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## SOME MEASUREMENTS AND WEIGHTS OF LIVE BIRDS

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It was with the feeling that a great deal of valuable information was slipping through the hands of banders that I took up the measuring and weighing of birds as a part of the regular banding work. During the past two years approximately 2700 individuals, including more than seventy species, have been measured and weighed at my two banding stations at Worcester, Massachusetts, and Pomfret, Connecticut. Sufficient numbers of birds of some species have been measured and weighed to obtain fairly accurate averages, while in many cases only one individual of a species has been handled. Feeling that this phase of bird-study may be of interest to other banders, I have gathered together the data in the tabulation presented herewith.

I have found that a millimeter rule works practically as well as dividers in measuring birds in the hand accurately as well as quickly, as the position of the bird is not changed from the time the bird is taken from the gathering cage until it is placed in the bag for weighing. Birds are held in a position similar to that of Figure 62 in "The Manual for Bird Banders." In measuring, the bird is held in the left hand in as natural but straight a position as possible, the tip of the bill and end of rule are placed together against the edge of the banding table, and by touching the tip of tail and rule with right thumbnail the length is easily determined to a quarter of a millimeter. Wing measurements are taken by placing left forefinger at the bend of right wing so that the end of the rule, when placed under the wing, will just touch the finger. The tip of the longest primary is then indicated on the rule by the right thumbnail. Tail, bill, and tarsus measurements are taken in the same manner as that of the wing.

For weighing a balance has been used having a scale graduated to tenths of a gram. It has been necessary to do all weighing inside the house, as the slightest breeze affects the scale. The birds are weighed by putting them into a small bag and folding it around them. Most of them lie perfectly quiet. I have found it possible, when necessary, thus to band, measure, and weigh as many as twenty birds an hour.

Great care has been taken in the following list (Table I) to eliminate all birds with abraded primaries and rectrices. Sex has been determined, not by measurement, but by behavior or song when sexes are identical, with the exception of the Purple Finches, some of which, weighed as females, may have been immature males. The immature male Purple Finches given are all olivaceous birds coming into rosy plumage.

Birds marked "Juv." are fledglings ready to leave the nest, while young birds taken in traps are called immature.

Immature Myrtle Warblers were positively distinguished from adults by down feathers on the head, but those marked adults may have included some immature birds, as size or degree of coloring cannot be depended upon to determine age, some immature Myrtle Warblers, probably males, having more yellow and black than most adults. It is interesting to note that Myrtle Warblers taken late in the season were noticeably heavier than early arrivals. The average weight of 160 Myrtle Warblers from September 24th to October 2d was 11.17 grams, while the average of 114 Myrtle Warblers from October 8th to November 4th was 12.74 grams. It is presumed that these birds were feeding on the plentiful supply of bayberries near by and putting on weight to withstand the cold of the coming winter.

The average measurements of migrating Song Sparrows given will be seen to be larger and their weights greater than those of summer residents, which supports the opinion of some other banders working with Song Sparrows, that a larger race of these birds nests somewhere to the North. I feel sure that unusually full crops do not account for the greater weights, for two reasons: (1) such birds are also larger than my nesting birds and, (2) with perhaps one exception, they were passing hurriedly along in migration, as shown by the fact that only one repeated.

In an effort to determine whether feathers, bones, or bill shrink in drying, comparisons have been made of average measurements of live birds with those of skins as given by Ridgway in his "Birds of North and Middle America."

Comparisons of length are not given in the list (Table II), for such measurements of skins are of little value, as the specimens may have been stretched or shrunk a considerable amount.

Although Ridgway's material came from a much larger area than those birds measured by me, his skins are all from birds of the Eastern States and should not usually include races other than those with which I have worked.

In comparing skins with live birds it will be noticed in the list that tail-measurements of live birds are longer in nearly every case. This may be explained by the fact that all live birds measured had unabraded rectrices, and also that tails were measured from the oil-gland and not from the base of the rectrices as was done by Ridgway. The distance from the base of the rectrices to the oil-gland varying in different species accounts for variations in length.

The accordance of all measurements of Purple Finches is quite remarkable in view of the fact that nearly all other species vary a great deal.

