris glabra)* were prevalent in 2006, ranging from 10% cover in T14, 21% cover in T6 and 23% cover in T15. Other non-native plant species providing relative cover values greater than 10% were wild oat (*Avena sp.)*, soft

chess (*Bromus hordeaceus),* rattlesnake grass (*Briza maxima)* and filago (*Filago gallica).* Photographs of the transects are in Appendix D.

Data from the three transects revealed that 14% of the plant cover within the occupied and suitable spineflower habitat areas was provided by native species; this is a decrease from 45% cover in 2005. The percentage of native plant species in the transects ranged from a low of 5.9% in T14 (a decrease from 33.7% in 2005) to a high of 28.6 in T6 (a decrease from 78% in 2005). T15 displayed 7.7% cover by native plant species (a decrease from 25% in 2005). Other native plant species that provided greater than 5% relative cover in these transects are sky lupine (*Lupinus nanus*) and Spanish clover (*Lotus purshianus)*. The trend in native and non-native plant cover in Years 1-3 is depicted in Figure 4-a. 2006 Plant cover data is portrayed on Figures 4-b (T6), 4-c (T14) and 4-d (T15), and compared to 2005 data.

In 2006 the cover provided by Scotts Valley spineflower decrease along Transects T6 and T14; only in T15 did spineflower cover increase. Spineflower cover was <1% in T14 (compared to 23% in 2005) and 4% in T6 (compared to 61% in 2005). T15 showed an increase in spineflower cover in 2006, from 2% in 2005 to 3.3% in 2006. The transect data and the seasonal reconnaissance surveys from the occupied and suitable Scotts Valley habitat areas documented the presence of several other native plant species growing amid the rocky outcrops. These species include small-headed clover (*Trifolium macrocephalum)*, sand pygmy weed (*Crassula erecta)*, common beach aster (*Lessingia filaginifolia)*, owl's clover (*Castilleja exserta)*, skunkweed (*Navarretia squarrosa),* golden aster (*Chrysopsis villosa* var. *villosa)*, coast tarweed (*Madia sativa)*, California poppy (*Eschscholtzia californica)*, California plantain (*Plantago erecta)*, blue-eyed grass (*Sisyrinchium bellum)*, pale sack clover (*Trifolium depauperatum)*, soap plant (*Chlorogalum pomeridianum)*, mariposa lily (*Calochortus luteus)*, false lupine (*Thermopsis macrophyla)*, checkerbloom (*Sidalcea malvaeflora),* and purple needlegrass (*Nassella pulchra).*

Other non-native grasses and forbs were observed growing in and around the outcrop areas including Italian ryegrass (*Lolium multiflorum)*, nit grass (*Gastridium ventricosum)*, European hairgrass (*Aira caryophyllea)*, rose clover (*Trifolium hirtum)*, white clover (*Trifolium repens)*, and sheep sorrel (*Rumex acetosella)*.

No invasive, non-native plant species were observed within the occupied and suitable habitat areas during the spring 2006 surveys.

4.2.2 Population Counts

The census of the Scotts Valley spineflower was conducted during a growing season with above normal total rainfall (63.41 inches, SVWD) as portrayed in the rainfall summary table (Appendix B). A total of approximately 10,742 individuals were counted at nine sites. The number of plants observed in 2006 is approximately 50% of the numbers observed in the previous two years. Approximately 28,118 individuals were documented in 2005; 25,237 individuals were documented in 2004.

All but one site that supported plants in 2005 supported fewer plants in 2006. Only site C-123 displayed an increase in the number of plants in 2006 (from 363 plants in 2005 to 594 plants in 2006) (Table 4-a). Within the occupied sites, plant counts per site ranged from a low of sixteen individuals (site C-77) to a high of 3,763 individuals (C-127), as

depicted on Table 4-a. Observations of spineflower plant growth in May 2006 found fewer numbers of plants that previous years; however, the plants, in general, were more robust, as exhibited by larger stature plants and more flowering stalks and flower clusters/plant. Small-stature plants supporting unbranched flower heads were not as numerous as previous year surveys.

Eight sites that contained plants in 1992 had no aboveground spineflower plants in May 2006, which is similar to observations from 2004 and 2005. Based on the comparison of the last three years of data, the number of occupied sites has remained relatively constant at nine sites. None of the areas mapped in 1992 as uninhabited, yet suitable habitat, were found to support the spineflower in 2006.

The occupied sites west of Glenwood Drive (sites C-129, C-128, C-127, C-126, C-125, C-123, and C-122) was found to support the majority of the site's population (10,133 individuals or 94% of the population). The spineflower inhabits the rocky outcrop along the lower edge of Teacup Hill. Native and non-native plant species intermix with the spineflower in these areas; however, the spineflower grows very densely in some areas. Individuals of dudleya (*Dudleya ceaspitosa),* California fuchsia (*Epilobium canum),* California phacelia (*Phacelia egena)*, sticky monkey flower (*Mimulus aurantiacus)* were observed within these sites, in addition to the herbaceous species documented in the transects. This area appears to have received little unauthorized activity in 2006. Only minor human disturbances were observed in and around these sites (some vegetation trampling and debris was observed between Teacup Hill and the high school property).

The sites east of Glenwood Drive collectively support 609 individuals, or 6%, of the population. Despite horse grazing within the panhandle area since 2004, no spineflower plants were observed in this area in May 2006 (previously occupied sites C-160, C-159, C-158, C-155, and C-156). During the May 2006 field survey, annual, non-native grasses and forbs continue to dominate the area, although the persistence of some native species was observed (i.e., individuals of dwarf brodiaea [*Brodiaea terrestris*]). Horses grazed the area, reducing the cover of the non-native grasses and exposing open rocky areas that appear suitable for the spineflower; however, no aboveground individuals were observed in 2006.

The two other occupied sites east of Glenwood Drive are located north of the pond. As depicted in Table 4-a, site C-74 only supported 16 spineflower plants in 2006. This is an increase from 2005 when only one individual was documented. Field observations indicate that horses grazed this area more in 2005/06 and reduced the amount of herbaceous grass growth. The lower cover by grasses may have benefited spineflower growth in this area in spring 2006. Although an increase in plants to 16 is good, it is still lower than the 55 plants documented in 2004. Site C-77 supported approximately 50% of the plants documented at this location in 2004 and 2005. 593 plants were documented in May 2006 verses 1,018 plants in 2005 and 1,204 plants in 2004.

Figure 4-a. Trends in Average Plant Cover Values, Years 1-3.

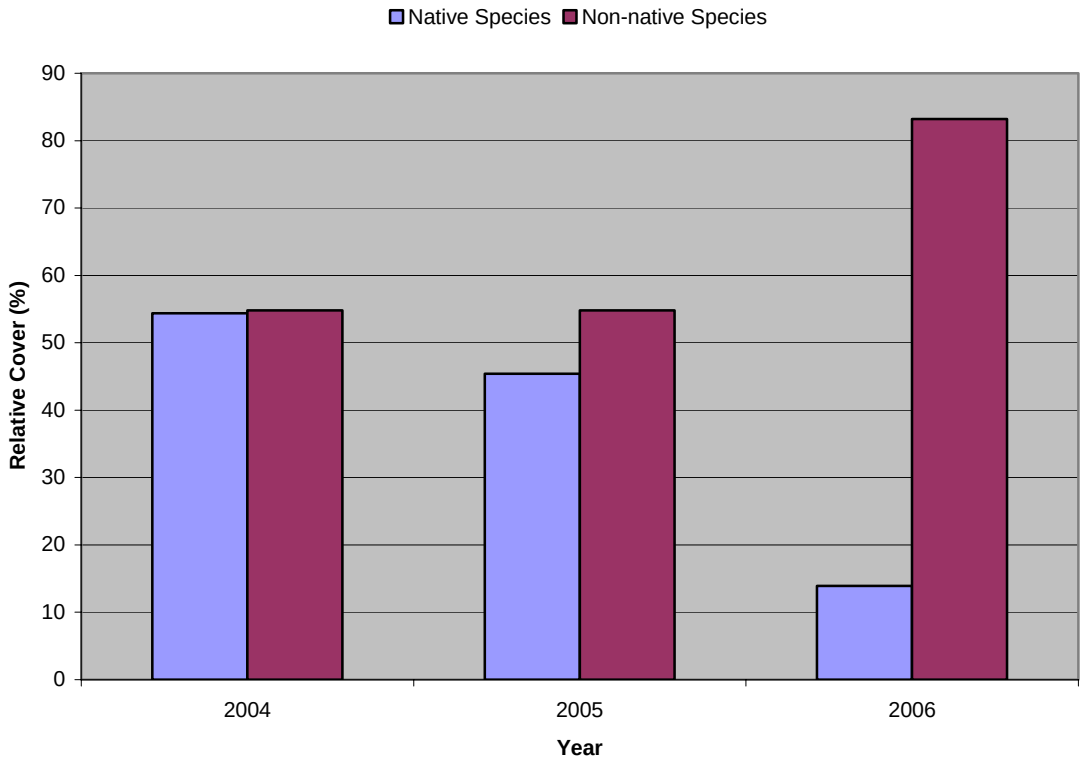


Figure 4-b. Relative cover by species in spineflower transect T6 for 2005 and 2006.

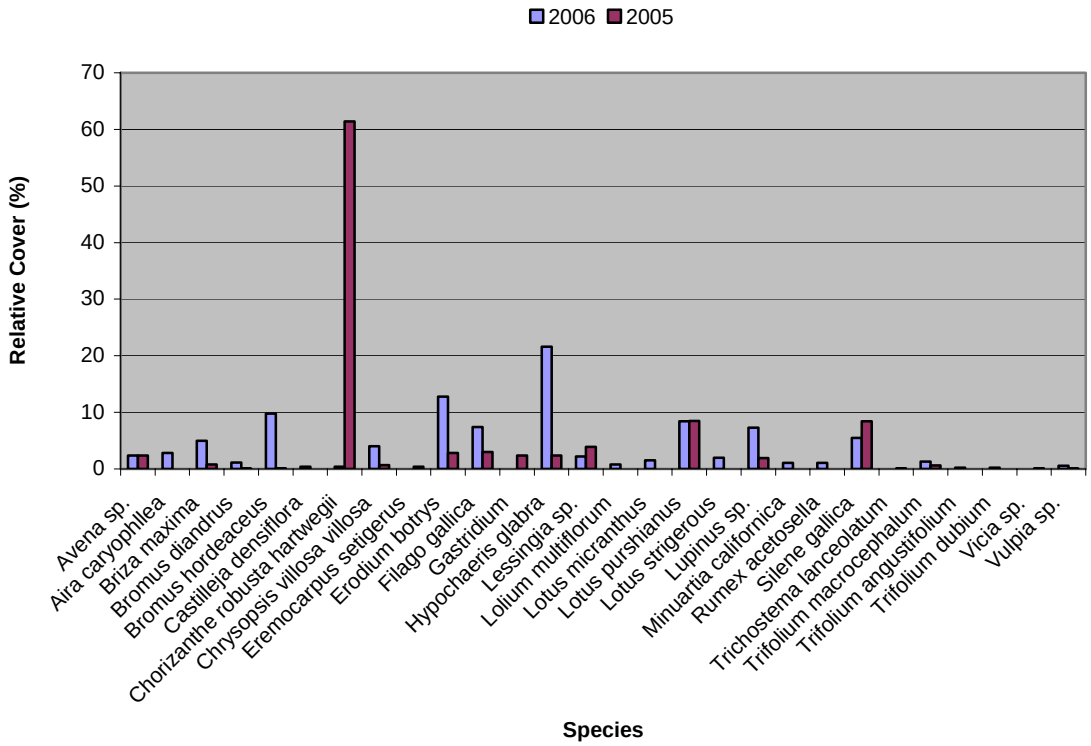


Figure 4-c. Relative cover by species in spineflower transect T14.

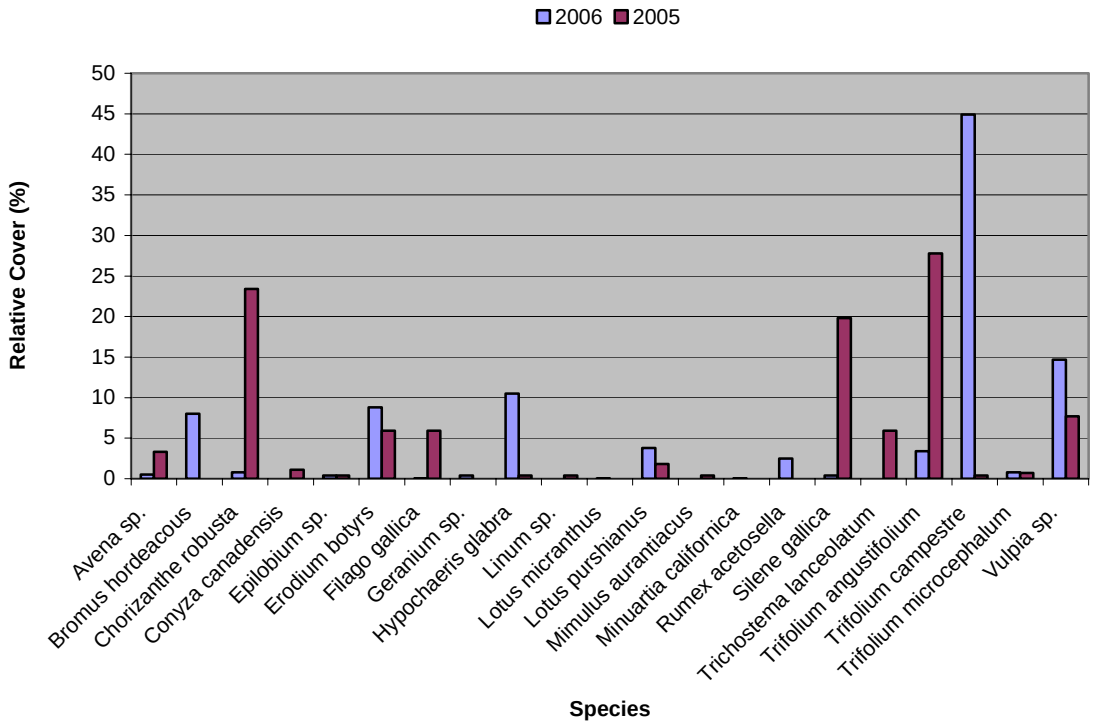


Figure 4-d. Relative cover by species in spineflower transect T15.

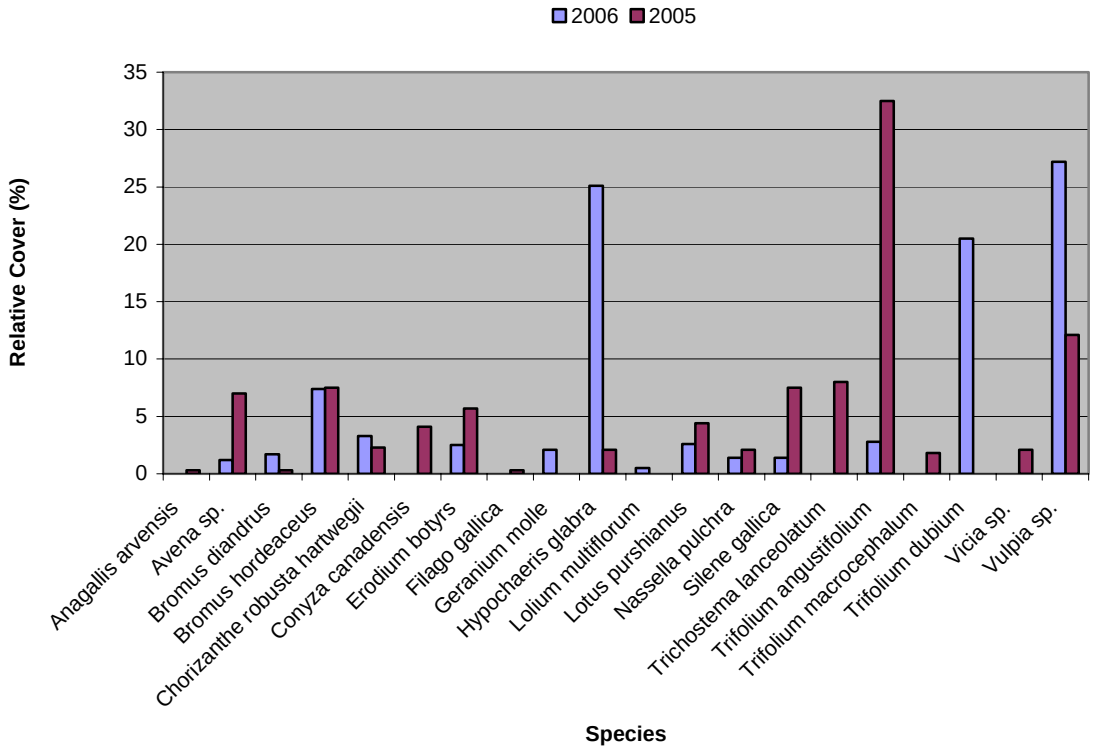


Table 4-a. Census of Scotts Valley Spineflower at Glenwood Preserve, 1992, 2004, 2005, and 2006.

Site Number	Population Estimate 1992 [1]	Population Census, May 2004	Population Census 2005	Population Census 2006	Location
C-64	1-10	0	0	0	E of Glenwood Drive, SE section
C-74	10-50	55	1	16	E of Glenwood Drive, central section
C-77	1,000-5,000	1,204	1,018	593	E of Glenwood Drive, central section
C-122	5,000-10,000	5,050	3,190	607	W of Glenwood Drive, Teacup Hill
C-123	1,000-5,000	370	363	594	W of Glenwood Drive, Teacup Hill
C-124	1-10	28	0	0	W of Glenwood Drive, Teacup Hill
C-125	1,000-5,000	1,490	1,760	875	W of Glenwood Drive, Teacup Hill
C-126	500-1,000	200	850	160	W of Glenwood Drive, Teacup Hill
C-127	5,000-10,000	5,390	6,933	3,763	W of Glenwood Drive, Teacup Hill
C-128	5,000-10,000	6,170	11,010	2,269	W of Glenwood Drive, Teacup Hill
C-129	5,000-10,000	5,280	2,993	1,765	W of Glenwood Drive, Teacup Hill
C-147	100-500	0	0	0	W of Glenwood Drive, grassland site
C-155	50-100	0	0	0	E of Glenwood Drive, panhandle area
C-156	50-100	0	0	0	E of Glenwood Drive, panhandle area
C-158	500-1,000	0	0	0	E of Glenwood Drive, panhandle area
C-159	50-100	0	0	0	E of Glenwood Drive, panhandle area
C-160	50-100	0	0	0	E of Glenwood Drive, panhandle area
Total	**28,500-55,000**	**25,237**	**28,118**	**10,742**	

1 – Source: 1992 Survey Data, Habitat Restoration Group

4.2.3 Monitoring of Management Activities Implemented in 2005

The goal for the population of extant Scotts Valley spineflower is to maintain, on average, all extant colonies and a total population that meets or exceeds the population data collected in 1992, although it is acknowledged that the population will vary from year to year based on environmental conditions.

