

9163
Excellent
Jobs!

Student Sample 2

3. POINT-QUARTER CENTER METHOD

Methodology:

First, a random point in the forest was established as a starting point. By using the compass and finding true North it was possible to divide the landscape into four quadrants with the 1st quadrant being located to the right of the north compass line and north of the east compass line. Once the quadrants were established, the closest tree in each quadrant was identified. The species was noted along with the distance from the center point to the tree, and the DBH. This data was collected for each of the closest trees in each quadrant. To randomly collect our data, the next point was determined by closing our eyes and spinning and throwing a stick in a direction. The direction of the thrown stick dictated the direction in which we took 30 large paces. The next point was established, compass oriented, quadrants defined trees located, etc. Once we had collected data for 20 points in the forest and 80 individual trees, we crunched the numbers.

Results:

The results of the computation of the relative density, relative dominance, and the relative frequency and then adding them together to obtain the importance value showed that the Ponderosa Pine was the most significant species in this forest. The Ponderosa Pine had 15 individuals in the 80 quarters behind the Sugar Pine that had 18 individuals but the Sugar Pine is ranked second behind the Ponderosa, possibly due to the higher relative dominance. This matches the observation that the Ponderosa Pines that were measured were rather well developed with large basal area. On the other end of the importance scale the Manzanita had the fewest individuals in the sample, 2, yet it was not

ranked last because of the high relative dominance. This could actually be an error because the dominance is dependant on the basal area, and this was very hard to measure on the Manzanita individuals because of the highly split trunks. The rest of the importance values almost mirror the occurrence number of each species. This point quarter method might give a more detailed description of the types of role and structure that each species has in the forest yet for a quick analysis it would be easier just to examine the occurrence numbers.

Nice Discussion!

4. POST-FIRE TRANSECT

15/15

When examining the vegetative cover data from 1993, the first obvious difference was that there was no bare areas left. Most of the bare areas are now filled in with ^mManzanita. The Interior ^lLive ^oOak expanded in coverage area in the areas where it had previously existed and also replaced some ^eCeanothus. In Plot A, the ⁱInterior ^oOak is now the dominant coverage, where in 1993 it was dominated by ^eCeanothus. The Manzanita has also increased its dominance especially in the first 20 meters of the transect. Ceanothus still had a major presence in the transect, especially between the 40 and 80 meter plots. It appears that slowly the Ceanothus is being replaced in the succession. The replacement is occurring at a higher rate in the upper 40 meters of the transect, possibly because of differing microclimatic conditions between the upper and lower portions of the transect. It is plausible that the past dominating Ceanothus was a primary successor but now is slowly being out competed by the Interior Oak and Manzanita. I predict that the next dominant species of this transect will be the Interior Oak and Manzanita. Eventually, in perhaps a few 100 years the Coulter Pine

lower case letters

will have out-dominated the Manzanita and Interior Oak by shading them out and out-competing them for resources. The Coulter Pine thrives in dry rocky slopes and this area is definitely dry and rocky. The snags left over from the fire were Coulter Pines, but I think that those pines were not at their full successional dominance before the fire. With the increased shade of the other species that need shade such as the Canyon Live Oak will also start to grow here like before the fire. This was a very interesting study and there is much to be learned from this data.

5. ANIMAL BEHAVIOR STUDY

10/10

The Western Fence Lizard (*Sceloporus occidentalis*) that we observed was a very large, dark male. He was residing in the woodpile by Mike's house. This wood pile that consisted of ^mManzanita and pine wood, provided a home to many lizards of the same species along with the ^eSage ^bBrush ^eLizard and the Side-Blotched Lizard. We were able to follow our individual for 30 minutes, recording its behavior every 15 seconds or when he did a drastic action change. We recorded 221 actions and totaled up the number of each type of action to obtain the percentage of occurrence. This lizard that we call "Puff Daddy" was quite active and demonstrated an array of behaviors. The actions and behaviors that we took note of included: resting in the sun, resting in the shade, alert and watching, running and jumping, bobbing, moving head, bobbing + throat puff, hiding in the wood pile, interacting with other lizards, opening its mouth, and standing in an erect position. The majority of time, Puff Daddy spent resting in the sun (33.9%, 75 occurrences). This is very typical behavior for this species and other lizards. We also recorded a high percentage of running and jumping when he was on the move to either retreat to the shade or move to a different

lower case letters.

spot in the woodpile. Our individual did not seem to have a specific territory on the woodpile because he moved all over from one end to the next. This can be attributed to his dominance because of his size and sex. Puff Daddy when resting moved his head a lot and was very alert, perhaps to our presence. He also demonstrated the bobbing behavior frequently, perhaps as a mating behavior or as a defense and intimidating behavior. It was an interesting experience diving into the world of lizards for a half-hour, it made me more aware of the lifestyle of Puff Daddy.