The average measurements of *live* male Downy Woodpeckers are less than those of females. With skins, although the average tail of males is less, the wing is greater than that of females. This average wing-measurement of skins must be an error. The skins of White-breasted Nuthatch males are given as larger than those of females, while I have found exactly the opposite to be the case with the living bird. It must be remembered, however, that not a sufficient number of birds have been measured in either case to draw true averages.

Ridgway's seven male Tree Swallow wings average .5 mm. longer than those of twelve live males, while his six female wings were 1.3 mm. shorter than those of eighteen live females. Why the average tail of his same seven males should have averaged 2.9 mm. shorter than the average tail of the smaller winged twelve live males is hard to explain, although we should expect to find a 2.7 mm. shorter average tail for his shorter-winged females. The average tarsus of his males is 1.8 mm. longer than that of live males, which corresponds with the longer wing, but not with shorter tail; on the other hand, the 1.1 mm. longer tarsus of his females with shorter average wing and tail should not be so.

The average wing and tail of male House Wren skins is 1.4 mm. and 6.6 mm. respectively shorter than the live-male measurements, yet the average tarsus of the same skins is 1.2 mm. longer than the live males. And so on right through the

Period	Common Name	Scientific Name	Age	Sex	No of Inds.
Sept. 21	Leach's Petrel	Oceanodroma l. leucorhoa	Ad.	..	1
Aug. 12	Eastern Green Heron	Butorides v. virescens	Im.	..	1
Aug.	Northern Red-shouldered Hawk	Buteo l. lineatus	Im.	..	1
Mar. 22	Eastern Sparrow Hawk	Falco s. sparverius	Ad.	♂	1
Sept. 18, Oct. 2			Ad.	♀	2
May 15, Aug. 24	Eastern Bob-white	Colinus v. virginianus	Ad.	♀	2
Aug. 4, July 29			Ad.	♀	2
May, April 30	Virginia Rail	Rallus l. limecola	Ad.	..	2
Nov. 17	Dovekie	Alle alle	Im.	..	1
Feb. 13, July 14	Eastern Mourning Dove	Zenaidura macroura carolinensis	Ad.	♀	2
Feb. 6	Saw-whet Owl	Cryptoglaux a. acadica	Ad.	..	1
July 9	Eastern Whip-poor-will	Antrostomus v. vociferus	Im.	♂	1
June 10	Eastern Belted Kingfisher	Megasceryle a. alcyon	Ad.	♂	1
July 9-Aug. 10	Northern Flicker	Colaptes auratus luteus	Im.	..	6
Oct. 13	Yellow-bellied Sapsucker	Sphyrapicus v. varius	Im.	..	1