The grassland management program (i.e., horse grazing) was implemented in spring 2004 and has continued east of Glenwood Drive in 2005 and 2006. No obvious adverse environmental site conditions (e.g., erosion, over-grazing or trampling) were noted within the spineflower areas during the spring 2006 field surveys. During 2006, the spineflower areas within the Preserve were subject to minor human disturbances. Pedestrians, many with unleashed dogs, traversed through the grassland on both sides of Glenwood Drive. To date, however, no significant impacts to the Scotts Valley spineflower were noted from this activity.

The spineflower areas both east and west of Glenwood Drive had high plant cover values for annual non-native plant species in 2006, such as hop clover. This is in comparison to abundant cover provided by the perennial narrow-leaved clover in 2005; this species was only marginally present in 2006. It is not known if the abundant growth of the annual forbs affected the germination or growth of Scotts Valley spineflower since the number of spineflower plants were generally fewer at all sites. The census found that the number of spineflower plants is fewer than previous years; incidental observations found the individual plants to be larger with multiple branching and flower heads. The spineflower population within the grazed areas (C-77 and C-74) declined in 2006, similar to that documented in the non-grazed areas, suggesting that the spineflower population did not decrease as a direct result of grazing.

4.3 CONCLUSIONS AND RECOMMENDATIONS

Based on the last three years of monitoring, the spineflower population displayed a 50% decline in 2006. Conversely, the cover provided by non-native forbs increased on and around the occupied sites. Interestingly the cover of perennial non-native forbs decreased in 2006, with much of this cover being replaced by annual non-native forbs. These observations were observed throughout all occupied spineflower locations (i.e., grazed and ungrazed), suggesting plant responses were temperature and rainfall related rather than from land management activities.

The rainfall for WY 2005/06 was above normal, with total rainfall approximately 10 inches more than WY 2004/05. During January and February (expected spineflower germination period), rainfall was recorded at 12.1 inches, which is in the normal range. Rainfall during March and April (period of spineflower vegetative growth) was 30.42 inches; this is approximately three times over the average and twice the amount received in 2005. This was followed by two months with average to below-average rainfall. This weather pattern, coupled with cool temperatures, may have affected spineflower germination but could have benefited individual plants (as observed by fewer, yet large-stature and robust individuals).

In order to ensure the continuing presence of spineflower on the Preserve, the following recommendations are offered for Year 4 (2007):

1. The Management Plan recommends as increase in the intensity of grazing if any known areas occupied by Scotts Valley spineflower east of Glenwood Drive (i.e., C-74 and C-77) become colonized by invasive species or coverage by non-native annual grasses increases by more than 25%. At sites C-77 spineflower numbers declined in 2006, yet spineflower number increased in C-74. It is recommended that the grassland in and around sites C-77 and C-74 continue to be grazed intensively similar to operations in

2006. This regime should inhibit the growth of non-native grasses and forbs. Continued intensive grazing in this area (as was conducted in 2006) is expected to maintain existing open area and create additional areas that would be suitable for the spineflower. The Management Plan recommends that spineflower areas maintain a high proportion of un-vegetated weathered sandstone or bare ground and additional grazing is expected to create such conditions.

2. Continue to graze the panhandle and monitor whether any spineflower plants occupy the area in spring 2006 (sites C-155, C-156, C-158, C-159 and C-160) and at spineflower site C-64, where no spineflower plants were observed in 2004, 2005, or 2006.
3. The Scotts Valley spineflower population should be monitored in spring 2007, with data compared to previous year's observations.
4. Although no evidence of impacts to spineflower was observed, human access within the Preserve should be monitored.

5.0 GRAZING MANAGEMENT

Prepared by David Amme, Resource Restoration and Management.

The 2006 grazing management program goals included 1) Maintain pasture infrastructure, 2) Manage herd size and rotation, 3) Monitor grazing patterns and utilization with emphasis on maintaining the locally open ground that is a critical environmental element for the Ohlone beetle habitat, 4) Manage herd health and horse owner relations.

5.1 METHODS

To accomplish these goals reconnaissance surveys, photo documentation, and fall residual dry matter (RDM) surveys were conducted. Reconnaissance surveys and site visits were conducted January 15, February 15, March 11, March 28, April 22, May 12, June 9, July 24, September 9, October 7 and 9, and November 4 and 16. The RDM values were measured on October 7. The visits included inspecting work, repairing fences, meeting with horse owners and neighbors and communicating with horse owners on the phone and email.

5.2 RESULTS

5.2.1 Pasture Infrastructure

The important fence, corral, and infrastructure projects were mostly completed in 2005. In 2006 the last of the water pressure reducer valves were completed for the Canham and Beetle pasture water troughs and a quick coupler was installed near the Pond pasture holding corral.

During the early part of 2006 the pasture fence at the top of the hill between the Pond and Tabor pastures was cut apparently to allow horses to move between the two pastures. This did not appreciably impact the horse rotation. Toward the end of July another couple of sections of the fence between the Pond and Tabor pasture were

broken, possibly by the horses or people trespassing around the pond. The grazing and horse managers repaired the fence sections near the pond. The cut section of fence at the top of the hill has not been repaired.

The Canham corral was designed with fencing materials similar to standard pasture fence and has deteriorated as a result of the heavy use during feeding and vet clinics. The support wires and 4-inch woven wire fence could result in injury to horses and should be replaced with a more durable design. Currently the horse corral in the Tabor Pasture is used to contain the horses during owner and veterinary visits.

5.2.2 Horse Management/Rotation

The herd began with 20 horses at the beginning of October 2005 (Table 1). Two horses were removed in November for the winter and a new horse arrived bringing the herd total to 19 in March. Four horses were removed permanently in May bringing the herd down to 15 horses. Since that time another horse came onto the pasture stabilizing the herd at 16 horses for the rest of the grazing season. The grazing program stayed on the scheduled strategy of bringing horses into the Beetle Pasture intermittently throughout the grazing season. During theses stays, between 8 to 9 horses were in the Beetle pasture for approximately 15 days in January, March, and May, and for 30 days in June.

Table 5-a shows the use of each pasture in terms of Animal Unit Months (AUMs) on a monthly basis 2005-06 grazing season (November 2005 to October 2006). The dashed line between the pastures means the gate is open between those pastures. From November to the end of May the horses were primarily allowed to roam the Canham, Pond and Tabor pastures. In April the Canham pasture was closed to grazing and the horses primarily used the Pond and Tabor pastures. In May, eight horses grazed the Beetle pasture for 15 days. These horses were also allowed to roam into the Beetle pasture the second half of the month from the adjacent Tabor and Pond pastures. With the recommendation of Dr. Arnold the eight horses returned to the Beetle pasture for the month of June increasing the utilization. In July the Canham pasture was opened and the horses returned to this pasture and are spending most of their time in this pasture. The Canham pasture's redwood grove provides good protection from the rain and wind but the horses tend to move to higher ground in the Pond pasture when the weather is too cold in the valley. Currently, the horses are beginning to roam back into the Pond, Tabor, and Beetle pastures.

The main purpose of the RDM measurements is to determine the grazing utilization (grazing pressure) of the Glenwood pasture. The 2006 RDM clipped plots were located at the same sites measured in 2005 in order to provide a comparison to the previous year and at the same time to map the more heavily utilized areas. Table 5-b gives the RDM values for the 21 sample plots for 2006 and includes the values for 2005 for comparison. The target minimum RDM values to assure enough cover and forage for the horses in the fall and early winter months should average between 1500 and 2000 lbs/acre in October. The forage consumption in 2006 was much closer to these target values than they were in 2005, generally being around 2000 lbs/acre except for the Canham pasture, which was a little higher, especially in the wet areas in the southern part (Plots 4-7).

Table 5-a. Actual grazing of the Glenwood Open Space in 2005-06 grazing season													
	Grazing season November to October Grazing Capacity: 275 AUMs. **2005 Actual: 207 AUMs** Note: When the months were divided in two the values are expressed in AUMs*												Estimated AUMs per Pasture*
Pasture	N	D	J	F	M		A	M*		J	J	A	S	O	
Canham (75 AUM)	18	18									15	18	17	16	~84 AUMs*
Pond (88 AUM)	18		11		9.5*	5*									~46 AUMs*
Tabor (93 AUM)				18			19	3.5*	7.5*	7					~56 AUMs*
Beetle (19 AUM)			3.5*			4.5*		4*		8					~21 AUMs
Adult Beetle	**********														*Estimates based on actual observed movements
Active Larvae	**********														
Below Ground	*********														
Spineflower	**********														
Total AUMs	18	18	18	18	19		19	16		15	15	18	17	16	**207 AUMs**

5.2.3 Pasture Utilization and Residual Dry Matter (RDM) Measurements

Appendix C presents rainfall data for growing seasons from 2003 to 2006 recorded at the Scott Valley Water District weather station and the Ben Lomond weather station, which is northwest of the Glenwood pasture. The 2006 rainfall season extends from September 2005 to October 2006. The total amount of rainfall was generally higher in 2006 season than the 2005 season. Much of that rainfall difference is due to the extra heavy rainfall in late December of 2005. The rainfall in March and April 2006 was heavier than 2005 but half of the 2005 amount in May and June 2006.

Table 5-b. Residual Dry Matter Summaries (Pastures A, B, C, and D).				
Canham Pasture (A). Danville loam. Normal year forage production 4000 lbs per acre (SCS).				
Plot 1 Near redwood grove, northeast corner. Lightly grazed, few weeds. Flat surface, no gopher signs.				
	15.6 g/ft.^{2}	0.55 oz/ ft.^{2}	**1,497 lbs/acre**	**2005 1,878 lbs/acre**
Plot 2 Southwest of Plot 1 between ground squirrel area and heavily used flat. Medium grazed. 5-6". Flat surface, no gopher signs. Near horse path.				
	32.5 g/ft.^{2}	1.15 oz/ ft.^{2}	**3,138 lbs/acre**	**2005 3,267 lbs/acre**
Plot 3 West of Plot 2 between two heavily used areas. Lightly grazed. 7-10" upright. Flat surface. Gopher hole.				
	22.9 g/ft.^{2}	0.8 oz/ ft.^{2}	**2,178 lbs/acre**	**2005 5,173 lbs/acre**
Plot 4 North end of south field (south of willow island). Near Transect # 1. Lightly grazed, medium RDM. 5-8" laying down. Scattered tarweed. Irregular surface. No signs of gophers.				
	39.8 g/ft.^{2}	1.4 oz/ ft.^{2}	**3,811 lbs/acre**	**2005 5,989 lbs/acre**
Plot 5 6" laying down. Typical. No clover. Grass and rumex. Flat surface, no gophers.				
	37.2 g/ft.^{2}	1.3 oz/ ft.^{2}	**3,539 lbs/acre**	**2005 844 lbs/acre**
Plot 6 West side of south field. Lightly grazed, heavy RDM. Laying down. 4-5". Like before.				
	59.5 g/ft.^{2}	2.1 oz/ ft.^{2}	**5,717 lbs/acre**	**2005 6,969 lbs/acre**
Plot 7 Wetland plot, southwest end of field in grassy only area. Light grazing. South of Transect # 2. Irregular surface, no signs of gophers.				
	44.5 g/ft.^{2}	1.6 oz/ ft.^{2}	**4,356 lbs/acre**	**2005 9,256 lbs/acre**

Pond Pasture (B). Bonnydoon loam. Normal year forage production 3200 lbs per acre (SCS).				
Plot 8 Cream cups/Opler's moth site near Transect 4. Little evidence of grazing, horse trailing through area. 4-5" standing and laying down. Irregular surface, signs of gophers.				
	20.8 g/ft.^{2}	.74 oz/ft.^{2}	**2,014 lbs/acre**	**2005 6,806 lbs/acre**
Plot 9 Cream cups/Opler's moth site near Transect 7. Heavy grazing, horse trailing through area. 4-6" laying down. Irregular surface, signs of gophers.				
	9.1g/ft.^{2}	0.32 oz/ft.^{2}	**871 lbs/acre**	**2005 2,423 lbs/acre**
Plot 10 Grassy area northeast of pond. Lightly grazed 8-10" Upright. Irregular surface, signs of gophers.				
	15.2 g/ft.^{2}	0.54 oz/ft.^{2}	**1,470 lbs/acre**	**2005 2,804 lbs/acre**
Plot 11 Below Transect 3 on south facing slope. Light grazing. 6" laying down. Irregular surface, signs of gophers. Italian thistle nearby				
	21 g/ft.^{2}	0.74 oz/ft.^{2}	**2,014 lbs/acre**	**2005 5,009 lbs/acre**
Plot 12 Northeast corner of pasture near top of hill. Horse trail nearby. 4-10" upright & laying. Irregular surface, signs of gophers.				
	18.2 g/ft.^{2}	0.64 oz/ft.^{2}	**1,742 lbs/acre**	**2005 3,049 lbs/acre**
Plot 13 Westside of pasture near top of ridge. Lightly grazed. 4" laying down. Flat surface, no signs of gophers.				
	17.2 g/ft.^{2}	0.61 oz/ft.^{2}	**1,661 lbs/acre**	**2005 2,314 lbs/acre**

Plot 19 North side of fence line at top of hill. 2-5" upright. Medium grazing. Irregular surface, signs of gophers.				
	10.8 g/ft.^{2}	0.4 oz/ft.^{2}	**1,089 lbs/acre**	**2005 5,989 lbs/acre**

Tabor Pasture (C). Hillsides dominated by Bonnydoon loam, normal year forage production 3200 lbs per acre. Wetland flat dominated by Danville loam, normal year forage production 4000 lbs per acre (SCS).				
Plot 17 Wetland sample near Transect 10 in south end of pasture. Well grazed. 2" Upright stubble. No signs of gophers.				
	19.6 g/ft.^{2}	0.7 oz/ft.^{2}	**1,905 lbs/acre**	**2005 4,356 lbs/acre**
Plot 18 Wetland southwest corner of pasture Grazed. 8-10" Grazed/stubble. Mostly iris-leaved juncus. No signs of gophers.				
	27.6 g/ft.^{2}	0.97 oz/ft.^{2}	**2,640 lbs/acre**	**2005 6,806 lbs/acre**
Plot 20 South of fence on top of hill opposite Plot 19. Medium grazed area near heavily grazed area. 2" laying down. Irregular surface, signs of gopher activity.				
	13.6 g/ft.^{2}	0.48 oz/ft.^{2}	**1,307 lbs/acre**	**2005 1,797 lbs/acre**
Plot 21 Southeast end of pasture on side of hill near Gray's clover sites. Lightly grazed. 4" laying down. Irregular surface, signs of gopher activity.				
	14.2 g/ft.^{2}	0.5 oz/ft.^{2}	**2,178 lbs/acre**	**2005 3,131 lbs/acre**

Beetle Pasture (D). Bonnydoon loam. Normal year forage production 3200 lbs per acre (SCS).				
Plot 14 South of Transect 11. Near grazed area. Medium grazed. Heaviest RDM. 2-4" upright. No gophers.				
	14.2 g/ft.^{2}	0.5 oz/ft.^{2}	**2,178 lbs/acre**	**2005 2,396 lbs/acre**
Plot 15 West of Transect 15. Heaviest RDM in central beetle area. Medium grazed. Irregular surface. No signs of gophers. Ground squirrels active near by.				
	11.5 g/ft.^{2}	0.4 oz/ft.^{2}	**1,089 lbs/acre**	**2005 2,722 lbs/acre**
Plot 16 North of water trough, west end of pasture. Light grazing. Irregular surface. Gophers nearby				
	10.6 g/ft.^{2}	0.37 oz/ft.^{2}	**1,007 lbs/acre**	**2005 4,900 lbs/acre**

The 2006 RDM values were generally half the 2005 RDM values. With the heavier rainfall in 2006 and an average of 3-4 fewer horses than 2005 it is surprising to see such a reduction. It appears utilization in 2006 was much more efficient and closer to the desired goal with fewer horses. This may be explained by both the weather interactions and differences in rotation. Although both years had individual months of high rainfall and high overall totals, temperature and probably cloud cover conditions resulted in greater forage production in 2005 than in 2006. The high rainfall in March and April of 2006 did not result in the high productivity resulting from the high 2004 rainfall. This may be due to generally cooler temperatures with less sunny days favorable for plant growth. The end of the 2004-05 wet season in May and June had sufficient amounts of rainfall (~ 3 inches) with warm temperatures and sunny days that contributed to a flush of increased forage growth well into June.

Another factor causing lower RDM in 2006 is a fundamental change in the rotation strategy. In 2005 horses were rotated through pastures by isolating them in a particular pasture in order to reduce RDM in that pasture but also to rest the remaining pastures. The rest periods resulted in greater overall forage production than continuous grazing. In the Beetle Pasture the result was low overall RDM but without sufficient bare ground areas particularly along former trails and during the critical development phases in spring. In 2006 the rotation was modified to maximizing access of horses to the Beetle Pasture with the intent of increasing circulation through the pasture in order to maintain bare ground along the trails within the beetle habitat. Gates between the Beetle and adjoining pastures were left open to encourage horse traffic on trails and continuous grazing that would minimize regrowth.

In 2005, resting the Canham and Pond pastures for 45 days in March and April restored the overall forage for these pastures for May and June grazing and resting the Tabor pasture for 75 days in April, May and June restored the forage for the Pond and Canham Pastures for July and August. In the 2004-05 grazing season, moving horses between pastures may actually have increased overall forage production. But this also would tend to provide rich forage for the horses. In fact, in the 2005-06 grazing season several horses were susceptible to foundering and four horses had to be moved off the rich pasturage between January and April. Finally, there is a possibility that the higher RDM values was a result of the build up of thatch during the period that horses were not on the pasture in 2004 and now the pasture is finally reaching equilibrium as the horses have had a chance to graze the surplus and the actual carrying capacity is less than the 275 AUM estimate.

In January 2006, Dr. Arnold recommended additional steps to increase bare ground within the Beetle Pasture. On February 15 with the approval of Roger Root of UWFWS, Amme and Greer scraped six one meter square plots to artificially create more bare ground in the vicinity of the primary Ohlone tiger beetle habitat. USFWS also approved limited horse grazing during dry periods during the spring. This allowed grazing and circulation of horses in the pasture during the period of greatest forage growth and during the period when maintenance of bare ground in likely the most critical. Eight to nine horses were moved into the Beetle pasture in March, May and June in order to increase as much bare ground as possible without overgrazing the pasture or stressing the horses. (In the second half of May, all the horses were allowed to roam in the Pond, Tabor, and Beetle pastures.) This grazing activity contributed greatly to increasing the amount of bare ground more in keeping with the requirements of the Ohlone tiger beetle. As mentioned above, the RDM values were significantly lower in 2006 than 2005.