6. VEGETATION ZONATION

9.5
/10

The southeast side of the San Jacinto Mountains is considered a rain shadow and the decent in elevation leads to the edge of the Colorado Desert. The first stop was located at still a relatively high elevation and contained sagebrush and evergreen grasses. The next stop was much drier and hotter and more drought tolerant species were present including Chamise, bunch grasses, and many flowering plants. The next stop was a relatively low elevation and the landscape was flat. The vegetation was very diverse ranging from blooming Prickly Pear Cacti to Singleleaf Pinyon Pine. There was also Smoke Tree and a type of Ceanothus. Our lunch area was an amazing place that exhibited a range of flora and the distant landscape showed vegetative patterns. The Deep Valley area showed riparian vegetation and elevational vegetative strata on the southeast facing sloped mountain with a pine forest at the top. On our nature hike there was Brittlebush, Sugarberry, White Sage, Prickly Pear, and other drought and heat adapted flora. The next stop we were lucky enough to see Big Horn Sheep along with a drier sparser landscape. This stop was denoted as the true

Colorado desert. Our last stop at the visitor center was very hot (111°F) and had many true desert plants including the Teddy Bear Cholla and the Jojoba. At this point I was not really noticing the vegetation because I was having a heat stroke.

*I can
relate!*

Sample point	Quarter #	Dist. (m)	Species	DBH
1	1	8.65	1	57
	2	4.81	2	71
	3	7.2	3	7
	4	9.71	1	31
2	1	13.1	7	75
	2	3.82	2	57
	3	12.11	2	17
	4	8.91	2	31
3	1	5.75	4	23
	2	9.31	1	27
	3	2.11	4	10
	4	6.11	4	18
4	1	7.82	7	49
	2	6.3	8	8
	3	4.5	1	16
	4	17.13	6	42
5	1	9.79	4	11
	2	3.62	1	19
	3	4.82	6	64
	4	9.5	1	77
6	1	1.42	1	74
	2	0.9	4	33
	3	1.3	1	55
	4	1.11	1	40
7	1	15.07	1	11
	2	5.01	1	38
	3	5.71	5	13
	4	5.39	2	32
8	1	2.5	4	39
	2	2.56	7	20
	3	1.47	7	23
	4	6.85	7	25
9	1	3.2	7	18
	2	11.79	6	39
	3	3.34	8	11
	4	1.9	5	14
10	1	2.8	8	8
	2	2.2	4	27
	3	1.48	8	46
	4	3.32	6	91
11	1	5.79	8	38
	2	3.37	9	23
	3	1.6	9	20
	4	6.18	1	12
12	1	2.72	4	20
	2	3.15	7	65
	3	1.99	8	18
	4	3.83	3	17
13	1	0.82	1	41
	2	5.03	6	48
	3	2.59	4	14

Species	# in quarters (x/80)
1 Ponderosa Pine	15
2 Jeffrey Pine	5
3 White Fir	4
4 Sugar Pine	18
5 Coulter Pine	3
6 Incense Cedar	10
7 Black Oak	12
8 Canyon Oak	11
9 Manzanita	2

	4	4.52	1	9
14	1	1.82	8	24
	2	1.5	7	22
	3	4.57	8	15
	4	2.65	3	9
15	1	1.06	6	17
	2	0.8	4	15
	3	0.6	6	19
	4	1.45	5	36
16	1	2.69	4	6
	2	2.45	1	54
	3	1.43	7	28
	4	1.8	6	8
17	1	3.05	3	37
	2	5.86	7	25
	3	2.39	4	27
	4	3.83	7	29
18	1	0.98	7	38
	2	3.94	4	27
	3	3.68	4	26
	4	5.41	6	19
19	1	4.37	6	18
	2	3.83	4	47
	3	3.4	4	47
	4	4.07	4	32
20	1	2.25	8	21
	2	3.6	4	21
	3	1.8	8	9
	4	2.92	8	16

