RELATIONSHIPS BETWEEN THE AMERICAN BLACK BEAR POPULATION AND THE BIGFOOT PHENOMENON

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ABSTRACT

Misidentification of the American black bear (*Ursus americanus*) is often named as a possible source of the Bigfoot phenomenon. Bigfoot report data and American black bear population data are presented and analyzed to identify any relationship between the two.

1. INTRODUCTION

Bigfoot believers and disbelievers alive have always been aware that, in theory, a person might mistake certain animals for Bigfoot. One of those animals is the bear. No person can deny that such misidentification is possible. It is clear that it *can* happen.

The question to be addressed in this paper is this: *does* it happen? The majority of the so-called skeptical community believes that it does, and that misidentification of common species of bear contributes a significant portion of Bigfoot reports. However, they have produced little in the way of actual examples to support this opinion. Hence the question of bear misidentification, and the degree to which it contributes to Bigfoot reporting, has always been unresolved.

2. GREEN'S SIGHTING DATA

Bigfoot researcher John Green claimed to have collected over 1,500 Bigfoot reports as of the 1981 printing of his book. Green's national sighting data as of November 1977 is summarized in Table 1 (Green 1981). This data is analyzed to determine if misidentification of the American black bear (*Ursus americanus*) is a significant contributor to the Bigfoot phenomenon.

TABLE 1
GREEN SIGHTING DATA AND BLACK BEAR POPULATION STATISTICS

Case (1)	State (2)	Black Bear Population (3)	Sq. Mi. (4)	Black Bear Pop. / Sq. Mi. (5)	Freq. (6)	Cluster Group (7)	Excluded (8)
1	Alaska	100,000	550,000	0.1818	20	A	
2	Montana	12,500	147,138	0.0850	74	A	
3	Oregon	25,000	96,981	0.2578	176	A	
4	Washington	25,000	68,192	0.3666	281	A	
5	N. California	10,250	79,347	0.1292	294	A	
6	S. California	10,250	79,347	0.1292	49	B	
7	Idaho	16,000	83,557	0.1915	32	A	
8	Wyoming	-	94,914	-	4	B	X
9	South Dakota	Very small	77,047	-	7	B	X
10	Nevada	300	110,540	0.0027	5	B	
11	New Mexico	4,000	121,510	0.0329	7	B	
12	Florida	1,250	58,560	0.0213	104	B	
13	Texas	50	267,339	0.0002	30	B	
14	Arkansas	2,500	53,104	0.0471	19	B	
15	Iowa	0	56,290	0	15	B	

16	North Dakota	Occasional transients	70,665	-	2	B	X
17	Arizona	2,500	113,575	0.0220	5	B	
18	Kansas	Occasional transients	82,264	-	6	B	X
19	Oklahoma	250	69,919	0.0036	9	B	
20	Mississippi	38	47,716	0.0008	8	B	
21	Nebraska	0	77,227	0	3	B	
22	Colorado	10,000	104,247	0.0959	4	B	
23	Missouri	100	69,686	0.0014	10	B	
24	Maine	21,000	33,040	0.6356	4	B	
25	Utah	1,100	84,916	0.0130	2	B	
26	Illinois	0	56,400	0	23	B	
27	Michigan	12,000	58,216	0.2061	18	B	
28	Georgia	1,800	58,876	0.0306	10	B	
29	Minnesota	20,000	84,068	0.2379	5	B	
30	Indiana	0	36,291	0	15	B	
31	Wisconsin	14,000	56,154	0.2493	8	B	
32	Pennsylvania	9,500	45,333	0.2096	24	B	
33	Tennessee	750	42,244	0.0176	9	B	
34	Kentucky	A few hundred	40,395	-	7	B	X
35	West Virginia	5,670	24,181	0.2344	6	B	
36	Ohio	25	41,222	0.0006	19	B	
37	Alabama	50	51,069	0.0010	5	B	
38	South Carolina	350	31,055	0.0113	6	B	
39	Louisiana	300	48,523	0.0062	5	B	
40	New Hampshire	2,750	9,304	0.2956	5	B	
41	North Carolina	8,000	52,712	0.1518	5	B	
42	New Jersey	500	7,836	0.0638	36	B	
43	Vermont	2,500	9,609	0.2602	2	B	
44	New York	4,600	49,476	0.0928	11	B	
45	Virginia	3,250	40,815	0.0796	4	B	
46	Maryland	300	10,577	0.0284	12	B	
47	Delaware	-	2,057	-	1	B	X
48	Connecticut	40	5,009	0.0080	2	B	
49	Massachusetts	1,200	8,257	0.1453	1	B	
50	Rhode Island	0	1,214	0	0	B	
51	Hawaii	0	10,932	0	-	B	X
	Mean	7326.07	70,177	0.1011	28.18		
	Median	1,800	56,290	0.0329	7.50		
	Std. Dev.	15,816.66	81,728	0.1305	61.09		
	Std. Err.	2,357.81	11,444	0.0195	8.64		

3. METHODOLOGY

Green’s data will be tested against a simplistic model of expected sighting rates for animals. The probability of receiving a report for a cataloged animal is modeled as:

$$p_r = p_s \cdot p_a \cdot p_h \cdot p_e \qquad \text{(Eq. 1)}$$

where,

p_r is the probability function of receiving a report,

p_s is the probability function that an observation results in a report submission,

p_a is the probability function of an animal being at a specific place and time to be observed,

p_h is the probability function of a human being in a specific place and time to make the observation, and

p_e is the probability function of an observer expecting to observe the phenomenon.