Figure 5-a. Photograph of scrapped plot ($1m^2$) in Beetle Pasture.
Photo was taken on April 22nd just before horses were moved back into the pasture in May. Beetle holes were found in 5 of the 6 scraped plots and adjacent trail.

Figure 5-b. Mapped heavily utilized areas and the location of the sample RDM plots. The Pond, Taber, and especially the Beetle pasture were utilized much more in 2006 than in previous years.

5.2.4 Managing Heard Health and Rotation

Grazing is the primary management tool for maintaining the open habitat of the beetle and spineflower. Grazing is managed through maintaining health of horses and the herd and through a rotation system. Horse health is important to ensure horses are available to graze the sensitive species habitats. Individual horses with special medical or feeding requirements must often be separated from the herd. The rotation system is used not only to protect sensitive habitats but also to create beneficial effects on vegetation and to maximize forage productivity. Rotation allows pastures periods of rest and regrowth can result in greater forage production and support a larger herd than continuous grazing.

Currently, health of the individual horses varies considerably within the herd. The horses are generally inspected and treated (shots, worming, hoof trimming, teeth "floating", etc.) at least twice a year either by their owners' veterinarian or during coordinated veterinarian clinics. However, a few owners choose not to participate. If the horse owners do not properly coordinate the vet visits, a few untreated horses can be quickly re-infected perpetuating worm infection of the herd. A few of the horses are literally "out to pasture" and will eventually die or have to be put down when they can no longer maintain their health and weight.

Health of individual horses also varies seasonally. Horses that live yearlong in an outdoor pasture experience the full range of temperatures, rainfall, and especially the flux of growth and dormancy of the forage. The horses' weight varies greatly with the season. Some horses have the propensity to founder on rich spring growth, especially in a rotation grazing program, which encourages lush regrowth of the grasses and clovers. For this reason, often the herd will need to be separated into fat and lean horses in the spring.

Rotation between pastures must consider not only maintenance of species habitat but also the health and behavior of the horses. Because of their limited digestive system horses need to graze up to 18 to 20 hours a day. During a single day the horses may roam extensively throughout the pasture, day and night, to acquire proper nutrition and find shelter from the elements and temperatures. This movement has created a network of trails and is important in maintaining the open habitat of the beetle.

The horse owners are responsible for giving their horses supplemental feed and nutrition and currently this is conducted individually. This usually requires isolation of a horse from the herd in a corral. There is opportunity to improve both health of horses and improve habitat by conducting coordinated supplemental feeding for the herd at specific locations. Supplemental feed can be used in the fall when nutritious feed is less available. This could promote circulation through the beetle pasture and create behavioral patterns that could persist during the growing season. Fall feeding could also reduce grazing pressure on sensitive wetland and perennial grasses that the horses favor during this season. In addition salt licks could also be used to improve circulation year round.

Infrastructure improvements are needed to ensure the safety of the horses and allow better management of horses. To help round up and handle the horses during vet clinics or other horse management activities a short cross fence should be installed on the north end of the Canham pasture with a gate to create a holding area. This will also enable more effective grazing on the south portion of the Canham pasture as the horses

tend to over utilize the northern portion of the pasture. The fence infrastructure is also in need of repair and an extra wire. Certain fence sections should have “no climb” field fencing to prevent injury to the horses as well as discourage trespass onto the pasture at key sites.

The cooperation and support of the horse owners is key to properly managing the Glenwood pasture for the sensitive species. Initially, the horse owners who had grazed the Glenwood pasture for many years were resistant to the grazing rotation program, preferring to let the horses manage themselves. Many of the long term horse owners are defacto absentee or passive horse owners and visit their horses only a few times a year during the organized vet clinics or to give their horses occasional supplemental feeding during lean times. While building up the herd in 2004 the new horse owners were very open to the rotating the horses. Two of the new horse owners, Renie Gallagher and her sister, Katie Harper, who have extensive experience in managing a large numbers of horses agreed to move the horses between the pastures and help implement the grazing rotation program. Their continued presence at the pasture has been very helpful in keeping trespassers to a minimum and informing the grazing manager of events and problems that occur at the pasture from time to time. Unfortunately there is little cooperation and communication between most of the remaining horse owners. Having the horses moved by one of the horse owners has been a source of conflict because the horses are in different states of health and weight and it is difficult for the owners to agree on what is best for their horses.

Relying on volunteers to move horses is a source of conflict between owners and may not be reliable when movement in or out of the Beetle Pasture during the spring is required. In addition relying on horse owners to maintain the health of their horses as they see fit may not be in the best interest of the health of the herd overall and can reduce the availability of horses needed to maintain the beetle habitat.

It is recommended that a horse manager be brought in to ensure that each horse is receiving appropriate health care and to conduct and coordinate movement of horses. It has become apparent that a “third party” horse manager who has expert knowledge of horse handling and health assessment should handle the task of moving the horses and objectively assessing their health needs. Currently, such a person has been identified and is helping the Glenwood pasture manager with these tasks as well as other tasks including assisting in repairing infrastructure. The horse manager identified has contacts in the local horse community that will be helpful acquiring new horses as necessary and organizing supplemental feed and health activities that could stabilize the herd with the possibility of increasing the horse numbers.

5.3 GRAZING RECOMMENDATION FOR 2005-06 GRAZING SEASON

The Glenwood carrying capacity as determined in the original 2003 Open Space Management Plan was 20 horses (245 AUMs). This was later increased to 23 horses (275 AUMs) in the 2003-04 monitoring report based on the higher RDM values. The result of the 2005-06 grazing season survey indicates there is a possibility that the 2003-04 stocking rate may be an overestimate. It is clear from the actual stocking rate for the 2005-06 grazing season given in Table 1 (i.e., ~16-18 horses @ 207 AUMs) and the RDM values in Table 2 that the current horse numbers (16) should be raised by at least four horses bringing the total closer to the original estimate of 20 horses (245 AUMs).

Currently, two horses are slated to be added to the pasture in January. In addition to increasing the horse numbers, the grazing strategy for 2006-07 will be to refine the four pasture rotation system and moderately to heavily graze the Beetle pasture at least 4 times during the Ohlone beetle adult and larvae stages between January and June. Table 5-c sketches the proposed pasture rotation program for the 2006-07 grazing season and includes a gradual increase to 20 horses in the spring. The key to managing the Beetle habitat is to allow as much access as possible to the Beetle pasture during the active larvae stage, at least every three to four weeks. During this time, if the herd is in the adjacent Tabor pasture and the weather is dry, the horses will be allowed to roam into Beetle pasture. After the ground dries up in May or June the two Beetle pasture gates would be left open to enhance horse circulation. The rotation schedule will be dependent upon the health and weight of the horses. Two herds may be necessary to manage the horses' health. The rotation will be managed jointly by the pasture manager and horse manager to preserve and increase the overall forage productivity of the Glenwood pasture while enhancing circulation and utilization of the critical beetle habitat in the Beetle pasture.

Table 5-c. Scheduled Pasture Rotation Program for Glenwood Preserve for the 2006-07 grazing season (November to October).

Max: Potential 240-275 AUMs	2006-07 Grazing Season Grazing Capacity: 227 AUMs Goal: Add 4 horses to the herd.												Estimated AUMs per Pasture
Pasture	N	D	J	F	M	A	M	J	J	A	S	O	
Canham (75 AUM)	16				11	10					20		~62 AUMs
Pond) (88 AUM		16		18			11		11				~69 AUMs
Tabor (93 AUM)			10			10		20		20		20	~72 AUMs
Beetle (19 AUM)			8		8		9		9				~24 AUMs
Adult Beetle/Egg Laying			**********										
Egg Hatching/Active Larvae Stages			**********										
Below Ground Pupae Stage	********												
Scotts Valley spineflower		**********											
Total AUMs	16	16	18	18	19	20	20	20	20	20	20	20	227 AUMs

6.0 VEGETATION MONITORING IN SENSITIVE HABITATS

Prepared by Philip Greer and Geoff Smick, WRA, Inc.

6.1 METHODS

Quantitative sampling of vegetation transects allows tracking of changes in plant cover and species composition. This information can be used in determining the effectiveness of the grazing and other management tools in maintaining habitat for sensitive species. The fifteen permanent transects established throughout the Preserve in different habitat types were monitored again in 2006. Locations of these transects are shown on the Preserve Map (Appendix A). Within the Ohlone tiger beetle and Scotts Valley spineflower habitats, three transects each were used to measure the vegetation characteristics. Three transects were established in wetlands, three in native grasslands, two in annual grasslands, and two in grasslands with the larval food plant (*Platystemon californicus*) for the Opler's longhorn moth.

Sampling was conducted along each transect using 0.1 meter-square quadrats, placed 1 meter apart, perpendicular to and on alternating sides of the meter tape. Species composition and percent cover were measured within each quadrat. Plant cover was estimated using Braun-Blaquet cover classes. Special attention was focused on the presence, estimated number, and/or percent cover of native perennial bunchgrasses, sensitive plant species, and invasive species.

Photographs were taken at each transect. Photographs will be used to monitor long-term changes in the site and its plant communities. Photographs can also be used to determine if localized areas are receiving either light or heavy grazing, are subject to erosion, or are being adversely affected by invasive species.

Vegetation surveys were conducted in April, May, June, and July in 2006, depending on the maturity of the flora in each habitat. Surveying dates for specific transects can be found on the 2006 data sheets included in Appendix C. The maturity of many native plants was delayed in 2006 compared to previous years. This is likely a result of high rainfall and low temperatures in March and April.

6.2 RESULTS AND DISCUSSION

Data collected during transect monitoring in 2006 is presented in Appendix C. Examples of photographs taken at transects are presented in Appendix D. Figures 6-a - 6-d compare vegetation composition and cover across the transects.

Figure 6-a shows the relative cover of bare ground compared to vegetation in the 15 transects. The average cover by vegetation along all transects decreased almost 10 percent from 2005 (x = 90.6%) to 2006 (x = 81.3%) but is nearly equal to levels estimated in 2004 (82.6%). All but one of the 15 transects had over 80 percent relative cover of vegetation in 2005 whereas that number had dropped to 7 transects in 2006. Six transects had fewer than 75% relative cover in 2006. Transects with the highest proportion of bare ground in 2006 were numbers 6, 10, and 13. Of special interest are the OTB transects, #'s 11, 12, and 13. One requirement of the endangered tiger beetle

that lives in those areas is bare ground. While two of the transects in that area gained bare ground in 2006 (bare ground in transects 12 and 13 doubled), one had an increase in vegetative cover from 18.7 to 6.5 percent. The high rainfall in March and April would be expected to increase vegetative cover. An overall decrease in vegetative cover indicates effectiveness of the grazing regime.

Relative cover of native vs. non-native species is graphed in Figure 6-b. Average relative percent cover of native species throughout all the transects decreased roughly 10 percent between 2005 (x = 25.4%) and 2006 (x = 14.2%) but is still higher than that measured in 2004 (13.1%). Transects 7 and 11 (OLM and OTB habitats, respectively) had the highest percentage of cover by natives in 2005 at 50 percent relative cover, however, in 2006 this value had dropped to 22.4 and 11.7 percent respectively. In contrast, transects 4, 10, and 13 showed increases in the cover of native vegetation in 2006 (e.g. #13 increased from 2.8% native cover in 2005 to 29.2% in 2006, and transect 4 (native grassland/OLM habitats) which had no native plants in 2005 had an estimated native species cover of 29% in 2006).

Relative cover of forbs vs. grasses, sedges, and rushes is graphed in Figure 6-c. Average cover on all transects by grasses, sedges, and rushes was similar in 2006 (x = 40.6%) to the values measured in 2005 (x = 37%), however, variation between transects was high this year. Data from 2006 show that while some transects had a considerable decrease in forb cover compared to 2005 (transects 5, 7, 8, and 12 decreased roughly 50% or greater each), other transects did just the opposite (forb cover in OTB transects 11 and 13 increased 386 and 513 percent respectively). In 2006 11 transects had a higher percentage of cover by forbs than non-forbs which is one less than in 2005. The considerable variation in change of forb cover between transects makes it difficult to correlate the change to a specific cause. Factors such as rainfall, temperature, and grazing practices likely all contribute some effect to these measurements. Individual species' response to environmental factors appears more important than forb or grass guild response.

The number and type of species occurring in the transects are presented in Figure 3-d. The average number of species across all transects dropped by 1.4 species between 2005 (x = 17.3 species) and 2006 (x = 15.9 species). The same three transects with a total of 20 or more species in 2005 also had over 20 species in 2006 (transects 3, 6, and 7). One transect had less than 10 species in 2006 (transect 2 with 8 species), whereas all transects had greater than ten species in 2005. Transect 2 was sampled later in the season than previous years and this likely contributed to the reduction in observed species.

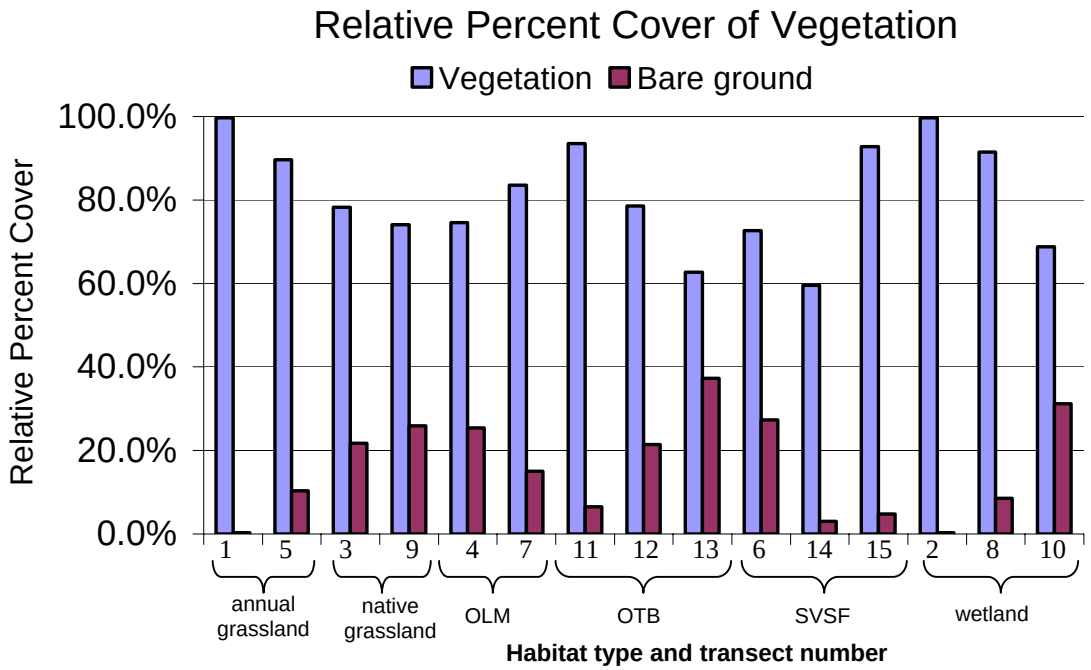


Figure 6-a. Relative percent cover of vegetation and bare ground calculated from transects placed in different habitat types in the Glenwood Preserve, 2006.

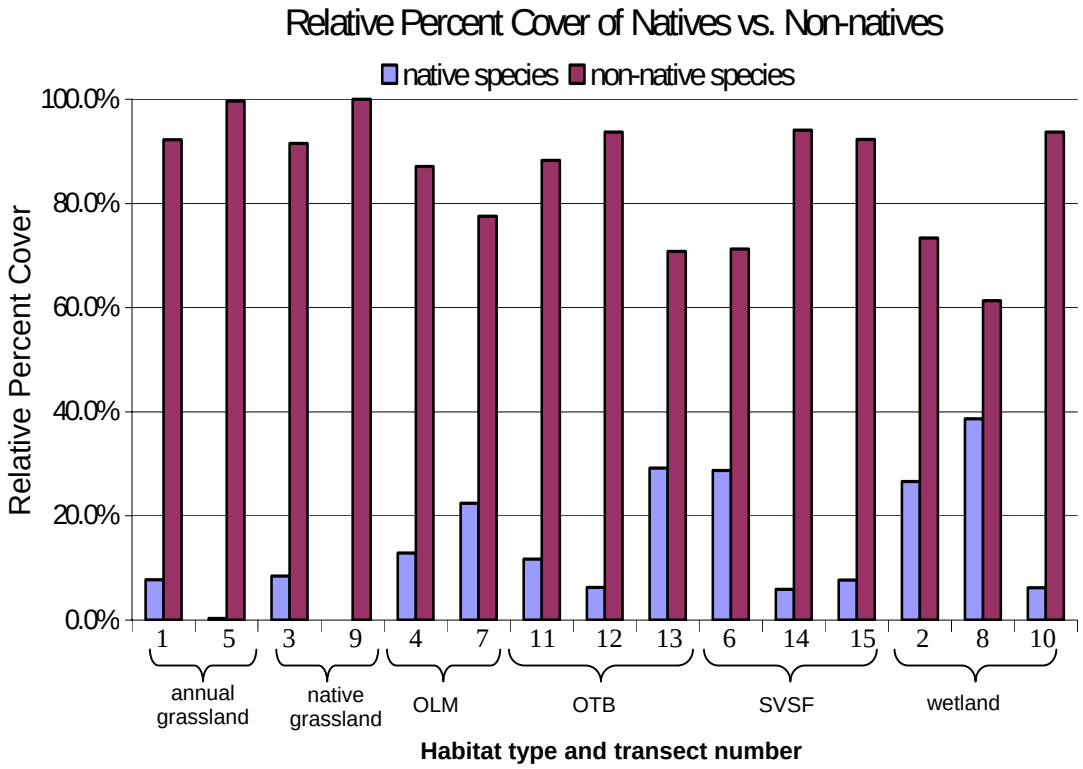


Figure 6-b. Relative percent cover of native and non-native species calculated from transects placed in different habitat types at the Glenwood Preserve, 2006.