Total: $\boxed{362.8} / 80 =$

✓ Mean distance: 4.535 m

* of trees per 10,000 m² = $10,000 / (4.535)^2 =$ $\boxed{486.23}$

✓ Absolute Density ←

Jeffrey Pine	$5/80 = .0625$	$\times 486.23 = 30.38$
Conter Pine	$3/80 = .0375$	$\times = 18.23$
Black Oak	$12/80 = .15$	$\times = 72.93$
Canyon Oak	$11/80 = .1375$	$\times = 66.86$
Ponderosa Pine	$15/80 = .1875$	$\times = 91.17$
White Fir	$4/80 = .05$	$\times = 24.31$
Sugar Pine	$18/80 = .225$	$\times = 109.40$
Incense Cedar	$10/80 = .125$	$\times = 60.78$
Manzanitas	$2/80 = .025$	$\times = 12.16$

TOTAL = $\underline{486.22}$

PONDEROSA PINE BASAL AREA

Diameter (cm)	BA (cm ²)
57	2551.7
31	754.8
27	572.6
16	201.1
19	283.5
77	4656.6
74	4300.8
55	2375.8
40	1256.6
11	95
38	1134.1
12	113.1
41	1320.3
9	63.6
54	2290.2
Total BA : 21969.8	
Mean BA : 1464.65	

SUGAR PINE BASAL AREA

Diameter (cm)	BA (cm ²)
23	415.5
10	78.5
18	254.5
11	95
33	855.3
39	1194.6
27	572.6
20	314.2
14	153.9
15	176.7
6	28.3
27	572.6
27	572.6
26	530.9
47	1734.9
47	1734.9
32	804.2
21	346.4
Total BA : 10435.6	
Mean BA : 579.75	

JEFFREY PINE BASAL AREA

Diameter (cm)	BA (cm ²)
71	3959.1
57	2551.7
17	226.9
31	754.7
32	804
Total BA : 8296.4	
Mean BA : 1659.28	

WHITE FIR BASAL AREA

Diameter (cm)	BA (cm ²)
7	38.5
17	226.9
9	63.6
37	1075.2
Total BA : 1404.2	
Mean BA : 351.05	

COULTER PINE BASAL AREA

Diameter (cm)	BA (cm ²)
13	132.7
14	153.9
36	1017.9
Total BA : 1304.5	
Mean BA : 434.83	

MANZANITA BASAL AREA

Diameter (cm)	BA (cm ²)
23	415.5
20	314.2
Total BA : 729.7	
Mean BA : 364.85	

INCENSE CEDAR BASAL AREA

Diameter (cm)	BA (cm ²)
42	1385.4
64	3216.9
39	1194.6
91	6503.8
48	1809.5
17	226.9
19	283.5
8	50.3
19	283.5
18	254.5
Total BA : 14875.1	
Mean BA : 1487.51	

BLACK OAK BASAL AREA

Diameter (cm)	BA (cm ²)
75	4417.9
49	1885.7
20	314.2
23	415.5
25	490.9
18	254.5
65	3318.3
22	380.1
28	615.7
25	490.9
29	660.5
38	1134.1
Total BA : 14378.3	
Mean BA : 1198.2	

CANYON OAK BASAL AREA

Diameter (cm)	BA (cm ²)
8	50.3
11	95
8	50.3
46	1661.9
38	1134.1
18	254.5
24	452.4
15	176.7
21	346.4
9	63.6
16	201.1
Total BA : 4486.3	
Mean BA : 407.84	

✓ ABSOLUTE DOMINANCE = mean BA per spp. x # of trees in 10,000 m²

<u>Dominance of</u>		<u>Dominance rank</u>
Ponderosa Pine	1464.65 x 91.17= 133532.14 cm ²	1
Jeffrey Pine	1659.28 x 30.38= 50408.93 cm ²	7
White Fir	351.05 x 24.31= 8534.02cm ²	4
Sugar Pine	579.75 x 109.40= 63424.65cm ²	6
Coulter Pine	434.83 x 18.23= 7926.95cm ²	5
Incense Cedar	1487.51 x 60.78= 90410.85cm ²	2
Black Oak	1198.2 x 72.93= 87384.73cm ²	3
Canyon Oak	407.84 x 66.86= 27268.18cm ²	8
Manzanita	364.85 x 12.16= 4436.57cm ²	9

