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Measurements Of 677 Pine Siskins Banded One Spring In South Carolina

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The erratic migratory habits of Pine Siskins (*Carduelis pinus*) makes them difficult birds to study during the non-breeding season. Dunning's (1984) compilation of bird body weights identified Clench and Leberman's (1978) data from southwestern Pennsylvania as the largest published dataset containing Pine Siskin weights. This dataset contained 356 observations gathered through 13 years of banding at the Powdermill Nature Reserve at Rector (about 48 miles ESE of Pittsburgh).

During the months of January through May, 1987, inclusive, 677 Pine Siskins were captured using mist nets at the principal author's residence about 2.5 miles ENE of Seneca (34.42N, 82.57W) in Oconee, the northwestern-most county of South Carolina.

Of the 677 Pine Siskins, 551 were banded with the standard aluminum North American Bird Banding Laboratory (NABBL) bands. The remainder of the siskins were color banded (authorized by BBL-23.3, January 13, 1986) in addition to receiving a NABBL band. These individuals, part of another study, were distributed over the period from mid-January through April. No color bands were placed on birds banded in May. Banding was performed three or four days per week. Fifty-six percent of the birds were captured before 10 a.m.; ninety percent before noon. The duration of each banding session varied greatly with netting success, weather, and conflicting responsibilities.

The data hereinafter presented represents the information collected on first capture only. The following measurements were taken on all birds, with only a couple exceptions.

Weight: Weight was measured to the nearest 0.1 gram after banding. The weight of the color bands was so slight as to be unmeasurable on the 30 gm Pesola Scale used.

Wing: The unflattened wing chord was measured to the nearest millimeter using a rule with an endstop.

Tail: Tail length was measured to the nearest millimeter using a thin stainless steel ruler.

Fat: Body fat of the furcular and abdominal areas was measured visually using a modified Helms (1960) classification system. Only the general fat category (0, 1, 2, . . . , 6) was noted without subdivision (i.e., 2.5 or 3+).

Table 1 presents a summary of the data for the season as well as a division of the data into two-week periods. Analysis of variance (ANOVA) and the Kruskal-Wallis One-Way Analysis of Variance by Ranks (calculated for the fat measurements) of the data indicated that there was statistically significant variation between "periods" within all variables. Tukey's Studentized Range Test was used to identify which "periods" were significantly different ($p < .05$) within a variable. In particular, the Tukey Test indicated that:

Weight was heaviest in late January (period 1) and early May (period 8) and lightest from early March through April (periods 4-7).

Furcular Fat was greatest in early May (period 8) and least in early April (period 6).

Abdominal Fat was greatest in early May (period 8) and least in early February (period 2).

Wing Chord was longest in late March and early April (periods 5 and 6) and shortest in late January (period 1) and early May (period 8).

Tail Length was shortest in early May (period 8).

In summary, Pine Siskins first captured in northwestern South Carolina in January or in late April and early May tended to weigh more and have more body fat than siskins whose first capture occurred between those periods (February, March, and April). The length of the wings and tails of siskins first captured in the middle months (February to mid-April) tended to be longer than those siskins whose first capture occurred in January or in late April and early May. Pine Siskins banded in South Carolina weighed significantly less than those reported by Clench and Leberman (1978) in Pennsylvania, month by month from January through April (t -Test: $p < .01$). There was no significant difference between

the two groups in May. The difference in the manner in which these two datasets were compiled makes speculation on the cause of these significant differences inappropriate except as a starting point for further study.

Literature Cited

Clench, M. H. and R. C. Leberman. 1978. Weights of 151 species of Pennsylvania birds analyzed by month, age, and sex. *Bulletin of Carnegie Museum of Natural History* 5:1-85. Pittsburgh, PA.

Dunning, J. B., Jr. 1984. Body weights of 686 species of North American Birds. *Western Bird Banding Association Monograph* 1:1-28. Cave Creek, AZ.

Helms, C. W. and W. H. Drury, Jr. 1960. Winter and migratory weight and fat field studies on some North American Buntings. *Bird Banding*, 31:1-40.

Table 1. Means and related statistics of five variables measured on 677 Pine Siskins captured during eight two-week periods from January to May 1987.