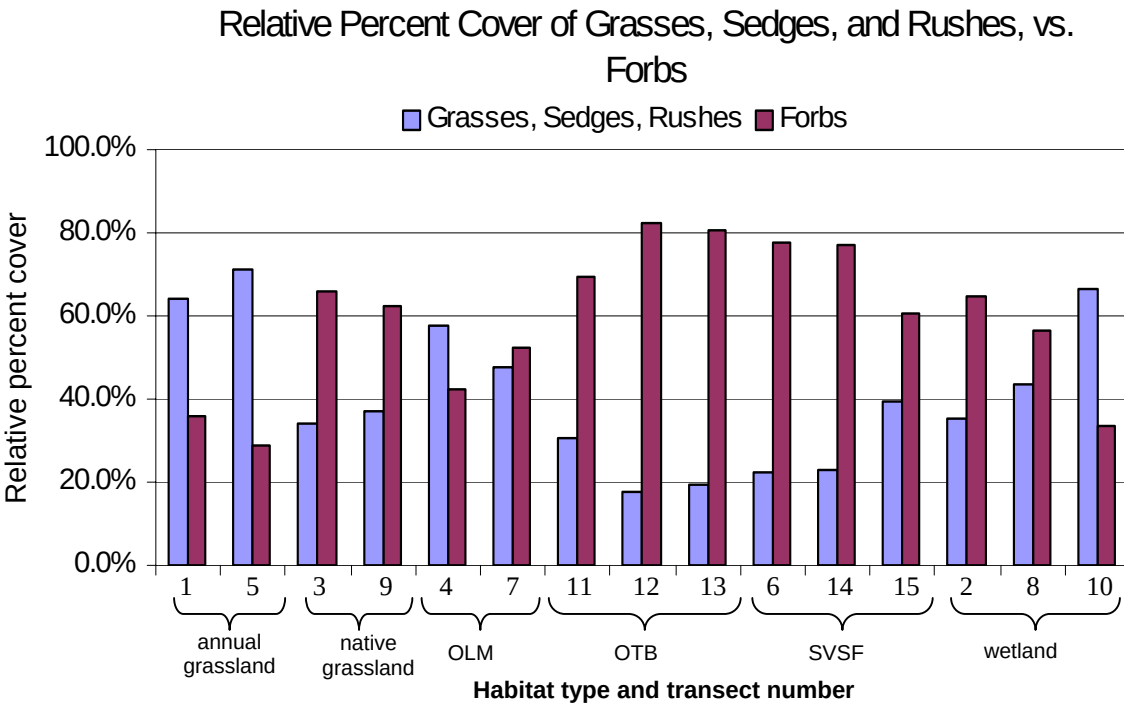


Figure 6-c. Relative percent cover of grasses, sedges, and rushes compared to forbs calculated from transects placed in different habitat types in the Glenwood Preserve, 2006.

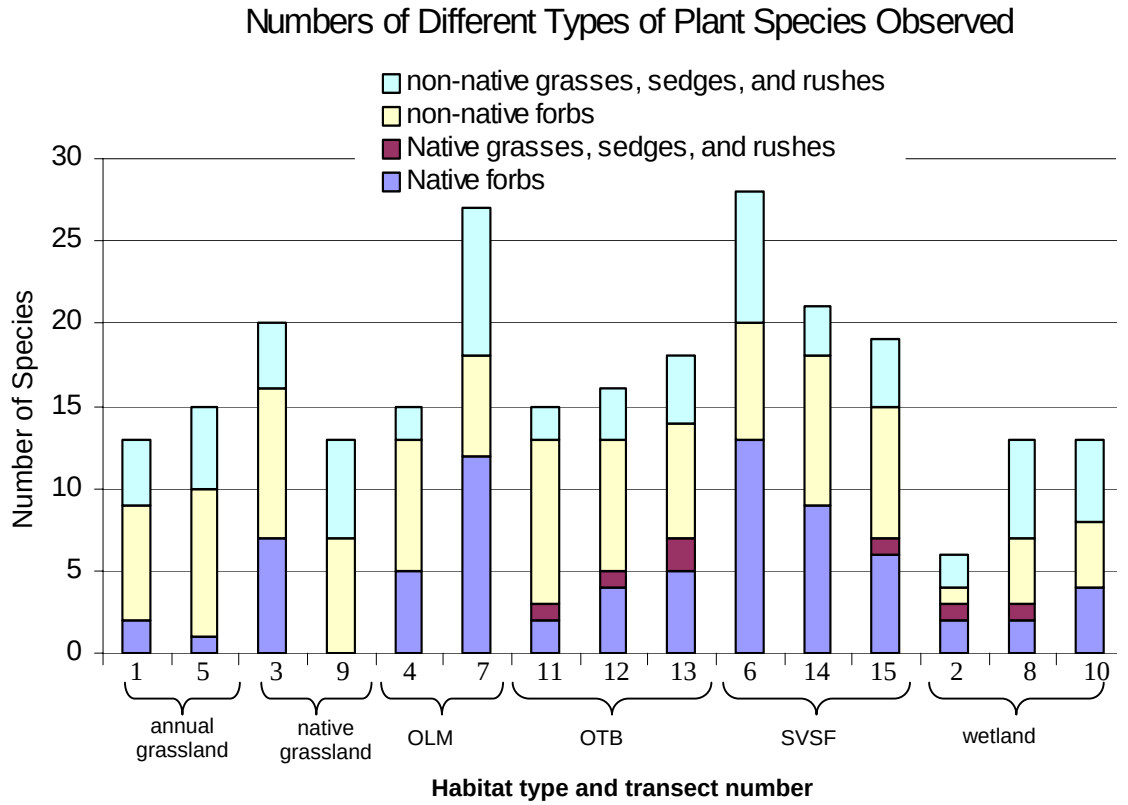


Figure 6-c. Relative percent cover of grasses, sedges, and rushes compared to forbs calculated from transects placed in different habitat types in the Glenwood Preserve, 2006.

7.0 OTHER SPECIAL STATUS PLANTS

7.1 METHODS

Surveys were conducted in April, May, June, and July to monitor the distribution of several special status species historically reported to occur or with the potential to occur in the Preserve. Locations were mapped using GPS/GIS. These species included linanthus (*Linanthus parviflorus*/*androsaceus* complex), white-tipped clover (*Trifolium* aff. *polyodon*), Gray's clover (*Trifolium barbigerum* var. *andrewsii*, formerly *T. grayi*), and grassland stebbinsoseris (*Stebbinsoseris heterocarpa*), all species of CNPS local concern, in addition to Choris's popcorn flower (*Plagiobothrys chorisianus* var. *chorisianus*, CNPS List 1B) and Mt. Diablo cottonweed (*Micropus amphibolus*, CNPS List 3).

The Glenwood Preserve is included in designated critical habitat for the federally endangered Scotts Valley polygonum (*Polygonum hickmanii*) (USFWS, Federal Register, Vol. 68, No. 67, April 8, 2003). Habitat for this species is very similar to that of the Scotts Valley spineflower and surveys were conducted in May 2006 for this species.

7.2 RESULTS

7.2.1 Mt. Diablo cottonweed

Locations of Mt. Diablo cottonweed are shown on the Preserve Map (Appendix A). Vegetation transects 6 and 9 were located near patches of Mt. Diablo cottonweed so that future cottonweed population trends can be examined in relation to trends in grassland plant composition.

Additional populations of Mt. Diablo Cottonweed were mapped during the 2006 floristic surveys that were not observed in previous years. The new populations of this species were observed on hilltops and slopes with thin, rocky soils in Pasture C. Other known populations of the species continued to perform well this year.

7.2.2 Gray's clover

Individuals of Gray's clover continue to grow in multiple locations in Pasture C. Distribution of the species in 2006 was similar to that observed in 2005 and the populations are shown on the Preserve Map in Appendix A. It should be noted that at the state level CNPS rejected *Trifolium grayi* for listing, considering it a synonym of *Trifolium barbigerum* var. *andrewsii*, a common taxon, however the local CNPS chapter still considers it a unique and rare species.

7.2.3 Choris's popcorn flower

Choris's popcorn flower is known to occur in the wetland in the southern part of Pasture C (see Appendix A, Preserve Map). Approximately 10 plants were observed in two locations in 2003. Transect 10 was located in the portion of the wetland where Choris's popcorn flower occurs so that future popcorn flower population trends can be examined

in relation to trends in wetland vegetation composition. Surveys conducted in May of 2005 turned up approximately 15 individuals of this species located in two adjacent patches near transect 10. In 2006, however, no individuals were observed. This was likely due to the wetland vegetation surveys occurring later in the season this year than in past years, and because there was focused grazing in pastures C and D to help improve habitat for the Ohlone Tiger Beetle. Results of the vegetation transect survey for this area corroborate this hypothesis as fewer species were observed this year than in past years and the vegetation present was heavily grazed.

7.2.4 Scotts Valley polygonum

On May 3, 2006, during the growth and flowering period of the Scotts Valley polygonum, a census was conducted. As the Scotts Valley polygonum has not been previously recorded from the Glenwood Open Space Preserve, a nearby locality (Polo Ranch) was field checked to ensure that the field surveys were conducted at the appropriate time. Kathleen Lyons and a field assistant conducted the census within the known and suitable Scotts Valley spineflower habitat areas. No individuals of Scotts Valley polygonum were observed within the open space preserve.

7.2.5 Other rare plant species

The rare linanthus complex, white-tipped clover, and grassland stebbinsoseris were not observed on the Preserve in 2003, 2004, 2005, or 2006. Surveys for these species will continue during Preserve reconnaissance surveys and surveys for Mount Diablo cottonweed in future years.

8.0 INVASIVE PEST PLANTS

Reconnaissance-level surveys were conducted to monitor stands of invasive pest plants (species listed on the Cal-IPC List A or B) that may threaten sensitive habitats and to monitor effectiveness of control activities. Several stands of the invasive exotic Italian thistle were observed and mapped during the 2006 surveys and previously known occurrences of other invasive species still exist onsite.

Stands of invasive plants on Cal-IPC's List A or B monitored on the Preserve in 2006 include:

- Pennyroyal (*Mentha pulegium*, List A-2) is abundant in the wetland swale near the southwest portion of Pasture A.
- Blackwood acacia (*Acacia melanoxylon*, 'Need More Information' List) was located in a few locations near the West Branch of Carbonera Creek and in the northwest corner of Pasture A. This species was cut and removed from some portions of the Preserve but others remain and should also be eradicated.
- Isolated individuals of bull thistle (*Cirsium vulgare*, List B) were found in scattered locations throughout the Preserve especially near the horse corral adjacent to the borrow area.
- Italian thistle (*Carduus pycnocephalus*, List B) was observed in 2006 as large stands of the species were found in the valleys and lower slopes of hills in pastures B and C. They appeared to be most prevalent on the southeast exposures of the hills which is also the primary direction the wind blows from.

- Small numbers of the perennial French broom (*Genista monspessulana*) were also observed in the northwest corner of Pasture A.
- Although a native, coyote brush (*Baccharis pilularis*) can be invasive in native grassland and disturbed areas. Some control of this species may be warranted to preserve the remaining grassland areas as discussed below.

Pennyroyal was represented in high numbers in 2006 at almost 40 percent relative cover in transect 2 and was the dominant species in that wetland. This wetland also contributes seed from this invasive species to the mitigation wetlands just below Pasture A. Grazing was reduced in Pasture A in 2006 to allow native species the chance to out compete pennyroyal which did not appear to be effective. Fully controlling this species is difficult as broken roots easily re-sprout and chemical control would jeopardize non-target plants.

The acacia trees growing along the water district road were cut in the summer of 2005. A landscape contractor removed most of the remaining populations of acacia during the spring of 2006, however one individual was missed along the bank of Carbonera Creek just above (north) of the main preserve entrance bridge. One additional group of relatively large trees in the northwest corner of Pasture A should also be cut. Stump sprouts were observed to be growing from the previously cut acacias that occur adjacent to the water district road just north of the borrow area in the Fall of 2006. These sprouts and other cut Acacia stands should be treated with an herbicide to effectively kill them as acacias are notorious for re-growing from cut stumps.

Thistles were cut by a landscaping contractor in the spring of 2006. Isolated bull thistle individuals were cut but new individuals were observed sprouting in the Fall of 2006. Similarly, the large expanses of Italian thistle were also cut. These species may re-sprout from taproots so continued monitoring of these treated populations will continue over the upcoming growing season.

The French broom shrubs growing along the edge of Pasture A should be pulled prior to setting seed in the 2006 growing season. The area should be also observed during future monitoring visits and any seedlings should also be eradicated.

9.0 REFERENCES

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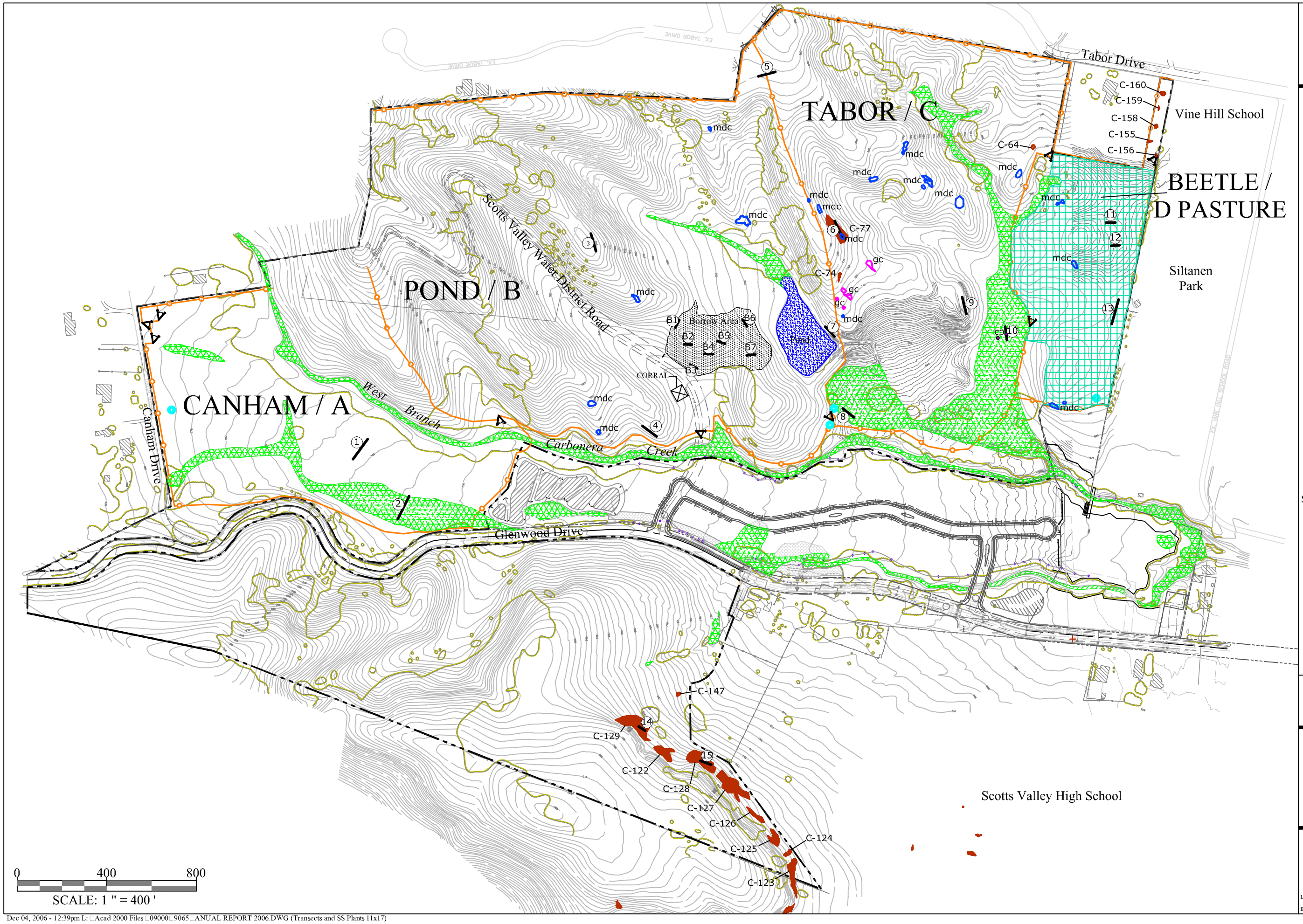
APPENDICES

Appendix A: Preserve Map



wra
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Map of Glenwood Preserve

LEGEND

- Open Space Preserve Boundary
- Wetlands
- Fence
- Gate Location
- Water Trough
- Water Pipe
- ④ Transect (with number)

Special Status Species

- Mount Diablo Cottonweed (mdc)
- Scotts Valley Spineflower (C-#)
- Ohlone Tiger Beetle
- Choris's Popcornflower (cp)
- Grey's Clover (gc)

Date	Issues And Revisions	No.
8-29-2005	AS BUILT	

PROJECT #9065
DRAWN BY: S.G.
ORIGINAL DRAWING SIZE: 24 " X 36"

SCALE: 1" = 400'

LANDSCAPE FENCE: The Guzzardo Partnership

BASEMAP: Ruggeri, Jensen, Azar & Assoc.

Dec 04, 2006 - 12:39pm L:□Acad 2000 Files□09000□9065□ANUAL REPORT 2006.DWG (Transects and SS Plants 11x17)

Appendix B: Area Rainfall Data for 2003-2006 Growing Seasons and Comparative WETS Data

Appendix B. Area rainfall data for 2003-2006 growing season in inches.

	02-03 growing season		03-04 growing season		04-05 growing season		05-06 growing season		WETS data averages	
	SVWD[1]	Ben Lomand[2]	SVWD[1]	Ben Lomand[2]	SVWD[1]	Ben Lomand[2]	SVWD[1]	Ben Lomand[2]	Low	High
Sep	0	0	0	0	0.11	0.2	0.08	0.11	0.03	0.51
Oct	0	0	0.19	-	7.24	8.7	0.19	0.22	0.77	2.73
Nov	5.8	7.43	3.93	4.49	3.25	4.24	2.84	4.02	2.08	7.33
Dec	21.4	24.77	17.55	19.39	14.39	15.49	21.73	25.95	3.16	8.69
Jan	2.77	2.52	4.44	6.14	8.3	11.83	6.55	7.2	4.2	12.99
Feb	2.95	3.15	9.69	11.33	7.2	8.05	5.26	5.9	4.46	12.52
Mar	2.54	2.44	1.19	1.65	10.01	10.36	15.29	16.84	3.54	9.58
Apr	5.75	7.52	0.65	0.8	3.79	4.35	10.44	13.58	1.12	3.38
May	1.08	1.1	0.07	0.05	2.13	2.47	1.01	0.91	0.11	1.19
Jun	0.16	0.08	0	0	0.94	1.26	0.01	0	0.05	0.28
Jul	0	0	0.06	0.01	0.02	0	0	0	0	0.08
Aug	0	0	0	0	0	0	0.01	0	0	0.13
TOTAL	42.45	49.01	37.77	43.86	57.38	66.95	63.41	74.73	37.61	57.12

green values indicate above average rainfall[3]

red values indicate below average rainfall[3]

no color indicates value is within "normal" (30% chance)[3]

"-" indicates no data for given period

[1] Data obtained from Scotts Valley Water District.

[2] Data obtained from NOAA/NCDC. Station ID: Ben Lomand No. 4.

[3] Data compared to USDA/NRCS WETS table for Ben Lomand station.