✓ ABSOLUTE FREQUENCY = # of points with spp./ total points x 100

Ponderosa Pine	$9/20 \times 100 = 45\%$
Jeffrey Pine	$3/20 \times 100 = 15\%$
White Fir	$4/20 \times 100 = 20\%$
Sugar Pine	$13/20 \times 100 = 65\%$
Coulter Pine	$3/20 \times 100 = 15\%$
Incense Cedar	$9/20 \times 100 = 45\%$
Black Oak	$9/20 \times 100 = 45\%$
Canyon Oak	$7/20 \times 100 = 35\%$
Manzanita	$1/20 \times 100 = 5\%$
	Total: 290%

✓ RELATIVE DENSITY = # of trees in 10,000m² / total # of individuals in 100

Ponderosa Pine	$91.17/486.23 \times 100 = 18.7\%$
Jeffrey Pine	$30.38/486.23 \times 100 = 6.24\%$
White Fir	$24.31/486.23 \times 100 = 5\%$
Sugar Pine	$109.40/486.23 \times 100 = 22.4\%$
Coulter Pine	$18.23/486.23 \times 100 = 3.7\%$
Incense Cedar	$60.78/486.23 \times 100 = 12.5\%$
Black Oak	$72.93/486.23 \times 100 = 14.9\%$
Canyon Oak	$66.86/486.23 \times 100 = 13.7\%$
Manzanita	$12.16/486.23 \times 100 = 2.5\%$

✓ RELATIVE DOMINANCE = dominance of spp/ dominance total spp x 100

Ponderosa Pine	$133532.14/473327.02 \times 100 = 28.2\%$
Jeffrey Pine	$50408.93/473327.02 \times 100 = 10.6\%$
White Fir	$8534.02/473327.02 \times 100 = 1.8\%$
Sugar Pine	$63424.65/473327.02 \times 100 = 13.3\%$
Coulter Pine	$7926.95/473327.02 \times 100 = 1.6\%$
Incense Cedar	$90410.85/473327.02 \times 100 = 19.1\%$
Black Oak	$87384.73/473327.02 \times 100 = 18.4\%$
Canyon Oak	$27268.18/473327.02 \times 100 = 5.7\%$
Manzanita	$4436.57/473327.02 \times 100 = .9\%$

✓ RELATIVE FREQUENCY = frequency of species/ sum frequency of all species x 100

Ponderosa Pine	$45/290 \times 100 = 15.5\%$
Jeffrey Pine	$15/290 \times 100 = 5.1\%$
White Fir	$20/290 \times 100 = 6.8\%$
Sugar Pine	$65/290 \times 100 = 22.4\%$
Coulter Pine	$15/290 \times 100 = 5.1\%$
Incense Cedar	$45/290 \times 100 = 15.5\%$
Black Oak	$45/290 \times 100 = 15.5\%$
Canyon Oak	$35/290 \times 100 = 12\%$
Manzanita	$5/290 \times 100 = 1.7\%$

Species	Relative Density	Relative Dominance	Relative Frequency	Importance Value	Importance Rank
Ponderosa Pine	18.7	28.2	15.5	62.4	1
Jeffrey Pine	6.24	10.6	5.1	21.94	6
White Fir	5	1.8	6.8	13.6	7
Sugar Pine	22.4	13.3	22.4	58.1	2
Coulter Pine	3.7	1.6	5.1	10.4	9
Incense Cedar	12.5	19.1	15.5	47.1	4
Black Oak	14.9	18.4	15.5	48.8	3
Canyon Oak	13.7	5.7	12	31.4	5
Manzanita	2.5	9	1.7	13.2	8

IMPORTANCE VALUE = sum of relative density, relative dominance, and relative frequency

WESTERN Fence LIZARD

(*Sceloporus occidentalis*)



"BUFDADDY"

