Cameron Mayer
Sam Wellsfry
Elis Armendariz
Trevor Stangle

Portuguese Bend Transecting Project

Introduction

The purpose of this research is to determine whether the species transecting data obtained in the Portuguese Bend Reserve in Spring 2019 is significantly different in comparison to data gathered by predecessors in Summer 2009. This study is important in the areas of conservation and native habitat preservation because it reveals, to some extent, the overall species diversity through the samples gathered. It additionally relates to the discipline of Biogeography in its explicit spatial analysis of the frequency of species presence. An alpha statistic of 0.05 was utilized for this study. The working hypothesis in this scenario is: the data gathered in this study exhibits a significant difference when compared with the data gathered by predecessors in the Portuguese Bend "Lemonadeberry forest". The null hypothesis is: there is no significant difference between the data collected for this study and previously collected data.

Data and Methods

The data gathered was put together by a group consisting of Cameron Mayer, Sam Wellsfry, Ellis Armendariz, and Trevor Stangle on April 24th, 2019 in the Portuguese Bend reserve of the Palos Verdes Peninsula. Methodology employed in this experiment involved taking nine 20 meter transects on three different trails. Species frequency count data from the transects was subsequently compiled into a spreadsheet so as to be readily available for analysis. Four transects were conducted on the Paintbrush trail, three were done on the Ishibashi trail, and two on the Rim trail (a somewhat informal trail in its current condition). Almost all of the transects were conducted parallel along the trails, with the two from the Rim trail being the exceptions. On a statistical note, the chi-square method of analysis was utilized due to its proficiency in association with the type of data collected (frequency counts- nominal data). The set alpha standard of 0.05 was selected due to a moderate level of confidence in the data collected and in conjunction with the primary concern of finding false significance, a Type 1 error.

Cameron Mayer
Sam Wellsfry
Elis Armendariz
Trevor Stangle

Portuguese Bend Transecting Project

Results

	A	B	C	D	E	F	G	H	I	J	K	L
1	X^2	Enter data and *alpha* in yellow cells only						Outputs in blue cells				
2	VAR 1		VAR 2			*		Cell	O	O sq.	E	O sq./E
3		a		b								
4	Obs	69		1		70		a	69	4761	52.635	90.454
5	Exp	*52.635*		*17.365*				b	1	1	17.365	0.058
6		c		d				c	38	1444	115.044	12.552
7	Obs	38		115		153		d	115	13225	37.956	348.432
8	Exp	*115.044*		*37.956*				e	226	51076	179.710	284.214
9		e		f				f	13	169	59.290	2.850
10	Obs	226		13		239		g	58	3364	43.612	77.136
11	Exp	*179.710*		*59.290*				h	0	0	14.388	0.000
12		g		h								
13	Obs	58		0		58						
14	Exp	*43.612*		*14.388*								
15												815.695
16	*	391		129		520					X^2_{calc}	295.695
17											*alpha*	0.05
18											df	3
19											X^2_{crit}	7.815
20		Percentage of expected counts < 5				0.00 %					prob	0.000
21		(if > 20%, collapse data rows)										
22		Number of expected counts ≤ 1				0					k (min r or c)	2
23		(if there are any, collapse rows)									(effect size measure) Cramér's V	0.754
24											(effect size measure) φc or w	0.754
25											Noncentrality (λ)	295.695
26		*β/α*: ratio of Type II to Type I error probability				###						
27											Estimated power (1-β)	1.000
28											Corrected power (Rodrigue)	1.000
29												

When analyzing the data between Lemonade berry forest in Spring 2019 and Lemonade berry forest in the Summer of 2009 we got a chi squared calculated of 295.695 which is larger than the chi squared critical of 7.815. We got a p-value of 0 which is less than the alpha standard 0.05 meaning we can reject the null hypothesis. We also got an effect size of 0.754 and a power of 1.000 .

Cameron Mayer
Sam Wellsfry
Elis Armendariz
Trevor Stangle

Portuguese Bend Transecting Project

Discussion

During our excursion through the Portuguese Bend in the Palos Verdes reserve the other week, our group transected in the "Lemonadeberry forest" portion of the park. *Rhus integrifolia,* or "Lemonade Berry" was once the dominant life form present in this area. Unfortunately for the native species in the Portuguese Bend area, the majority of critters we encountered were not the native "Lemonadeberry," that was once abundant in the area.

Brassica nigra, or "Black mustard" is a special species of flora that has a special ability of allelopathy. Allelopathy is a process that eradicates the seedlings of other species, allowing only the mustard to thrive in that area that is dominated by the invasive species "Black mustard."

In the advent of the immense amount of Black Mustard during our groups' nine transects, our x^2 was an immensely high number due to the difference in seasons between a dry summer and a wet winter.

Due to the wildfire in 2009 that burned the entire Portuguese Bend trail area, is now alive with forests of Black mustard. It was difficult for our team of four to navigate the forests of black mustard. We literally had to push half inch stalks standing eight feet height.

In addition to the amount of critters we discovered on the trail, we noticed when comparing our data with our predecessors from the summer of 2009 that we had almost no bare dirt in comparison to the previous team.

With the abundance of rain received in the early part of 2019, invasive species, such as Black Mustard; had room, water, and light to have explosive growth rate to fill in the empty dirt patches. Although our group encountered a few Lemonadeberry individuals, the comparison of our groups data collected compared to our predecessors' data in 2009 is completely different.

To gain a more accurate representation of the species in this area along the Portuguese Trail would be to conduct a new set of transects during the summer dry months. This would potentially provide an opportunity to for many of the invasive species to dye off, leaving the more

Cameron Mayer
Sam Wellsfry
Elis Armendariz
Trevor Stangle Portuguese Bend Transecting Project

Conclusion

For further research we would recommend gathering more data at all times of the year or not doing it in the spring, because all of our sites were overrun with black mustard. It was difficult to get accurate readings of native plants in our transects. Consequently, we realize that past students collected data in the fall, resulting in less plants alive to record. The summer would potentially be the best time to gather data because all of the invasives, such as black mustard, would be dead, but not the natives. Also, since most of what could be seen was mustard, as it was at least two feet overhead at many locations, coupled with the fact that there were cliffs off the trail, parallel transects were done almost exclusively (with the exception of two). Leaving the trail was not a legitimate option for the most part since visibility was generally poor and safety was a priority.

References

-Data collected in Summer 2009 by: Karyssa Fenderson, Victoria Zamora, Marilyn Roun, Jade Dean