Appendix C: Data from Vegetation Transect Monitoring

Glenwood Preserve vegetation transects 2006

Date: 7/19/06
Monitor(s): GAS/SW
Transect: 1
original transect # A2
pasture A
habitat annual grassland

Cover class	Range	Mean
r	<<1	*
+	<1	0.1
1	1 to 5	2.5
2	5 to 25	15
3	25 to 50	37.5
4	50 to 75	62.5
5	75 to 100	87.5

SPECIES	Present?	n=native, i=invasive x=exotic	g=grass, h=herb	1	2	3	4	5	6	7	8	SUM	% REL	%REL VEG	% native	% non-native	% grass	% forb	% native grass	% non-native grass	% native forb	% non-native forb
Aira caryophylla	y	x	g	0.0	0.0	0.0	15.0	0.0	0.0	0.0	2.5	17.5	2.1%	2.1%	0.0%	2.1%	2.1%	0.0%	0.0%	2.1%	0.0%	0.0%
Hordeum marinum ssp. gussoneanum	y	x	g	37.5	37.5	15.0	37.5	37.5	37.5	37.5	37.5	277.5	32.9%	33.0%	0.0%	33.0%	33.0%	0.0%	0.0%	33.0%	0.0%	0.0%
Geranium dissectum	y	x	h	15.0	2.5	0.0	0.0	15.0	0.0	0.0	0.0	32.5	3.9%	3.9%	0.0%	3.9%	0.0%	3.9%	0.0%	0.0%	0.0%	3.9%
Juncus bufonius	y	n	h	0.0	0.0	15.0	15.0	0.0	15.0	15.0	0.0	60.0	7.1%	7.1%	7.1%	0.0%	0.0%	7.1%	0.0%	0.0%	7.1%	0.0%
Lolium multiflorum	y	x	g	37.5	37.5	15.0	37.5	0.0	37.5	37.5	37.5	240.0	28.5%	28.6%	0.0%	28.6%	28.6%	0.0%	0.0%	28.6%	0.0%	0.0%
Lotus purshianus	y	n	h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.5	2.5	0.3%	0.3%	0.3%	0.0%	0.0%	0.3%	0.0%	0.0%	0.3%	0.0%
Madia sp. (sativa?)	y	x	h	2.5	15.0	37.5	2.5	2.5	0.0	0.0	0.0	60.0	7.1%	7.1%	0.0%	7.1%	0.0%	7.1%	0.0%	0.0%	0.0%	7.1%
Rumex pulcher	y	x	h	0.0	0.0	2.5	0.0	0.0	0.0	0.0	0.0	2.5	0.3%	0.3%	0.0%	0.3%	0.0%	0.3%	0.0%	0.0%	0.0%	0.3%
(Helenium) Sneeze weed	y	n	h	0.0	0.0	2.5	2.5	0.0	0.0	0.0	0.0	5.0	0.6%	0.6%	0.6%	0.0%	0.0%	0.6%	0.0%	0.0%	0.6%	0.0%
Trifolium dubium	y	x	h	2.5	2.5	0.0	0.0	0.0	0.0	15.0	0.0	20.0	2.4%	2.4%	0.0%	2.4%	0.0%	2.4%	0.0%	0.0%	0.0%	2.4%
Trifolium sp. (hairy)	y	x	h	15.0	15.0	0.0	2.5	15.0	15.0	37.5	15.0	115.0	13.6%	13.7%	0.0%	13.7%	0.0%	13.7%	0.0%	0.0%	0.0%	13.7%
Trifolium fragiferum	y	x	h	0.0	2.5	0.0	2.5	0.0	0.0	0.0	0.0	5.0	0.6%	0.6%	0.0%	0.6%	0.0%	0.6%	0.0%	0.0%	0.0%	0.6%
Vulpia bromoides	y	x	g	0.0	0.0	0.0	0.0	2.5	0.0	0.0	0.0	2.5	0.3%	0.3%	0.0%	0.3%	0.3%	0.0%	0.0%	0.3%	0.0%	0.0%
					VEGETATION TOTALS							**840.0**	**99.7%**	**100.0%**	**8.0%**	**92.0%**	**64.0%**	**36.0%**	**0.0%**	**64.0%**	**8.0%**	**28.0%**
Bare ground				2.5								2.5	0.3%									
Moss																						
Thatch													0.0%									
Rock																						
					GRAND TOTALS							**842.5**	100.0%									

Glenwood Preserve vegetation transects 2006

Date:	7/19/06
Monitor(s):	GAS/SW
Transect:	2
original transect #	A1 Wetland
pasture	A
habitat	wetland

Cover class	Range	Mean
r	<<1	*
+	<1	0.1
1	1 to 5	2.5
2	5 to 25	15
3	25 to 50	37.5
4	50 to 75	62.5
5	75 to 100	87.5

SPECIES	Present?	n=native, i=invasive x=exotic	g=grass, h=herb	1	2	3	4	5	6	7	8	SUM	% REL	%REL_ VEG	% native	% non-native	% grass	% forb	% native grass	% non-native grass	% native forb	% non-native forb
Hordeum marinum ssp. gussoneanum	y	x	g	15.0	2.5	0.0	0.0	0.0	0.0	0.0	0.0	17.5	2.2%	2.2%	0.0%	2.2%	2.2%	0.0%	18.3%	0.0%	0.0%	0.0%
Juncus xiphioides	y	n	g	0.0	2.5	0.0	0.0	0.0	37.5	15.0	87.5	142.5	18.2%	18.3%	18.3%	0.0%	18.3%	0.0%	0.0%	11.9%	0.0%	0.0%
Lolium multiflorum	y	x	g	37.5	15.0	0.0	2.5	37.5	0.0	0.0	0.0	92.5	11.8%	11.9%	0.0%	11.9%	11.9%	0.0%	0.0%	0.0%	38.8%	38.8%
Mentha pulegeum	y	I	h	2.5	62.5	62.5	37.5	62.5	37.5	37.5	0.0	302.5	38.7%	38.8%	0.0%	38.8%	0.0%	38.8%	0.0%	2.9%	0.0%	0.0%
Polypogon monspeliensis	y	x	g	0.0	0.0	2.5	0.0	2.5	2.5	15.0	0.0	22.5	2.9%	2.9%	0.0%	2.9%	2.9%	0.0%	0.0%	0.0%	0.0%	17.6%
Rumex crispus	y	x	h	15.0	2.5	15.0	37.5	15.0	15.0	37.5	0.0	137.5	17.6%	17.6%	0.0%	17.6%	0.0%	17.6%	0.0%	0.0%	0.3%	0.0%
Eleocharis macrostachya	y	n	h	0.0	0.0	0.0	0.0	2.5	0.0	0.0	0.0	2.5	0.3%	0.3%	0.3%	0.0%	0.0%	0.3%	0.0%	0.0%	8.0%	0.0%
Rorippa nasturtium-aquaticum	y	n	h	0.0	0.0	0.0	62.5	0.0	0.0	0.0	0.0	62.5	8.0%	8.0%	8.0%	0.0%	0.0%	8.0%	0.0%	0.0%	0.0%	0.0%
					VEGETATION TOTALS							780.0	99.7%	100.0%	26.6%	73.4%	35.2%	64.7%	18.3%	14.7%	47.1%	56.4%
Bare ground											2.5	2.5	0.3%									
Moss																						
Thatch																						
Rock																						
					GRAND TOTALS							782.5	100.0%									

Glenwood Preserve vegetation transects 2006

Date:	4/18/06
Monitor(s):	AH and GAS
Transect:	3
original transect #	B3
pasture	B
habitat	native grassland

Cover class	Range	Mean
r	<<1	*
+	<1	0.1
1	1 to 5	2.5
2	5 to 25	15
3	25 to 50	37.5
4	50 to 75	62.5
5	75 to 100	87.5

SPECIES	Present?	n=native, i=invasive x=exotic	g=grass, h=herb	1	2	3	4	5	6	7		SUM	% REL	%REL_ VEG	% native	% non-native	% grass	% forb	% native grass	% non-native grass	% native forb	% non-native forb
Avena barbata	y	x	g	0.0	0.0	0.0	0.1	0.0	0.0	0.0		0.1	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Bromus diandrus	y	x	g	2.5	2.5	2.5	2.5	2.5	15.0	0.1		27.6	3.6%	4.7%	0.0%	4.7%	4.7%	0.0%	0.0%	4.7%	0.0%	0.0%
Bromus hordeaceus	y	x	g	15.0	15.0	15.0	15.0	15.0	15.0	15.0		105.0	13.9%	17.8%	0.0%	17.8%	17.8%	0.0%	0.0%	17.8%	0.0%	0.0%
Carduus pycnocephalus	y	x	h	0.0	2.5	0.0	0.0	0.1	15.0	15.0		32.6	4.3%	5.5%	0.0%	5.5%	0.0%	5.5%	0.0%	0.0%	0.0%	5.5%
Castilleja densiflora ssp densiflora	y	n	h	2.5	0.0	0.0	0.1	0.0	0.0	0.0		2.6	0.3%	0.4%	0.4%	0.0%	0.0%	0.4%	0.0%	0.0%	0.4%	0.0%
Cerastium fontanum ssp. vulgare	y	x	h	0.0	0.0	0.0	0.0	0.0	2.5	0.0		2.5	0.3%	0.4%	0.0%	0.4%	0.0%	0.4%	0.0%	0.0%	0.0%	0.4%
Erodium botrys	y	x	h	0.0	15.0	15.0	0.0	2.5	0.0	2.5		35.0	4.6%	5.9%	0.0%	5.9%	0.0%	5.9%	0.0%	0.0%	0.0%	5.9%
Eschscholzia californica	y	n	h	0.0	0.0	0.0	0.0	0.0	0.0	2.5		2.5	0.3%	0.4%	0.4%	0.0%	0.0%	0.4%	0.0%	0.0%	0.4%	0.0%
Filago gallica	y	n	h	15.0	0.0	0.0	0.0	0.0	0.0	0.0		15.0	2.0%	2.5%	2.5%	0.0%	0.0%	2.5%	0.0%	0.0%	2.5%	0.0%
Juncus bufonius	y	n	h	2.5	0.0	0.0	0.0	0.0	0.0	0.0		2.5	0.3%	0.4%	0.4%	0.0%	0.0%	0.4%	0.0%	0.0%	0.4%	0.0%
Hypochaeris glabra	y	x	h	2.5	37.5	15.0	15.0	2.5	2.5	37.5		112.5	14.9%	19.1%	0.0%	19.1%	0.0%	19.1%	0.0%	0.0%	0.0%	19.1%
Lolium multiflorum	y	x	g	0.0	15.0	2.5	0.1	0.0	0.0	2.5		20.1	2.7%	3.4%	0.0%	3.4%	3.4%	0.0%	0.0%	3.4%	0.0%	0.0%
Lotus corniculatus	y	x	h	2.5	0.0	0.0	0.0	0.0	0.0	0.0		2.5	0.3%	0.4%	0.0%	0.4%	0.0%	0.4%	0.0%	0.0%	0.0%	0.4%
Lupinus nanus	y	n	h	15.0	0.0	0.0	2.5	0.0	0.0	0.0		17.5	2.3%	3.0%	3.0%	0.0%	0.0%	3.0%	0.0%	0.0%	3.0%	0.0%
Plagiobotrys nothofulvis	y	n	h	2.5	0.0	2.5	0.0	0.0	0.0	2.5		7.5	1.0%	1.3%	1.3%	0.0%	0.0%	1.3%	0.0%	0.0%	1.3%	0.0%
Silene gallica	y	x	h	15.0	15.0	0.0	0.0	0.0	2.5	0.0		32.5	4.3%	5.5%	0.0%	5.5%	0.0%	5.5%	0.0%	0.0%	0.0%	5.5%
Trifolium depauparatum	y	n	h	2.5	0.0	0.0	0.0	0.0	0.0	0.0		2.5	0.3%	0.4%	0.4%	0.0%	0.0%	0.4%	0.0%	0.0%	0.4%	0.0%
Trifolium dubium	y	x	h	0.0	2.5	37.5	37.5	0.0	0.0	15.0		92.5	12.2%	15.7%	0.0%	15.7%	0.0%	15.7%	0.0%	0.0%	0.0%	15.7%
Trifolium subterraneum	y	x	h	0.0	0.0	0.0	0.0	0.0	0.0	15.0		15.0	2.0%	2.5%	0.0%	2.5%	0.0%	2.5%	0.0%	0.0%	0.0%	2.5%
Vicia sativa	y	x	h	0.0	0.0	0.0	0.0	0.0	15.0	0.0		15.0	2.0%	2.5%	0.0%	2.5%	0.0%	2.5%	0.0%	0.0%	0.0%	2.5%
Vulpia bromoides	y	x	g	0.0	0.0	2.5	15.0	15.0	15.0	0.0		47.5	6.3%	8.0%	0.0%	8.0%	8.0%	0.0%	0.0%	8.0%	0.0%	0.0%
							VEGETATION TOTALS					590.5	78.0%	100.0%	8.5%	91.5%	33.9%	66.1%	0.0%	33.9%	8.5%	57.6%
Bare ground				60	20	15	15	30	15	10		165	21.8%									
Moss																						
Thatch								2				2	0.3%									
Rock																						
							GRAND TOTALS					757.5	100.0%									

Glenwood Preserve vegetation transects 2006

Date:	4/18/06
Monitor(s):	AH, GS
Transect:	4
original transect #	B1
pasture	B
habitat	OLM, native grassland

Cover class	Range	Mean
r	<<1	*
+	<1	0.1
1	1 to 5	2.5
2	5 to 25	15
3	25 to 50	37.5
4	50 to 75	62.5
5	75 to 100	87.5

SPECIES	Present?	n=native, i=invasive x=exotic	g=grass, h=herb	1	2	3	4	5				SUM	% REL	%REL_ VEG	% native	% non-native	% grass	% forb	% native grass	% non-native grass	% native forb	% non-native forb
Aira caryophyllea	y	x	g	15.0	0.0	15.0	0.0	2.5				32.5	7.0%	11.9%	0.0%	11.9%	11.9%	0.0%	0.0%	11.9%	0.0%	0.0%
Lotus sp	y	x	h	0.1	0.0	0.0	0.0	0.1				0.2	0.0%	0.1%	0.0%	0.1%	0.0%	0.1%	0.0%	0.0%	0.0%	0.1%
Bromus hordeaceus	y	x	g	2.5	15.0	15.0	15.0	15.0				62.5	13.5%	22.9%	0.0%	22.9%	22.9%	0.0%	0.0%	22.9%	0.0%	0.0%
Erodium botrys	y	x	h	2.5	2.5	0.0	0.0	0.0				5.0	1.1%	1.8%	0.0%	1.8%	0.0%	1.8%	0.0%	0.0%	0.0%	1.8%
Eschscholzia californica	y	n	h	0.0	0.0	0.0	0.0	0.1				0.1	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Hypochaeris glabra	y	x	h	15.0	0.0	0.0	0.0	0.0				15.0	3.2%	5.5%	0.0%	5.5%	0.0%	5.5%	0.0%	0.0%	0.0%	5.5%
Hypochaeris radicata	y	x	h	0.0	0.0	37.5	0.0	0.0				37.5	8.1%	13.7%	0.0%	13.7%	0.0%	13.7%	0.0%	0.0%	0.0%	13.7%
Lolium multiflorum	y	x	g	2.5	15.0	15.0	15.0	15.0				62.5	13.5%	22.9%	0.0%	22.9%	22.9%	0.0%	0.0%	22.9%	0.0%	0.0%
Plantago erecta	y	n	h	15.0	0.0	0.0	0.0	0.0				15.0	3.2%	5.5%	5.5%	0.0%	0.0%	5.5%	0.0%	0.0%	5.5%	0.0%
Rumex acetosella	y	x	h	0.0	2.5	15.0	0.0	0.0				17.5	3.8%	6.4%	0.0%	6.4%	0.0%	6.4%	0.0%	0.0%	0.0%	6.4%
Trifolium sp.	y	x	h	0.0	0.0	0.1	0.0	0.0				0.1	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Lupinus nanus	y	x	h	0.0	0.1	0.0	0.0	0.1				0.2	0.0%	0.1%	0.0%	0.1%	0.0%	0.1%	0.0%	0.0%	0.0%	0.1%
Platystemon californicus	y	n	h	0.0	0.0	0.1	0.0	15.0				15.1	3.3%	5.5%	5.5%	0.0%	0.0%	5.5%	0.0%	0.0%	5.5%	0.0%
Trifolium microcephalum	y	n	h	2.5	0.1	0.0	0.0	0.0				2.6	0.6%	1.0%	1.0%	0.0%	0.0%	1.0%	0.0%	0.0%	1.0%	0.0%
Cerastium fontanum ssp. vulgare	y	x	h	2.5	2.5	0.1	0.0	0.0				5.1	1.1%	1.9%	0.0%	1.9%	0.0%	1.9%	0.0%	0.0%	0.0%	1.9%
Aphanes occidentalis	y	n	h	2.5	0.0	0.0	0.0	0.0				2.5	0.5%	0.9%	0.9%	0.0%	0.0%	0.9%	0.0%	0.0%	0.9%	0.0%
					VEGETATION TOTALS							**273.4**	**58.9%**	**100.0%**	**12.9%**	**87.1%**	**57.6%**	**42.4%**	**0.0%**	**57.6%**	**12.9%**	**29.5%**
Bare ground				30	30	25	30	3				118	25.4%									
Moss																						
Thatch				0.1	8	10	30	25				73.1	15.7%									
Rock																						
					GRAND TOTALS							**464.5**	100.0%									

Glenwood Preserve vegetation transects 2006

Date: 5/18/06
Monitor(s): AH
Transect: 5
original transect # top b/c
pasture B (11-20), C (1-10)
habitat annual grassland

Cover class	Range	Mean
r	<<1	*
+	<1	0.1
1	1 to 5	2.5
2	5 to 25	15
3	25 to 50	37.5
4	50 to 75	62.5
5	75 to 100	87.5