HABITAT: WOOD PILE

pine & manzanita wood
stumps / logs

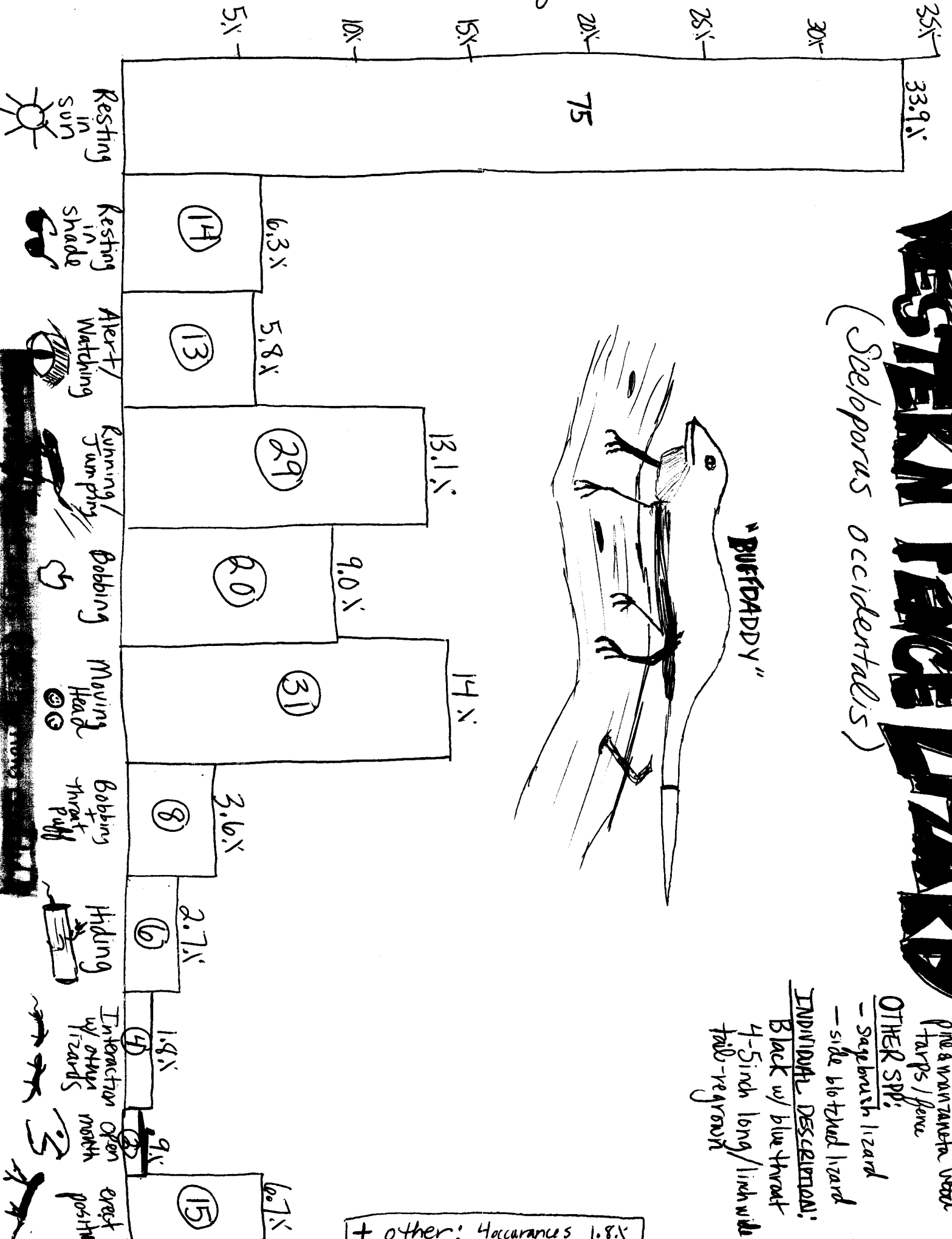
OTHER SP:

- Sagebrush lizard
- side blotched lizard

INDIVIDUAL DESCRIPTION:

Black w/ blue throat
4-5 inch long / limb with
tail - re-grow

+ other: 4 occurrences 1.8%



Resting/Sun		14	6.3	75	39.9%
Resting/Shade		13	5.0%		
Alert/Watching		20	9.0%	29	13.1%
Running/Jumping (in motion)		6	2.5%		
Bobbing		4	1.8%		
Moving Head		8	3.6%	31	14.9%
Bobbing/Throat puff		6	2.5%		
Hiding		4	1.8%		
Interaction w/ other lizards		2	0.9%		
Opening Mouth (possibly eating)		15	6.7%		
In erect position		4	1.8%		
Other					

2 occurrences 9.9%

Western Fence Lizard

221 records x 15 = 3315 sec.
 3315 ÷ 60 = 55 min.

99.6%