

**CRESCENT CITY MARSH WILDLIFE AREA
GRAZING IMPACTS MONITORING PLAN**

**FIRST YEAR:
PLOT INSTALLATION, MONITORING PROTOCOL,
AND BASELINE DATA COLLECTION**

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BY

**ROBIN BENCIE
KYLE WEAR**

**Prepared Under Interagency Agreement
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ATTACHMENTS:

1. 2003 Field Data Sheets, Humboldt Road and Humboldt Road West Sites
2. 2003 Spreadsheet Data Files on CD
3. Photographs of Circular Plots: taken at a distance of 20 ft. from plot center, facing the direction indicated on the photo.

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INTRODUCTION

The Crescent City Marsh Wildlife Area (CCMWA) is a floristically diverse area supporting several rare plant species and wetland plant communities (Figure 1). Acquired by the California Department of Fish and Game (CDFG) in 1980, a specific goal of the CCMWA Management Plan (now in draft form) is to maintain and enhance the existing fen and coastal prairie habitats, as well as, to restore sites of degraded wetland and prairie (Wear, 2003). Nine of the eleven special interest plant species found at the CCMWA are restricted to these two habitat types.

Annual monitoring of the population and habitat of the federally endangered western lily (*Lilium occidentale*) at the CCMWA since 1994 has documented robust encroachment of woody vegetation into wetland areas, with a corresponding decline in the reproductive ability of western lily and the habitat available for the lily and other sensitive species (Bencie and Wear, 2004). Removal of shrub canopy at selected sites was followed by an increase in the number of western lily seedlings, juveniles, and flowering plants. Although manual vegetation removal was successful in releasing the population, this method of vegetation control is labor intensive and costly to implement at a frequency necessary for maintaining optimum habitat conditions (Bencie and Imper, 2003). Controlled grazing has been recommended as an effective and economical method for maintaining open habitats critical for many sensitive species present at the CCMWA.

Experimental controlled grazing at the Table Bluff Ecological Reserve (TBER) has been successful in maintaining forest openings, and has led to an increase in the number of western lily individuals in all age classes (Bencie and Imper, 2003). However, whereas experimental grazing controlled in duration, intensity, and seasonality has been beneficial, the uncontrolled deer browsing at TBER remains the most serious threat to mature western lily during the blooming season. In 2000 at the CCMWA, experimental goat grazing was attempted at the Humboldt Road and Highway 101 sites, but unfortunately resulted in the death of the goats presumably via toxicity from the vegetation (Imper and Sawyer, 2000). Thus, future experimental cattle grazing should be implemented cautiously during the initial grazing period.

The primary objective of this grazing impacts monitoring project is to identify and evaluate the beneficial and detrimental impacts of grazing on the populations of sensitive species and their habitat. The initial stage in determining grazing impacts is the collection of baseline data on the pre-grazing cover and height of common and sensitive species. Future post-grazing monitoring will indicate changes in vegetation structure, species composition, and the loss or introduction of species. Future monitoring should also include observations throughout the grazing area to assess the degree of soil compaction, increase in bare, unvegetated ground, shifts in the relative location of the marsh edge, and introduction of invasive species.

Target species for this monitoring plan include the federally endangered western lily (*Lilium occidentale*) and selected species appearing on the California Native Plant Society (CNPS) List 2 (rare, threatened, or endangered in California but more common outside the state): great burnet (*Sanguisorba officinalis*), marsh violet (*Viola palustris*), marsh pea (*Lathyrus palustris*), and arctic starflower (*Trientalis arctica*) (CNPS, 2001). Other species of interest include: uncommon northern bugleweed (*Lycopus uniflorus*) and *Carex buxbaumii*; stream orchid (*Epipactis*

gigantea) which typically is found inland in montane and serpentine habitats; pacific reed grass (*Calamagrostis nutkaensis*) as an indicator species of western lily habitat; *Danthonia decumbens*, an exotic grass recently found at the CCMWA; and western dog violet (*Viola adunca*), a larval host for the endangered Oregon silverspot butterfly (*Speyeria zerene hipployta*). It is important also to monitor the abundance of common or dominant species that characterize habitat types, as changes may indicate broad-scale shifts in vegetation structure.

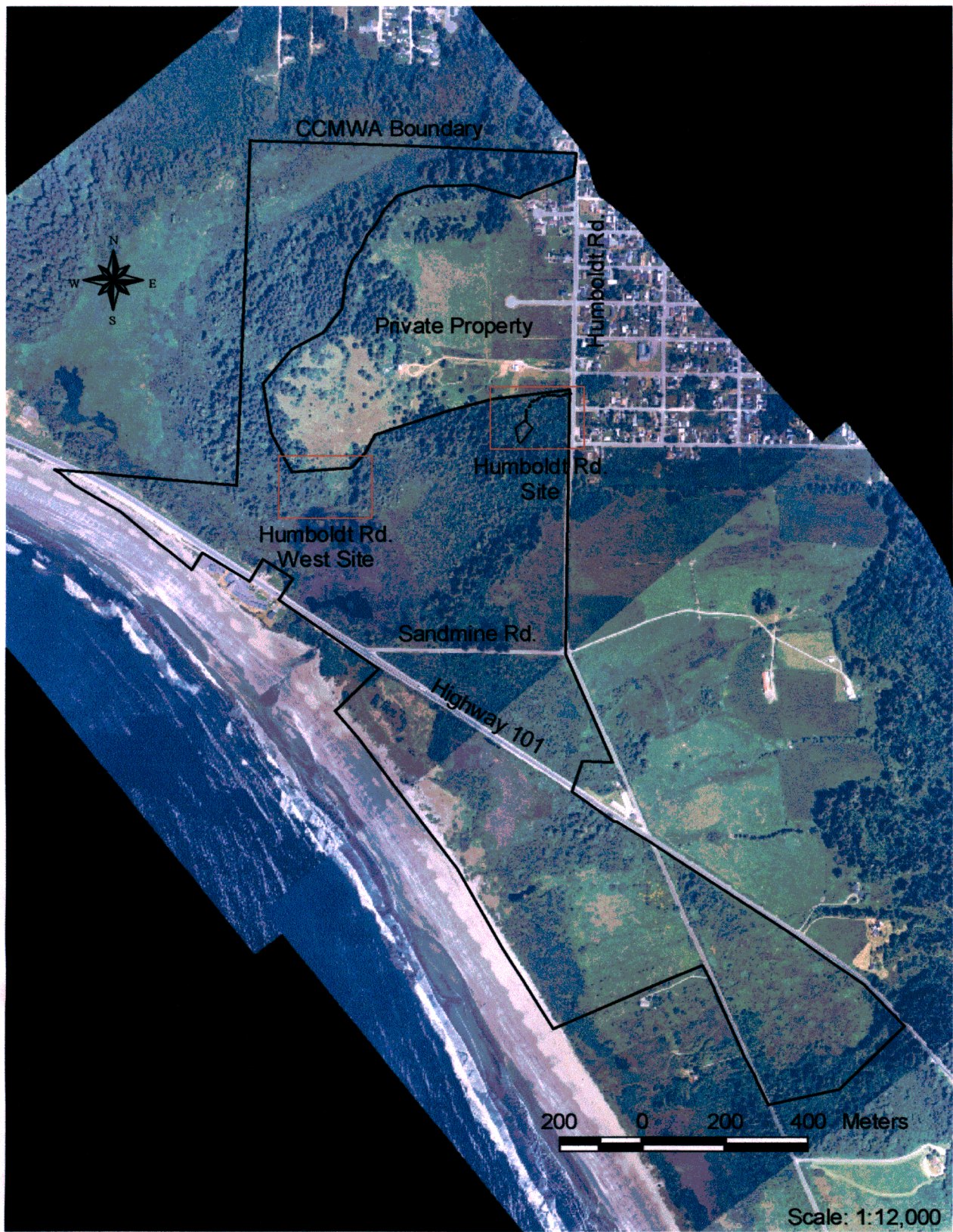


Figure 1. Locations of Humboldt Road and Humboldt Road West monitoring sites within the Crescent City Marsh Wildlife Area.

METHODS

Plot Installation

A total of 19 circular plots (each 30 ft. in diameter) and 38 quadrats (each 6 ft.²) were installed on July 24, 25, and 27, 2003 at the Humboldt Road West and Humboldt Road sites at the CCMWA. Each circular plot contains two interior quadrats (designated as A and B), with the exceptions of plot #7 with only a single interior quadrat and plot #18 with three interior quadrats. The large circular plots are intended to assess change in broad-scale vegetation structure, primarily the cover and height of woody species and the dominant herbaceous species. The interior quadrats provide a more detailed assessment of the species composition of the herbaceous layer and the abundance of sensitive species. The locations of circular plots and interior quadrats are given in Table 1. Circular plots and reference baselines are mapped in Figures 2 and 3.

At the Humboldt Road West site, three vegetation types (strata) were identified: scrub, marsh edge, and freshwater marsh. These three strata were generally delineated by changes in species composition and vegetation structure that correspond with elevation, ground saturation, and distance from the marsh shoreline. Along the eastern perimeter of the large freshwater *Carex* marsh, a search was conducted for sites that exhibited a clear transition from upland stratum to marsh stratum. At each of the five chosen sites, a circular plot was placed within each of the three strata, and a reference baseline was installed in order to facilitate relocation of each circular plot (Figure 2). Plot placement was made subjectively in order to include the most representative vegetation samples and to insure the presence of target species. The majority of monitoring plots were established at the Humboldt Road West site due to the high number of sensitive species present.

At the Humboldt Road site, scrub and herbaceous opening were the two vegetation strata identified. Plots were installed within the western lily census monitoring enclosure, and the census baseline was used as the grazing monitoring reference baseline (Figure 3).

Reference baselines were mapped using a Garmin GPS 12XL; UTM coordinates were taken for both the baseline origin (0 ft.) and the terminal end. Flagged rebar capped with plastic tubing was placed at both ends of the reference baseline. The centers of all circular plots were marked with flagged rebar, and then mapped with UTM coordinates and by compass direction and distance relative to the reference baseline (Table 1). For each interior quadrat, the location of the corner closest to the center of the circular plot and that corner's corresponding diagonal corner were recorded by compass direction and distance from the center of the circular plot. These two corners were also marked with flagged and capped rebar (Table 1).

Photographs were taken of each circular plot to visually document change in the overall vegetation structure. Each photograph was taken in the direction indicated on the photo, facing the center of the plot from a distance of 20 ft. (Attachment 3).

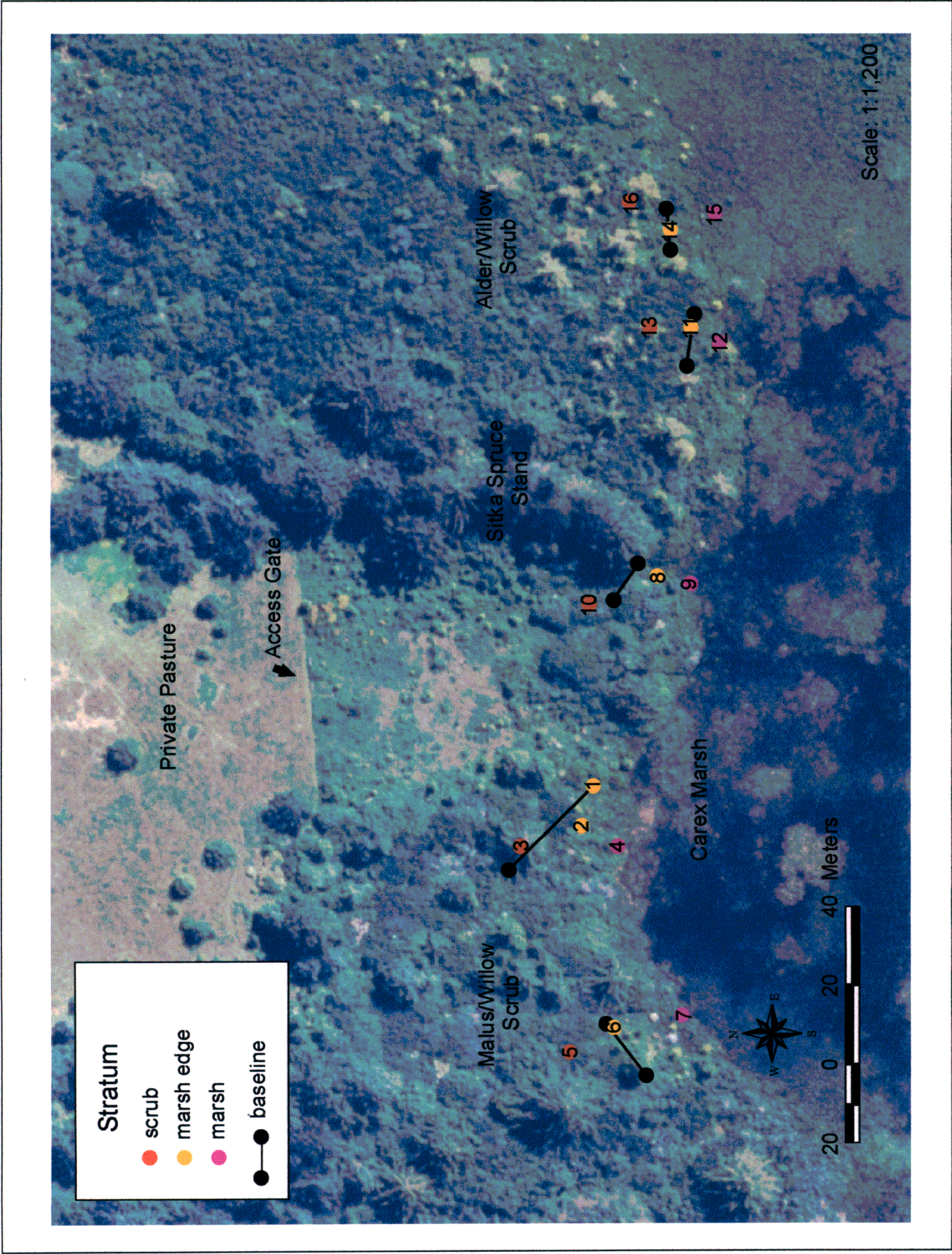


Figure 2. Grazing plot locations at the Humboldt Road West site. Circular plot centers and vegetation strata are indicated.

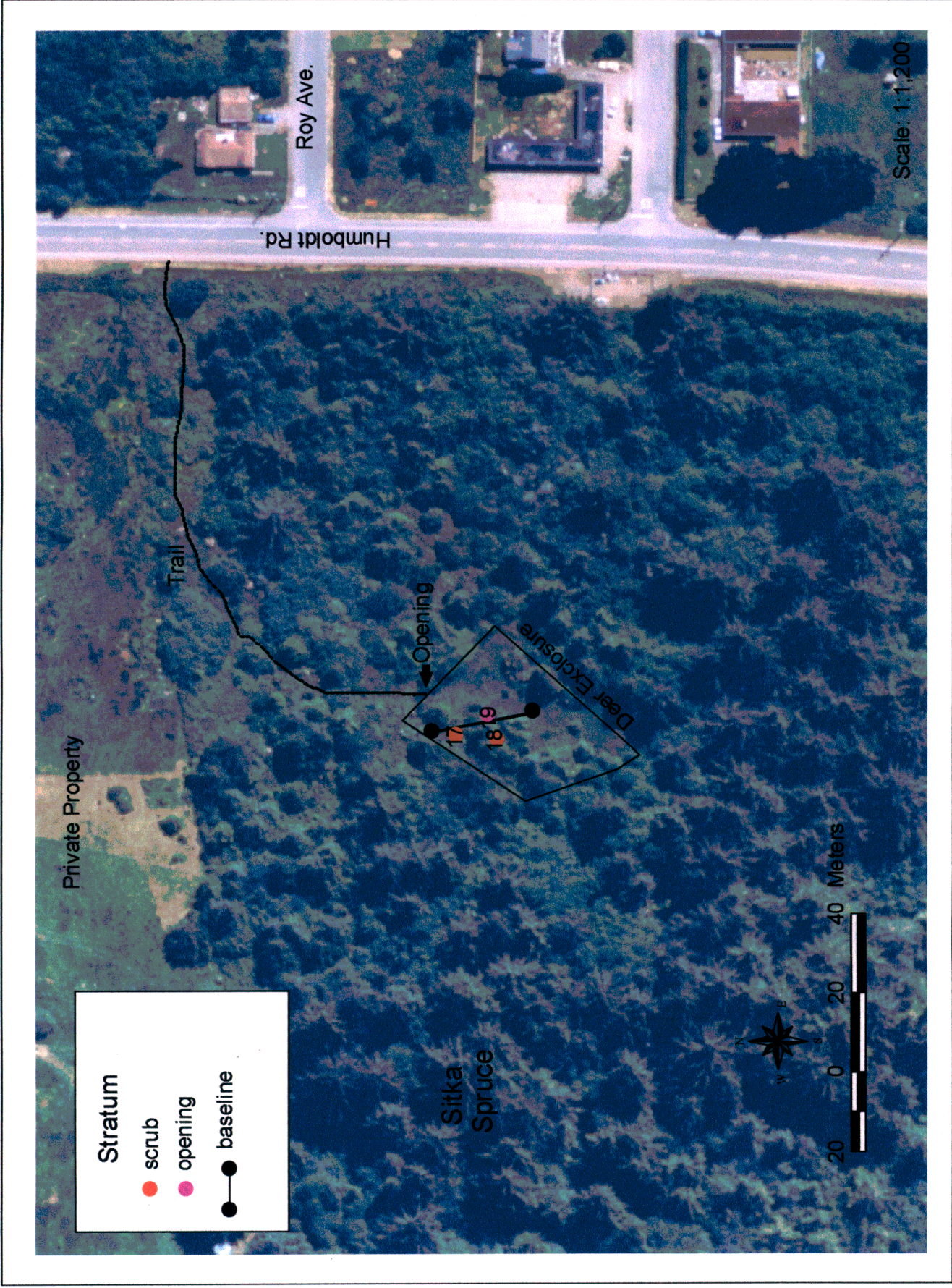


Figure 3. Grazing plot locations at the Humboldt Road Site. Circular plot centers and vegetation strata are indicated.