SPECIES	Present?	n=native, i=invasive x=exotic	g=grass, h=herb	1	2	3	4	5	6	7	8	9	10	SUM	% REL	%REL_ VEG	% native	% non-native	% grass	% forb	% native grass	% non-native grass	% native forb	% non-native forb
				2R	4L	6R	8L	10R	12L	14R	16L	18R	20L											
Avena sp.	y	x	g	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.5	0.0	0.0	2.5	0.3%	0.3%	0.0%	0.3%	0.3%	0.0%	0.0%	0.0%	0.0%	0.0%
Bromus diandrus	y	x	g	0.0	0.0	0.0	0.0	0.0	2.5	0.0	0.0	0.0	0.0	2.5	0.3%	0.3%	0.0%	0.3%	0.3%	0.0%	0.0%	0.3%	0.0%	0.0%
Bromus hordeaceus	y	x	g	37.5	15.0	15.0	15.0	37.5	15.0	2.5	37.5	15.0	37.5	227.5	26.7%	30.3%	0.0%	30.3%	30.3%	0.0%	0.0%	30.3%	0.0%	0.0%
Erodium botrys	y	x	h	0.0	0.0	2.5	0.0	0.0	2.5	0.0	0.0	0.0	2.5	7.5	0.9%	1.0%	0.0%	1.0%	0.0%	1.0%	0.0%	0.0%	0.0%	1.0%
Hordeum marinum spp. gussoneaum	y	x	g	0.0	2.5	0.0	0.0	0.0	2.5	0.0	0.0	0.0	0.0	5.0	0.6%	0.7%	0.0%	0.7%	0.7%	0.0%	0.0%	0.7%	0.0%	0.0%
Hypochaeris glabra	y	x	h	15.0	2.5	2.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	20.0	2.3%	2.7%	0.0%	2.7%	0.0%	2.7%	0.0%	0.0%	0.0%	2.7%
Lolium multiflorum	y	x	g	15.0	15.0	15.0	2.5	2.5	37.5	15.0	15.0	15.0	37.5	170.0	19.9%	22.7%	0.0%	22.7%	22.7%	0.0%	0.0%	22.7%	0.0%	0.0%
Rumex acetocella	y	x	h	2.5	2.5	15.0	2.5	0.0	0.0	0.0	0.0	0.0	0.0	22.5	2.6%	3.0%	0.0%	3.0%	0.0%	3.0%	0.0%	0.0%	0.0%	3.0%
Carduus pycnocephalus	y	x	h	0.0	0.0	0.0	0.0	37.5	0.0	0.0	0.0	0.0	0.0	37.5	4.4%	5.0%	0.0%	5.0%	0.0%	5.0%	0.0%	0.0%	0.0%	5.0%
Trifolium dubium	y	x	h	2.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.5	0.3%	0.3%	0.0%	0.3%	0.0%	0.3%	0.0%	0.0%	0.0%	0.3%
Trifolium subterraneum	y	x	h	2.5	15.0	15.0	2.5	15.0	15.0	15.0	0.0	15.0	2.5	97.5	11.4%	13.0%	0.0%	13.0%	0.0%	13.0%	0.0%	0.0%	0.0%	13.0%
Briza minor	y	x	h	2.5	2.5	2.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	7.5	0.9%	1.0%	0.0%	1.0%	0.0%	1.0%	0.0%	0.0%	0.0%	1.0%
Vulpia bromoides	y	x	g	2.5	15.0	0.0	0.0	15.0	0.0	37.5	15.0	37.5	2.5	125.0	14.7%	16.7%	0.0%	16.7%	16.7%	0.0%	0.0%	16.7%	0.0%	0.0%
Geranium dissectum	y	x	h	2.5	2.5	0.0	0.0	2.5	0.0	2.5	2.5	2.5	2.5	17.5	2.1%	2.3%	0.0%	2.3%	0.0%	2.3%	0.0%	0.0%	0.0%	2.3%
Vicia sativa	y	x	h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.5	0.0	2.5	0.3%	0.3%	0.0%	0.3%	0.0%	0.3%	0.0%	0.0%	0.0%	0.3%
Escholozia californica	y	n	h	0.0	0.0	0.0	2.5	0.0	0.0	0.0	0.0	0.0	0.0	2.5	0.3%	0.3%	0.3%	0.0%	0.0%	0.3%	0.0%	0.0%	0.3%	0.0%
					VEGETATION TOTALS									750.0	87.9%	100.0%	0.3%	99.7%	71.0%	29.0%	0.0%	70.7%	0.3%	28.7%
Bare ground				5	5	15	0	20	20	5	15	3	0	88	10.3%									
Moss																								
Thatch				0	0	0	0	0	10	0	5	0	0	15	1.8%									
Rock																								
					GRAND TOTALS									853.0	100.0%									

Glenwood Preserve vegetation transects 2006

Date: 5/2/06
Monitor(s): K Lyons
Transect: 6
original transect # CHORO 1
pasture B
habitat SVSF

Cover class	Range	Mean
r	<<1	*
+	<1	0.1
1	1 to 5	2.5
2	5 to 25	15
3	25 to 50	37.5
4	50 to 75	62.5
5	75 to 100	87.5

SPECIES	Present?	n=native, i=invasive x=exotic	g=grass, h=herb	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	SUM	%REL	%REL veg	% native	% non-native	% grass	% forb	% native grass	% non-native grass	% native forb	% non-native forb
Avena sp.	y	x	g	0.1	0.1	2.5	2.5	2.5	0.1	2.5	2.5	2.5	2.5	2.5	2.5	0	0.1	0.1	2.5	0	2.5	2.5	2.5	33.0	1.7%	2.4%	0.0%	2.4%	2.4%	0.0%	0.0%	2.4%	0.0%	0.0%
Aira caryophllea	y	x	g	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	37.5	0.1	0.1	0.1	37.8	2.0%	2.8%	0.0%	2.8%	2.8%	0.0%	0.0%	2.8%	0.0%	0.0%
Briza maxima	y	x	g	0	0	0	2.5	2.5	2.5	0	0	0	0.1	0	2.5	2.5	37.5	15	0	2.5	0	0	0	67.6	3.5%	5.0%	0.0%	5.0%	5.0%	0.0%	0.0%	5.0%	0.0%	0.0%
Bromus diandrus	y	x	g	0	+	0	0	0	0.1	0.1	0	0	0	0.1	0	0	0	0.1	15	0	0	0	0	15.4	0.8%	1.1%	0.0%	1.1%	1.1%	0.0%	0.0%	1.1%	0.0%	0.0%
Bromus hordeaceus	y	x	g	1	3	37.5	37.5	15	2.5	2.5	2.5	2.5	2.5	0.1	0	0	0.1	2.5	15	2.5	2.5	2.5	2.5	134.2	7.0%	9.8%	0.0%	9.8%	9.8%	0.0%	0.0%	9.8%	0.0%	0.0%
Castilleja densiflora	y	n	h	0	0	0.0	0.0	0	0	0	2.5	0	0	0.1	0	0	0	0	2.5	0	0	0	0	5.1	0.3%	0.4%	0.4%	0.0%	0.0%	0.4%	0.0%	0.0%	0.4%	0.0%	0.0%
Chorizanthe robusta hartwegii	y	n	h	0	0	0	0	0	0	2.5	0	2.5	0.1	0	0.1	0	0	0	0	0	0	0	0	5.2	0.3%	0.4%	0.4%	0.0%	0.0%	0.4%	0.0%	0.0%	0.4%	0.0%	0.0%
Chrysopsis villosa villosa	y	n	h	0	0	0	0	0	0	0	0	0	0	0	0	15	0	0.1	0	37.5	2.5	0	0	55.1	2.9%	4.0%	4.0%	0.0%	0.0%	4.0%	0.0%	0.0%	4.0%	0.0%	0.0%
Eremocarpus setigerus	n	n	h	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Erodium botrys	y	x	h	15	2.5	2.5	15	15	15	2.5	15	15	15	2.5	2.5	2.5	2.5	2.5	2.5	15	2.5	15	15	175.0	9.1%	12.8%	0.0%	12.8%	0.0%	12.8%	0.0%	0.0%	0.0%	12.8%	0.0%
Filago gallica	y	x	h	2.5	15	2.5	2.5	0.1	15	15	2.5	15	2.5	15	2.5	2.5	0.1	2.5	2.5	2.5	0.1	0.1	0	100.4	5.2%	7.4%	0.0%	7.4%	0.0%	7.4%	0.0%	0.0%	0.0%	7.4%	0.0%
Gastridium	y	x	g	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0	0	0	0	0.1	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Hypochaeris glabra	y	x	h	15	2.5	15	15	15	15	15	15	15	15	2.5	15	2.5	15	15	15	37.5	2.5	15	37.5	295.0	15.4%	21.6%	0.0%	21.6%	0.0%	21.6%	0.0%	0.0%	0.0%	21.6%	0.0%
Lessingia sp.	y	n	h	0	15	0	0	0	0	0	0	0	0	0	0	0	0	15	0	0	0	0	0	30.0	1.6%	2.2%	2.2%	0.0%	0.0%	2.2%	0.0%	0.0%	2.2%	0.0%	0.0%
Lolium multiflorum	y	x	g	0	2.5	0.1	0	0.1	0	0	0.1	0.1	0	0	0	0	0	0	2.5	0.1	2.5	2.5	0	10.5	0.5%	0.8%	0.0%	0.8%	0.8%	0.0%	0.0%	0.8%	0.0%	0.0%	0.0%
Lotus micranthus	y	n	h	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2.5	15	0	0	2.5	0.1	20.1	1.0%	1.5%	1.5%	0.0%	0.0%	1.5%	0.0%	0.0%	1.5%	0.0%	0.0%
Lotus purshianus	y	n	h	0	15	0	2.5	0	2.5	2.5	2.5	2.5	15	2.5	15	2.5	2.5	15	15	15	2.5	0	2.5	115.0	6.0%	8.4%	8.4%	0.0%	0.0%	8.4%	0.0%	0.0%	8.4%	0.0%	0.0%
Lotus strigerous	y	n	h	0	0	0	0	0	2.5	0	0	2.5	2.5	2.5	0.1	0.1	0.1	0	0	15	0	2.5	0	27.8	1.4%	2.0%	2.0%	0.0%	0.0%	2.0%	0.0%	0.0%	2.0%	0.0%	0.0%
Lupinus sp.	y	n	h	2.5	2.5	0	2.5	15	15	15	2.5	15	15	0	2.5	0	2.5	0	0	2.5	2.5	2.5	2.5	100.0	5.2%	7.3%	7.3%	0.0%	0.0%	7.3%	0.0%	0.0%	7.3%	0.0%	0.0%
Minuartia californica	y	n	h	0	0.1	2.5	2.5	0	0	0	2.5	0.1	0	2.5	2.5	2.5	0	0	0	0.1	0	0	0.1	15.4	0.8%	1.1%	1.1%	0.0%	0.0%	1.1%	0.0%	0.0%	1.1%	0.0%	0.0%
Rumex acetosella	y	x	h	0	0	0	0	0	0	0	0	0	0	0	0	0	0	15	0	0	0	0	0	15.0	0.8%	1.1%	0.0%	1.1%	0.0%	1.1%	0.0%	0.0%	0.0%	1.1%	0.0%
Silene gallica	y	x	h	0	0	2.5	2.5	2.5	0.1	2.5	2.5	2.5	2.5	2.5	2.5	0	2.5	15	0.1	2.5	2.5	15	15	75.2	3.9%	5.5%	0.0%	5.5%	0.0%	5.5%	0.0%	0.0%	0.0%	5.5%	0.0%
Trichostema lanceolatum	n	n	h	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Trifolium macrocephalum	y	n	h	0	0	0.1	2.5	0	0	0	0	0	0	0	0	0.1	0	0	15	0	0	0	0	17.7	0.9%	1.3%	1.3%	0.0%	0.0%	1.3%	0.0%	0.0%	1.3%	0.0%	0.0%
Trifolium angustifolium	y	x	h	0	2.5	0	0	0	0	0	0	0	0	0.1	0	0	0	0.1	0	0	0	0	0	2.7	0.1%	0.2%	0.0%	0.2%	0.0%	0.2%	0.0%	0.0%	0.0%	0.2%	0.0%
Trifolium dubium	y	x	h	0	2.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2.5	0.1%	0.2%	0.0%	0.2%	0.0%	0.2%	0.0%	0.0%	0.0%	0.2%	0.0%
Vicia sp.	n	n	h	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Vulpia sp.	y	x	g	0	0	0	0	0	2.5	0	0	0	0	2.5	0.1	0	0.1	0	0	2.5	0	0	0	7.7	0.4%	0.6%	0.6%	0.0%	0.0%	0.6%	0.0%	0.0%	0.6%	0.0%	0.0%
					VEGETATION TOTALS																			**1363.5**	**71.0%**	100.0%	28.7%	71.3%	22.5%	77.5%	0.0%	1.3%	28.3%	48.8%
Bare ground				62.5	37.5	15.0	37.5	###	15.0	15.0	37.5	37.5	37.5	62.5	15.0	62.5	15.0	37.5	2.5	15.0	87.5	37.5	15.0	525.0	27.4%										
Moss																									0.0%										
Thatch				0	15	2.5	2.5	0.1	0.1	0	2.5	0	0	0	0.1	2.5	0.1	0	2.5	0.1	0	2.5	0	30.5	1.6%										
Rock				0	0	0.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0.0%										
GRAND TOTAL					**GRAND TOTALS**																			**1919.1**	100.0%										

Chorizanthe individuals																																		

Glenwood Preserve vegetation transects 2006

Date: 5/18/06
Monitor(s): AH
Transect: 7
original transect # OPLER 1
pasture B
habitat OLM

Cover class	Range	Mean
r	<<1	*
+	<1	0.1
1	1 to 5	2.5
2	5 to 25	15
3	25 to 50	37.5
4	50 to 75	62.5
5	75 to 100	87.5

SPECIES	Present?	n=native, i=invasive x=exotic	g=grass, h=herb	1	2	3	4	5	6	7	8			SUM	% REL	%REL_ VEG	% native	% non-native	% grass	% forb	% native grass	% non-native grass	% native forb	% non-native forb
Aira caryophyllea	y	x	g	37.5	37.5	15.0	15.0	15.0	15.0	15.0	37.5			187.5	25.6%	32.3%	0.0%	32.3%	32.3%	0.0%	0.0%	32.3%	0.0%	0.0%
Anthemis cotula	y	x	h	0.0	0.0	0.0	0.0	0.0	0.0	2.5	0.0			2.5	0.3%	0.4%	0.0%	0.4%	0.0%	0.4%	0.0%	0.0%	0.0%	0.4%
Avena barbata	y	x	g	2.5	2.5	0.0	0.0	2.5	0.0	2.5	0.0			10.0	1.4%	1.7%	0.0%	1.7%	1.7%	0.0%	0.0%	1.7%	0.0%	0.0%
Avena sp.	y	x	g	0.0	0.0	0.0	0.0	0.0	15.0	0.0	0.0			15.0	2.1%	2.6%	0.0%	2.6%	2.6%	0.0%	0.0%	2.6%	0.0%	0.0%
Briza maxima	y	x	g	0.0	0.0	0.0	2.5	0.0	0.0	0.0	0.0			2.5	0.3%	0.4%	0.0%	0.4%	0.4%	0.0%	0.0%	0.4%	0.0%	0.0%
Bromus diandrus	y	x	g	0.0	0.0	0.0	2.5	0.0	2.5	0.0	0.0			5.0	0.7%	0.9%	0.0%	0.9%	0.9%	0.0%	0.0%	0.9%	0.0%	0.0%
Castilleja densiflora	y	n	h	0.0	0.0	0.0	0.0	2.5	0.0	0.0	0.0			2.5	0.3%	0.4%	0.4%	0.0%	0.0%	0.4%	0.0%	0.0%	0.4%	0.0%
Erodium botrys	y	x	h	0.0	2.5	0.0	0.0	0.0	2.5	2.5	2.5			10.0	1.4%	1.7%	0.0%	1.7%	0.0%	1.7%	0.0%	0.0%	0.0%	1.7%
Hypochaeris glabra	y	x	h	2.5	0.0	2.5	15.0	15.0	2.5	2.5	15.0			55.0	7.5%	9.5%	0.0%	9.5%	0.0%	9.5%	0.0%	0.0%	0.0%	9.5%
Lolium multiflorum	y	x	g	2.5	2.5	2.5	2.5	2.5	2.5	15.0	2.5			32.5	4.4%	5.6%	0.0%	5.6%	5.6%	0.0%	0.0%	5.6%	0.0%	0.0%
Plagiobothrys nothofulvus	y	n	h	0.0	0.0	0.0	0.0	0.0	0.0	2.5	2.5			5.0	0.7%	0.9%	0.9%	0.0%	0.0%	0.9%	0.0%	0.0%	0.9%	0.0%
Platystemon californicus	y	n	h	0.0	0.0	2.5	2.5	0.0	0.0	2.5	0.0			7.5	1.0%	1.3%	1.3%	0.0%	0.0%	1.3%	0.0%	0.0%	1.3%	0.0%
Rumex acetosella	y	x	h	15.0	0.0	15.0	0.0	15.0	0.0	15.0	0.0			60.0	8.2%	10.3%	0.0%	10.3%	0.0%	10.3%	0.0%	0.0%	0.0%	10.3%
Trifolium depauperatum	y	n	h	0.0	0.0	0.0	0.0	0.0	2.5	0.0	2.5			5.0	0.7%	0.9%	0.9%	0.0%	0.0%	0.9%	0.0%	0.0%	0.9%	0.0%
Trifolium dubium	y	x	h	2.5	15.0	2.5	2.5	15.0	2.5	0.0	0.0			40.0	5.5%	6.9%	0.0%	6.9%	0.0%	6.9%	0.0%	0.0%	0.0%	6.9%
Trifolium gracilentum	y	n	h	2.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0			2.5	0.3%	0.4%	0.4%	0.0%	0.0%	0.4%	0.0%	0.0%	0.4%	0.0%
Trifolium wildenovii	y	n	h	0.0	2.5	2.5	0.0	2.5	0.0	0.0	2.5			10.0	1.4%	1.7%	1.7%	0.0%	0.0%	1.7%	0.0%	0.0%	1.7%	0.0%
Vulpia bromoides	y	x	g	0.0	0.0	0.0	0.0	0.0	0.0	2.5	0.0			2.5	0.3%	0.4%	0.0%	0.4%	0.4%	0.0%	0.0%	0.4%	0.0%	0.0%
Triphysaria pusillum	y	n	h	15.0	15.0	2.5	0.0	2.5	2.5	2.5	0.0			40.0	5.5%	6.9%	6.9%	0.0%	0.0%	6.9%	0.0%	0.0%	6.9%	0.0%
Briza minor	y	x	g	2.5	0.0	0.0	0.0	0.0	0.0	2.5	15.0			20.0	2.7%	3.4%	0.0%	3.4%	3.4%	0.0%	0.0%	3.4%	0.0%	0.0%
Clarkia purpurata	y	n	h	0.0	0.0	0.0	15.0	2.5	2.5	2.5	2.5			25.0	3.4%	4.3%	4.3%	0.0%	0.0%	4.3%	0.0%	0.0%	4.3%	0.0%
Eschscholzia californica	y	n	h	0.0	0.0	0.0	15.0	2.5	0.0	2.5	2.5			22.5	3.1%	3.9%	3.9%	0.0%	0.0%	3.9%	0.0%	0.0%	3.9%	0.0%
Vulpia bromoides	y	x	g	0.0	0.0	0.0	2.5	0.0	0.0	0.0	0.0			2.5	0.3%	0.4%	0.4%	0.0%	0.0%	0.4%	0.0%	0.0%	0.4%	0.0%
Filago gallica	y	x	h	0.0	0.0	0.0	2.5	0.0	0.0	0.0	0.0			2.5	0.3%	0.4%	0.0%	0.4%	0.0%	0.4%	0.0%	0.0%	0.0%	0.4%
Soliva sessilis	y	x	h	0.0	0.0	0.0	0.0	2.5	0.0	2.5	0.0			5.0	0.7%	0.9%	0.0%	0.9%	0.0%	0.9%	0.0%	0.0%	0.0%	0.9%
Hemizonia sp.	y	n	h	0.0	0.0	0.0	0.0	0.0	2.5	0.0	2.5			5.0	0.7%	0.9%	0.9%	0.0%	0.0%	0.9%	0.0%	0.0%	0.9%	0.0%
Trifolium mcrodon	y	n	h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.5			2.5	0.3%	0.4%	0.4%	0.0%	0.0%	0.4%	0.0%	0.0%	0.4%	0.0%
					VEGETATION TOTALS									580.0	79.3%	100.0%	22.0%	78.0%	47.8%	52.2%	0.0%	47.8%	22.0%	30.2%
Bare ground				5	15	50.0	5.0	15.0	5.0	5.0	10.0			110	15.0%									
Moss					1									1	0.1%									
Thatch							10	5	5	5	5			30	4.1%									
Rock					5	5								10	1.4%									
GRAND TOTAL					GRAND TOTALS									731.0	100.0%									