VARIABLE	PERIOD								OVERALL
	1	2	3	4	5	6	7	8	
1987 Dates	19 Jan- 1 Feb	2 Feb- 15 Feb	16 Feb- 1 Mar	2 Mar- 15 Mar	16 Mar- 29 Mar	30 Mar- 12 Apr	13 Apr- 26 Apr	27 Apr- 11 May	19 Jan- 11 May
<u>Weight</u>									
N	52	100	42	96	78	121	133	53	675
X	14.35	13.58	14.20	13.51	13.79	13.53	13.60	14.79	13.78
STD	1.03	.93	.90	.92	.81	.86	1.19	1.48	1.08
RANGE	12.5-16.6	11.5-15.7	12.3-16.1	11.1-15.4	11.8-16.0	11.4-16.1	11.4-19.9	12.0-18.2	11.1-19.9
¹ DIFFERENT FROM	>2 >4 >5 >6 >7	<1 <3 <8	>2 >4 >6 >7	<1 <3 <8	<1 <8	<1 <3 <8	<1 <3 <8	>2 >4 >5 >6 >7	F=13.86 p<.01
<u>²Fat-Furcular</u>									
N	53	100	42	96	77	121	132	54	675
X	2.53	2.18	2.81	2.48	2.30	1.19	2.35	3.44	2.40
STD	.75	.66	.80	.82	.67	.87	1.24	.96	.97
RANGE	2-4	0-4	2-4	0-4	1-4	0-4	0-6	2-5	0-6
¹ DIFFERENT FROM	>6 <8	<3 <8	>2 >6 <8	>6 <8	<8	<1 <3 <4 <7 <8	>6 <8	>1-7	F=16.55 p<.01
<u>²Fat-Abdominal</u>									
N	53	100	42	96	77	121	132	54	675
X	2.41	2.32	2.76	2.70	2.84	2.56	2.60	3.46	2.66
STD	.72	.71	.61	.74	.69	.88	1.00	.79	.85
RANGE	1-4	0-4	2-4	1-4	1-4	0-4	0-6	2-5	0-6
¹ DIFFERENT FROM	<8	<3 <4 <5 <7 <8	>2 <8	>2 <8	>2 <8	<8	<8	>1-7	F=11.91 p<.01
<u>Wing (mm)</u>									
N	53	100	42	96	78	121	133	54	677
X	73.38	73.62	73.83	74.94	74.76	74.70	74.26	73.37	74.09
STD	1.80	1.81	1.92	2.12	1.95	2.12	1.99	1.93	2.03
RANGE	69-78	70-79	71-78	69-78	69-80	70-79	70-79	68-77	68-80
¹ DIFFERENT FROM	<5 <6	<5 <6			>1 >2 >8	>1 >2 >8		<5 <6	F=6.02 p<.01
<u>Tail (mm)</u>									
N	53	100	42	96	78	121	133	54	677
X	46.13	46.44	46.62	46.23	46.32	46.27	46.11	46.56	46.22
STD	1.62	1.75	1.72	1.87	1.49	1.58	1.58	1.43	1.65
RANGE	44-51	43-50	43-50	40-51	43-49	42-50	42-50	43-50	40-51
¹ DIFFERENT FROM		>8	>8					<2 <3	F=2.03 p<.05
NET HOURS	10.35	22.29	11.70	16.38	15.71	22.71	22.13	33.51	154.78

¹Significant at the 5% level. Tukey's Studentized Range (HSD) Test was used to indicate where the differences occurred. For example, for the measurement "Fat-Furcular" in Period 1, the "Different From" values were >6 and <8. Hence, the furcular fat of Pine Siskins measured during Period 1 was significantly greater than that of Siskins banded during Period 6 and significantly less than those banded in Period 8.

²A Kruskal-Wallis Test (chi-square approximation) was performed for each fat measurement to test the hypothesis that the birds in each sample period came from the same population. The results were: Furcular Fat: chi-square = 87.45 with df = 7; Abdominal Fat: chi-square = 78.00 with df = 7. Both chi-square values were statistically significant at the 1% level. Analysis of variance and the Tukey Test values are given in the table to indicate where the differences most likely occur.