Monitoring Protocol

For each circular plot and interior quadrat, the cover class value and average height for each species was recorded (Table 2). Overstory and understory species were recorded separately to more accurately describe the vegetation structure within each stratum (Attachment 1). The following cover class scale has familiar, easily observable categories which expedite field observations while still providing accurate data between years and botanists (Elzinga et al., 1998):

- SO = solitary, occurring once
- SE = seldom, scattered
- 1 = 1 – 4%
- 2 = 5 – 10%
- 3 = 11 – 25%
- 4 = 26 – 33%
- 5 = 34 – 50%
- 6 = 51 – 75%
- 7 = 76 – 90%
- 8 = 91 – 100%

Cover less than 50% is split into finer categories than cover above 50% in order to more accurately describe the low percent cover of a majority of the species present. This cover class scale allows a broad-scale assessment of vegetation structure and the composition of dominant species, in addition to a more precise evaluation of the relative abundance of sensitive species which generally occur at low cover.

Data Analysis

The first year of monitoring data was summarized with an estimate of each species' average percent cover and average height within each vegetation stratum, calculated separately for circular plots and for interior quadrats (Table 2). A species' average percent cover was estimated by first determining the midpoint % of each cover class value recorded, and then calculating the mean of these midpoints. For example: *Potentilla palustris* was found in all 5 circular plots within the Marsh stratum, and was assigned a cover class value of 3 in three plots and a value of 1 in two plots. The average percent cover across circular plots = $[(18 \times 3) + (2.5 \times 2)] / 5 = 11.8\%$, or rounding up, 12% average cover. Frequency, or the proportion of sampling units in which a species occurs, was also determined separately for both circular plots and interior quadrats.

The primary goal of this monitoring project is to determine the difference, if any, in species cover and stature between grazing events. With future data, differences between species' pre- and post-grazing average percent cover, average height, and frequency will signify change in overall species composition and vegetation structure. Although circular plots and quadrats were subjectively placed, all plot placements are representative of the habitat, and thus provide useful and accurate data on change in vegetation structure and species abundance.

Whether a significant change has occurred between years in a species' average percent cover or average height can be determined by using a paired-sample t-test. Pair-wise comparisons may also be made between years for a species' cover and height within a single circular plot or quadrat. Because our sample plots are permanently located, a paired t-test is more powerful in detecting change than an independent sample t-test (Elzinga et al., 1998). A repeated measures analysis is not appropriate for this project as the important assumption of equal correlation between pairs of data for all years will likely not be satisfied. In addition, with repeated measures analysis there is often difficulty in determining which year is different when the *P* value indicates a significant difference exists.

The change in a species' frequency within a stratum should be analyzed using McNemar's test, a paired-sample test for proportions similar to a chi-square test (Elzinga et al., 1998). A drawback of the McNemar's test is it may only be used to test for a significant difference between two separate years.

RESULTS

The 2004 pre-grazing monitoring data are provided in Table 2. Each species cover class value and average height within each circular plot and quadrat are given. Overall average percent cover, average height, and frequency were calculated separately among circular plots and quadrats. Many species' estimated averages were similar for both circular plots and quadrats.

Humboldt Road West Site

Scrub Stratum. Five circular plots and 10 quadrats were installed within the Scrub stratum at the Humboldt Road West site. A total of 36 species were observed within the sample plots. The overstory was dominated by Oregon crabapple (*Malus fusca*), willow (*Salix* spp.), western azalea (*Rhododendron occidentale*), spiraea (*Spiraea douglasii*), and red alder (*Alnus rubra*). Oregon crabapple occurred within all sample plots, while spiraea and azalea were present in all circular plots and a majority of the quadrats. Other common associated shrubs in the Scrub stratum included cascara (*Rhamnus purshiana*) and wax myrtle (*Myrica californica*). The woody vegetation varied in average height from large trees (e.g., red alder, 20 ft.; cascara, 16 ft.) furthest from the marsh edge, to mid-size shrubs located closer to the shoreline (e.g., azalea, 8 ft.; wax myrtle, 12 ft.).

The herbaceous understory beneath the scrub canopy was dominated by slough sedge (*Carex obnupta*), with common associates: skunk cabbage (*Lysichiton americanum*), false lily-of-the-valley (*Maianthemum dilatatum*), lady fern (*Athyrium filix-femina*), and California blackberry (*Rubus ursinus*). Generally, the understory averaged 36 inches in height, with some skunk cabbage reaching 60 inches. Target species occurring at low frequency with low cover were: western lily, marsh pea, great burnet, and northern bugleweed. Bare, unvegetated ground beneath the scrub canopy was found in all circular plots and 90% of the quadrats, with an average percent cover from 8% in circular plots to 18% in quadrats.

Plots in this stratum are intended to track the annual growth and encroachment of woody vegetation into the open habitat near the marsh edge. Comparisons between grazing events will indicate whether cattle grazing can either reduce or maintain the existing shrub canopy cover.

Marsh Edge Stratum. A total of 6 circular plots and 12 quadrats were installed within the Marsh Edge stratum. This stratum is identified as the openings of low, herbaceous vegetation straddling the marsh shoreline, appearing as the transition zone between scrub and freshwater marsh. The greatest species diversity was found within this stratum (38 species), with target species marsh pea, great burnet, and northern bugleweed occurring in high frequency but with low cover. With the exception of stream orchid, all target species and species of interest were present within this stratum. It was also noted that arctic starflower, *Carex buxbaumii*, western dog violet, and marsh violet were only observed in sample plots within this stratum.

The Marsh Edge stratum was dominated by an understory of *Carex aquatilis* var. *dives*, slough sedge, and spiraea, with common associates: marsh cinquefoil (*Potentilla palustris*), skunk cabbage, rush (*Juncus effusus*), pacific silverweed (*Potentilla anserina* ssp. *pacifica*), great burnet, marsh pea, and northern bugleweed. The overstory is sparse and generally distributed

along the perimeter of the opening. The common shrubs present are spiraea, azalea, and willow, with red alder, wax myrtle, and Sitka spruce (*Picea sitchensis*) less frequent.

Marsh Stratum. A total of 5 circular plots and 9 quadrats were installed within the Marsh stratum. Only 17 species were observed within these sample plots. The vegetation is primarily herbaceous, dominated by *Carex aquatilis* var. *dives*, marsh cinquefoil, and pacific silverweed. Other common species with low cover values are: skunk cabbage, *Carex vesicaria*, slough sedge, and marsh pea. Spiraea and willow are the most common woody species in this stratum, but occur with low cover (less than 10%). The average height of spiraea was nearly equivalent to the average height of *Carex aquatilis* var. *dives* (42" and 44"). The presence of standing water or bare ground is characteristic of this stratum. Target species present within the Marsh stratum include marsh pea, great burnet, and *Carex buxbaumii*.

An indicator of significant change in species composition and vegetation structure will be whether target species currently absent within this stratum (marsh violet, arctic starflower, northern bugleweed, western lily, and pacific reed grass) appear after grazing. The post-grazing appearance of these species into the Marsh stratum could indicate several possible negative impacts due to grazing, from soil compaction to alteration of hydrological processes.

The following target species were observed only at the Humboldt Road West site: marsh violet, arctic starflower, northern bugleweed, marsh pea, western dog violet, and *Carex buxbaumii*.

Humboldt Road Site

Scrub Stratum. Two circular plots and 5 quadrats were installed within the Scrub stratum at the Humboldt Road site. A total of 30 species were observed within the sample plots. Dominant overstory species included cascara, azalea, wax myrtle, Sitka spruce, and spiraea. Other overstory species present frequently but with relatively low cover are red alder, crabapple, and twinberry (*Lonicera involucrata* var. *ledebourii*). The understory beneath the scrub canopy is generally depauperate with a high cover of bare ground. Common herbaceous species present with relatively high cover values are California blackberry (*Rubus ursinus*), bracken fern (*Pteridium aquilinum*), and horsetail (*Equisetum telmateia*). Target species present with low cover values within the sample plots are western lily, great burnet, stream orchid, pacific reed grass, and *Danthonia decumbens*.

Opening Stratum. Only a single circular plot and 2 interior quadrats were installed within the Opening stratum, and thus no averages were calculated. A fewer number of species (25) were observed within this stratum than within the surrounding Scrub stratum. The herbaceous understory is dominated by California blackberry, great burnet, pacific reed grass, pacific silverweed, and *Aster chilensis*, with common associates bracken fern, slough sedge, and sweet vernal grass (*Anthoxanthum odoratum*). The overstory is depauperate with occasional red alder, wax myrtle, azalea, crabapple, cascara, and spiraea occurring along the perimeter.

Other species of interest included within the sample plots at the Humboldt Road site are tufted hairgrass (*Deschampsia caespitosa*), a native of coastal prairie and marshes, and invasive weeds *Cotoneaster* sp. and fireweed (*Erechtites minima*).

SUMMARY

Annual population and habitat monitoring conducted at the Crescent City Marsh Wildlife Area for western lily indicates that encroachment of woody vegetation into fen and coastal prairie habitats has been detrimental to the lily's reproductive potential by decreasing the number of flowering plants and suppressing fruit development. Manual removal of woody vegetation has been necessary to maintain the open habitat structure required for western lily, which is likely also critical habitat for other sympatric sensitive species as well.

A formal controlled grazing plan, featuring a detailed seasonal grazing scenario followed by annual monitoring, has been recommended as both a biologically and economically effective method for maintaining optimal habitat conditions for sensitive species. This monitoring project is the initial phase in preparation for the introduction of controlled cattle grazing at the CCMWA. Additional activities required before grazing commences include specific recommendations for the total number of cows (intensity), the number of days grazing (duration), the seasonality of grazing, and the logistics of transporting cattle to and from the CCMWA. The criteria to be used for evaluating the success of the experimental grazing must also be determined.

The strengths of the monitoring protocol presented here is twofold: the ability to collect a considerable amount of reliable data in a cost effective and timely manner, and an enhanced power to assess changes over time by using a pair-wise statistical test with permanent sample plots. With subsequent year's data, increases and decreases in species' average percent cover and frequency will quantify the impacts to wetland habitats and sensitive species as a result of grazing.

LITERATURE CITED

- Bencie, R. and D. K. Imper. 2003. 2002 Status Report, Western Lily Vegetation Strategy. Prepared Under Interagency Agreement, California State University/California Department of Fish and Game.
- Bencie, R. and K. Wear. 2004. 2003 Western Lily Monitoring Report, Highway 101 West, Humboldt Road, and Humboldt Road West Sites. Prepared Under Interagency Agreement, California State University/California Department of Fish and Game.
- California Native Plant Society. 2001. Inventory of Rare and Endangered Plants of California. Sixth Edition.
- Imper, D. K. and J. O. Sawyer. 2000. 2000 Western lily Monitoring Report, Highway 101 West, Humboldt Road, and Humboldt Road West Sites. Prepared Under Interagency Agreement, California State University/California Department of Fish and Game.
- Elzinga, C. L., Salzer, D. W., and Willoughby, J. W. 1998. Measuring and Monitoring Plant Populations. Bureau of Land Management Technical Reference 1730-1.
- Wear, K. 2003. Crescent City Marsh Wildlife Area Draft Management Plan. Prepared Under Interagency Agreement, California State University/California Department of Fish and Game.

TABLE 1. Locations of Circular Plots and Interior Quadrats for Grazing Impacts Monitoring, Humboldt Road West and Humboldt Road Sites, CCMWA. Circular plots and reference baselines are mapped in Figures 2 and 3. For each interior quadrat, the closest corner to the center of the circular plot is given first, followed by its corresponding diagonal corner; (E) = the eastern corner of the quadrat, (W) = western, etc.

Circular Plot #	Stratum	Baseline UTM Coordinates (easting, northing)	Location of Circular Plot Center (easting, northing; relative to baseline)	Interior Quadrat A (6 ft. x 6 ft.)	Interior Quadrat B (6 ft. x 6 ft.)
1	Marsh Edge	403326 / 4621764 403347 / 4621743 0' = SE end; 100' = NW end	403347 / 4621743 X=0, Y=0 on western lily census monitoring grid	6.5 ft. @ 60° (E) 12.0 ft. @ 280° (W)	9.0 ft. @ 165° (N) 17.0 ft. @ 350° (S)
2	Marsh Edge	same as Plot #1	403337 / 4621746 X=38.5, Y=13 on census monitoring grid	10.0 ft. @ 260° (S) 17.0 ft. @ 280° (N)	10.0 ft. @ 160° (N) 17.0 ft. @ 150° (S)
3	Scrub	same as Plot #1	403332 / 4621761 X=75, Y=-16 on census monitoring grid	7.0 ft. @ 225° (N) 12.0 ft. @ 170° (S)	7.5 ft. @ 350° (E) 15.5 ft. @ 330° (W)
4	Marsh	same as Plot #1	403332 / 4621737 X=38.5, Y=46 on census monitoring grid	8.0 ft. unrecorded 14.0 ft. unrecorded	6.0 ft. @ 195° (W) 12.5 ft. @ 150° (E)
5	Scrub	403274 / 4621730 403287 / 4621740 0' = SW end; 57' = NE end	403280 / 4621749 50 ft. @ 340° from 42.5 ft. on baseline	7.7 ft. @ 85° (SW) 15.5 ft. @ 45° (NE)	15.0 ft. @ 120° (NE) 23.0 ft. @ 125° (SW)
6	Marsh Edge	same as Plot #5	403286 / 4621738 25 ft. @ 135° from 32.0 ft. on baseline	5.5 ft. @ 110° (SW) 8.0 ft. @ 5° (NE)	6.5 ft. @ 210° (NE) 15.0 ft. @ 180° (SW)
7	Marsh	same as Plot #5	403289 / 4621721 55 ft. @ 140° from 31.0 ft. on baseline	12.5 ft. @ 290° (E) 15.0 ft. @ 280° (W)	
8	Marsh Edge	403393 / 4621738 403402 / 4621732 0' = NW end; 61' = SE end	403399 / 4621727 9.5 ft. @ 205° from 14.5 ft. on baseline	6.0 ft. @ 350° (S) 14.5 ft. @ 355° (N)	3.5 ft. @ 145° (NE) 12.0 ft. @ 145° (SW)
9	Marsh	same as Plot #8	403397 / 4621719 40 ft. @ 200° from 19 ft. on baseline	6.5 ft. @ 5° (S) 15.0 ft. @ 5° (N)	6.0 ft. @ 125° (NW) 14.5 ft. @ 125° (SE)
10	Scrub	same as Plot #8	403392 / 4621744 35 ft. @ 340° from 5.5 ft. on baseline (at base of alder inside shrub thicket)	circle center (W) 8.5 ft. @ 70° (E)	6.5 ft. @ 340° (SE) 15.0 ft. @ 340° (NW)

TABLE 1 (con't). Locations of Circular Plots and Interior Quadrats for Grazing Impacts Monitoring, Humboldt Road West and Humboldt Road Sites, CCMWA. Circular plots and reference baselines are mapped in Figures 2 and 3. For each interior quadrat, the closest corner to the center of the circular plot is given first, followed by its corresponding diagonal corner; (E) = the eastern corner of the quadrat, (W) = western, etc.

<u>Circular Plot #</u>	<u>Stratum</u>	<u>Baseline UTM Coordinates</u> (easting, northing)	<u>Location of Circular Plot Center</u> (easting, northing; relative to baseline)	<u>Interior Quadrat A</u> (6. ft. x 6. ft.)	<u>Interior Quadrat B</u> (6. ft. x 6. ft.)
11	Marsh Edge	403451 / 4621720 403464 / 4621718 0' = W end; 40' = E end	403461 / 4621719 1.5 ft. @ 180° from 31.5 ft. on baseline	6.0 ft. @ 345° (S) 14.5 ft. @ 345° (N)	circle center (W) 8.5 ft. @ 90° (E) (= baseline @ 40.0 ft. (E))
12	Marsh	same as Plot #11	403457 / 4621712 30 ft. @ 190° from 22 ft. on baseline	5.5 ft. @ 10° (S) 14.0 ft. @ 10° (N)	circle center (W) 8.5 ft. @ 120° (E)
13	Scrub	same as Plot #11	403461 / 4621729 33 ft. @ 5° from 30.5 ft. on baseline	5.0 ft. @ 220° (N) 8.5 ft. @ 310° (W)	circle center (E) unrecorded
14	Marsh Edge	403480 / 4621724 403490 / 4621725 0' = W end; 36' = E end	403485 / 462172 43.5 ft. @ 170° from 20.5 ft. on baseline	circle center (SE) 8.5 ft. @ 275° (NW)	5.5 ft. @ 105° (W) 14.0 ft. @ 105° (E)
15	Marsh	same as Plot #15	403489 / 4621713 36 ft. @ 160° from 20 ft. on baseline	circle center (W) 8.5 ft. @ 55° (E)	5.5 ft. @ 340° (S) 14.0 ft. @ 340° (N)
16	Scrub	same as Plot #15	403492 / 4621734 33 ft. @ 30° from 21 ft. on baseline	circle center (S) 8.5 ft. @ 35° (N)	12.5 ft. @ 260° (N) 14.5 ft. @ 225° (S)
17	Scrub	403816 / 4621933 403821 / 4621908 0' = S end; 116' = N end	403815 / 4621927 10 ft. @ 265° from 95 ft. on baseline (baseline is the census monitoring transect)	circle center (SE) 8.5 ft. @ 345° (NW)	2.5 ft. @ 105° (W) 11.0 ft. @ 105° (E)
18	Scrub	same as Plot #17	403814 / 4621917 27 ft. @ 300° from 35 ft. on baseline (baseline is the census monitoring transect) *Interior Quadrat C:	7.0 ft. @ 305° (E) 15.0 ft. @ 290° (W) 14.0 ft. @ 225° (N) 22.5 ft. @ 200° (S)	6.0 ft. @ 120° (W) 14.5 ft. @ 120° (E)
19	Opening	same as Plot #17	403820 / 462191 99 ft @ 75° from 55 ft. on baseline (baseline is the census monitoring transect)	circle center (S) 8.5 ft. @ 0° (N)	7.5 ft. @ 260° (E) 15.5 ft. @ 230° (W)

TABLE 2 (cont.) Pre-Grazing Baseline Data for Grazing Impacts Monitoring Plots: Species Cover, Height, and Frequency, Humboldt Road West Site, July 24, 25, and 27, 2003.