Oct. 25-Jan. 18	Northern Downy Woodpecker	Dryobates pubescens medianus	Ad.	♂	3
Nov. 6, Feb. 6			Ad.	♀	2
June 10-July 3	Eastern Kingbird	Tyrannus tyrannus	Ad.	♂	3
July 3			Juv.	..	1
June 10-July 30	Eastern Phoebe	Sayornis phoebe	Ad.	..	3
July 8-Sept. 24	" "	" "	Im.	..	38
July 22	" "	" "	Juv.	..	1
July 27, Aug. 1	Least Flycatcher	Empidonax minimus	Im.	..	2
Feb. 18	Northern Horned Lark	Otocoris a. alpestris	Ad.	♂	1
June 11-July 13	Tree Swallow	Iridoprocne bicolor	Ad.	♂	12
May 11-July 13	" "	" "	Ad.	♂	18
Aug. 24	" "	" "	Im.	..	1
June 11, July 30	" "	" "	Juv.	..	2
Sept. 14-June 29	Northern Blue Jay	Cyanocitta c. cristata	Ad.	..	44
Sept. 22-May 31	Black-capped Chickadee	Penthestis a. atricapillus	Ad.	..	58
Oct. 20-Jan. 17	White-breasted Nuthatch	Sitta c. carolinensis	Ad.	♂	4
Nov. 12, 20	" "	" "	Ad.	♀	2
May 19-Aug. 15	Eastern House Wren	Troglodytes a. aedon	Ad.	♂	11
May 20-Aug. 5	" "	" "	Ad.	♂	13
July 20-Aug. 30	" "	" "	Im.	..	8
June 23	" "	" "	Juv.	..	1
Jan. 30	Eastern Mockingbird	Mimus p. polyglottos	Ad.	♂	1
May 13-Oct. 6	Catbird	Dumetella carolinensis	Ad.	..	11
July 12-Sept. 1	" "	" "	Im.	..	43
June 23	" "	" "	Juv.	..	1
July 4-Sept. 24	Brown Thrasher	Toxostoma rufum	Im.	..	8
April 4-Aug. 21	Eastern Robin	Turdus m. migratorius	Ad.	♂	8
May 25-Aug. 21	" "	" "	Ad.	♀	8
July 4-Sept. 6	" "	" "	Im.	..	31
May 29-Aug. 20	" "	" "	Juv.	..	3
June 12	Wood Thrush	Hylocichla mustelina	Ad.	..	1
Nov. 3	Eastern Hermit Thrush	Hylocichla guttata faxoni	Im.	..	1
July 21-26	Veery	Hylocichla f. fuscescens	Im.	..	3
April 5-Oct. 13	Eastern Bluebird	Sialia s. sialis	Ad.	♂	10
April 5-Oct. 13	" "	" "	Ad.	♂	10
July 16-Oct. 9	" "	" "	Im.	♂	15
July 16-Oct. 9	" "	" "	Im.	♂	15
Aug. 25	" "	" "	Juv.	..	1
Aug. 25	" "	" "	Juv.	♀	1
July 17-23	Cedar Waxwing	Bombycilla cedrorum	Ad.	..	2
July 17	" "	" "	Juv.	..	2
Nov. 25	Northern Shrike	Lanius b. borealis	Im.	..	1
Nov. 29-Jan. 18	Starling	Sturnus v. vulgaris	Ad.	..	24
July 4	Red-eyed Vireo	Vireo olivaceus	Ad.	♂	1
July 4	" "	" "	Ad.	♂	1
Aug. 11	" "	" "	Im.	..	1
July 4	" "	" "	Juv.	..	2
June 21-23	Black and White Warbler	Mniotilta varia	Ad.	♂	2
June 21-23	" "	" "	Ad.	♀	2
June 21-23	" "	" "	Juv.	..	3
May 2, June 28	Eastern Yellow Warbler	Dendroica a. aestiva	Ad.	♂	2
June 25, 27	" "	" "	Ad.	♀	2
Aug. 21	" "	" "	Im.	..	1
June 25-28	" "	" "	Juv.	..	3
Sept. 24-Nov. 4	Myrtle Warbler	Dendroica coronata	Ad.	..	274
Oct. 14-22	" "	" "	Im.	..	66