The author assumes that the probability that an observation results in a report submission is geographically uniform, so this reduces to a constant. The probability that a human in a specific place and time makes an observation is directly proportional to human population density. The probability of an animal being in a specific place and time to be observed is directly proportional to the animal's population density. This is modeled on a per-state basis as the population divided by the number of square miles.

4. ANALYSIS

Table 1 is organized on a per-state basis and is ordered in descending normalized frequency (not shown) (Glickman 1998). The "Black Bear Population" column is the 1997 black bear population figure for the state (Burch 1997). Where a range of possible populations was given by Burch, the mean of the data was used. "Sq. Mi.' is the number of square miles in the state. "Black Bear Pop. / Sq. Mi." is derived as "Black Bear Population" divided by "Sq. Mi." The "Freq." column contains Green's reported observation frequencies (Green 1981). "Cluster Group" is the assigned cluster group resulting from cluster analysis (Glickman 1998). The "Excluded" column indicates the states excluded from the analysis due to incomplete data.

The bivariate correlation coefficient for Table 1 data between frequency and black bear population density is computed as a baseline prior to data clustering and is called the baseline correlation. The frequency is not well correlated to the black bear population density across the entire dataset.

Hierarchical cluster analysis has previously been performed by Glickman on the normalized frequency. Cases 1, 2, 3, 4, 5, and 7 were called Group A which consists of Alaska, Montana, Oregon, Washington, Northern California, and Idaho. The remainder of the cases was called Group B. (Glickman 1998)

The same correlations as those computed for the baseline were computed for Group A and B and are summarized in Table 2.

TABLE 2
POST-CLUSTERING CORRELATIONS OF GREEN'S SIGHTING DATA TO BLACK BEAR POPULATION STATISTICS

(1)	Frequency vs. Black Bear Population Density (2)
Baseline Correlation	+0.2562
Baseline Significance	1.718
Baseline Cases	44
Group A Correlation	+0.4139
Group A Significance	0.909
Group A Cases	6
Group B Correlation	-0.1219
Group B Significance	-0.737
Group B Cases	38

5. DISCUSSION

Glickman noted that the report frequency in Group A has a high correlation to human population density. This is consistent with the model of receiving a report for an animal (Eq. 1). Glickman also noted that the report frequency in Group B has a high correlation to human population. He hypothesized that Group B may represent manufactured reports. (Glickman 1998)

If misidentification of black bears was a significant contributor to Green's sighting data, and, by extension, to the Bigfoot phenomenon as a whole, a strong correlation between black bear population density and report frequency is expected.

If Group B represents manufactured reports only, no correlation between black bear population density and report frequency is expected.

No relationship is observed between black bear population density and frequency: the Baseline, Group A, and Group B correlations of +0.2562, +0.4139, and -0.1219, respectively, are all low.

Since no correlation was found between black bear population density and report frequency in Group B, the hypothesis that Group B represents only manufactured reports has not been contradicted.

The lack of correlation between black bear population density and report frequency in Group A is of special interest. As noted above, the correlation between human population density and report frequency in Group A is consistent with the model of receiving a report of an animal. This suggests that some animal species may be responsible for the Bigfoot phenomenon in Group A. However, the correlation between black bear population density and report frequency in Group A is low, which suggests that misidentification of black bears is not a significant contributor to the Group A phenomenon.

6. CONCLUSIONS

The goal of this analysis was to determine the degree to which misidentification of the American black bear contributes to the Bigfoot phenomenon. The lack of significant correlation between black bear population statistics and Green's sighting data suggests that misidentification of black bears is responsible for only a small fraction of Bigfoot reports.

The hypothesis that a significant portion of the Bigfoot phenomenon results from misidentification of black bears has been proved false. Those attempting to study the Bigfoot phenomenon scientifically, especially members of the so-called skeptical community, should respond by rejecting this hypothesis, and should in the future refrain from offering the hypothesis as a plausible explanation for the Bigfoot phenomenon.

Taken together with the results of Glickman's analysis, the results in this paper indicate that some species of animal other than the American black bear is responsible for the Bigfoot phenomenon observed in Alaska, Montana, Oregon, Washington, Northern California, and Idaho. The animal species responsible remains unidentified. The Bigfoot phenomenon in these states may be the result of an uncataloged animal, or it may result from misidentification of some other species of cataloged animal.

REFERENCES

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