Stratum:	4		7A		9		12A		15		15A		15B		CIRCLES		QUADRATS					
	cov.	ht.	cov.	ht.	cov.	ht.	cov.	ht.	cov.	ht.	cov.	ht.	cov.	ht.	freq.	avg. cov.	avg. ht.	freq.				
Agrostis sp.																						
Alnus rubra																						
Alnus viridis ssp. sinuata																						
Angelica genuflexa																						
Anthoxanthum odoratum																						
Aster chilensis																						
Athyrium filix-femina										1	36	1	20	<1	36	0.2	<1	20	0.11			
Bare ground										1				3		0.6	5		0.56			
Blechnum spicant																						
Calamagrostis nutkanaensis																						
Carex aquatilis var. dives										6	48	5	40	4	48	75	44	100	59	42	100	
Carex buxbaumii										1	50											
Carex cusickii																						
Carex obnupta										SE	40											
Carex vesicaria																						
Cornus sericea																						
Danthonia decumbens																						
Deschampsia caespitosa																						
Disporum smithii																						
Eleocharis sp.																						
Epipactis gigantea																						
Equisetum telmateia																						
Erechites minima																						
Gallium sp.																						
Gaultheria shallon																						
Holcus lanatus																						
Hypericum sp.																						
Hypochoeris radicata																						
Juncus sp.																						
Juncus effusus																						
Lathyrus palustris																						
Lathyrus sp. (2-leaflet)																						
Ledum glandulosum																						
Lilium occidentale																						
Lonicera involucrata var. lebedourii																						
Lotus corniculatus																						
Lotus formosissimus																						
Lysichiton americanum																						
Lycopus uniflorus																						
Maianthemum dilatatum																						
Malus fusca																						
Myrica californica																						
Picea sitchensis																						
Polystichum murinum																						
Potentilla arserina ssp. paci																						
Potentilla palustris																						
Prunella vulgaris																						
Pteridium aquilinum																						
Ranunculus repens																						
Rhamnus purshiana																						
Rhododendron occidentale																						
Rosa sp.																						
Rubus discolor																						
Rubus spectabilis																						
Rubus ursinus																						
Salix spp.																						
Sanguisorba officinalis																						
Solidago sp.																						
Spiraea douglasii																						
Standing water, no vegetatic																						
Trifolium arctica																						
Veronica sp.																						
Viola adunca																						
Viola palustris																						

*Cover Class Values: SO = solitary, SE = seldom or scattered, 1 = 1-4%, 2 = 5-10%, 3 = 11-25%, 4 = 26-33%, 5 = 34-50%, 6 = 51-75%, 7 = 76-90%, 8 = 91-100%.

**CRESCENT CITY MARSH WILDLIFE AREA
GRAZING IMPACTS MONITORING PROJECT**

ATTACHMENT 1

**2003 FIELD DATA SHEETS
PRE-GRAZING MONITORING
HUMBOLDT ROAD WEST AND
HUMBOLDT ROAD SITES**

GRAZING IMPACTS FIELD DATA SHEET

SITE: Humboldt Rd West DATE 7-24-03 BY: AC/JC

STRATA: Willow Scrub Marsh Edge Marsh Spiraea/Ledum Grass/Openings
 Malus/Azalea Other: Marsh edge - Spiraea/Ledum - Azalea

CIRCULAR PLOT # 1 (30 ft. diameter; 15 ft. radius)

LOCATION: x=0 y=0 (same rebar as X transect)

PHOTOPOINT: Azimuth From / To Center: Distance:

SPECIES	COVER CLASS	AVG. HT.	NOTES
---------	-------------	----------	-------

Overstory:

✓ Spruce	Solitary / 1-4%	6m	
✓ Azalea	11-25%	6 ft	
✓ Spiraea	5-10%	3.5 (+) ft	
✓ Ledum & Salix	1-4%	3.5 ft	
✓ Alnus rubra	Solitary / 1-4%	6m	rooted outside ○

Understory: Carex obnupta ✓ 26-33% 3.5 ft 3.5 ft } collectively up to 33%

✓ Spiraea	11-25%	3.5 (-) ft	
✓ Sanguisorba	1	24 in.	
✓ Liliium occidentale	1	4.5 ft	
✓ Viola palustris	seldom	10 in	
✓ Potentilla (both spp)	seldom	24 in	% cover is for each
✓ Lathyrus palustris	1	24 in	
✓ Tricentalis arctica	1	6 in.	
✓ Eleocharis	11-25%	12 in.	
✓ Lotus corniculatus (?)	1	36 in.	

INTERIOR QUADRAT # 1A LOCATION FROM CENTER: 6.5 ft, 60°, 120°, 240°, 300°, 360°
 (azimuth and distance to nearest quadrat corner from circular plot center)

PHOTOPOINT: Azimuth From / To Circular Plot Center: Distance:

SPECIES	COVER CLASS	AVG. HT.	NOTES
---------	-------------	----------	-------

Overstory:

Azalea	5	5 ft	
--------	---	------	--

Little Mint	seldom	6 in	Axillary white flrs. RB collected
Awnless Danthonia mystery	seldom	24 in	Collected
Aster <u>Solidago</u>	seldom	20 in	

Understory:

Liliium occidentale	1	5 ft (flowering)	(see counts over) →
Juncus (effusus)	2	36 in	
Potentilla palustris	seldom	24 in	
Sanguisorba	1	24 in	
Potentilla (Silverweed)	1	24 in	
Spiraea sp / Carex obnupta	1	30 in	same info each sp.
Eleocharis	3	18 in	
Viola [palustris]	seldom	12 in	no flower
Erigeron sp	seldom	24 in	
Lotus sp.	1	24 in	
Rubus ursinus	seldom	18 in	
Lathyrus palustris	seldom	18 in	} no flr.
2-nd pea	seldom	18 in	
Potentilla / Mainanthemum	seldom	6 in	same info each sp

INTERIOR QUADRAT # 1B LOCATION FROM CENTER: 9 ft, 165°; 17 ft, 350°

(azimuth and distance to nearest quadrat corner from circular plot center)

PHOTOPOINT: Azimuth From / To Circular Plot Center: _____ Distance: _____

SPECIES COVER CLASS AVG. HT. NOTES

Overstory:

✓ Spruce 3 10ft functionally - not rooted in plot

Understory:

✓ Carex obnupta	7	36 in.	Lathyrus palustris
✓ Sanguisorba	2	30 in.	is nearby but
✓ Spiraea	1	24 in.	not in plot.
✓ Slink cabbage	Seldom	12 in.	
✓ Potentilla (silverweed)	1	18 in.	
✓ Eleocharis	2	12 in.	
✓ Athyzum	Solitary	12 in.	

Cover Class Values:

- solitary
- very scattered; seldom
- 1 = 1 - 4%
- 2 = 5 - 10%
- 3 = 11 - 25%
- 4 = 26 - 33%
- 5 = 34 - 50%
- 6 = 51 - 75%
- 7 = 76 - 90%
- 8 = 91 - 100%

Target Species:

- Lilium occidentale ✓
- Trientalis arctica ✓
- Lathyrus palustris ✓
- Viola palustris
- Sanguisorba officinalis
- Carex leptalea, C. viridula,
- C. lyngbyei, C. praticola
- Plantathera leucostachys
- Epipactis gigantea
- Hierochloe odorata

✓ 1A lily count

1 seedlings
1 veg
60" (2 FR)
60" (3 FR)
48" (1 FR)



GRAZING IMPACTS FIELD DATA SHEET

SITE: Humboldt Rd West DATE 7/24/03 BY: AC/UC

STRATA: Willow Scrub Marsh Edge Marsh Spiraea/Ledum Grass/Openings
 Malus/Azalea Other: +Spiraea / Carex / Ferns

CIRCULAR PLOT # 2 (wetter than 1) (30 ft. diameter; 15 ft. radius)

LOCATION: x=38.5 y=13 ft NW

PHOTOPOINT: Azimuth From / To Center: _____ Distance: _____

SPECIES COVER CLASS AVG. HT. NOTES

Overstory:

Willow, Lonicera & Spiraea stand tall but the rest of the veg is so tall that there isn't functionally an overstory here.

Cosmos seldom 5 ft

Angelica seldom 6 ft

Understory:

Spiraea douglasii 4 5 ft

Salix sp. 2 6 ft

Lonicera involucrata 1 6 ft

Carex obnupta 5 5 ft

Skunk Cabbage 1

Lathyrus 1

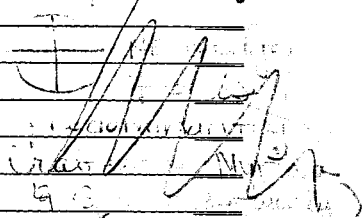
Lotus cornicu seldom

Rubus ursinus 1

Athyrium 3

Pteridium 1

• Rosa not seen in Ⓞ but is just outside of circumference



INTERIOR QUADRAT # 2A LOCATION FROM CENTER: 10 ft, 260° ; 17 ft, 180°
 (azimuth and distance to nearest quadrat corner from circular plot center)

PHOTOPOINT: Azimuth From / To Circular Plot Center: _____ Distance: _____

SPECIES COVER CLASS AVG. HT. NOTES

Overstory:

∅

Understory:

Carex obnupta 7 5 ft

Spiraea douglasii 3 5 ft

Athyrium 2 4.5 ft

Lathyrus palustris 1 4 ft

Potentilla (silverweed) seldom 4 ft

Lotus co. 1 4 ft

Rubus ursinus seldom 5 ft

Little Mint seldom 8 in.

2 leaflet pea seldom 24 in.

INTERIOR QUADRAT # 2B LOCATION FROM CENTER: 10 ft 160° ; 17 ft 150°
 (azimuth and distance to nearest quadrat corner from circular plot center)

PHOTOPOINT: Azimuth From / To Circular Plot Center: _____ Distance: _____

SPECIES COVER CLASS AVG. HT. NOTES

Overstory:

Understory:
 ✓ *Spiza do.* 3 4 ft
 ✓ *Carex sp.* 6 4 ft
 ✓ *Potentilla (silveweed)* 1 2 ft
 ✓ *Potentilla palustris* 2 3 ft • about to flower
 ✓ *Lathyrus palustris* seldom 30 in.
 ✓ *Sanguisorba* 1 3 ft
 ✓ Bare ground 2

• Carex covers most of bare ground aurally but when pushed back, much of the ground lacks any rooted material.

Cover Class Values:

- solitary
- very scattered; seldom
- 1 = 1 - 4%
- 2 = 5 - 10%
- 3 = 11 - 25%
- 4 = 26 - 33%
- 5 = 34 - 50%
- 6 = 51 - 75%
- 7 = 76 - 90%
- 8 = 91 - 100%

Target Species:

- Lilium occidentale*
- Trientalis arctica*
- Lathyrus palustris*
- Viola palustris*
- Sanguisorba officinalis*
- Carex leptalea*, *C. viridula*,
- C. lyngbyei*, *C. praticola*
- Plantathera leucostachys*
- Epipactis gigantea*
- Hierochloe odorata*

GRAZING IMPACTS FIELD DATA SHEET

SITE: Humboldt Rd West DATE 7-25-03 BY: JC/AC

STRATA: Willow Scrub Marsh Edge Marsh Spiraea/Ledum Grass/Opening

WOODY Malus/Azalea Other: Myrica/Alder Cascara Spruce

CIRCULAR PLOT # 3 (30 ft. diameter; 15 ft. radius)

LOCATION: x=75 y=-16 ft

PHOTOPOINT: Azimuth From / To Center: _____ Distance: _____

SPECIES	COVER CLASS	AVG. HT.	NOTES
---------	-------------	----------	-------

Overstory:

✓ Myrica	3	10	6 1/2 veg 8 seedlings + birds
✓ Azalea	2	6	
✓ Malus	2	12	
✓ Alnus viridus	1	7	
✓ Spruce	1	12	

Understory:

✓ Lonicera	1	5 ft	
✓ Salal	1	3.5 ft	
✓ Pteridium	1	4 ft	
✓ Spiraea	1	5 ft	
✓ Liliium occidentale	1	4 ft	(flowering)
✓ Sanguisorba	1	1 ft	

(ADD spp from A & B to this list)

INTERIOR QUADRAT # 3A LOCATION FROM CENTER: 7 ft 60°; 12 ft 170°
(azimuth and distance to nearest quadrat corner from circular plot center)

PHOTOPOINT: Azimuth From / To Circular Plot Center: _____ Distance: _____

SPECIES	COVER CLASS	AVG. HT.	NOTES
---------	-------------	----------	-------

Overstory:

✓ Azalea	3	6 ft	not noted in plot
✓ Myrica	2	8 ft	
✓ Alnus viridus	1	6 ft	
✓ Malus	3	6 ft	
✓ Spiraea	2	5 ft	

Understory:

✓ Juncus	1	3 ft	<div style="border: 2px solid black; padding: 5px; width: fit-content;"> 1 (4B) 6 vegetative 8 seedlings </div>
✓ Carex sp.	1	3.5 ft	
✓ Salal	2	3.5 ft	
✓ Angelica	seldom	3 ft	
✓ Pteridium	1	4 ft	
✓ Liliium occidentale	1	4 ft	
✓ Rubus	1	2 ft	
✓ Rosa	1	3 ft	
✓ Spruce sapling	Solitary	5 ft	
✓ Sanguisorba	Seldom	1 ft	
✓ Eleocharis	2	1 ft	
✓ Holcus	seldom	1.5 ft	
✓ Little white mint	seldom	8 inches	
✓ Maianthemum	seldom	6 inches	

1 (4B)
6 vegetative
8 seedlings

• bidding ht but
in vegetative & seedling
also present.
(see census 7/23)

INTERIOR QUADRAT # 3B LOCATION FROM CENTER: 7.5 ft 350°; 15.5' 330°
 (azimuth and distance to nearest quadrat corner from circular plot center)

PHOTOPOINT: Azimuth From / To Circular Plot Center: _____ Distance: _____

SPECIES	COVER CLASS	AVG. HT.	NOTES
Overstory:			
✓ Azalea	6	8 ft	almost rooted in plot
✓ Spruce	5	20 ft	rooted outside plot
✓ Cascara	2	12 ft	rooted in plot
✓ Myrica	3	15 ft	rooted inside

99% canopy cover

Understory:			
✓ Carex obnupta	2	1 in	
✓ Malus seedlings	seldom	4 in	
✓ Liliun occ. (5 seedlings)	1	2 in	5 seedlings
✓ Bare ground	7		
✓ Athysanella	solitary	3 in	
✓ Maianthemum	1	4 in	

✓ could be X. fragilla

Cover Class Values:

- solitary
- very scattered; seldom
- 1 = 1 - 4%
- 2 = 5 - 10%
- 3 = 11 - 25%
- 4 = 26 - 33%
- 5 = 34 - 50%
- 6 = 51 - 75%
- 7 = 76 - 90%
- 8 = 91 - 100%

Target Species:

- Lilium occidentale
- Trientalis arctica
- Lathyrus palustris
- Viola palustris
- Sanguisorba officinalis
- Carex leptalea, C. viridula,
- C. lyngbyei, C. praticola
- Plantathera leucostachys
- Epipactis gigantea
- Hierochloe odorata

GRAZING IMPACTS FIELD DATA SHEET

SITE: Humboldt Rd West DATE 9/25/03 BY: JCI/AC

STRATA: Willow Scrub Marsh Edge Marsh Spiraea/Ledum Grass/Openings
 MARS# Malus/Azalea Other:

CIRCULAR PLOT # 4 (30 ft. diameter; 15 ft. radius)

LOCATION: X = 38.5 y = 46

PHOTOPOINT: Azimuth From / To Center: _____ Distance: _____

SPECIES	COVER CLASS	AVG. HT.	NOTES
---------	-------------	----------	-------

Overstory: Ø

Understory:

✓ <i>Carex obtusa</i>	1	42 inches	
✓ <i>Carex aquatica</i>	7	42	
✓ <i>Potentilla palustris</i>	1	36	
✓ <i>Potentilla</i> (silverweed)	1	36	
✓ <i>Veronica</i> - P-UNK1	1	30 inches	
✓ <i>Carex</i> (<i>trivittata</i>) <i>vesicaria</i>	2	30 in	
✓ Skunk cabbage	seldom	18	

• chunky spikelet
 there's probably
 more here than
 we see. We
 see ~10%.

INTERIOR QUADRAT # 4A LOCATION FROM CENTER: 8 ft ; 14 ft.