	Tail	Exposed Culmen	Tarsus	Weight in Grams
	85.75	16.00	22.25	37.40
	67.00	50.75	50.75	119.10
	203.00	24.00	76.25	.....
	127.00	12.50	35.50	87.75
F <sub>30</sub> (198.13)	127.00-130.00 (128.50)	9.75-12.25 (11.13)	31.75-32.25 (32.00)	111.30-115.20 (113.25)
F <sub>25</sub> (117.75)	67.00-67.50 (67.25)	11.25-14.50 (12.88)	32.25-33.00 (32.63)	193.80-198.90 (196.35)
F <sub>20</sub> (116.00)	61.00-68.50 (64.75)	11.75-14.50 (13.13)	28.00-30.50 (29.25)	206.80-207.30 (207.05)
F <sub>15</sub> (111.63)	44.00-55.75 (49.88)	34.50-43.25 (38.88)	31.00-33.50 (32.25)	68.00
	41.25	13.25	19.50	93.10
F <sub>10</sub> (145.75)	142.75-146.00 (144.38)	12.75-17.00 (14.88)	20.25-20.75 (20.50)	138.40
	76.00	15.00	20.00	.....
	97.50	10.50	15.00	51.72
	88.75	50.75	.....	.....
H <sub>00</sub> (145.71)	91.00-112.00 (101.88)	26.25-35.00 (28.79)	26.50-29.00 (27.21)	107.40-147.25 (116.33)
	75.50	23.00	19.75	40.50
K <sub>00</sub> (95.09)	55.75-68.50 (62.59)	13.25-15.75 (14.42)	14.00-16.50 (14.92)	26.80-29.40 (28.10)
	66.75-70.25 (68.50)	14.00-17.00 (15.50)	14.00-16.50 (15.25)	21.45-27.90 (24.68)
L <sub>50</sub> (113.75)	82.50-86.50 (83.92)	11.50-16.25 (13.92)	15.50-19.50 (17.17)	28.88-30.92 (35.60)
	28.00	8.50	17.75	35.30
K <sub>75</sub> (85.17)	70.25-75.50 (72.25)	11.75-13.75 (12.50)	16.00-20.25 (18.34)	16.50-19.00 (17.59)
K <sub>00</sub> (84.83)	65.00-82.50 (73.12)	11.25-16.50 (12.59)	16.00-19.00 (17.60)	15.60-22.50 (18.69)
	26.50	9.75	20.25	16.20
K <sub>50</sub> (62.25)	53.00-53.75 (53.38)	9.25-12.25 (11.00)	15.00-16.00 (15.50)	9.24
	75.00	9.75	23.50	.....
H <sub>25</sub> (117.20)	52.25-62.50 (58.55)	6.50-7.75 (6.82)	8.25-12.75 (10.50)	18.98-23.20 (20.58)
H <sub>75</sub> (115.84)	51.25-60.25 (57.47)	5.50-7.25 (6.51)	7.00-13.25 (11.13)	19.00-24.70 (20.58)
	46.50	7.00	12.75	19.60
	.....	.....	.....	21.30-22.00 (21.65)
H <sub>75</sub> (132.14)	86.50-149.25 (133.90)	19.00-27.25 (24.06)	31.75-37.50 (34.68)	80.00-103.40 (89.22)
H <sub>00</sub> (64.87)	57.25-70.50 (63.47)	7.00-9.25 (7.84)	11.50-19.00 (16.35)	9.40-13.20 (11.11)
K <sub>20</sub> (90.63)	48.50-53.75 (50.32)	17.00-19.75 (18.50)	17.75-18.75 (18.25)	22.00-23.00 (22.44)
K <sub>25</sub> (91.75)	49.50-54.50 (52.00)	16.50-17.50 (17.00)	17.25-18.50 (17.68)	20.80-20.90 (20.85)
L <sub>75</sub> (52.18)	42.25-72.75 (48.89)	10.75-13.13 (12.16)	14.75-18.75 (16.57)	10.00-11.20 (10.55)
L <sub>25</sub> (49.67)	41.50-46.00 (43.79)	11.25-13.75 (12.33)	12.50-17.25 (15.83)	10.58-12.90 (11.72)
L <sub>25</sub> (50.84)	42.00-45.75 (44.34)	10.50-12.25 (11.25)	15.00-18.50 (16.91)	9.60-10.90 (10.38)
	12.25	7.75	17.75	12.30