Glenwood Preserve vegetation transects 2006

Date:	7/19/06
Monitor(s):	GAS/SW
Transect:	8
original transect #	C-5
pasture	C
habitat	wetland

Cover class	Range	Mean
r	<<1	*
+	<1	0.1
1	1 to 5	2.5
2	5 to 25	15
3	25 to 50	37.5
4	50 to 75	62.5
5	75 to 100	87.5

NOTES:
ZERO END UNDER WILLOW
NO GPS POINT FOUND
AVERAGE PLANT HEIGHT <2M
HEAVILY GRAZED
HORSE TRAIL AT 6-6.7M

SPECIES	Present?	n=native, i=invasive x=exotic	g=grass, h=herb	1	2	3	4	5	6	7		SUM	% REL	%REL_ VEG	% native	% non-native	% grass	% forb	% native grass	% non-native grass	% native forb	% non-native forb
				1L	4R	7L	10R	13L	16R	19L												
Aira caryopyllea	y	x	g	2.5	0.0	2.5	2.5	0.0	0.0	0.0		7.5	1.1%	1.2%	0.0%	1.2%	1.2%	0.0%	0.0%	0.0%	0.0%	0.0%
Holcus lanatus	y	x	g	2.5	0.0	0.0	15.0	15.0	37.5	2.5		72.5	10.4%	11.3%	0.0%	11.3%	11.3%	0.0%	0.0%	11.3%	0.0%	0.0%
Hypochaeris glabra	y	x	h	0.0	0.0	0.0	0.0	2.5	0.0	0.0		2.5	0.4%	0.4%	0.0%	0.4%	0.0%	0.4%	0.0%	0.0%	0.0%	0.4%
Lolium multiflorum	y	x	g	15.0	15.0	15.0	15.0	15.0	0.0	15.0		90.0	12.9%	14.1%	0.0%	14.1%	14.1%	0.0%	0.0%	14.1%	0.0%	0.0%
Trifolium dubium	y	x	h	0.0	2.5	0.0	2.5	0.0	0.0	0.0		5.0	0.7%	0.8%	0.0%	0.8%	0.0%	0.8%	0.0%	0.0%	0.0%	0.8%
Trifolium fragiferum	y	x	h	0.0	15.0	0.0	0.0	0.0	0.0	2.5		17.5	2.5%	2.7%	0.0%	2.7%	0.0%	2.7%	0.0%	0.0%	0.0%	2.7%
Lythrum hyssopifolia	y	x	h	15.0	15.0	37.5	15.0	2.5	15.0	2.5		102.5	14.6%	16.0%	0.0%	16.0%	0.0%	16.0%	0.0%	0.0%	0.0%	16.0%
Juncus xiphioides	y	n	h	37.5	37.5	15.0	37.5	37.5	37.5	15.0		217.5	31.1%	34.0%	34.0%	0.0%	0.0%	34.0%	0.0%	0.0%	34.0%	0.0%
Vulpia sp.	y	x	g	2.5	0.0	15.0	0.0	0.0	0.0	0.0		17.5	2.5%	2.7%	0.0%	2.7%	2.7%	0.0%	0.0%	2.7%	0.0%	0.0%
Ploypogon monspeliensis	y	x	g	2.5	15.0	0.0	0.0	0.0	0.0	0.0		17.5	2.5%	2.7%	0.0%	2.7%	2.7%	0.0%	0.0%	2.7%	0.0%	0.0%
Juncus bufonus	y	x	g	0.0	15.0	37.5	0.0	0.0	0.0	2.5		55.0	7.9%	8.6%	0.0%	8.6%	8.6%	0.0%	0.0%	8.6%	0.0%	0.0%
Briza minor	y	x	g	0.0	0.0	0.0	0.0	0.0	2.5	2.5		5.0	0.7%	0.8%	0.0%	0.8%	0.8%	0.0%	0.0%	0.8%	0.0%	0.0%
Eleocharis macrostachya	y	n	h	0.0	0.0	0.0	0.0	0.0	15.0	0.0		15.0	2.1%	2.3%	2.3%	0.0%	0.0%	2.3%	0.0%	0.0%	2.3%	0.0%
Cyperus eragrostis	y	n	g	0.0	0.0	0	0	0	0	15		15.0	2.1%	2.3%	2.3%	0.0%	2.3%	0.0%	2.3%	0.0%	0.0%	0.0%
					VEGETATION TOTALS							640.0	91.4%	100.0%	38.7%	61.3%	43.8%	56.3%	2.3%	40.2%	36.3%	19.9%
Bare ground				0	0	15.0	15.0	15.0	0.0	15.0		60	8.6%									
Moss																						
Thatch																						
Rock																						
					GRAND TOTALS							700.0	100.0%									

Glenwood Preserve vegetation transects 2006

Date:	5/3/06
Monitor(s):	AP and GS
Transect:	9
original transect #	C-3
pasture	C
habitat	native grassland

Cover class	Range	Mean
r	<<1	*
+	<1	0.1
1	1 to 5	2.5
2	5 to 25	15
3	25 to 50	37.5
4	50 to 75	62.5
5	75 to 100	87.5

NOTES:
FOR QUADRAT 6: GOPHER ACTIVITY MAY AFFECT BARE GROUND VALUE

SPECIES	Present?	n=native, i=invasive x=exotic	g=grass, h=herb	1	2	3	4	5	6	7		SUM	% REL	%REL_ VEG	% native	% non-native	% grass	% forb	% native grass	% non-native grass	% native forb	% non-native forb
				3R	6L	9R	12L	15R	18L	21R												
Aira caryophyllea	y	x	g	0.00	0.00	2.50	2.50	2.50	0.00	2.50		10.0	1.4%	1.9%	0.0%	1.9%	1.9%	0.0%	0.0%	0.0%	0.0%	0.0%
Briza minor	y	x	g	0.05	0.00	15.00	2.50	15.00	2.50	15.00		50.0	7.2%	9.7%	0.0%	9.7%	9.7%	0.0%	0.0%	9.7%	0.0%	0.0%
Avena sp.	y	x	g	2.50	0.00	0.00	2.50	0.00	0.00	0.00		2.5	0.4%	0.5%	0.0%	0.5%	0.5%	0.0%	0.0%	0.5%	0.0%	0.0%
Bromus diandrus	y	x	g	0.00	2.50	2.50	2.50	2.50	2.50	0.00		10.0	1.4%	1.9%	0.0%	1.9%	1.9%	0.0%	0.0%	1.9%	0.0%	0.0%
Bromus hordeaceus	y	x	g	15.00	15.00	15.00	37.50	37.50	15.00	15.00		120.0	17.3%	23.3%	0.0%	23.3%	23.3%	0.0%	0.0%	23.3%	0.0%	0.0%
Erodium botrys	y	x	h	37.50	15.00	15.00	2.50	15.00	37.50	37.50		107.5	15.5%	20.9%	0.0%	20.9%	0.0%	20.9%	0.0%	0.0%	0.0%	20.9%
Hypochaeris glabra	y	x	h	0.00	0.00	2.50	0.00	0.00	0.00	0.00		2.5	0.4%	0.5%	0.0%	0.5%	0.0%	0.5%	0.0%	0.0%	0.0%	0.5%
Lolium multiflorum	n	x	g	0.00	0.05	0.00	0.00	0.00	0.00	0.00		0.0	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Geranium dissectum	y	x	h	0.00	0.00	0.00	2.50	0.00	0.00	0.00		2.5	0.4%	0.5%	0.0%	0.5%	0.0%	0.5%	0.0%	0.0%	0.0%	0.5%
Rumex acetosella	y	x	h	15.00	15.00	2.50	0.05	15.00	15.00	0.05		32.6	4.7%	6.3%	0.0%	6.3%	0.0%	6.3%	0.0%	0.0%	0.0%	6.3%
Trifolium dubium	y	x	h	0.00	0.00	2.50	15.00	15.00	15.00	62.50		110.0	15.8%	21.4%	0.0%	21.4%	0.0%	21.4%	0.0%	0.0%	0.0%	21.4%
Trifolium subterraneum	y	x	h	0.00	0.00	15.00	0.00	2.50	15.00	15.00		47.5	6.8%	9.2%	0.0%	9.2%	0.0%	9.2%	0.0%	0.0%	0.0%	9.2%
Vulpia sp.	n	x	g	2.50	2.50	0.00	0.00	0.00	0.00	0.00		0.0	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Anagallis arvensis	y	x	h	15.00	15.00	0.05	15.00	2.50	2.50	0.00		20.1	2.9%	3.9%	0.0%	3.9%	0.0%	3.9%	0.0%	0.0%	0.0%	3.9%
SUM					**VEGETATION TOTALS**							**515.2**	**74.1%**	**100.0%**	**0.0%**	**100.0%**	**37.3%**	**62.6%**	**0.0%**	**35.4%**	**0.0%**	**62.6%**
Bare ground				10	15	50	40	20	40	5		180	25.9%									
Moss												0	0.0%									
Thatch												0	0.0%									
Rock												0	0.0%									
					GRAND TOTALS							**695.2**	100.0%									

Glenwood Preserve vegetation transects 2006

Date:	7/14/06
Monitor(s):	GAS/SW
Transect:	10
original transect #	C-4
pasture	C
habitat	wetland

class	Range	Mean
r	<<1	*
+	<1	0.1
1	1 to 5	2.5
2	5 to 25	15
3	25 to 50	37.5
4	50 to 75	62.5
5	75 to 100	87.5

NOTES:

AVG. VEG HEIGHT >.1M
ALL GRASSES DRIED
HORSETRAIL @ 9M
NO VISIBLE PLAGIOBOTHRYS
MENTHA PRESENT IN PATCHES 25%

SPECIES	Present ?	n=native, i=invasive x=exotic	g=grass, h=herb	1	2	3	4	5	6	7		SUM	% REL	%REL_ VEG	% native	% non-native	% grass	% forb	% native grass	% non-native grass	% native forb	% non-native forb
Hordeum marinum	y	x	g	15.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Lolium multiflorum	y	x	g	37.5	15.0	0.0	0.0	0.0	15.0	37.5		52.5	11.3%	16.4%	0.0%	16.4%	16.4%	0.0%	0.0%	16.4%	0.0%	0.0%
Rumex pulcher	y	x	h	2.5	0.0	15.0	0.0	0.0	0.0	2.5		17.5	3.8%	5.5%	0.0%	5.5%	0.0%	5.5%	0.0%	0.0%	0.0%	5.5%
Trifolium fragiferum	y	x	h	0.0	0.0	0.0	0.0	2.5	0.0	0.0		2.5	0.5%	0.8%	0.0%	0.8%	0.0%	0.8%	0.0%	0.0%	0.0%	0.8%
Vulpia sp.	n	x	g	15.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Juncus bufonus	y	x	g	37.5	0.0	37.5	2.5	37.5	0.0	0.0		77.5	16.7%	24.2%	0.0%	24.2%	24.2%	0.0%	0.0%	24.2%	0.0%	0.0%
Lythrum hyssopifolia	y	x	h	32.0	0.0	15.0	2.5	15.0	15.0	2.5		50.0	10.8%	15.6%	0.0%	15.6%	0.0%	15.6%	0.0%	0.0%	0.0%	15.6%
Juncus xiphioides	y	n	h	0.0	37.5	15.0	0.0	0.0	0.0	0.0		15.0	3.2%	4.7%	4.7%	0.0%	0.0%	4.7%	0.0%	0.0%	4.7%	0.0%
Epilobium sp.	n	n	h	0.0	2.5	0.0	0.0	0.0	0.0	0.0		0.0	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Eremocarpus setigerus	n	n	h	0.0	2.5	0.0	0.0	0.0	0.0	0.0		0.0	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Polypogon monspeliensis	y	x	g	0.0	2.5	15.0	0.0	37.5	15.0	15.0		82.5	17.7%	25.8%	0.0%	25.8%	25.8%	0.0%	0.0%	25.8%	0.0%	0.0%
Eleocharis macrostachya	y	n	h	0.0	0.0	0.0	0.0	2.5	2.5	0.0		5.0	1.1%	1.6%	1.6%	0.0%	0.0%	1.6%	0.0%	0.0%	1.6%	0.0%
Polygonum aranastrum	y	x	h	0.0	0.0	0.0	0.0	0.0	15.0	2.5		17.5	3.8%	5.5%	0.0%	5.5%	0.0%	5.5%	0.0%	0.0%	0.0%	5.5%
SUM					**VEGETATION TOTALS**							**320.0**	**68.8%**	**100.0%**	**6.3%**	**93.8%**	**66.4%**	**33.6%**	**0.0%**	**66.4%**	**6.3%**	**27.3%**
Bare ground				2.5		15	95	7.3	15	10		144.8	31.2%									
Moss												0	0.0%									
Thatch												0	0.0%									
Rock												0	0.0%									
					GRAND TOTALS							**464.8**	**100.0%**									

Glenwood Preserve vegetation transects 2006

Date: 4/18/06
Monitor(s): AH and GS
Transect: 11
original transect # OTB 3
pasture D
habitat OTB

Cover class	Range	Mean
r	<<1	*
+	<1	0.1
1	1 to 5	2.5
2	5 to 25	15
3	25 to 50	37.5
4	50 to 75	62.5
5	75 to 100	87.5

NOTES:
TRAIL @ 22FT

SPECIES	Present?	n=native, i=invasive x=exotic	g=grass, h=herb	1	2	3	4	5				SUM	% REL	%REL_ VEG	% native	% non-native	% grass	% forb	% native grass	% non-native grass	% native forb	% non-native forb
				7R	14L	21R	28L	33R														
Aira caryophyllea	y	x	g	2.5	15	2.5	2.5	15				20.0	3.5%	3.8%	0.0%	3.8%	3.8%	0.0%	0.0%	3.8%	0.0%	0.0%
Bromus hordeaceus	y	x	g	2.5	15	2.5	15	15				32.5	5.7%	6.1%	0.0%	6.1%	6.1%	0.0%	0.0%	6.1%	0.0%	0.0%
Castilejia sp.	y	x	h	2.5	0.0	0.0	0.0	2.5				2.5	0.4%	0.5%	0.0%	0.5%	0.0%	0.5%	0.0%	0.0%	0.0%	0.5%
Erodium botrys	y	x	h	15	15	2.5	0.05	15				17.6	3.1%	3.3%	0.0%	3.3%	0.0%	3.3%	0.0%	0.0%	0.0%	3.3%
Hypochaeris glabra	y	x	h	0	62.5	15	2.5	62.5				142.5	25.0%	26.7%	0.0%	26.7%	0.0%	26.7%	0.0%	0.0%	0.0%	26.7%
Lolium multiflorum	y	x	h	2.5	0.0	0.0	0.0	0.0				2.5	0.4%	0.5%	0.0%	0.5%	0.0%	0.5%	0.0%	0.0%	0.0%	0.5%
Juncus bufonius	y	n	g	15.0	15.0	15.0	2.5	15.0				62.5	11.0%	11.7%	11.7%	0.0%	11.7%	0.0%	11.7%	0.0%	0.0%	0.0%
Lolium multiflorum	y	x	g	15.0	2.5	0.1	15.0	15.0				47.6	8.3%	8.9%	0.0%	8.9%	8.9%	0.0%	0.0%	8.9%	0.0%	0.0%
Rumex acetosella	y	x	h	0.0	0.0	0.0	2.5	15.0				17.5	3.1%	3.3%	0.0%	3.3%	0.0%	3.3%	0.0%	0.0%	0.0%	3.3%
Trifolium depauperatum	y	x	h	0.0	0.0	15.0	0.0	0.0				15.0	2.6%	2.8%	0.0%	2.8%	0.0%	2.8%	0.0%	0.0%	0.0%	2.8%
Trifolium dubium	y	x	h	37.5	2.5	2.5	2.5	15.0				60.0	10.5%	11.3%	0.0%	11.3%	0.0%	11.3%	0.0%	0.0%	0.0%	11.3%
Soliva sessilis	y	x	h	2.5	15.0	37.5	2.5	37.5				95.0	16.7%	17.8%	0.0%	17.8%	0.0%	17.8%	0.0%	0.0%	0.0%	17.8%
Spergula arvensis	y	x	h	0.0	0.0	2.5	0.1	15.0				17.6	3.1%	3.3%	0.0%	3.3%	0.0%	3.3%	0.0%	0.0%	0.0%	3.3%
Trifolium subterranean	n	x	h	0.0	0.0	0.0	0.1	0.0				0.1	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Triphyseria pusilla	n	n	h	0.0	0.1	0.0	0.0	0.0				0.1	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Lepidium nitidum	n	n	h	0.0	0.1	0.0	0.0	0.0				0.1	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
					VEGETATION TOTALS							532.8	93.5%	100.0%	11.7%	88.3%	30.6%	69.5%	11.7%	18.8%	0.0%	69.5%
Bare ground				15.0	5.0	5.0	10.0	2.0				37.0	6.5%									
Moss												0.0	0.0%									
Thatch												0.0	0.0%									
Rock												0.0	0.0%									
					GRAND TOTALS							569.75	6.5%									

Glenwood Preserve vegetation transects 2006

Date:	4/18/06
Monitor(s):	AH and GS
Transect:	12
original transect #	OTB 2
pasture	D
habitat	OTB

Cover class	Range	Mean
r	<<1	*
+	<1	0.1
1	1 to 5	2.5
2	5 to 25	15
3	25 to 50	37.5
4	50 to 75	62.5
5	75 to 100	87.5