(azimuth and distance to nearest quadrat corner from circular plot center)

PHOTOPOINT: Azimuth From / To Circular Plot Center: _____ Distance: _____

SPECIES	COVER CLASS	AVG. HT.	NOTES
---------	-------------	----------	-------

Overstory: Ø

Understory:

✓ <i>Carex obtusa</i>	seldom	42	
✓ <i>Carex aquatica</i>	7	42	
✓ <i>Potentilla palustris</i>	seldom	36	
✓ <i>Potentilla</i> (silverweed)	seldom	36	
✓ <i>Lysichiton</i> (skunk cabbage)	solitary	18	

pung

INTERIOR QUADRAT # 4B LOCATION FROM CENTER: 6ft 195° ; 12.5ft 150°
 (azimuth and distance to nearest quadrat corner from circular plot center)

PHOTOPOINT: Azimuth From / To Circular Plot Center: _____ Distance: _____

SPECIES COVER CLASS AVG. HT. NOTES

Overstory: Ø

Understory:

✓ <i>Carex aquatica</i>	6	40 in.
✓ <i>Carex hirsutata vesicaria</i>	3	36 in.
✓ <i>Potentilla palustris</i>	1	30 in.
✓ <i>Potentilla anserina</i>	1	24 in.
✓ Bare water	2	—

Cover Class Values:

- solitary
- very scattered; seldom
- 1 = 1 - 4%
- 2 = 5 - 10%
- 3 = 11 - 25%
- 4 = 26 - 33%
- 5 = 34 - 50%
- 6 = 51 - 75%
- 7 = 76 - 90%
- 8 = 91 - 100%

Target Species:

- Lilium occidentale*
- Trientalis arctica*
- Lathyrus palustris*
- Viola palustris*
- Sanguisorba officinalis*
- Carex leptalea, C. viridula,*
- C. lyngbyei, C. praticola*
- Plantathera leucostachys*
- Epipactis gigantea*
- Hierochloe odorata*

* Add 015 to shrub plot - place at edge towards shore

* Please note
2nd corner in location for quadrats

GRAZING IMPACTS FIELD DATA SHEET

SITE: Humboldt Rd West DATE: 7/27/03 BY: AC/JC
7/24/03

STRATA: Willow Scrub Malus/Azalea Marsh Edge Marsh Spiraea/Ledum Grass/Openings Other: _____

CIRCULAR PLOT # # 5 (30 ft. diameter; 15 ft. radius)

LOCATION: 50' @ 340° from 425 baseline

PHOTOPOINT: Azimuth From / To Center: _____ Distance: _____

SPECIES	COVER CLASS	AVG. HT.	NOTES
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Overstory:

✓ Alder	5	20 ft	
✓ Malus	5	20 ft	
✓ Cascara	2	20 ft	

Understory:

✓ Carex obnupta	4	60 in	
✓ Sword fern	4	54 in	
✓ Athyrium	1	48 in	
✓ Rubus ursinus	1	48 in	viney
✓ Azalea	2	10 feet	
✓ Maianthemum	1	6 inches	
✓ Blechnum spicant	1	12 inches	
✓ Rubus spectabilis	1	60 inches	
✓ Bare ground	3		

INTERIOR QUADRAT # 5A LOCATION FROM CENTER: 15.5' @ 45° (2nd rebar)
7'8" @ 85° to SW corner
(azimuth and distance to nearest quadrat corner from circular plot center)

PHOTOPOINT: Azimuth From / To Circular Plot Center: _____ Distance: _____

SPECIES	COVER CLASS	AVG. HT.	NOTES
---------	-------------	----------	-------

Overstory:

✓ Alnus	5	20 ft	
✓ Malus	5	20 ft	

Understory:

✓ Carex obnupta	6	48	
✓ Athyrium	1	36	
✓ Blechnum spicant	seldom	12	
✓ Rubus spectabilis	seldom	30	
✓ Maianthemum	1	6	
✓ Polypodium monitum	1	42	
✓ Bare ground	2		

2nd rebar 23 ft @ 125°
 15 ft @ 120°

AT # 53 LOCATION FROM CENTER: _____
 (azimuth and distance to nearest quadrat corner from circular plot center)

th From / To Circular Plot Center: _____ Distance: _____
 COVER CLASS AVG. HT. NOTES

4	8 feet	saplings in plot
1	9	
1	10	
1	5	
1	11	saplings in plot

USA	2	4 ft	
PTA	6	4 ft	
	2	3.5 ft	
seldom	1	2 ft	not goldenrod

s:
om

- Target Species:**
 Lilium occidentale
 Trientalis arctica
 Lathyrus palustris
 Viola palustris
 Sanguisorba officinalis
 Carex leptalea, C. viridula,
 C. lyngbyei, C. praticola
 Plantathera leucostachys
 Epipactis gigantea
 Hierochloa odorata

INTERIOR QUADRAT # 5B LOCATION FROM CENTER: 2nd rebar 23 ft @ 125°
15 ft @ 120°
 (azimuth and distance to nearest quadrat corner from circular plot center)

PHOTOPOINT: Azimuth From / To Circular Plot Center: _____ Distance: _____

SPECIES	COVER CLASS	AVG. HT.	NOTES
Overstory:			
✓ Salix	4	8 feet	sapling in plot
✓ Cascara	1	9	
✓ Malus	1	10	
✓ Spiraea	1	5	
✓ Alnus	1	11	saplings in plot

Understory:			
✓ Rubus ursinus	2	4 ft	
✓ Carex obovata	6	4 ft	
✓ Lathyrum	2	3.5 ft	
✓ Bare ground	1	-	
✓ Aster	seldom	2 ft	not goldenrod

Cover Class Values:

- solitary
- very scattered; seldom
- 1 = 1 - 4%
- 2 = 5 - 10%
- 3 = 11 - 25%
- 4 = 26 - 33%
- 5 = 34 - 50%
- 6 = 51 - 75%
- 7 = 76 - 90%
- 8 = 91 - 100%

Target Species:

- Lilium occidentale
- Trientalis arctica
- Lathyrus palustris
- Viola palustris
- Sanguisorba officinalis
- Carex leptalea, C. viridula,
- C. lyngbyei, C. praticola
- Plantathera leucostachys
- Epipactis gigantea
- Hierochloe odorata

* Please note the 2nd corner in location for quadrat B

GRAZING IMPACTS FIELD DATA SHEET

SITE: Arnold Rd. West DATE: 7/27/03 BY: AC/JC
7/25/03 AB/KW

STRATA: Willow Scrub Marsh Edge Marsh Spiraea/Ledum Grass/Openings
 Malus/Azalea Other: _____

CIRCULAR PLOT # 6 (30 ft. diameter; 15 ft. radius)

LOCATION: 25 ft. @ 135° from 32.0 ft. on baseline

PHOTOPOINT: Azimuth From / To Center: _____ Distance: _____

SPECIES COVER CLASS AVG. HT. NOTES

Overstory:

Myrica 1 9 ft

Azalea 1 8 ft

Casparia solitary 6 ft very twiggy

Agrostis 1 24 in

Sanguisorba 1 24 in

Rubus 1 24 in

Understory: Calamagrostis 1 36 in 2 species?

Carex obnupta 2 36

Pteridium 1 24

Athyrium 1 18

Spiraea 2 48 in

Lotus corn. 1 24 in

Little white plant 1 12 in

Potentilla anserina 2 24 in

Juncus 2 36 in

Lonicera 1 60 in 2 bushy

Salix 1 60 in

Trientalis 1-6
Viola 1-8
Aster 1-18
Solidago
 Most prolific yet

INTERIOR QUADRAT # 6A LOCATION FROM CENTER: 5.5 ft. @ 110° from plot center
 (azimuth and distance to nearest quadrat corner from circular plot center) ^{to SW corner}

PHOTOPOINT: Azimuth From / To Circular Plot Center: _____ Distance: 2nd return: 8 ft @ 5°

SPECIES COVER CLASS AVG. HT. NOTES

Overstory:

Ø

Spiraea/Azalea/Lonicera
 (one bush)
 almost in plot

Understory:

Carex obnupta 3 36

Rubus ursinus 1 24

Juncus sp. 3 36

Potentilla anserina 3 18

Sanguisorba 1 24

Spiraea douglasii 1 24

Little White Plant 1 12

Athyrium 1 24

Lotus cornic. 1 24

Aster sp. Solidago 1 18

Viola sp. 1 6 lf ~ 1 in across

2nd rebar : 15 ft @ 180°

INTERIOR QUADRAT # 6B LOCATION FROM CENTER: 6.5 ft. @ 210° from Plot center to NE corner
(azimuth and distance to nearest quadrat corner from circular plot center)

PHOTOPOINT: Azimuth From / To Circular Plot Center: _____ Distance: _____

SPECIES COVER CLASS AVG. HT. NOTES

Overstory:

Spiraea 1 4 ft barely in

Understory:

Juncus 3 40

Spiraea 3 36 dying

Little White Mint 3 12

Carex oenantha 1 36

Pteridium 1 24

Athyrium 2 18

Potentilla anserina 3 12

Aster 1 24

Lotus cornic. 1 12

Sanguisorba 1 12

Trientalis 1 6

Viola sp. 1 8

• 1 cauline leaf?
• edge of plot
there may be
2 spp out here
(this 2).

Cover Class Values:

- solitary
- very scattered; seldom
- 1 = 1 - 4%
- 2 = 5 - 10%
- 3 = 11 - 25%
- 4 = 26 - 33%
- 5 = 34 - 50%
- 6 = 51 - 75%
- 7 = 76 - 90%
- 8 = 91 - 100%

Target Species:

- Lilium occidentale
- Trientalis arctica
- Lathyrus palustris
- Viola palustris
- Sanguisorba officinalis
- Carex leptalea, C. viridula,
- C. lyngbyei, C. praticola
- Plantathera leucostachys
- Epipactis gigantea
- Hierochloa odorata

What we've been calling Aster are actually be Goldenrod. (Just saw one blooming)

*Add 7B in Marsh plot towards edge towards ~~shore~~

GRAZING IMPACTS FIELD DATA SHEET

Please note 2nd corner in location for quadrats

SITE: Humboldt Rd West DATE: 7/27/03 BY: AC/JC
7/25/03 PB/MW
 STRATA: Willow Scrub Marsh Edge Marsh Spiraea/Ledum Grass/Openings
 Malus/Azalea Other: _____

CIRCULAR PLOT # 7 (30 ft. diameter; 15 ft. radius)
 LOCATION: 55 ft. @ 140° from 31' on baseline

PHOTOPOINT: Azimuth From / To Center: _____ Distance: _____
 SPECIES COVER CLASS AVG. HT. NOTES

Overstory: Ø

Understory:
 ✓ Carex aquatilis 1 48 inches
 ✓ Potentilla palustris 1 24 inches
 ✓ Bare water 2

INTERIOR QUADRAT # 7A LOCATION FROM CENTER: 15.0' @ 280 (2nd refer)
12.5' from center @ 290°
 (azimuth and distance to nearest quadrat corner from circular plot center)

PHOTOPOINT: Azimuth From / To Circular Plot Center: _____ Distance: _____
 SPECIES COVER CLASS AVG. HT. NOTES

Overstory: Ø

Understory:
 ✓ Carex aquatilis 1 48
 ✓ Potentilla palustris 1 24
 ✓ Bare water/muck 2

This area: Baseline 0-28 ft. (120°)

GRAZING IMPACTS FIELD DATA SHEET

SITE: Humboldt Road DATE 7/25/03 BY: PB/KW AC/JC

STRATA: Willow Scrub Marsh Edge Marsh Spiraea/Ledum Grass/Openings
 Malus/Azalea Other: _____

CIRCULAR PLOT # 8 (30 ft. diameter; 15 ft. radius)

LOCATION: PLOT center: 9.5 ft. from baseline 14.5 ft. @ 205°

PHOTOPOINT: Azimuth From / To Center: _____ Distance: _____

SPECIES COVER CLASS AVG. HT. NOTES

Overstory:
 / Azalea 1 5 ft. barely hangs over \odot circumference

Understory:
 Little white Mint seldom 18 in
 Carex UNK 1-bulbous seldom 18 in
 Lathyrus palustris 1 18 in
 Carex aquatilis 6 40 in
 Spiraea doug 4 48
 Potentilla palustris 3 24
 Potentilla anserina 2 18
 Skunk Cabbage 1 18
 Sanquisorba 1 24
 Eleocharis 2 18 2 spp.
 Juncus 1 36
 Angelica graciflexa solitary 30
 Carex stricta 2 40

INTERIOR QUADRAT # 8A LOCATION FROM CENTER: 6ft. @ 350° to S. corner;
 (azimuth and distance to nearest quadrat corner from circular plot center)

PHOTOPOINT: Azimuth From / To Circular Plot Center: _____ Distance: _____

SPECIES COVER CLASS AVG. HT. NOTES

Overstory:
 \emptyset

Understory:
 Lathyrus seldom 36
 Sanquisorba 2 30
 Spiraea doug 2 40
 Juncus 1 36
 Carex stricta 2 40
 Carex aquatilis 1 40
 Skunk Cabbage 2 18
 Eleocharis 2 12
~~Potentilla palustris 3~~
 Potentilla anserina 1 30
 Angelica gen. solitary 30
 Little white Mint solitary 18

+14.5 to N. corner

INTERIOR QUADRAT # 8B LOCATION FROM CENTER: 3.5 ft. @ 145° to NE corner.
 (azimuth and distance to nearest quadrat corner from circular plot center) 12' to SW

PHOTOPOINT: Azimuth From / To Circular Plot Center: _____ Distance: _____

SPECIES COVER CLASS AVG. HT. NOTES

Overstory:

8

Understory:

✓ Spiraea doug	3	42	
✓ Carex obsoleta	3	40	
✓ Potentilla anserina	2	12 in	
✓ Potentilla palustris	1	12 in	
✓ Juncus	2	24 in	
✓ Eleocharis	2	12 in	
✓ Carex aquatilis	1	40	
✓ Skunk cabbage	1	12 in	
✓ Lathyrus palustris	seldom	24 in	
✓ Sanguisorba	seldom	24 in	
✓ Bare ground	2	—	
✓ Little white mint	seldom	18	
✓ Viola	solitary	3 in	

• looks like *V. adunca*
 No fl.

Cover Class Values:

- solitary
- very scattered; seldom
- 1 = 1 - 4%
- 2 = 5 - 10%
- 3 = 11 - 25%
- 4 = 26 - 33%
- 5 = 34 - 50%
- 6 = 51 - 75%
- 7 = 76 - 90%
- 8 = 91 - 100%

Target Species:

- Lilium occidentale
- Trientalis arctica
- Lathyrus palustris
- Viola palustris
- Sanguisorba officinalis
- Carex leptalea, C. viridula,
- C. lyngbyei, C. praticola
- Plantathera leucostachys
- Epipactis gigantea
- Hierochloe odorata

GRAZING IMPACTS FIELD DATA SHEET

KW/RB

SITE: Humboldt Road West DATE 7/25/03 BY: Ac/SC

STRATA: Willow Scrub Marsh Edge Marsh Spiraea/Ledum Grass/Openings
 Malus/Azalea Other: _____

CIRCULAR PLOT # 9 (30 ft. diameter; 15 ft. radius)

LOCATION: 40 ft. from baseline 19 ft. @ 200°

PHOTOPOINT: Azimuth From / To Center: _____ Distance: _____

SPECIES	COVER CLASS	AVG. HT.	NOTES
---------	-------------	----------	-------

Overstory:

Ø

Understory:

✓ <i>Carex aquatica</i>	6	40 in	
✓ <i>Spiraea douglasii</i>	2	40	
✓ <i>Potentilla palustris</i>	3	40 in	
✓ <i>Potentilla anserina</i>	1	10 in	
✓ Bare ground/mud	2	—	
✓ Horsetail	1	10 in	(diminutive sp.)
✓ <i>Ledum</i>	1	46 in	
✓ Skunk Cabbage	1	20 in	
✓ <i>Carex obnupta</i>	seldom	40 in	
✓ <i>Eleocharis</i>	seldom	6 in	

INTERIOR QUADRAT # 9A LOCATION FROM CENTER: 6.5 ft. @ 5° to S corner; 15' to N. Corner
 (azimuth and distance to nearest quadrat corner from circular plot center)

PHOTOPOINT: Azimuth From / To Circular Plot Center: _____ Distance: _____

SPECIES	COVER CLASS	AVG. HT.	NOTES
---------	-------------	----------	-------

Overstory:

Ø

Understory:

✓ <i>Carex aquatica</i>	6	40 in	
✓ <i>Spiraea douglasii</i>	2	42 in	
✓ <i>Potentilla palustris</i>	2	40 in	
✓ <i>Potentilla anserina</i>	1	10 in	
✓ Bare ground/mud	2	—	
✓ Horsetail	1	10 in	

INTERIOR QUADRAT # 9B LOCATION FROM CENTER: 6' @ 125° to NW corner; 14.5'
 (azimuth and distance to nearest quadrat corner from circular plot center) to SE corner

PHOTOPOINT: Azimuth From / To Circular Plot Center: _____ Distance: _____

SPECIES COVER CLASS AVG. HT. NOTES

Overstory:

Ø

Understory:

✓ <i>Carex aquatilis</i>	6	40 in
✓ <i>Saxaea douglasii</i>	seldom	30 in
✓ <i>Potentilla palustris</i>	3	30 in
✓ <i>Elcocharis</i>	seldom	6 in
✓ <i>Potentilla anserina</i>	seldom	6 in
✓ Bare ground	3	—
✓ <i>Skunk cabbage</i>	solitary	12 in

Cover Class Values:

solitary
 very scattered; seldom
 1 = 1 - 4%
 2 = 5 - 10%
 3 = 11 - 25%
 4 = 26 - 33%
 5 = 34 - 50%
 6 = 51 - 75%
 7 = 76 - 90%
 8 = 91 - 100%

Target Species:

Lilium occidentale
Trientalis arctica
Lathyrus palustris
Viola palustris
Sanguisorba officinalis
Carex leptalea, *C. viridula*,
C. lyngbyei, *C. praticola*
Plantathera leucostachys
Epipactis gigantea
Hierochloe odorata

GRAZING IMPACTS FIELD DATA SHEET

SITE: Humboldt Road West DATE 7/25/03 BY: RB/KW
JC/AC

STRATA: Willow Scrub Marsh Edge Marsh Spiraea/Ledum Grass/Openings
ALDER Malus/Azalea Other: _____

CIRCULAR PLOT # 10 (30 ft. diameter; 15 ft. radius)

LOCATION: 35 ft. from baseline 5.5 ft. @ 340°

PHOTOPOINT: Azimuth From / To Center: _____ Distance: _____

SPECIES	COVER CLASS	AVG. HT.	NOTES
---------	-------------	----------	-------

Overstory:			
✓ Malus	5	20 ft	
✓ Cascara	3	15 ft	
✓ Azalea	2	10 ft	
✓ Lonicera	1	8 ft	
✓ Salix	1	15 ft	
✓ Rubus discolor	1	10 ft	
Understory:			
✓ Alder	2	20 ft	
✓ Carex obnupta	3	48 in	
✓ Polystichum auratum	1	36 in	
✓ Athyrium	1	48 in	
✓ Blechnum	1	20 in	
✓ Rubus ursinus	1	36 in	
✓ Maianthemum	1	6 in	
✓ Skunk cabbage	1	60 in	
✓ Disporum	seldom	6 in	
✓ Bare ground	2		
✓ Spiraea	2	6 ft	

INTERIOR QUADRAT # 10A LOCATION FROM CENTER: Center of big plot is W. corner; E corner is 8.5 @ 70°
 (azimuth and distance to nearest quadrat corner from circular plot center)

PHOTOPOINT: Azimuth From / To Circular Plot Center: _____ Distance: _____

SPECIES	COVER CLASS	AVG. HT.	NOTES
---------	-------------	----------	-------

Overstory:			
✓ Malus	2	15 ft	
✓ Cascara	5	8 ft	
✓ Azalea	2	8 ft	
✓ Alder	3	20 ft	

Understory: <u>10B</u>			
✓ Carex obnupta	2	48 in	<u>10B</u>
✓ Maianthemum	1	6	
✓ Athyrium	1	18	
✓ Rubus	1	24	
✓ Polystichum	2	36	
✓ Blechnum	Solitary	8 in	
✓ Disporum	Solitary	4 in	
✓ Bare ground	3		

INTERIOR QUADRAT # 10B LOCATION FROM CENTER: 6.5 ft. @ 340° to SE corner
 (azimuth and distance to nearest quadrat corner from circular plot center)

PHOTOPOINT: Azimuth From / To Circular Plot Center: _____ Distance: _____

SPECIES	COVER CLASS	AVG. HT.	NOTES
Overstory:			
✓ Malus	6	15 ft	
✓ Cassara	1	8	
✓ Azalea	1	8	seedling
✓ Alder	2	20	

15' @
340° to
NW
COR.

