

Community-Based Wildlife Survey – A Pilot Study

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Background:

- Over the past few years significant vegetative restoration and preservation programs have been conducted for Upper Newport Bay (UNB) coastal sage scrub (CSS) areas.
- The aims have been to produce sustainable native plant habitats, provide resistance to invasive plants, and promote fauna and other biotic processes expected in CSS areas.
- A partial measurement of successes has been the positive visual impact, but success also has been evaluated by monitoring the native plants for survival rates and percent coverage.
- An important aspect remained to be investigated, and that was the quantitative monitoring of CSS wildlife including mammals, amphibians, reptiles, and arthropods including butterflies and moths.

Survey Goals:

- Characterize density and diversity of fauna (especially invertebrates in the pilot phase) associated with three "habitat types" (mature, restored, un-restored) within typical CSS areas along the UNB.
- Generate descriptive statistics by habitat type, such as means, totals, and associated measures of dispersion, e.g. mean number percent of spiders per transect within each of the 3 habitat types and associated variance, standard error, coefficient of variation, statistical significance, etc.
 - evaluate differences in species compositions within and between the habitat types, as well as across years (2009-10)
 - examine fauna estimates in the context of native plant coverage
 - identify potential "indicator" species, i.e., species composition subset that captures most of the variation measured across habitat types.
- Identify survey-related biases in the field that can be alleviated (or minimized) for future monitoring programs.
- Develop long-term data sets that can be used to inform management bodies regarding the status (health) of these critical buffer zones of the UNB.



A sample transect

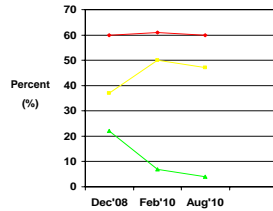
Study Design:

- A total of twenty-one 50' line transects were placed in mature, restored, and un-restored CSS. These were used for the native plant coverage and wildlife survey (WLS) studies.
- Percent coverage by native plants was determined by the line intercept method twice a year.
- Four to 6 times a year the WLS was conducted by trained observers. It was done at the same time of day and with at least two observers. A pathway of two shoulder widths (~6 ft) along a line between the transect stakes was inspected for existing wildlife (wildlife included mammals, amphibians, reptiles, arthropods including butterflies and moths, and evidence of use including tracks, scat, burrows, nests, and signs of herbivorous activity). Fauna seen on the ground, on the plant life, and in the air were counted. The survey inspection was timed at 15 minutes. A standardized form was used for recording the raw data.

Results:

This graph displays the percent coverage by native plants during the course of the study

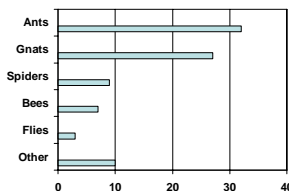
Red=Mature, Yellow=Restored, Green= Un-restored



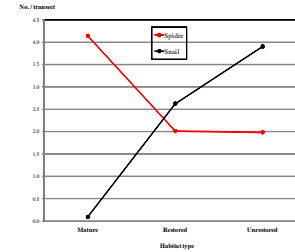
Combined WLS Data (2009-2010) – Incidence Numbers

Habitat	Transect n	Total	Inverts	Arthropods
Mature	22	609	589	587
Restored	66	2163	2095	1922
Un-restored	60	1496	1430	1196

All habitats – Percents of all arthropod species observed



Incidence of Snails (*Otala sp.*) and Spiders (*Hololena sp.*) in the three study habitats



Snail (*Otala sp.*)



Spider (*Hololena sp.*)

Mean number of species per transect and related statistics across habitat types in CSS areas in UNB study site (2009-10).

Habitat	n	Species	Mean (no.)	CV (%)	Mean (%)
Mature	22	Gnat (Diptera)	0.41	31	3.9
Mature	22	Ant (<i>Emyphana sp.</i>)	6.82	3.5	25
Mature	22	Spider (<i>Hololena sp.</i>)	4.34	4.5	15
Mature	22	Other	3.09	30	12
Mature	22	Beet (<i>Apa sp.</i>)	1.54	62	4
Mature	22	Fly (Diptera)	10.5	41	4
Mature	22	Snail (<i>Otala sp.</i>)	0.09	69	<1
Mature	22	Leafhopper (Homoptera)	0.05	100	<1
Mature	22	Hemipteran bug (<i>Mayaneta sp.</i>)	0	0	0
Mature	22	Ladybird beetle (<i>Coccinellidae</i>)	0	0	0
Restored	66	Ant (<i>Emyphana sp.</i>)	11.11	19	35
Restored	66	Gnat (Diptera)	6.32	16	2.0
Restored	66	Other	5.53	44	17
Restored	66	Snail (<i>Otala sp.</i>)	2.62	4.5	9
Restored	66	Beet (<i>Apa sp.</i>)	2.06	2.7	6
Restored	66	Spider (<i>Hololena sp.</i>)	2.02	29	6
Restored	66	Hemipteran bug (<i>Mayaneta sp.</i>)	0.28	28	2
Restored	66	Fly (Diptera)	0.39	43	3
Restored	66	Leafhopper (Homoptera)	0.23	31	1
Restored	66	Ladybird beetle (<i>Coccinellidae</i>)	0.06	60	<1
Un-restored	60	Gnat (Diptera)	5.62	21	2.4
Un-restored	60	Other	4.30	31	2.0
Un-restored	60	Ant (<i>Emyphana sp.</i>)	4.4.5	26	22
Un-restored	60	Snail (<i>Otala sp.</i>)	3.36	21	16
Un-restored	60	Spider (<i>Hololena sp.</i>)	1.98	20	8
Un-restored	60	Beet (<i>Apa sp.</i>)	1.67	31	7
Un-restored	60	Hemipteran bug (<i>Mayaneta sp.</i>)	0.90	58	4
Un-restored	60	Fly (Diptera)	0.32	2.5	1
Un-restored	60	Leafhopper (Homoptera)	0.28	42	<1
Un-restored	60	Ladybird beetle (<i>Coccinellidae</i>)	0.02	100	<1

Comments:

- Comparisons of individual species ('density') within and between habitat types were mixed, i.e., relatively high variability associated with data collected in the initial (pilot) phase of the study hindered statistical interpretation.
- Arthropod density in un-restored CSS was least.
- Native plant coverage increased during the study in restored CSS.
- Evidence of mammals found included rabbits, squirrels, coyotes, and rodents (numbers too limited for analysis).
- Species compositions ('diversity') were statistically different between habitat types (P<0.05).

Conclusions:

- A significant difference in diversity of invertebrates was observed among the three habitat types.
- The population of the snail (*Otala sp.*) was highest in un-restored CSS.
- Spider (*Hololena sp.*) population was greatest in mature CSS
- Survey-based field biases have been identified, and a UNB database created for record storage.
- Data can provide the basis for future hypothesis-directed studies.



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