NOTES:
TRAIL @ 18FT

SPECIES	Present?	n=native, i=invasive x=exotic	g=grass, h=herb	1	2	3	4	5				SUM	% REL	%REL_ VEG	% native	% non-native	% grass	% forb	% native grass	% non-native grass	% native forb	% non-native forb
				R7	L14	R21	L28	R35														
Aira caryophyllea	y	x	g	15.0	2.5	15.0	15.0	2.5				50.0	6.1%	7.8%	0.0%	7.8%	7.8%	0.0%	0.0%	5.8%	0.0%	0.0%
Bromus hordeaceus	y	x	g	2.5	15.0	2.5	15.0	2.5				37.5	4.6%	5.8%	0.0%	5.8%	5.8%	0.0%	0.0%	0.0%	2.3%	0.0%
Castillegia densiflora	y	n	h	0.0	0.1	15.0	0.1	0.0				15.1	1.8%	2.3%	2.3%	0.0%	0.0%	2.3%	0.0%	0.0%	0.0%	9.7%
Erodium botrys	y	x	h	15.0	15.0	15.0	15.0	2.5				62.5	7.6%	9.7%	0.0%	9.7%	0.0%	9.7%	0.0%	0.0%	0.0%	7.0%
Hypochaeris glabra	y	x	h	0.0	15.0	15.0	15.0	0.0				45.0	5.5%	7.0%	0.0%	7.0%	0.0%	7.0%	0.0%	0.8%	0.0%	0.0%
Lolium multiflorum	y	x	g	0.0	2.5	0.0	2.5	0.0				5.0	0.6%	0.8%	0.0%	0.8%	0.8%	0.0%	0.0%	0.0%	0.4%	0.0%
Lupinum nanus	y	n	h	0.0	2.5	0.0	0.0	0.0				2.5	0.3%	0.4%	0.4%	0.0%	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%
Rumex acetosella	y	x	h	0.1	0.1	0.0	0.0	0.0				0.1	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	2.7%	0.0%	0.0%	0.0%
Juncus bufonius	y	n	g	0.0	0.0	0.1	15.0	2.5				17.6	2.1%	2.7%	2.7%	0.0%	2.7%	0.0%	0.0%	0.0%	0.0%	11.7%
Trifolium dubium	y	x	h	15.0	15.0	15.0	15.0	15.0				75.0	9.2%	11.7%	0.0%	11.7%	0.0%	11.7%	0.0%	0.0%	0.0%	13.2%
Trifolium subterraneum	y	x	h	15.0	37.5	2.5	15.0	15.0				85.0	10.4%	13.2%	0.0%	13.2%	0.0%	13.2%	0.0%	0.0%	0.0%	29.2%
Soliva sessilis	y	x	h	37.5	37.5	37.5	37.5	37.5				187.5	22.9%	29.2%	0.0%	29.2%	0.0%	29.2%	0.0%	0.0%	0.0%	8.2%
Hypochaeris radicata	y	x	h	37.5	0.0	0.0	0.0	15.0				52.5	6.4%	8.2%	0.0%	8.2%	0.0%	8.2%	0.0%	0.0%	0.0%	0.0%
Lepidium nitidum	y	x	h	0.0	0.1	0.0	0.0	0.0				0.1	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.8%	0.0%
Cerastium glomeratum	y	n	h	0.1	2.5	0.0	0.0	2.5				5.1	0.6%	0.8%	0.8%	0.0%	0.0%	0.8%	0.0%	0.0%	0.0%	0.0%
Juncus sp.	y	n	h	0.0	0.0	0.1	0.1	0.0				0.1	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.4%	0.0%	0.0%
Vulpia sp.	y	x	g	0.0	2.5	0.0	0.0	0.0				2.5	0.3%	0.4%	0.0%	0.4%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%
					VEGETATION TOTALS							**643.0**	**78.6%**	**100.0%**	**6.3%**	**93.7%**	**17.5%**	**82.5%**	**2.7%**	**7.0%**	**3.5%**	**79.0%**
Bare ground				0	37.5	37.5	37.5	62.5	0	0	0	175	21.4%									
Moss				0	0	0	0	0	0	0	0	0										
Thatch				85	0	15	15	0	0	0	0											
Rock				0	0	0	0	0	0	0	0											
					GRAND TOTALS							**818.0**	21.4%									

Glenwood Preserve vegetation transects 2005

Date: 4/18/06
Monitor(s): AH and GS
Transect: 13
original transect # OTB 1
pasture D
habitat OTB

Cover class	Range	Mea
r	<<1	*
+	<1	0.1
1	1 to 5	2.5
2	5 to 25	15
3	25 to 50	37.5
4	50 to 75	62.5
5	75 to 100	87.5

SPECIES	Present?	n=native, i=invasive x=exotic	g=grass, h=herb	1	2	3	4	5				SUM	% REL	Veg %REL	% native	% non-native	% grass	% forb	% native grass	% non-native grass	% native forb	% non-native forb
				15	30	45	60	75														
Aphanes occidentalis	y	n	h	15.0	0.0	0.0	0.0	0.0				15	1.6%	2.5%	2.5%	0.0%	0.0%	2.5%	0.0%	0.0%	2.5%	0.0%
Aira caryophyllea	y	x	g	2.5	15.0	15.0	2.5	2.5				37.5	3.9%	6.2%	0.0%	6.2%	6.2%	0.0%	0.0%	6.2%	0.0%	0.0%
Bromus hordeaceus	y	x	g	15.0	2.5	2.5	0.1	15.0				35.05	3.6%	5.8%	0.0%	5.8%	5.8%	0.0%	0.0%	5.8%	0.0%	0.0%
Crassula erecta	y	n	h	0.0	37.5	2.5	2.5	2.5				45	4.7%	7.5%	7.5%	0.0%	0.0%	7.5%	0.0%	0.0%	7.5%	0.0%
Erodium botrys	y	x	h	2.5	2.5	2.5	2.5	0.1				10.05	1.0%	1.7%	0.0%	1.7%	0.0%	1.7%	0.0%	0.0%	0.0%	1.7%
Filago galica	y	x	h	2.5	2.5	0.1	0.0	0.0				5.05	0.5%	0.8%	0.0%	0.8%	0.0%	0.8%	0.0%	0.0%	0.0%	0.8%
Hypochaeris glabra	y	x	h	37.5	15.0	15.0	15.0	15.0				97.5	10.1%	16.2%	0.0%	16.2%	0.0%	16.2%	0.0%	0.0%	0.0%	16.2%
Juncus bufonius	y	n	g	0.0	15.0	15.0	2.5	0.0				32.5	3.4%	5.4%	5.4%	0.0%	5.4%	0.0%	5.4%	0.0%	0.0%	0.0%
Juncus sp.	y	n	g	0.0	0.0	0.1	0.0	0.0				0.05	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Lasthenia californica	y	n	h	0.0	15.0	15.0	37.5	15.0				82.5	8.6%	13.7%	13.7%	0.0%	0.0%	13.7%	0.0%	0.0%	13.7%	0.0%
Lolium multiflorum	y	x	g	2.5	2.5	2.5	2.5	0.1				10.05	1.0%	1.7%	0.0%	1.7%	1.7%	0.0%	0.0%	1.7%	0.0%	0.0%
Rumex acetosella	y	x	h	0.0	0.0	0.0	0.0	2.5				2.5	0.3%	0.4%	0.0%	0.4%	0.0%	0.4%	0.0%	0.0%	0.0%	0.4%
Soliva sessilis	y	x	h	15.0	0.0	62.5	15.0	62.5				155	16.1%	25.8%	0.0%	25.8%	0.0%	25.8%	0.0%	0.0%	0.0%	25.8%
Trifolium subterraneum	y	x	h	15.0	0.0	0.0	0.0	0.0				15	1.6%	2.5%	0.0%	2.5%	0.0%	2.5%	0.0%	0.0%	0.0%	2.5%
Tryphysaria pusillus	y	n	h	0.0	0.1	0.0	0.1	0.0				0.1	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Trifolium bifidum	y	n	h	0.0	0.0	0.1	0.0	0.0				0.05	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Trifolium dubium	y	x	h	37.5	15.0	0.1	2.5	0.0				55.05	5.7%	9.2%	0.0%	9.2%	0.0%	9.2%	0.0%	0.0%	0.0%	9.2%
Vulpia bromoides	y	x	g	0.0	2.5	0.0	0.1	0.0				2.55	0.3%	0.4%	0.0%	0.4%	0.4%	0.0%	0.0%	0.4%	0.0%	0.0%
					VEGETATION TOTALS							600.5	62.5%	100.0%	29.2%	70.8%	19.6%	80.4%	5.4%	14.2%	23.8%	56.6%
Bare ground				15.0	98.0	62.5	98.0	85.0				358.5	37.3%									
Moss																						
Thatch								2.5				2.5	0.26%									
Rock																						
					GRAND TOTALS							961.5	100.0%									

Glenwood Preserve vegetation transects 2006

Date: 5/3/06
Monitor(s): K. Lyons
Transect: 14
original transect # CHORO-2
pasture E
habitat SVSF

Cover class	Range	Mean
r	<<1	*
+	<1	0.1
1	1 to 5	2.5
2	5 to 25	15
3	25 to 50	37.5
4	50 to 75	62.5
5	75 to 100	87.5

SPECIES	Present?	n=native, i=invasive x=exotic	g=grass, h=herb	1	2	3	4	5	6	7	8	SUM	% REL	%Rel veg	% native	% non-native	% grass	% forb	% native grass	% non-native grass	% native forb	% non-native forb
Avena sp.	y	x	g	0.1	0	0	0	0.1	0	2.5	0	2.7	0.3%	0.5%	0.0%	0.5%	0.5%	0.0%	0.0%	0.5%	0.0%	0.0%
Bromus hordeacous	y	x	g	2.5	0	0	2.5	0	2.5	37.5	2.5	47.5	4.4%	8.0%	0.0%	8.0%	8.0%	0.0%	0.0%	8.0%	0.0%	0.0%
Chorizanthe robusta	y	n	h	0	0	0	0	2.5	0	0	2.5	5	0.5%	0.8%	0.8%	0.0%	0.0%	0.8%	0.0%	0.0%	0.8%	0.0%
Conyza canadensis	n	n	h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Epilobium sp.	y	n	h	0	2.5	0	0	0	0	0	0	2.5	0.2%	0.4%	0.4%	0.0%	0.0%	0.4%	0.0%	0.0%	0.4%	0.0%
Erodium botyrs	y	x	h	2.5	2.5	0	2.5	2.5	2.5	37.5	2.5	52.5	4.9%	8.8%	0.0%	8.8%	0.0%	8.8%	0.0%	0.0%	0.0%	8.8%
Filago gallica	y	x	h	0	0	0	0	0	0	0	0.1	0.1	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Geranium sp.	y	x	h	0	0	0	0	0	0	2.5	0	2.5	0.2%	0.4%	0.0%	0.4%	0.0%	0.4%	0.0%	0.0%	0.0%	0.4%
Hypochaeris glabra	y	x	h	2.5	2.5	0.1	2.5	15	2.5	38	0	62.6	5.9%	10.5%	0.0%	10.5%	0.0%	10.5%	0.0%	0.0%	0.0%	10.5%
Linum sp.	n	x	h	0	0	0	0	0	0	0	0	0	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Lotus micranthus	y	n	h	0	0	0	0	0	0	0.1	0.1	0.2	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Lotus purshianus	y	n	h	2.5	0	2.5	0	2.5	15	0	0	22.5	2.1%	3.8%	3.8%	0.0%	0.0%	3.8%	0.0%	0.0%	3.8%	0.0%
Mimulus aurantiacus	n	n	h	0	0	0	0	0	0	0	0	0	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Minuartia californica	y	n	h	0	0	0	0	0.1	0	0	0.1	0.2	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Rumex acetosella	y	x	h	15	0	0	0	0	0	0	0	15	1.4%	2.5%	0.0%	2.5%	0.0%	2.5%	0.0%	0.0%	0.0%	2.5%
Silene gallica	y	x	h	0.0	0.0	0.0	0.0	0.0	0.0	2.5	0.1	2.6	0.2%	0.4%	0.0%	0.4%	0.0%	0.4%	0.0%	0.0%	0.0%	0.4%
Trichostema lanceolatum	n	n	h	0	0	0	0	0	0	0	0	0	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Trifolium angustifolium	y	x	h	0	0.1	0	0	2.5	15	2.5	0	20.1	1.9%	3.4%	0.0%	3.4%	0.0%	3.4%	0.0%	0.0%	0.0%	3.4%
Trifolium campestre	y	x	h	62.5	37.5	87.5	37.5	2.5	37.5	2.5	0.1	267.6	25.0%	44.9%	0.0%	44.9%	0.0%	44.9%	0.0%	0.0%	0.0%	44.9%
Trifolium microcephalum	y	n	h	0	2.5	2.5	0	0	0	0	0	5	0.5%	0.8%	0.8%	0.0%	0.0%	0.8%	0.0%	0.0%	0.8%	0.0%
Vulpia sp.	y	x	g	15	2.5	0	2.5	15	15	38	0.1	87.6	8.2%	14.7%	0.0%	14.7%	14.7%	0.0%	0.0%	14.7%	0.0%	0.0%
					VEGETATION TOTALS							596.2	55.8%	100.0%	5.9%	94.1%	23.1%	76.9%	0.0%	22.7%	5.9%	70.9%
Bare ground				2.5	15	0	15	0	0	0	0	32.5	3.0%									
Moss												0	0.0%									
Thatch				2.5	0	0.1	0	0	0	38	0	40.1	3.8%									
Rock				0	62.5	37.5	87.5	87.5	37.5	0	87.5	400	37.4%									
					GRAND TOTALS							1068.8	100.0%									

Glenwood Preserve vegetation transects 2006

Date: 5/3/06
Monitor(s): K. Lyons
Transect: 15
original transect # CHORO-3
pasture E
habitat SVSF

Cover class	Range	Mean
r	<<1	*
+	<1	0.1
1	1 to 5	2.5
2	5 to 25	15
3	25 to 50	37.5
4	50 to 75	62.5
5	75 to 100	87.5

SPECIES	Present?	n=native, i=invasive x=exotic	g=grass, h=herb	1	2	3	4	5	6	7	8	9	10	11	12	13	SUM	% rel	%rel veg	% native	% non-native	% grass	% forb	% native grass	% non-native grass	% native forb	% non-native forb
Anagallis arvensis	n	x	h	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Avena sp.	y	x	g	0	2.5	0.1	0	2.5	0.1	2.5	2.5	2.5	2.5	0.1	2.5	0	17.8	1.1%	1.2%	0.0%	1.2%	1.2%	0.0%	0.0%	0.0%	0.0%	0.0%
Bromus diandrus	y	x	g	2.5	15	0	0.1	2.2	0	0	2.5	0	0	0	0	2.5	24.8	1.6%	1.7%	0.0%	1.7%	1.7%	0.0%	0.0%	1.7%	0.0%	0.0%
Bromus hordeaceus	y	x	g	15	0	15	0.1	15	0.1	15	0.1	0	37.5	2.5	2.5	2.5	105.3	6.7%	7.4%	0.0%	7.4%	7.4%	0.0%	0.0%	7.4%	0.0%	0.0%
Chorizanthe robusta	y	n	h	0	0	0	15	0	15	0	15	2.5	0	0	0	0	47.5	3.0%	3.3%	3.3%	0.0%	0.0%	3.3%	0.0%	0.0%	3.3%	0.0%
Conyza canadensis	n	n	h	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Erodium botyrs	y	x	h	2.5	2.5	0	2.5	0	0	15	2.5	2.5	0.1	2.5	2.5	2.5	35.1	2.2%	2.5%	0.0%	2.5%	0.0%	0.0%	0.0%	0.0%	0.0%	2.5%
Filago gallica	y	x	h	0	0	0	0.1	0	0	0	0.1	0	0	0	0	0	0.2	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Geranium molle	y	x	h	0	0.1	0.1	0	0.1	0	2.5	2.5	2.5	15	2.5	2.5	2.5	30.3	1.9%	2.1%	0.0%	2.1%	0.0%	0.0%	0.0%	0.0%	0.0%	2.1%
Hypochaeris glabra	y	x	h	3	15	37.5	15	15	15	37.5	15	62.5	62.5	62.5	3	15	357.5	22.9%	25.0%	0.0%	25.0%	0.0%	25.0%	0.0%	0.0%	0.0%	25.0%
Lolium multiflorum	y	x	g	0	0	0.0	0	0	3	0.0	0	0.0	0.0	2.5	3	0	7.6	0.5%	0.5%	0.0%	0.5%	0.5%	0.0%	0.0%	0.5%	0.0%	0.0%
Lotus purshianus	y	n	h	2.5	0	0.1	0	2.5	15	2.5	15	0.1	0	0	0	0	37.7	2.4%	2.6%	2.6%	0.0%	0.0%	2.6%	0.0%	0.0%	2.6%	0.0%
Nassella pulchra	y	n	g	0	0	0	0	2.5	0	15	0	2.5	0	0	0	0	20	1.3%	1.4%	1.4%	0.0%	1.4%	0.0%	1.4%	0.0%	0.0%	0.0%
Silene gallica	y	x	h	0	0	0	0	0	0.1	0	0.1	2.5	2.5	15	0	0	20.2	1.3%	1.4%	0.0%	1.4%	0.0%	0.0%	0.0%	0.0%	0.0%	1.4%
Trichostema lanceolatum	n	n	h	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Trifolium angustifolium	y	x	h	0	37.5	0	0	0	0	2.5	0	0	0	0	0.1	0	40.1	2.6%	2.8%	0.0%	2.8%	0.0%	0.0%	0.0%	0.0%	0.0%	2.8%
Trifolium macrocephalum	y	n	h	0	0	0	0.1	0	0	0	0	0	0	0	0	0	0.1	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Trifolium dubium	y	x	h	15	15	62.5	37.5	62.5	15	15	0	15	0	37.5	15	2.5	292.5	18.7%	20.5%	0.0%	20.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Vicia sp.	y	n	h	2.5	0.1	0	0	0	0	0	0	0	0	2.5	0	0	5.1	0.3%	0.4%	0.4%	0.0%	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%
Vulpia sp.	y	x	g	15	2.5	62.5	15	2.5	62.5	37.5	37.5	37.5	37.5	37.5	37.5	2.5	387.5	24.8%	27.1%	0.0%	27.1%	27.1%	0.0%	0.0%	0.0%	0.0%	0.0%
					VEGETATION TOTALS												**1429.3**	**91.4%**	100.0%	**7.7%**	**92.3%**	**39.3%**	**60.6%**	**1.4%**	**9.6%**	**6.0%**	**33.8%**
Bare ground				0	15	2.5	37.5	2.5	15	0.1	2.5	15	0.1	15	0	0	75.1	4.8%									
Moss																	0	0.0%									
Thatch				15	2.5	2.5	0	0	0	2.5	0	2.5	2.5	0	37.5	62.5	22.5	1.4%									
Rock				0	37.5	0	0	0	0	0	0	0	0	15	0	0	37.5	2.4%									
					GRAND TOTALS												**1564.4**	100.0%									

Appendix D: Vegetation Transect Photos

Left: Transect #3 in grassland habitat.

Right: Transect #4 in grassland habitat where cream cups are known to grow.

Photographs taken at Glenwood preserve in 2006

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Left: Transect 5 in grassland habitat in pastures B and C.

Right: Transect 7 where cream cups and Opler's moth are known to occur.

Photographs taken at Glenwood preserve in 2006

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Left: Transect 9 in native grassland habitat.

Right: Transect 11 in Ohlone tiger beetle habitat, note bare ground near center of transect.

Photographs taken at Glenwood preserve in 2006

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Left: Transect 12 in Ohlone tiger beetle habitat, note horse trail in center of transect.

Right: Transect 13 in Ohlone tiger beetle habitat.

Photographs taken at Glenwood preserve in 2006

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