Understory: 10A

✓ Carex obnupta	4	60 in	
✓ Polystichum minutum	1	48 in	
✓ Bare ground	3	—	
✓ Athyrium	1	12 in	
✓ Blechnum	1	12 in	
✓ Skunk Cabbage	1	40 in	
Rubus			

10A

Cover Class Values:

- solitary
- very scattered; seldom
- 1 = 1 - 4%
- 2 = 5 - 10%
- 3 = 11 - 25%
- 4 = 26 - 33%
- 5 = 34 - 50%
- 6 = 51 - 75%
- 7 = 76 - 90%
- 8 = 91 - 100%

Target Species:

- Lilium occidentale
- Trientalis arctica
- Lathyrus palustris
- Viola palustris
- Sanguisorba officinalis
- Carex leptalea, C. viridula,
- C. lyngbyei, C. praticola
- Plantathera leucostachys
- Epipactis gigantea
- Hierochloe odorata

10A

GRAZING IMPACTS FIELD DATA SHEET

SITE: Humboldt Rd, West DATE 7/25/03 BY: AC/JO
7/25/03

STRATA: Willow Scrub Marsh Edge Marsh Spiraea/Ledum Grass/Openings
 Malus/Azalea Other: _____

CIRCULAR PLOT # 11 (30 ft. diameter; 15 ft. radius)

LOCATION: 1.5 ft. from baseline 31.5 ft. @ 180°

PHOTOPOINT: Azimuth From / To Center: _____ Distance: _____

SPECIES COVER CLASS AVG. HT. NOTES

Overstory:

Salix	2	6ft	
Azalea	1	5 ft	edge of @
Juncus	1	36	
Carex UNK 1 =	1	24	C. blaxbaunii
Horseshoe	1	18	diminutive
Understory: Viola	1	4	
Carex aquatilis	5	40	Potentilla pal. 2 / 36
Carex cusickii	1	40	P. ansurinus 1 / 12
Sanskrisora	1	18	SKUNK CABBAGE 2 / 24
Lathyrus palustris	1	24	
Etiocallis	2	10	
Spiraea	5	42	
Little white mint	1	16	
Carex obovata	1	30	
Big yellow Comp	1	18	
Bare ground	1		

INTERIOR QUADRAT # 11/A LOCATION FROM CENTER: 6' @ 345° from center = S corner
 (azimuth and distance to nearest quadrat corner from circular plot center) 14.5 ft

PHOTOPOINT: Azimuth From / To Circular Plot Center: _____ Distance: _____ @ 345° to N. corner

SPECIES COVER CLASS AVG. HT. NOTES

Overstory: Ø

Understory:

Viola	1	4	V. adunca ??
Little white mint	1	6	
Spiraea	3	36	
Big yellow Comp	1	8	
SKUNK CABBAGE	2	20	
Carex obovata	2	30	
Carex cusickii	1	36	
Potentilla radicans	1	16	
P. ansurina	1	12	
SKUNK CABBAGE	1	8	
Etiocallis	2	6	
Bare ground	1	1	
Galium	seldom	6	

INTERIOR QUADRAT # 11B LOCATION FROM CENTER: Western corner = circular plot center; eastern corner is 85' @ 90°
 (azimuth and distance to nearest quadrat corner from circular plot center)

PHOTOPOINT: Azimuth From / To Circular Plot Center: _____ Distance: _____

SPECIES COVER CLASS AVG. HT. NOTES

Overstory:

0

Understory:

✓ Viola	1	4 in	V. adunca? 4
✓ Spiraea	5	36 in	
✓ Carex aquatilis	3	36 in	
✓ Carex obnupta	3	36	
✓ Potentilla palustris	2	24 in	
✓ P. anserina	1	12 in	
✓ Sanguisorba	1	12 in	
✓ SKUNK cabbage	2	12 in	
○ Big yellow comp	1	20 in	
✓ Horsetail	1	8 in	
✓ Carex UNK 1	1	30 in	C. burkhamii
✓ Little white mint	seldom	12 in	
✓ Background	2		

Cover Class Values:

- solitary
- very scattered; seldom
- 1 = 1 - 4%
- 2 = 5 - 10%
- 3 = 11 - 25%
- 4 = 26 - 33%
- 5 = 34 - 50%
- 6 = 51 - 75%
- 7 = 76 - 90%
- 8 = 91 - 100%

Target Species:

- Lilium occidentale
- Trientalis arctica
- Lathyrus palustris
- Viola palustris
- Sanguisorba officinalis
- Carex leptalea, C. viridula,
- C. lyngbyei, C. praticola
- Plantathera leucostachys
- Epipactis gigantea
- Hierochloe odorata

GRAZING IMPACTS FIELD DATA SHEET

KW/IRB
AC/JC

SITE: Humboldt Rd west DATE: 7/25/03 BY: AC/JC

STRATA: Willow Scrub Marsh Edge Marsh Spiraea/Ledum Grass/Openings
 Malus/Azalea Other:

CIRCULAR PLOT # 12 (30 ft. diameter; 15 ft. radius)

LOCATION: center = 30ft. from baseline 22.0' @ 190°

PHOTOPOINT: Azimuth From / To Center: _____ Distance: _____

SPECIES	COVER CLASS	AVG. HT.	NOTES
---------	-------------	----------	-------

Overstory: Ø

Understory:

<u>✓ Carex aquatilis</u>	<u>7</u>	<u>42</u>	
<u>✓ Spiraea v. doug.</u>	<u>2</u>	<u>42</u>	
<u>✓ Salix</u>	<u>2</u>	<u>48 in</u>	
<u>✓ Sanguisorba</u>	<u>1</u>	<u>30</u>	
<u>✓ Skunk Cabbage</u>	<u>1</u>	<u>18</u>	
<u>✓ Carex virgultata cusickii</u>	<u>1</u>	<u>5 ft!</u>	<u>← 50 flring culm only.</u>
<u>✓ Potentilla palustris</u>	<u>3</u>	<u>42</u>	<u>→ veg is 42 in</u>
<u>✓ Potentilla anserinus</u>	<u>1</u>	<u>12</u>	
<u>✓ Bare ground / water</u>	<u>1</u>	<u>—</u>	

INTERIOR QUADRAT # 12A LOCATION FROM CENTER: 5.5 ft. @ 10° to S corner
 (azimuth and distance to nearest quadrat corner from circular plot center)

PHOTOPOINT: Azimuth From / To Circular Plot Center: _____ Distance: _____

SPECIES	COVER CLASS	AVG. HT.	NOTES
---------	-------------	----------	-------

Overstory: Ø

Understory:

<u>✓ Carex aquatica</u>	<u>5</u>	<u>36</u>	
<u>✓ Spiraea</u>	<u>2</u>	<u>48</u>	
<u>✓ Potentilla anserinus</u>	<u>1</u>	<u>24</u>	
<u>✓ P. palustris</u>	<u>2</u>	<u>24</u>	
<u>✓ Bare muck</u>	<u>3</u>	<u>—</u>	

14 ft @
10° to
N.
corner



INTERIOR QUADRAT # 12B LOCATION FROM CENTER: western corner ~~to~~ plot
 (azimuth and distance to nearest quadrat corner from circular plot center)

circular plot center is
 center; E corner 8.5' @ 120°

PHOTOPOINT: Azimuth From / To Circular Plot Center: _____ Distance: _____

SPECIES COVER CLASS AVG. HT. NOTES

Overstory: Ø

Understory:

✓ <i>Carex aquatica</i>	6	48	
✓ <i>Soricea doug.</i>	3	48	
✓ <i>Potentilla palustris</i>	1	46	
✓ Skunk cabbage	1	24	
✓ <i>Potentilla anserina</i>	1	10	
✓ Bare ground/water	2	—	

Cover Class Values:

- solitary
- very scattered; seldom
- 1 = 1 - 4%
- 2 = 5 - 10%
- 3 = 11 - 25%
- 4 = 26 - 33%
- 5 = 34 - 50%
- 6 = 51 - 75%
- 7 = 76 - 90%
- 8 = 91 - 100%

Target Species:

- Lilium occidentale*
- Trientalis arctica*
- Lathyrus palustris*
- Viola palustris*
- Sanguisorba officinalis*
- Carex leptalea*, *C. viridula*,
- C. lyngbyei*, *C. praticola*
- Plantathera leucostachys*
- Epipactis gigantea*
- Hierochloe odorata*

GRAZING IMPACTS FIELD DATA SHEET

SITE: Aumboldt Rd West DATE: 7/25/03 BY: RB/KW
JC/AE

STRATA: Willow (Scrub) Marsh Edge Marsh Spiraea/Ledum Grass/Openings
 Malus/Azalea Other: _____

CIRCULAR PLOT # 13 (30 ft. diameter; 15 ft. radius)

LOCATION: 33 ft. from baseline 30.5' @ 5°

PHOTOPOINT: Azimuth From / To Center: _____ Distance: _____

SPECIES	COVER CLASS	AVG. HT.	NOTES
---------	-------------	----------	-------

Overstory:

✓ Malus	4	15 ft	
✓ Salix	4	15 ft	
✓ Myrica	1	10 ft	
Spiraea	2	9 ft	
✓ Azalea	1	8 ft	

Understory:

✓ Spiraea	2	4.5 ft	
✓ Carex obnupta	5	4 ft	
✓ Skunk cabbage	3	4 ft	
✓ Salal	1	4 ft	
✓ Rubus	1	3 ft	
✓ Sanguisorba	1	3 ft	
✓ Lathyrus palustris	1	3 ft	
✓ Equisetum	1	1 ft	
✓ Little White Flower	1	1 ft	
✓ Ledum	1	3 ft	

INTERIOR QUADRAT # 13A LOCATION FROM CENTER: 5 ft @ 220° to N corner

(azimuth and distance to nearest quadrat corner from circular plot center)

PHOTOPOINT: Azimuth From / To Circular Plot Center: _____ Distance: _____

SPECIES	COVER CLASS	AVG. HT.	NOTES
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Overstory:

✓ Malus	4	10 ft	
Spiraea	1	8 ft	
✓ Azalea	2	7 ft	

Understory:

✓ Ledum	2	4 ft	
✓ Spiraea	3	4 ft	
✓ Carex obnupta	4	4 ft	
✓ Skunk Cabbage	3	4 ft	
✓ Bare ground	2	—	
✓ Rubus	seldom	6 inches	• seedlings
✓ Little White Flower	Solitary	4 inches	• on edge
✓ Sanguisorba	Solitary	24 inches	• on edge


INTERIOR QUADRAT # 13B LOCATION FROM CENTER: Corner, western corner 8.5 @
 (azimuth and distance to nearest quadrat corner from circular plot center) 310

Circular plot center is eastern

PHOTOPOINT: Azimuth From / To Circular Plot Center: _____ Distance: _____

SPECIES	COVER CLASS	AVG. HT.	NOTES
Overstory:			
✓ Salix	3	8 ft	large piece of timber in 10% of plot was included in "bare ground"
✓ Malus	3	10 ft	
✓ Spiraea	2	7 ft	
✓ Myrica	1	10 ft	

Understory:			
✓ Carex obnupta	5	4 ft	
✓ Skunk cabbage	3	4 ft	
✓ Bare ground	3	-	

There were violets just outside of 

- Cover Class Values:**
 solitary
 very scattered; seldom
 1 = 1 - 4%
 2 = 5 - 10%
 3 = 11 - 25%
 4 = 26 - 33%
 5 = 34 - 50%
 6 = 51 - 75%
 7 = 76 - 90%
 8 = 91 - 100%

- Target Species:**
 Lilium occidentale
 Trientalis arctica
 Lathyrus palustris
 Viola palustris
 Sanguisorba officinalis
 Carex leptalea, C. viridula,
 C. lyngbyei, C. praticola
 Plantathera leucostachys
 Epipactis gigantea
 Hierochloa odorata

GRAZING IMPACTS FIELD DATA SHEET

SITE: Humboldt Rd. West DATE: 7/27/03 AC/SC
 STRATA: Willow Scrub Marsh Edge Marsh Spiraea/Ledum Grass/Openings
 Malus/Azalea Other: _____ BY: RB/KW

CIRCULAR PLOT # 14 (30 ft. diameter; 15 ft. radius)

LOCATION: 3.5 ft. from Baseline 20.5 ft. @ 170°

PHOTOPOINT: Azimuth From / To Center: _____ Distance: _____

SPECIES	COVER CLASS	AVG. HT.	NOTES
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Overstory: Ø

✓ Bare ground	1	—	
✓ Lotus corniculatus	seldom	48	
Understory: ✓ Calamagrostis	seldom	48	
✓ Salix	3	60	
✓ Sanguisorba	1	24	flowering stems taller
✓ Spiraea	5	50	
✓ Athyrium	1	36	
✓ Skunk Cabbage	2	36	
✓ Ledum	1	48	
✓ Azalea	2	60	
✓ Lathyrus palustris	1	48	
✓ Carex aquatilis	3	48	
✓ Potentilla palustris	2	36	

INTERIOR QUADRAT # 14A LOCATION FROM CENTER: Center of circular plot is SE corner NW corner is 8.5 ft @ 275°
 (azimuth and distance to nearest quadrat corner from circular plot center)

PHOTOPOINT: Azimuth From / To Circular Plot Center: _____ Distance: _____

SPECIES	COVER CLASS	AVG. HT.	NOTES
---------	-------------	----------	-------

Overstory: Ø

Understory:			
✓ Carex aquatilis	3	48	
✓ Potentilla palustris	1	36	
✓ Salix	3	66	
✓ Spiraea	2	48	
✓ Bare ground	1	—	
✓ Sanguisorba	1	28	
✓ Lathyrus palustris	1	42	
✓ Skunk Cabbage	3	36	
✓ Ledum	1	36	
✓ Calamagrostis	1	48	
✓ Athyrium	1	40	

INTERIOR QUADRAT # 14B LOCATION FROM CENTER: 5.5 ft. @ 105° to western corner. 14 ft. @ 105° to S. corner
 (azimuth and distance to nearest quadrat corner from circular plot center)

PHOTOPOINT: Azimuth From / To Circular Plot Center: _____ Distance: _____

SPECIES COVER CLASS AVG. HT. NOTES

Overstory:

Understory:

<i>Carex aquatilis</i>	4	48	
<i>Potentilla canadensis</i>	2	36	
<i>Salix</i>	1	48	not noted
<i>Sorbus</i>	3	50	
<i>Samolus</i>	1	—	
<i>Sarrisola</i>	1	20	
<i>Lathyrus palustris</i>	1	48	
<i>Sanguisorba</i>	1	24	

Cover Class Values:

- solitary
- very scattered; seldom
- 1 = 1 - 4%
- 2 = 5 - 10%
- 3 = 11 - 25%
- 4 = 26 - 33%
- 5 = 34 - 50%
- 6 = 51 - 75%
- 7 = 76 - 90%
- 8 = 91 - 100%

Target Species:

- Lilium occidentale*
- Trientalis arctica*
- Lathyrus palustris*
- Viola palustris*
- Sanguisorba officinalis*
- Carex leptalea*, *C. viridula*,
- C. lyngbyei*, *C. praticola*
- Plantathera leucostachys*
- Epipactis gigantea*
- Hierochloe odorata*

GRAZING IMPACTS FIELD DATA SHEET

SITE: Humboldt Rd West DATE: 7/27/03 BY: AC/JC
7/25/03 BY: RB/KW

STRATA: Willow Scrub Marsh Edge Marsh Spiraea/Ledum Grass/Openings
 Malus/Azalea Other:

CIRCULAR PLOT # 15 (30 ft. diameter; 15 ft. radius)

LOCATION: 36 ft. from baseline 20 ft. @ 160°

PHOTOPOINT: Azimuth From / To Center: Distance:

SPECIES	COVER CLASS	AVG. HT.	NOTES
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Overstory:

✓ <i>Salix</i>	solitary	10 ft	

Understory:

✓ <i>Carex aquatilis</i>	6	48	
✓ <i>Spiraea</i>	4	45	
✓ <i>Lathyrus palustris</i>	1	46	
✓ <i>Salix</i>	seldom	46	
✓ <i>Potentilla palustris</i>	3	40	
✓ <i>P. anserina</i>	1	24	
✓ <i>Carex virginica cusickii</i>	1	50	
✓ <i>Athyrium</i>	1	36	
✓ Skunk cabbage	1	30	
✓ Bare ground	1	—	

INTERIOR QUADRAT # 15A LOCATION FROM CENTER: center of circular is the western corner; eastern corner is 8.5 ft. @ 55°
 (azimuth and distance to nearest quadrat corner from circular plot center)

PHOTOPOINT: Azimuth From / To Circular Plot Center: Distance:

SPECIES	COVER CLASS	AVG. HT.	NOTES
---------	-------------	----------	-------

Overstory: Ø

Salix is almost overstory for this plot

Understory:

✓ <i>Carex aquatilis</i>	5	40	
✓ <i>Lathyrus palustris</i>	1	24	
✓ Skunk cabbage	1	24	
✓ <i>Spiraea</i>	3	42	
✓ <i>Potentilla palustris</i>	3	34	
✓ <i>P. anserina</i>	2	18	
✓ Bare ground	1	—	

TER: 5.5 ft. @ 340° to S corner,
quadrat corner from circular plot center)
Distance: 14 ft. @ 340° to N. corner

T. NOTES

same Salix is almost
overstory for this plot
(rising sun, if there were any,
would be shaded)

we to rest of marsh

8
8
0
4
-
0

- cies:**
dentale
retica
lustris
tris
a officinalis
lea, C. viridula,
i, C. praticola
leucostachys
igantea
odorata

INTERIOR QUADRAT # 15B LOCATION FROM CENTER: 5.5 ft. @ 340° to S corner
 (azimuth and distance to nearest quadrat corner from circular plot center)

PHOTOPOINT: Azimuth From / To Circular Plot Center: _____ Distance: 14 ft. @ 340° to N. corner

SPECIES COVER CLASS AVG. HT. NOTES

Overstory: Ø

same Salix is almost
 overstory for this plot
 (rising sun, if there were any
 would be shaded)

this is
 of marsh

Marsh veg is tall (here) relative to rest of marsh

Understory:

✓ <i>Carex aquatilis</i>	4	48
✓ <i>Spiraea</i>	3	48
✓ <i>Lathyrus palustris</i>	1	36
✓ <i>Potentilla palustris</i>	2	36
✓ <i>Kunk cabbage</i>	1	24
✓ Bare ground	1	—
✓ <i>Athyrium</i>	1	20

- Cover Class Values:**
- solitary
 - very scattered; seldom
 - 1 = 1 - 4%
 - 2 = 5 - 10%
 - 3 = 11 - 25%
 - 4 = 26 - 33%
 - 5 = 34 - 50%
 - 6 = 51 - 75%
 - 7 = 76 - 90%
 - 8 = 91 - 100%

- Target Species:**
- Lilium occidentale*
 - Trientalis arctica*
 - Lathyrus palustris*
 - Viola palustris*
 - Sanguisorba officinalis*
 - Carex leptalea*, *C. viridula*,
 - C. lyngbyei*, *C. praticola*
 - Plantathera leucostachys*
 - Epipactis gigantea*
 - Hierochloe odorata*

Seasonal moving water in this U

GRAZING IMPACTS FIELD DATA SHEET

SITE: Humboldt Rd West DATE: 7/27 7/25/03 BY: AC/JC
RR/KW

STRATA: Willow Scrub Marsh Edge Marsh Spiraea/Ledum Grass/Openings
Malus/Azalea Other: Malus Spiraea Small shrubs

CIRCULAR PLOT # 16 (30 ft. diameter; 15 ft. radius)

LOCATION: 33 ft. from 21' baseline @ 30°

PHOTOPOINT: Azimuth From / To Center: _____ Distance: _____

SPECIES	COVER CLASS	AVG. HT.	NOTES
Overstory: Dogwood	1	10 ft	
✓ Malus	3	15 ft	
✓ Picca	2	15 ft	not rooted
✓ Manica	1	10 ft	
✓ Salix	3	15 ft	
✓ Lonicera	1	10 ft	} debatably also in understory
✓ Azalea	2	6 ft	
Understory:			
Rosa	1	4 ft	
✓ Skunk cabbage	2	4 ft	
✓ Ledum	2	5 ft	• debatably in overstory
✓ Carex obnupta	3	4.5 ft	
✓ Spiraea	2	5 ft	• debatably in overstory
✓ Lathyrus palustis	1	48 in	
✓ Bare ground	2	—	
✓ Rhynium	1	30 in	

INTERIOR QUADRAT # 16A LOCATION FROM CENTER: Circular plot center 15 S. corner
at corner 8.5' @ 35°
(azimuth and distance to nearest quadrat corner from circular plot center)

PHOTOPOINT: Azimuth From / To Circular Plot Center: _____ Distance: _____

SPECIES	COVER CLASS	AVG. HT.	NOTES
Overstory:			
✓ Azalea	2	10 ft	
✓ Malus	3	15 ft	
✓ Salix	3	15 ft	
✓ Spiraea	1	9 ft	
✓ Ledum	1	5 ft	
Understory:			
✓ Skunk Cabbage	1	60 in	
✓ Carex obnupta	3	54	
✓ Bare ground	3	—	

INTERIOR QUADRAT # 16B LOCATION FROM CENTER: 12.5' @ 260° from center
(azimuth and distance to nearest quadrat corner from circular plot center) to N. corner: 14.5' @ 275°

PHOTOPOINT: Azimuth From / To Circular Plot Center: _____ Distance: _____

SPECIES COVER CLASS AVG. HT. NOTES

Overstory:
Malus 2 8-ft 7

Understory:
Spiraea 4 5 ft
Skunk Cabbage 3 3 ft
Azalea 3 5 ft
ledum 1 5 ft
Carex obnupta 3 4.5 ft
Lathyrus palustris 1 4 ft
Bare ground 2 -

Center
to S.
corner

Nice
machete
job Kyle!

Cover Class Values:

- solitary
- very scattered; seldom
- 1 = 1 - 4%
- 2 = 5 - 10%
- 3 = 11 - 25%
- 4 = 26 - 33%
- 5 = 34 - 50%
- 6 = 51 - 75%
- 7 = 76 - 90%
- 8 = 91 - 100%

Target Species:

- Lilium occidentale
- Trientalis arctica
- Lathyrus palustris
- Viola palustris
- Sanguisorba officinalis
- Carex leptalea, C. viridula,
- C. lyngbyei, C. praticola
- Plantathera leucostachys
- Epipactis gigantea
- Hierochloe odorata

Baseline is the Enclosure's baseline 0 to +100 ft.

GRAZING IMPACTS FIELD DATA SHEET

SITE: Humboldt Road DATE 7.27.03 BY: _____

STRATA: Willow Scrub Marsh Edge Marsh Spiraea/Ledum Grass/Openings

Malus/Azalea ~~from~~ Other: Rhamnus / Myrica Shrubw / Lilies

CIRCULAR PLOT # 17 (30 ft. diameter; 15 ft. radius)

LOCATION: 10 ft from baseline +95 ft @ 265°

PHOTOPOINT: Azimuth From / To Center: _____ Distance: _____

SPECIES COVER CLASS AVG. HT. NOTES

Overstory: ^{total cover = 45%}

✓ Spruce	1	(^{little w. side} on E. side) = 40' tall	Loncera Solitary 5'
✓ Spiraea	3	5'	
✓ Azalea	3	5'	
✓ Rhamnus	2	20'	
✓ Myrica	1	20'	

Understory:

✓ Aster	1	24"	Azalea seedling = scattered 3"
✓ Anthoxanthum	1	36"	Juncus sp. 1 36"
✓ Abies	Scattered 1	30"	✓ Hypericoides # Scattered 3"
✓ Pteridium	2	36"	✓ Potentilla anserina Scattered 24"
✓ Liliom - the	3	from plot 17B	Rhamnus seedling - scattered
✓ Calamagrostis	1	48"	✓ Little Hypericum: Solitary clump 3
✓ Rubus	2	24"	
✓ Equisetum	1	20"	
✓ Panthoria decumbens	1	12"	
✓ Phronelle Vulgaris	1	mostly just lvs 3"	

INTERIOR QUADRAT # 17A LOCATION FROM CENTER: quadrat; N.W. corner is 8.5 ft @ 345°
(azimuth and distance to nearest quadrat corner from circular plot center)

PHOTOPOINT: Azimuth From / To Circular Plot Center: _____ Distance: _____

SPECIES COVER CLASS AVG. HT. NOTES

Overstory: overstory > 90%

✓ Rhamnus	3	20'	
✓ Azalea	3	5'	
✓ Spiraea	5	5'	

Understory:

✓ Liliom	16"	juv. at edge of Azalea/Spiraea on E. side of plot
✓ Pteridium	2	36"
✓ Equisetum	2	16"
✓ Rubus	2	6"
✓ Juncus effusus	2	24"
✓ Bare ground	4	
✓ Rhamnus seedlings	1	3"
✓ Hypochaeris radicata		scattered = ground level. 3"

INTERIOR QUADRAT # 198 LOCATION FROM CENTER: 2.5' from ^{PLOT} center @ 105° (azimuth and distance to nearest quadrat corner from circular plot center)
E corner is 11' @ 105°

PHOTOPOINT: Azimuth From / To Circular Plot Center: _____ Distance: _____

SPECIES	COVER CLASS	AVG. HT.	NOTES
Overstory: total canopy cover > 90%			
✓ Spiraea	6	72"	
✓ Rhamnus	1	10'	
✓ Azalea	2	72"	
✓ Lonicera involucrata	1	60"	

ell on edge of Spiraea/Rhamnus at eastern corner

Understory:			
✓ Lilium occidentale	5 seedlings	4.8" w/ 2 fr. 38" spaced, 436, 15"	
✓ Pteridium	1	36" 20"	
✓ Erechtites	scattered	24"	
✓ Rubus ursinus	2	30"	
✓ Carex obovata	2	36"	
✓ Equisetum	1	18"	
✓ Juniperus l.	1	30"	

Cover Class Values:

- solitary
- very scattered; seldom
- 1 = 1 - 4%
- 2 = 5 - 10%
- 3 = 11 - 25%
- 4 = 26 - 33%
- 5 = 34 - 50%
- 6 = 51 - 75%
- 7 = 76 - 90%
- 8 = 91 - 100%

Target Species:

- Lilium occidentale
- Trientalis arctica
- Lathyrus palustris
- Viola palustris
- Sanguisorba officinalis
- Carex leptalea, C. viridula,
- C. lyngbyei, C. praticola
- Plantathera leucostachys
- Epipactis gigantea
- Hierochloe odorata

GRAZING IMPACTS FIELD DATA SHEET

in 30' circular count all flowering Lilies
in small quadrats: all Lilies counted

SITE: Humboldt Road DATE: 7-27-03 BY: Roz

STRATA: Willow Scrub Marsh Edge Marsh Spiraea/Ledum Grass/Openings
Malus/Azalea Other: _____

CIRCULAR PLOT # 18 (30 ft. diameter; 15 ft. radius)

LOCATION: 27 ft. from baseline 35 ft. @ 300°

PHOTOPOINT: Azimuth From / To Center: _____ Distance: _____

SPECIES	COVER CLASS	AVG. HT.	NOTES
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Overstory: total overstory > 95% 12'

✓ Spruce	2	35'	
----------	---	-----	--

✓ Rhamnus	5	20'	
-----------	---	-----	--

✓ Alder rubra	1	20'	
---------------	---	-----	--

✓ Myrica	3	10'	
----------	---	-----	--

✓ Azalea	2	6'	
----------	---	----	--

✓ Malus	solitary	20'	
---------	----------	-----	--

Understory:

✓ Lillium → no flowering Lilies 50, 8"			✓ Epipactis - 12" scattered on SW side
--	--	--	--

✓ Rubus ursinus	2	ground level 3"	✓ Holcus scattered 24"
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✓ Sanguisorba	1	16"	✓ Potentilla anserina Scatt. 12"
---------------	---	-----	----------------------------------

✓ Pteridium	2	30"	✓ Juncus cuspidatus seldom 16"
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✓ Equisetum	2	16"	✓ Carex obtusa 7 36"
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✓ Danthonia decumbens	1	on ground - 8"	✓ Lotus corniculatus scattered meadow
-----------------------	---	----------------	---------------------------------------

✓ Maianthemum	scattered	8"	✓ Anthoxanthum 1 30"
---------------	-----------	----	----------------------

✓ Calamagrostis	1	48"	
-----------------	---	-----	--

✓ Spiraea	scattered	12"	
-----------	-----------	-----	--

✓ Bare ground:	5		
----------------	---	--	--

INTERIOR QUADRAT # 18A LOCATION FROM CENTER: 7 ft. @ 305° to E. corner
(azimuth and distance to nearest quadrat corner from circular plot center)

PHOTOPOINT: Azimuth From / To Circular Plot Center: _____ Distance: 15' @ 290° to W. corner

SPECIES	COVER CLASS	AVG. HT.	NOTES
---------	-------------	----------	-------

Overstory: total overstory > 98%

✓ Spruce	5	30'	✓ Alder 2 15'
----------	---	-----	---------------

✓ Rhamnus	2	20'	
-----------	---	-----	--

✓ Myrica	2	6'	
----------	---	----	--

✓ Azalea	2	6'	
----------	---	----	--

Understory:

✓ Lillium = 6" juv; 3" juv; 1 seedling			
--	--	--	--

✓ Rhamnus sapling	solitary	9"	
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✓ Rubus ursinus	1	on ground 3"	
-----------------	---	--------------	--

✓ Danthonia decumbens	5	laying @ ground level, 8" mostly SW side of plot	
-----------------------	---	--	--

✓ Sanguisorba	scattered	6"	
---------------	-----------	----	--

✓ Pteridium	solitary	12"	
-------------	----------	-----	--

✓ Equisetum	1	18"	
-------------	---	-----	--

✓ Bare ground	5	on NE side plot	
---------------	---	-----------------	--

INTERIOR QUADRAT # 18B LOCATION FROM CENTER: 6 ft. @ 120° to W. corner.
 (azimuth and distance to nearest quadrat corner from circular plot center)

PHOTOPOINT: Azimuth From / To Circular Plot Center: _____ Distance: 14.5 ft
 E. corner

SPECIES COVER CLASS AVG. HT. NOTES

Overstory: - total canopy cover = 298%

✓ Spruce	5	30'	
✓ Rhododendron	3	20'	
✓ Azalea	3	5'	

Understory: Danthonia dec.
 ✓ Small stemmed grass (Agrostis?) - mostly laying flat, 6

✓ Maianthemum	Scattered	6"	
✓ Pteridium	Solitary	12"	
✓ Rubus ursinus	1	6"	
✓ Spiraea	Scattered	12"	
✓ Equisetum	Scattered	12"	on outer edge
✓ Calamagrostis	1	24"	
✓ Lilium occidentale	6" juv.; 8" juv.		inside at base next to dense shrub
✓ Bare ground	3		

- Cover Class Values:**
- solitary
 - very scattered; seldom
 - 1 = 1 - 4%
 - 2 = 5 - 10%
 - 3 = 11 - 25%
 - 4 = 26 - 33%
 - 5 = 34 - 50%
 - 6 = 51 - 75%
 - 7 = 76 - 90%
 - 8 = 91 - 100%

- Target Species:**
- Lilium occidentale
 - Trientalis arctica
 - Lathyrus palustris
 - Viola palustris
 - Sanguisorba officinalis
 - Carex leptalea, C. viridula,
 - C. lyngbyei, C. praticola
 - Plantathera leucostachys
 - Epipactis gigantea
 - Hierochloe odorata

GRAZING IMPACTS FIELD DATA SHEET

SITE: Humboldt Rd. DATE: 7-27-03 BY: _____

STRATA: Willow Scrub Marsh Edge Marsh Spiraea/Ledum Grass/Openings
Malus/Azalea Other:

CIRCULAR PLOT # ~~180~~ (30 ft. diameter; 15 ft. radius)

LOCATION: _____

PHOTOPOINT: Azimuth From / To Center: _____ Distance: _____

SPECIES COVER CLASS AVG. HT. NOTES

Overstory: _____

Understory: _____

INTERIOR QUADRAT # 180 LOCATION FROM CENTER: 14' @ 225° to N. corner

(azimuth and distance to nearest quadrat corner from circular plot center)

PHOTOPOINT: Azimuth From / To Circular Plot Center: _____ Distance: 22.5 to S. corner @ 200

SPECIES COVER CLASS AVG. HT. NOTES

Overstory: total canopy cover = 450%
✓ Spruce 3 40' plot placed for
✓ Rhamnus 1 10' Epipactis
✓ Azalea 1 5' _____

Understory:
✓ Epilobium 3 24"
✓ Rubus 3 24"
✓ Sanguisorba 1 18"
✓ Lotus cornu 1 18"
✓ Carex obs. 1 36"
✓ Spiraea 1 18"
✓ Hippochaeris Scattered 12"
✓ Epipactis (looks right, not flowering) leaves clasp stem, rounded scattered = 12"
✓ Pteridium 1 18"
✓ Hieracium 1 36"
✓ Potentilla anserina seldom 12"
✓ Juncus tenuifolius - Scattered 16"

GRAZING IMPACTS FIELD DATA SHEET

SITE: Humboldt Rd. DATE 7-27-03 BY: RB

STRATA: Willow Scrub Marsh Edge Marsh Spiraea/Ledum Grass/Openings
 Malus/Azalea Other: _____

CIRCULAR PLOT # 19 (30 ft. diameter; 15 ft. radius)