	123.50	19.75	33.00	.....
F <sub>75</sub> (91.64)	66.75-107.75 (95.50)	13.25-17.75 (16.02)	25.75-30.00 (27.73)	34.70-44.40 (38.50)
F <sub>75</sub> (90.84)	67.75-108.00 (95.63)	11.75-19.75 (15.83)	22.50-30.50 (27.65)	32.30-40.60 (36.04)
	24.75	12.75	28.50	34.60
H <sub>50</sub> (100.63)	120.25-126.00 (123.03)	19.00-23.50 (21.33)	31.50-37.00 (33.94)	59.50-76.90 (66.25)
H <sub>25</sub> (129.09)	94.50-112.00 (101.47)	17.25-20.75 (20.41)	30.50-34.50 (32.34)	73.00-80.94 (77.20)
H <sub>00</sub> (125.21)	92.00-104.25 (97.49)	17.00-20.50 (18.25)	31.00-33.25 (31.84)	65.80-84.09 (76.05)
H <sub>50</sub> (127.04)	81.25-108.50 (100.77)	15.25-21.50 (18.03)	28.50-35.00 (32.31)	63.20-82.00 (72.49)
H <sub>25</sub> (77.08)	20.25-33.00 (24.50)	12.00-14.00 (13.33)	30.00-30.50 (30.33)	50.70-52.20 (51.44)
	63.50	12.75	25.25	.....
	73.50	13.25	31.75	29.90
F <sub>25</sub> (106.63)	63.50-76.25 (70.88)	13.50-15.25 (14.19)	26.50-32.50 (30.25)	31.70-33.60 (32.47)
F <sub>50</sub> (98.00)	62.00-70.50 (64.70)	10.25-13.25 (11.42)	19.00-21.50 (19.73)	27.60-31.62 (29.98)
F <sub>75</sub> (96.73)	57.75-89.50 (65.83)	10.25-14.25 (11.80)	17.25-20.25 (19.55)	27.78-34.08 (29.23)
H <sub>00</sub> (102.85)	62.25-70.25 (65.57)	10.00-12.00 (11.04)	16.25-20.25 (19.22)	25.50-36.30 (30.98)
F <sub>50</sub> (95.47)	59.00-65.25 (62.27)	9.75-12.00 (10.94)	16.75-20.25 (19.35)	27.40-30.70 (29.79)
	29.75	7.75	19.00	28.20
	26.50	7.75	20.25	30.00
H <sub>00</sub> (94.88)	57.00-57.50 (57.25)	8.50-9.75 (9.13)	14.25-18.00 (16.13)	31.10
H <sub>50</sub> (68.00)	30.50-32.25 (31.38)	7.75-8.00 (7.88)	16.75-17.25 (17.00)	26.00-27.10 (26.55)
	111.50	16.25	26.00	57.50
H <sub>00</sub> (125.72)	58.25-68.50 (64.47)	22.50-25.25 (24.16)	26.00-31.25 (29.12)	64.30-88.50 (77.82)
	62.50	13.50	17.50	17.48
	52.00	12.75	18.00	15.98
	54.25	12.00	17.50	17.78
	.....	.....	.....	11.56-13.66 (12.62)
H <sub>00</sub> (64.75)	44.50-68.00 (56.25)	11.75-12.00 (11.88)	16.00-16.50 (16.25)	.....
H <sub>50</sub> (34.42)	44.50-50.75 (47.63)	11.75-12.75 (12.25)	16.50-17.50 (17.00)	.....
H <sub>25</sub> (62.75)	3.25-6.50 (5.42)	8.00-8.25 (8.17)	12.75-16.00 (14.92)	.....
H <sub>25</sub> (60.13)	41.25-49.25 (45.25)	9.75	19.00	.....
	38.00-45.75 (41.88)	9.50-10.00 (9.75)	15.25-18.75 (17.00)	9.50
	44.00	7.75	19.00	9.80
H <sub>00</sub> (30.13)	1.75-7.75 (4.75)	6.50-7.75 (7.13)	15.25-18.00 (16.63)	.....
H <sub>25</sub> (70.39)	50.25-66.25 (56.43)	7.75-10.25 (8.77)	16.00-22.25 (18.46)	9.20-16.40 (11.93)
H <sub>00</sub> (72.33)	52.50-64.00 (58.93)	8.25-10.50 (9.14)	15.50-19.50 (17.79)	10.70-14.90 (12.52)