LOCATION: center = 9 ft. from baseline 55 ft. @ 75°

PHOTOPOINT: Azimuth From / To Center: _____ Distance: _____

SPECIES COVER CLASS AVG. HT. NOTES

Overstory: 0 Total Overstory = 10%

✓ Myrica	1		10'
✓ Alnus rubra	Solitary		6'
✓ Rhamnus	1		12'
✓ Malus	1		20'
✓ Spiraea	1		6'

Understory:

✓ Rubus ursinus	3	24"	✓ Carex obnupta	2	36"
✓ Aster chilensis	3	24"	✓ Agrostis sp. scattered	124"	
✓ Lotus formosus	scattered	24"	✓ Erigeron	seldom	36"
✓ Sanguisorba	3	24"	✓ Cotoneaster	Solitary	18"
✓ Lotus cornic.	1	24"	✓ Deschampsia	scattered	36"
✓ Pteridium	2	24"	✓ Plantago lanceolata	1	not
✓ Anthoxanthum	2	36"	✓ Juncus acutiflorus	scattered	Floric. included
✓ Holcus	Seldom	36"			
✓ Prunella vulgaris	Scattered	12"			
✓ Potentilla anserina	3	24"			

Circular plot center is corner

INTERIOR QUADRAT # 19A LOCATION FROM CENTER: N corner is 8.5' @ 0°

(azimuth and distance to nearest quadrat corner from circular plot center)

PHOTOPOINT: Azimuth From / To Circular Plot Center: _____ Distance: _____

SPECIES COVER CLASS AVG. HT. NOTES

Overstory: 0 Total overstory = 0

plot placed for Sanguisorba

Understory:

✓ Rubus ursinus	4	24"
✓ Sanguisorba officinalis	3	24"
✓ Lotus corniculatus (type)	1	24"
✓ Pteridium	1	24"
✓ Anthoxanthum	1	36"
✓ Carex obnupta	2	36"
✓ Potentilla anserina	2	24"
✓ Deschampsia caespitosa	Scattered	36"
✓ Equisetum	Scattered	24"

INTERIOR QUADRAT # 19B LOCATION FROM CENTER: 7.5 ft @ 260° to E. corner
 (azimuth and distance to nearest quadrat corner from circular plot center) to W. corner = 15.5' @ 230°

PHOTOPOINT: Azimuth From / To Circular Plot Center: _____ Distance: _____

SPECIES	COVER CLASS	AVG. HT.	NOTES
Overstory:			
✓ <i>Azalea</i>	1	6'	plot designated Placed for CANA
✓ <i>Myrica</i>	1	8'	
✓ <i>Malus</i>	3	20'	
✓ <i>Rhamnus</i>	1	6'	

Understory:			
✓ <i>Calamagrostis nukaensis</i>	46	48"	
✓ <i>Pteridium</i>	7	36"	
✓ <i>Rubus ursinus</i>	2	24"	
✓ <i>Holcus</i>	scattered	24"	
✓ <i>Equisetum</i>	seldom	24"	
✓ <i>Potentilla anserina</i>	seldom	24"	

Cover Class Values:

- solitary
- very scattered; seldom
- 1 = 1 - 4%
- 2 = 5 - 10%
- 3 = 11 - 25%
- 4 = 26 - 33%
- 5 = 34 - 50%
- 6 = 51 - 75%
- 7 = 76 - 90%
- 8 = 91 - 100%

Target Species:

- Lilium occidentale*
- Trientalis arctica*
- Lathyrus palustris*
- Viola palustris*
- Sanguisorba officinalis*
- Carex leptalea*, *C. viridula*,
- C. lyngbyei*, *C. praticola*
- Plantathera leucostachys*
- Epipactis gigantea*
- Hierochloe odorata*

**CRESCENT CITY MARSH WILDLIFE AREA
GRAZING IMPACTS MONITORING PROJECT**

ATTACHMENT 2

**2003 SPREADSHEET DATA FILES ON CD
PRE-GRAZING MONITORING
HUMBOLDT ROAD WEST AND
HUMBOLDT ROAD SITES**

TABLE 1. Locations of Circular Plots and Interior Quadrats for Grazing Impacts Monitoring, Humboldt Road West and Humboldt Road Sites, CCMWA. Circular plots and reference baselines are mapped in Figures 2 and 3. For each interior quadrat, the closest corner to the center of the circular plot is given first, followed by its corresponding diagonal corner; (E) = the eastern corner of the quadrat, (W) = western, etc.

Circular Plot #	Stratum	Baseline UTM Coordinates	Location of Circular Plot Center	Interior Quadrat A	Interior Quadrat B
		easting / northing	(easting / northing; relative to baseline)	(6 ft. x 6 ft.)	(6 ft. x 6 ft.)
1	Marsh Edge	403326 / 4621764 403347 / 4621743 0'=SE end; 100'=NW end	403347 / 4621743 X=0, Y=0 on western lily census monitoring grid	6.5 ft. @ 60° (E) 12.0 ft. @ 280° (W)	9.0 ft. @ 165° (N) 17.0 ft. @ 350° (S)
2	Marsh Edge	same as Plot #1	403337 / 4621746 X=38.5, Y=13 on census monitoring grid	10.0 ft. @ 260° (S) 17.0 ft. @ 280° (N)	10.0 ft. @ 160° (N) 17.0 ft. @ 150° (S)
3	Scrub	same as Plot #1	403332 / 4621761 X=75, Y= -16 on census monitoring grid	7.0 ft. @ 225° (N) 12.0 ft. @ 170° (S)	7.5 ft. @ 350° (E) 15.5 ft. @ 330° (W)
4	Marsh	same as Plot #1	403332 / 4621737 X=38.5, Y=46 on census monitoring grid	8.0 ft. unrecorded 14.0 ft. unrecorded	6.0 ft. @ 195° (W) 12.5 ft. @ 150° (E)

5	Scrub	403274 / 4621730 403287 / 4621740 0'=SW end; 57' =NE end	403280 / 4621749 50 ft. @ 340° from 42.5 ft. on baseline	7.7 ft. @ 85° (SW) 15.5 ft. @ 45° (NE)	15.0 ft @ 120° (NE) 23.0 ft. @ 125° (SW)
6	Marsh Edge	same as Plot #5	403286 / 4621738 25 ft. @ 135° from 32.0 ft. on baseline	5.5 ft. @ 110° (SW) 8.0 ft. @ 5° (NE)	6.5 ft. @ 210° (NE) 15.0 ft. @ 180° (SW)
7	Marsh	same as Plot #5	403289 / 4621721 55 ft. @ 140° from 31.0 ft. on baseline	12.5 ft. @ 290° (E) 15.0 ft. @ 280° (W)	

8	Marsh Edge	403393 / 4621738 403402 / 4621732 0'=NW end; 61'=SE end	403399 / 4621727 9.5 ft. @ 205° from 14.5 ft. on baseline	6.0 ft. @ 350° (S) 14.5 ft. @ 355° (N)	3.5 ft. @ 145° (NE) 12.0 ft. @ 145° (SW)
9	Marsh	same as Plot #8	403397 / 4621719 40 ft. @ 200° from 19 ft. on baseline	6.5 ft. @ 5° (S) 15.0 ft. @ 5° (N)	6.0 ft. @ 125° (NW) 14.5 ft. @ 125° (SE)
10	Scrub	same as Plot #8	403392 / 4621744 35 ft. @ 340° from 5.5 ft. on baseline (at base of alder inside shrub thicket)	circle center (W) 8.5 ft. @ 70° (E)	6.5 ft. @ 340° (SE) 15.0 ft. @ 340° (NW)

TABLE 1 (con't.). Locations of Circular Plots and Interior Quadrats for Grazing Impacts Monitoring, Humboldt Road West and Humboldt Road Sites, CCMWA. Circular plots and reference baselines are mapped in Figures 2 and 3. For each interior quadrat, the closest corner to the center of the circular plot is given first, followed by its corresponding diagonal corner; (E) = the eastern corner of the quadrat, (W) = western, etc.

Circular Plot #	Stratum	Baseline UTM Coordinates	Location of Circular Plot Center	Interior Quadrat A	Interior Quadrat B
		easting / northing	(easting / northing; relative to baseline)	(6 ft. x 6 ft.)	(6 ft. x 6 ft.)
11	Marsh Edge	403451 / 4621720 403464 / 4621718 0'=W end; 40'=E end	403461 / 4621719 1.5 ft. @ 180° from 31.5 ft. on baseline	6.0 ft. @ 345° (S) 14.5 ft. @ 345° (N)	circle center (W) 8.5 ft. @ 90° (E) (= baseline @ 40.0 ft. (E))
12	Marsh	same as Plot #11	403457 / 4621712 30 ft. @ 190° from 22 ft. on baseline	5.5 ft. @ 10° (S) 14.0 ft. @ 10° (N)	circle center (W) 8.5 ft. @ 120° (E)
13	Scrub	same as Plot #11	403461 / 4621729 33 ft. @ 5° from 30.5 ft. on baseline	5.0 ft. @ 220° (N) 8.5 ft. @ 310° (W)	circle center (E) unrecorded

14	Marsh Edge	403480 / 4621724 403490 / 4621725 0'=W end; 36'=E end	403485 / 462172 43.5 ft. @ 170° from 20.5 ft. on baseline	circle center (SE) 8.5 ft. @ 275° (NW)	5.5 ft. @ 105° (W) 14.0 ft. @ 105° (E)
15	Marsh	same as Plot #15	403489 / 4621713 36 ft. @ 160° from 20 ft. on baseline	circle center (W) 8.5 ft. @ 55° (E)	5.5 ft. @ 340° (S) 14.0 ft. @ 340° (N)
16	Scrub	same as Plot #15	403492 / 4621734 33 ft. @ 30° from 21 ft. on baseline	circle center (S) 8.5 ft. @ 35° (N)	12.5 ft. @ 260° (N) 14.5 ft. @ 225° (S)

17	Scrub	403816 / 4621933 403821 / 4621908 0'=S end; 116'=N end	403815 / 4621927 10 ft. @ 265° from 95 ft. on baseline (baseline is the census monitoring transect)	circle center (SE) 8.5 ft. @ 345° (NW)	2.5 ft. @ 105° (W) 11.0 ft. @ 105° (E)
18	Scrub	same as Plot #17	403814 / 4621917 27 ft. @ 300° from 35 ft. on baseline (baseline is the census monitoring transect)	7.0 ft. @ 305° (E) 15.0 ft. @ 290° (W) *Interior Quadrat C: 14.0 ft. @ 225° (N) 22.5 ft. @ 200° (S)	6.0 ft. @ 120° (W) 14.5 ft. @ 120° (E)
19	Opening	same as Plot #17	403820 / 462191 99 ft @ 75° from 55 ft. on baseline (baseline is the census monitoring transect)	circle center (S) 8.5 ft. @ 0° (N)	7.5 ft. @ 260° (E) 15.5 ft. @ 230° (W)

TABLE 2 (cont): Pre-Grazing Baseline Data for Grazing Impacts Monitoring Plots: Species Cover, Height, and Frequency, Humboldt Road West Site, CCMWA, July 24, 25, and 27, 2003.

(Plots grouped by stratum; cov. = cover class value*; ht.= average height (inches); avg. cov. (%), avg. ht. (in.), and frequency (%) were calculated within each stratum.)

Plot Number:	1		1A		1B		2		2A		2B		6		6A		6B		8		8A		8B	
Stratum:	Marsh Edge						Marsh Edge						Marsh Edge						Marsh Edge					
Species	cov.	ht.	cov.	ht.	cov.	ht.	cov.	ht.	cov.	ht.	cov.	ht.	cov.	ht.	cov.	ht.	cov.	ht.	cov.	ht.	cov.	ht.	cov.	ht.
<i>Agrostis sp.</i>													1	24			1	24						
<i>Alnus rubra</i>	1	216																						
<i>Alnus viridus ssp. sinuata</i>																								
<i>Angelica genuflexa</i>							SE		72										SO		30	SO		30
<i>Anthoxanthum odoratum</i>																								
<i>Aster chilensis</i>																								
<i>Athyrium filix-femina</i>	2	42			SO		12	3	60	2	54		1	18	1	24	2	18						
<i>Bare ground</i>							SE					2												2
<i>Blechnum spicant</i>																								
<i>Calamagrostis nutkaensis</i>													1	36										
<i>Carex aquatilis var. dives</i>																				6	40	1	40	1
<i>Carex buxbaumii</i>	2	42																	SE		18			
<i>Carex cusickii</i>																								
<i>Carex obnupta</i>	4	42	1	30	7	36	5	60	7	60	6	48	2	36	3	36	1	36	2	40	2	40	3	
<i>Carex vesicaria</i>																								
<i>Cornus sericea</i>																								
<i>Danthonia decumbens</i>	SE		24	SE		24																		
<i>Deschampsia caespitosa</i>																								
<i>Disporum smithii</i>																								
<i>Eleocharis sp.</i>	3	12	3	18	2	12														2	18	2	12	2
<i>Epipactis gigantea</i>																								
<i>Equisetum telmateia</i>													1	10										
<i>Erechtites minima</i>																								
<i>Galium sp.</i>																								
<i>Gaultheria shallon</i>																								
<i>Holcus lanatus</i>																								
<i>Hypericum sp.</i>																								
<i>Hypochaeris radicata</i>																								
<i>Juncus sp.</i>																								
<i>Juncus effusus</i>	2	42	2	36			SE		36				2	36	3	36	3	40	1	36	1	36	2	
<i>Lathyrus palustris</i>	1	24	SE		18			1	60	1	48	SE	30						1	18	SE		36	SE

		11			11A			11B			14			14A			14B			CIRCLES			QUADRATS		
		Marsh Edge						Marsh Edge																	
ht.	cov.	ht.	cov.	ht.	cov.	ht.	cov.	ht.	cov.	ht.	cov.	ht.	cov.	ht.	cov.	ht.	cov.	ht.	avg. cov.	avg. ht.	avg. freq.	avg. cov.	avg. ht.	avg. freq.	
																			<1	24	0.17	<1	24	0.08	
																			<1	216	0.17	0	0	0	
																			0	0	0	0	0	0	
																			<1	51	0.33	<1	30	0.08	
																			0	0	0	0	0	0	
																			0	0	0	0	0	0	
									1	36	1	40							5	39	0.67	2	25	0.42	
		1		1		2		1		1		1		1					2		0.67	3		0.5	
																			0	0	0	0	0	0	
																			<1	42	0.33	<1	48	0.08	
							SE		48	1	48								21	43	0.5	6	42	0.42	
40	5	40				3	36	3	48	3	48	4	48	48	21	43	0.5	6	42	0.42					
		1	24			1	30								2	28	0.5	<1		30	0.08				
		1	40	1	36										<1	41	0.17	<1		36	0.08				
40	1	30	2	30	3	36									15	42	0.83	30	39	0.83					
															0	0	0	0	0	0	0	0	0	0	
															0	0	0	0	0	0	0	0	0	0	
															<1	24	0.17	<1		24	0.08				
															0	0	0	0	0	0	0	0	0	0	
															0	0	0	0	0	0	0	0	0	0	
12	2	10	2	6											6	13	0.5	4	12	0.42					
															0	0	0	0	0	0	0	0	0	0	
		1	18			1	8								<1	14	0.33	<1		8	0.08				
															0	0	0	0	0	0	0	0	0	0	
	SE		6 SE		6										<1	6	0.17	<1		6	0.08				
															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	
24	1	36													4	37	0.83	11	34	0.42					
24	1	24					1	48	1	42	1	40	40	2	35	0.83	<1		34	0.58					

<i>Lathyrus sp. (2 leaflet)</i>	se	18 SE	18	SE	24 SE	24																	
<i>Ledum glandulosum</i>	1	42																					
<i>Lilium occidentale</i>	1	54	1	60																			
<i>Lonicera involucrata var. lebedourii</i>						1	72				1	60											
<i>Lotus corniculatus</i>	1	36	1	24	SE	60	1	48		1	24	1	24	1	12								
<i>Lotus formosissimus</i>																							
<i>Lycopus uniflora</i>	SE	6 SE	6	SE	8 SE	8			1	12	1	12	3	12 SE		18 SO		18 SE					
<i>Lysichiton americanum</i>	SE	12		SE	12	1	60									1	18	2	18	1			
<i>Maianthemum dilatatum</i>	SE	6 SE	6																				
<i>Malus fusca</i>																							
<i>Myrica californica</i>											1	108											
<i>Picea sitchensis</i>	1	216		3	120																		
<i>Polystichum munitum</i>																							
<i>Potentilla anserina ssp. pacifica</i>	SE	24	1	24	1	18 SE	36 SE	48	1	24	2	24	3	18	3	12	2	18	1	30	2		
<i>Potentilla palustris</i>	SE	24 SE	24			2	36		2	36							3	24			1		
<i>Prunella vulgaris</i>																							
<i>Pteridium aquilinum</i>	2	42 SE	24			1	60				1	24			1	24							
<i>Ranunculus repens</i>											1	10											
<i>Rhamnus purshiana</i>						SE	60				SO	72											
<i>Rhododendron occidentale</i>	3	72	5	60							1	96					1	60					
<i>Rosa sp.</i>																							
<i>Rubus discolor</i>																							
<i>Rubus spectabilis</i>																							
<i>Rubus ursinus</i>	SE	18 SE	18			1	60 SE	60			1	24	1	24									
<i>Salix spp.</i>	1	42					2	72			1	60											
<i>Sanguisorba officinalis</i>	1	24	1	24	2	30 SE	36		1	36	1	24	1	24	1	12	1	24	2	30 SE			
<i>Solidago sp.</i>	SE	20 SE	20								1	18	1	18									
<i>Spiraea douglasii</i>	3	42	1	30	1	24	4	60	3	60	3	48	2	48	1	24	3	36	4	48	2	40	3
<i>Standing water</i>																							
<i>Trientalis arctica</i>	1	6 SE	6								1	6			1	6							
<i>Viola adunca</i>																	SE	3			SO		
<i>Viola palustris</i>	SE	10 SE	12								1	8	1	6	1	8							

*Cover Class Values: SO = solitary, SE = seldom or scattered, 1 = 1-4%, 2 = 5-10%, 3 = 11-25%, 4 = 26-33%, 5 = 34-50%, 6 = 51-75%, 7 = 76-90%, 8 = 91-100%.

														<1	21	0.33	<1	21	0.17
							1	48	1	36				<1	45	0.33	<1	36	0.08
														<1	54	0.17	<1	60	0.08
														<1	66	0.33	0	0	0
	SE		48											1	42	0.67	<1	27	0.33
														0	0	0	0	0	0
18	1	16	1	6 SE		12								1	12	0.83	2	12	0.67
12	2	24	2	20	2	12	2	36	3	36	1	24	4	30	0.83	4	19	0.58	
														<1	6	0.17	<1	6	0.08
														0	0	0	0	0	0
														<1	108	0.17	0	0	0
														<1	216	0.17	2	120	0.08
														0	0	0	0	0	0
12	1	12	1	12	1	12								3	23	0.83	5	21	0.83
12	2	36	1	16	2	24	2	36	1	36	2	36	7	31	0.83	3	26	0.58	
														0	0	0	0	0	0
														2	42	0.5	<1	24	0.17
														<1	10	0.17	0	0	0
														<1	66	0.33	0	0	0
	1	60					2	60						6	70	0.83	4	60	0.08
														0	0	0	0	0	0
														0	0	0	0	0	0
														0	0	0	0	0	0
														1	34	0.5	<1	34	0.25
	2	72					3	60	3	66	1	48	6	61	0.83	2	57	0.17	
24	1	18			1	12	1	24	1	18	1	20	2	25	100	3	23	0.83	
														<1	19	0.33	<1	19	0.17
42	5	42	3	36	5	36	5	50	2	48	3	54	28	48	100	25	40	100	
														0	0	0	0	0	0
														<1	6	0.33	<1	6	0.17
3	1	4	1	4	1	4								<1	4	0.33	<1	4	0.25
														<1	9	0.33	<1	13	0.25

TABLE 2. Pre-Grazing Baseline Data for Grazing Impacts Monitoring Plots: Species Cover, Height, and Frequency, Humboldt Road West Site, July 24, 25, and 27, 2003.

(Plots grouped by stratum: cov. = cover class value*; ht.= average height (inches); avg. cov. (%), avg. ht. (in.), and frequency (%) were calculated within each stratum.)

Plot Number:	3		3A		3B		5		5A		5B		10		10A		10B		13		13A		13B		
Stratum:	Scrub				Scrub				Scrub				Scrub												
Species	cov.	ht.	cov.	ht.	cov.	ht.	cov.	ht.	cov.	ht.	cov.	ht.	cov.	ht.	cov.	ht.	cov.	ht.	cov.	ht.	cov.	ht.	cov.	ht.	cov.
<i>Agrostis sp.</i>																									
<i>Alnus rubra</i>							5	240	5	240	1	132	2	240	3	240	2	240							
<i>Alnus viridus ssp. sinuata</i>		1	84	1	72																				
<i>Angelica genutiflexa</i>	SE		36	SE	36																				
<i>Anthoxanthum odoratum</i>																									
<i>Aster chilensis</i>							SE	24			SE	24													
<i>Athyrium filix-femina</i>	SE		3		SO	3	1	48	1	36	2	42	1	48	1	12	1	18							
<i>Bare ground</i>		1				7		3		2		1		2		3		3		1		2		3	
<i>Blechnum spicant</i>							1	12	SE		12		1	20	1	12	SO		8						
<i>Calamagrostis nutkaensis</i>																									
<i>Carex aquatilis var. dives</i>																									
<i>Carex buxbaumii</i>																									
<i>Carex cusickii</i>																									
<i>Carex obnupta</i>		1	36	1	42	2	1	4	60	6	48	6	48	3	48	4	60	2	42	5	48	4	48	5	
<i>Carex vesicaria</i>																									
<i>Cornus sericea</i>																									
<i>Danthonia decumbens</i>																									
<i>Deschampsia caespitosa</i>																									
<i>Disporum smithii</i>													SE	6		SO	4								
<i>Eleocharis sp.</i>		2	12	2	12																				
<i>Epipactis gigantea</i>																									
<i>Equisetum telmateia</i>																					1	12			
<i>Erechtites minima</i>																									
<i>Galium sp.</i>																									
<i>Gaultheria shallon</i>		1	42	2	42																1	48			
<i>Holcus lanatus</i>	SE		18	SE	18																				
<i>Hypericum sp.</i>																									
<i>Hypochaeris radicata</i>																									
<i>Juncus sp.</i>																									
<i>Juncus effusus</i>		1	36	1	36																				
<i>Lathyrus palustris</i>																					1	36			

		16		16A		16B		CIRCLES			QUADRATS		
Scrub								avg.		avg.		avg.	
ht.	cov.	ht.	cov.	ht.	cov.	ht.	cov.	ht.	freq.	cov.	ht.	freq.	
								0	0	0	0	0	
								10	240	0.4	7	213	
								<1	84	0.2	<1	72	
								<1	36	0.2	<1	36	
								0	0	0	0	0	
								<1	24	0.2	<1	24	
	1	30						2	32	0.8	2	22	
	2		3			2		8		100	18	0.9	
								1	16	0.4	<1	11	
								0	0	0	0	0	
								0	0	0	0	0	
								0	0	0	0	0	
								0	0	0	0	0	
48	3	54	3	54	3	54	22	49	100	28	45	100	
								0	0	0	0	0	
	1	120					<1	120	0.2	0	0	0	
								0	0	0	0	0	
								0	0	0	0	0	
							<1	6	0.2	<1	4	0.1	
								2	12	0.2	<1	12	
								0	0	0	0	0	
							<1	12	0.2	0	0	0	
								0	0	0	0	0	
								0	0	0	0	0	
							<1	42	0.4	1	45	0.1	
							<1	18	0.2	<1	18	0.1	
								0	0	0	0	0	
								0	0	0	0	0	
								0	0	0	0	0	
							<1	36	0.2	<1	36	0.1	
	1	48			1	48	1	42	0.4	<1	48	0.1	

Lathyrus sp. (2-leaflet)

<i>Ledum glandulosum</i>																		1	36	2	48		
<i>Lilium occidentale</i>	1	48	1	48	1	2																	
<i>Lonicera involucrata var. lebedourii</i>	1	60									1	96											
<i>Lotus corniculatus</i>																							
<i>Lotus formosissimus</i>																							
<i>Lycopus uniflora</i>	SE	8 SE		8														1	12 SO		4		
<i>Lysichiton americanum</i>											1	60	1	40				3	48	3	48	3	
<i>Maianthemum dilatatum</i>	1	5 SE		6	1	4	1	6	1	6		1	6			1	6						
<i>Malus fusca</i>	2	144	3	72 SE		4	5	240	5	240	1	120	5	240	2	180	6	180	4	180	4	120	3
<i>Myrica californica</i>	3	120	2	96	3	180												1	120			1	
<i>Picea sitchensis</i>	1	144 SO		60	5	240																	
<i>Polystichum munitum</i>							4	54	1	42			1	36	1	48	2	36					
<i>Potentilla anserina ssp. pacifica</i>																							
<i>Potentilla palustris</i>																							
<i>Prunella vulgaris</i>																							
<i>Pteridium aquilinum</i>	1	48	1	48																			
<i>Ranunculus repens</i>																							
<i>Rhamnus purshiana</i>	1	144			2	144	2	240			1	108	3	180	5	96	1	96					
<i>Rhododendron occidentale</i>	2	72	3	72	6	96	2	120					2	120	2	96	1	96	1	96	2	84	
<i>Rosa sp.</i>	1	36	1	36																			
<i>Rubus discolor</i>													1	120									
<i>Rubus spectabilis</i>							1	60 SE		30													
<i>Rubus ursinus</i>	1	24	1	24			1	48			2	48	1	36			1	24	1	36 SE		6	
<i>Salix spp.</i>							3	96			4	96	1	180					4	180			3
<i>Sanguisorba officinalis</i>	1	12 SE		12															1	36 SO		24	
<i>Solidago sp.</i>																							
<i>Spiraea douglasii</i>	1	60	2	60			1	60			1	60	2	72					2	84	2	72	2
<i>Standing water</i>																							
<i>Trientalis arctica</i>																							
<i>Viola adunca</i>																							
<i>Viola palustris</i>																							

*Cover Class Values: SO = solitary, SE = seldom or scattered, 1 = 1-4%, 2 = 5-10%, 3 = 11-25%, 4 = 26-33%, 5 = 34-50%, 6 = 51-75%, 7 = 76-90%, 8 = 91-100%.

							0	0	0	0	0	0
	2	60	1	60	1	60	2	48	0.4	1	56	0.3
							<1	48	0.2	<1	25	0.2
	1	120					2	92	0.6	0	0	0
							0	0	0	0	0	0
							0	0	0	0	0	0
							<1	10	0.4	<1	6	0.2
48	2	48	1	60	3	36	6	52	0.6	6	46	0.5
							2	6	0.6	<1	6	0.4
120	3	180	3	180	2	96	28	197	100	21	131	100
120	1	120					5	120	0.6	3	132	0.3
	2	180					2	162	0.4	4	150	0.2
							6	45	0.4	1	42	0.3
							0	0	0	0	0	0
							0	0	0	0	0	0
							0	0	0	0	0	0
							<1	48	0.2	<1	48	0.1
							0	0	0	0	0	0
							6	188	0.6	5	111	0.4
	2	72	2	120	3	60	7	96	100	10	62	0.7
	1	48					1	42	0.4	<1	36	0.1
							<1	10	0.2	0	0	0
							<1	60	0.2	<1	30	0.1
							2	36	0.8	1	26	0.4
96	3	180	3	180			14	159	0.8	7	124	0.3
							1	24	0.4	<1	18	0.2
							0	0	0	0	0	0
84	2	60	1	108	4	60	6	67	100	6	74	0.6
							0	0	0	0	0	0
							0	0	0	0	0	0
							0	0	0	0	0	0
							0	0	0	0	0	0

15A		15B		CIRCLES			QUADRATS				
ht.	cov.	ht.	cov.	ht.	avg. cov.	avg. ht.	avg. freq.	avg. cov.	avg. ht.	avg. freq.	
					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	
36				1	20 <1	36	0.2 <1		20	0.11	
	1			1		3	0.6	5		0.56	
						0	0	0	0	0	
						0	0	0	0	0	
48	5	40	4	48	75	44	100	59	42	100	
						0	0	0	0	0	
50						1	50	0.4	0	0	
					<1		41	0.4 <1		42	0.11
						2	30	0.2	2	36	0.11
						0	0	0	0	0	0
						0	0	0	0	0	0
						0	0	0	0	0	0
						0	0	0	0	0	0
					<1		6	0.2 <1		6	0.11
						0	0	0	0	0	0
					<1		10	0.2 <1		10	0.11
						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	0	0	0	0
46	1	24	1	36 <1		46	0.2 <1		3	0.22	

<i>Lathyrus sp. (2-leaflet)</i>																							
<i>Ledum glandulosum</i>										1	46												
<i>Lilium occidentale</i>																							
<i>Lonicera involucrata</i> var. <i>lebedourii</i>																							
<i>Lotus corniculatus</i>																							
<i>Lotus formosissimus</i>																							
<i>Lycopus uniflora</i>																							
<i>Lysichiton americanum</i>	SE	18	SO	18						1	20		SO	12	1	18			1	24	1		
<i>Maianthemum dilatatum</i>																							
<i>Malus fusca</i>																							
<i>Myrica californica</i>																							
<i>Picea sitchensis</i>																							
<i>Polystichum munitum</i>																							
<i>Potentilla anserina</i> ssp. <i>pacifica</i>	1	36	SE	36	1	24				1	10	1	10	SE	6	1	12	1	24	1	10	1	
<i>Potentilla palustris</i>	1	36	SE	36	1	30	1	24	1	24	3	40	2	40	3	30	3	42	2	24	1	46	3
<i>Prunella vulgaris</i>																							
<i>Pteridium aquilinum</i>																							
<i>Ranunculus repens</i>																							
<i>Rhamnus purshiana</i>																							
<i>Rhododendron occidentale</i>																							
<i>Rosa</i> sp.																							
<i>Rubus discolor</i>																							
<i>Rubus spectabilis</i>																							
<i>Rubus ursinus</i>																							
<i>Salix</i> spp.																	2	48					SO
<i>Sanguisorba officinalis</i>																	1	30					
<i>Solidago</i> sp.																							
<i>Spiraea douglasii</i>										2	40	2	42	SE	30	2	42	2	48	3	48	4	
<i>Standing water, no vegetation</i>	SE			2		2		2								1				2			
<i>Trientalis arctica</i>																							
<i>Veronica</i> sp.		1	30																				
<i>Viola adunca</i>																							
<i>Viola palustris</i>																							

*Cover Class Values: SO = solitary, SE = seldom or scattered, 1 = 1-4%, 2 = 5-10%, 3 = 11-25%, 4 = 26-33%, 5 = 34-50%, 6 = 51-75%, 7 = 76-90%, 8 = 91-100%.

					0	0	0	0	0	0
				<1		46	0.2	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
30	1	24	1	24	2	22	0.8	1	20	0.56
					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
24	2	18			2	21	0.8	2	18	0.78
40	3	34	2	36	12	36	100	7	33	100
					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	0	0	0	0
					0	0	0	0	0	0
					0	0	0	0	0	0
120					2	84	0.4	0	0	0
				<1		30	0.2	0	0	0
					0	0	0	0	0	0
45	3	42	3	48	9	42	0.6	8	43	0.67
					2		0.6	3		0.33
					0	0	0	0	0	0
				<1		30	0.2	0	0	0
					0	0	0	0	0	0
					0	0	0	0	0	0

19A 19B

cov. ht. cov. ht.

1 36

6 48

2 36

SE 36

SE 24 SE 24

SE 24

<i>Lathyrus sp. (2-leaflet)</i>																				0	0	0	0	0	0			
<i>Ledum glandulosum</i>																					0	0	0	0	0	0		
<i>Lilium occidentale</i>	SE	40	SO		16	SE		40	SE		8	SE		6	SE		8			1	24	100	<1		18	0.8		
<i>Lonicera involucrata var. lebedourii</i>	SO		60			1		60												<1	60	0.5	<1		60	0.2		
<i>Lotus corniculatus</i>								SE		12				1		18	<1				12	0.5	<1		18	0.2	1	24
<i>Lotus formosissimus</i>																					0	0	0	0	0	0	SE	24
<i>Lycopus uniflora</i>																					0	0	0	0	0	0		
<i>Lysichiton americanum</i>																					0	0	0	0	0	0		
<i>Maianthemum dilatatum</i>							SE		6			SE		6						<1	6	0.5	<1		6	0.2		
<i>Malus fusca</i>							SO		240												<1	240	0.5	0	0	0	1	240
<i>Myrica californica</i>		1	240					3	120	2	72									11	180	100	2	72	0.2	1	120	
<i>Picea sitchensis</i>		1	480					2	370	5	360	5	360	3	480					5	425	100	20	400	0.6			
<i>Plantago lanceolata</i>																					0	0	0	0	0	0	1	4
<i>Polystichum munitum</i>																					0	0	0	0	0	0		
<i>Potentilla anserina ssp. pacifica</i>	SE		24				SE		12				SE		12					1	18	100	<1		12	0.2	3	24
<i>Potentilla palustris</i>																					0	0	0	0	0	0		
<i>Prunella vulgaris</i>		1	3																		1	3	0.5	0	0	0	SE	12
<i>Pteridium aquilinum</i>		2	36	2	36	1	36	2	30	SO		12	SO		12	1	18			8	33	100	3	22	100	2	24	
<i>Ranunculus repens</i>																					0	0	0	0	0	0		
<i>Rhamnus purshiana</i>		2	240	3	240	1	120	5	240	2	240	3	240	1	120	25	240	100	10	192	100				1	144		
<i>Rhododendron occidentale</i>		3	60	3	60	2	72	2	72	2	72	3	60	1	60	13	66	100	11	65	100				1	72		
<i>Rosa sp.</i>																					0	0	0	0	0	0		
<i>Rubus discolor</i>																					0	0	0	0	0	0		
<i>Rubus spectabilis</i>																					0	0	0	0	0	0		
<i>Rubus ursinus</i>		2	24	2	6	2	30	2	3	1	3	1	6	3	24	8	14	100	8	14	100				3	24		
<i>Salix spp.</i>																					0	0	0	0	0	0		
<i>Sanguisorba officinalis</i>								1	16	SE		6		1	18	1	16	0.5	<1			12	0.4		3	24		
<i>Solidago sp.</i>																					0	0	0	0	0	0		
<i>Spiraea douglasii</i>		3	60	5	60	6	72	SE		12		SE		12	1	18	10	36	100	22	41	0.8			1	72		
<i>Standing water</i>																					0	0	0	0	0	0		
<i>Trientalis arctica</i>																					0	0	0	0	0	0		
<i>Viola adunca</i>																					0	0	0	0	0	0		
<i>Viola palustris</i>																					0	0	0	0	0	0		

*Cover Class Values: SO = solitary, SE = seldom or scattered, 1 = 1-4%, 2 = 5-10%, 3 = 11-25%, 4 = 26-33%, 5 = 34-50%, 6 = 51-75%, 7 = 76-90%, 8 = 91-100%.

1 24

3 240

1 96

2 24 SE 24

1 24 1 36

1 72

1 72

4 24 2 24

3 24

**CRESCENT CITY MARSH WILDLIFE AREA
GRAZING IMPACTS MONITORING PROJECT**

ATTACHMENT 3

**2003 PHOTOGRAPHS OF CIRCULAR PLOTS
PRE-GRAZING MONITORING
HUMBOLDT ROAD WEST AND
HUMBOLDT ROAD SITES**

Note: Not provided with final report