TABLE I—Cont.

Period	Common Name	Scientific Name	Age	Sex	No. of Inds.
Aug. 2	Chestnut-sided Warbler	<i>Dendroica pensylvanica</i>	Ad.	♀	1
Sept. 15, 17	Northern Pine Warbler	<i>Dendroica p. pinus</i>	Ad.	♂	3
Aug. 17—Sept. 5	Northern Prairie Warbler	<i>Dendroica d. discolor</i>	Im.	♂	2
Oct. 2	Yellow Palm Warbler	<i>Dendroica palmarum hypochrysea</i>	Im.	♂	1
July 14—Aug. 12	Ovenbird	<i>Seiurus aurocapillus</i>	Im.	♂	6
July 11	Northern Water-Thrush	<i>Seiurus n. noveboracensis</i>	Ad.	♂	1
July 11	Northern Yellow-throat	<i>Geothlypis trichas brachidactyla</i>	Ad.	♀	1
July 29	" " "	" " "	Im.	♂	20
July 21—Sept. 7	" " "	" " "	Ad.	♂	1
June 30	Bobolink	<i>Dolichonyx oryzivorus</i>	Ad.	♀	1
June 30	" "	" "	Ad.	♂	1
June 30	" "	" "	Juv.	♂	1
June 24	Eastern Meadowlark	<i>Sturnella m. magna</i>	Ad.	♀	1
June 13	Eastern Red-wing	<i>Agelaius p. phoeniceus</i>	Ad.	♀	1
Aug. 3	" "	" "	Im.	♂	1
June 17—July 11	Baltimore Oriole	<i>Icterus galbula</i>	Ad.	♂	4
May 22—Aug. 5	" "	" "	Ad.	♀	4
July 12—Aug. 14	" "	" "	Im.	♂	52
June 22	" "	" "	Juv.	♂	1
Oct. 12	Rusty Blackbird	<i>Euphagus carolinus</i>	Ad.	♀	1
Feb. 5	Bronzed Grackle	<i>Quiscalus quiscula zeneus</i>	Ad.	♂	1
Feb. 10—Sept. 25	Eastern Cowbird	<i>Molothrus a. ater</i>	Ad.	♂	10
Mar. 28—Sept. 25	" "	" "	Ad.	♀	10
July 1—Sept. 24	" "	" "	Im.	♂	16
Aug. 21	Scarlet Tanager	<i>Piranga erythromelas</i>	Ad.	♀	1
July 31	Rose-breasted Grosbeak	<i>Hedymeles ludovicianus</i>	Ad.	♂	72
July 9—May 16	Eastern Purple Finch	<i>Carpodacus p. purpureus</i>	Ad.	♂	148
July 1—May 17	" "	" "	Ad.	♀	19
Mar. 20—Aug. 14	" "	" "	Im.	♂	23
July 12—Aug. 14	" "	" "	Im.	♂	23
May 4—Sept. 22	Eastern Goldfinch	<i>Spinus t. tristis</i>	Ad.	♂	5
July 17—Oct. 15	" "	" "	Ad.	♀	5
Aug. 26	" "	" "	Juv.	♂	1
April 30—Oct. 2	Red-eyed Towhee	<i>Pipilo e. erythrophthalmus</i>	Ad.	♂	8
May 14—Aug. 26	" "	" "	Ad.	♀	6
July 17—Oct. 8	" "	" "	Im.	♂	12
July 25—Oct. 7	" "	" "	Im.	♀	12
April 17—Oct. 29	Eastern Savannah Sparrow	<i>Passerculus sandwichensis savanna</i>	Ad. & Im.	♂	82
July 5—Oct. 25	Eastern Grasshopper Sparrow	<i>Ammodramus savannarum australis</i>	Ad.	♂	4
July 16—Sept. 24	Eastern Grasshopper Sparrow	<i>Ammodramus savannarum australis</i>	Im.	♂	14
April 22—Oct. 22	Eastern Vesper Sparrow	<i>Poocetes g. gramineus</i>	Ad.	♂	20
Oct. 1—April 29	Slate-colored Junco	<i>Junco h. hyemalis</i>	Ad.	♂	171
Oct. 29—April 24	Eastern Tree Sparrow	<i>Spizella a. arborea</i>	Ad.	♂	48
April 23—Oct. 23	Eastern Chipping Sparrow	<i>Spizella p. passerina</i>	Ad.	♂	97
July 11—Oct. 22	" "	" "	Im.	♂	102
July 3—17	" "	" "	Juv.	♂	5
April 16—Oct. 2	Eastern Field Sparrow	<i>Spizella p. pusilla</i>	Ad.	♂	22
July 19—Sept. 25	" "	" "	Im.	♂	18
May 14, Oct. 8—13	White-crowned Sparrow	<i>Zonotrichia l. leucophrys</i>	Ad.	♂	7
Oct. 1—Nov. 1	" "	" "	Im.	♂	20
April 22—May 6	White-throated Sparrow	<i>Zonotrichia albicollis</i>	Ad.	♂	4
Sept. 26—Nov. 25	" "	" "	Im.	♂	376
Mar. 21—April 21	Eastern Fox Sparrow	<i>Passerella i. iliaca</i>	Ad.	♂	16
Oct. 24—Nov. 13	" "	" "	Im.	♂	37
Sept. 24—Oct. 10	Lincoln's Sparrow	<i>Melospiza l. lincolni</i>	Im.	♂	9
April 29	Swamp Sparrow	<i>Melospiza georgiana</i>	Ad.	♂	1
July 27—Oct. 23	" "	" "	Im.	♂	30
April 15—Aug. 30	Eastern Song Sparrow	<i>Melospiza m. melodia</i>	Ad. <sup>1</sup>	♂	34
May 7—Sept. 14	" "	" "	Ad. <sup>1</sup>	♀	21
Mar. 13—30	" "	" "	Ad. <sup>2</sup>	♂	39
Sept. 23—Nov. 11	" "	" "	Ad. & Im. <sup>2</sup>	♂	81
June 24—Sept. 5	" "	" "	Im. <sup>1</sup>	♂	121
July 25	" "	" "	Juv.	♂	1

<sup>1</sup> Summer residents.<sup>2</sup> Spring migrants.

Wing	Tail	Exposed Culmen	Tarsus	Weight in Grams
60.75	34.00	12.00	17.00	....
76.25 (73.13)	55.75- 57.00 (56.38)	11.75-12.75 (12.25)	16.50	....
53.00 (56.09)	46.00- 51.00 (49.17)	9.25- 9.50 ( 9.42)	15.50-18.50 (17.34)	5.92- 8.02 ( 7.16)
63.50	58.25	9.75	19.00	....
77.25 (76.41)	52.00- 59.75 (54.88)	10.75-12.75 (11.79)	20.00-23.00 (21.71)	19.18- 22.70 ( 20.44)
71.00	49.75	12.00	21.75	15.90
59.75	55.00	12.00	18.50	9.72
54.50	50.75	9.50	20.50	10.00
60.00 (56.50)	45.75- 56.00 (50.92)	9.75-11.75 (10.75)	18.00-21.50 (19.83)	8.90- 12.90 ( 10.44)
95.00	66.00	14.00	22.75	....
82.50	54.00	12.75	21.00	....
43.75	9.50	11.00	22.00	....
107.75	75.50	31.75	34.25	....
101.75	77.50	16.00	29.00	....
110.25	88.25	17.00	29.75	....
99.75 (95.57)	71.75- 77.75 (75.32)	17.75-20.25 (18.57)	21.25-22.75 (22.13)	31.40- 36.10 ( 33.64)
95.00 (85.07)	69.75- 76.75 (73.88)	15.75-17.75 (16.75)	19.00-25.25 (22.98)	35.30- 37.70 ( 36.50)
99.00 (89.53)	67.00- 85.75 (72.95)	11.75-19.75 (16.45)	21.00-25.75 (23.15)	26.88- 39.98 ( 32.60)
56.00	19.00	12.00	21.75	....
115.25	96.25	19.50	32.25	....
114.75	137.25	24.00	36.75	152.52
118.00 (112.30)	70.75- 79.00 (75.98)	15.00-23.00 (16.74)	24.25-26.50 (25.35)	44.54- 49.20 ( 47.69)
100.75 (96.89)	63.50- 97.50 (67.78)	12.00-14.25 (13.38)	22.25-25.75 (24.13)	31.40- 38.00 ( 35.63)
109.25 (100.91)	61.25- 75.50 (68.02)	12.25-16.00 (14.16)	22.50-26.50 (24.69)	29.02- 46.40 ( 37.81)
99.25	71.00	14.25	19.25	28.90
70.00	72.75	16.50	23.75	37.50
88.00 (83.44)	54.25- 62.75 (59.71)	9.50-12.00 (10.64)	15.25-19.00 (17.17)	20.40- 29.98 ( 25.86)
87.00 (80.52)	35.25- 62.50 (56.27)	9.25-12.00 (10.57)	15.00-20.25 (17.04)	20.00- 31.29 ( 24.60)
85.25 (81.27)	52.00- 62.00 (57.39)	9.50-11.25 (10.39)	15.50-19.50 (17.31)	22.00- 27.36 ( 24.37)
84.50 (80.52)	54.00- 60.25 (56.13)	9.50-14.00 (10.25)	13.50-18.75 (17.20)	17.50- 23.52 ( 20.98)
73.00 (71.50)	45.75- 49.75 (46.55)	8.00-10.00 ( 9.30)	11.50-13.75 (13.00)	11.40- 13.30 ( 12.15)
71.25 (69.68)	44.50- 49.25 (46.80)	9.00- 9.75 ( 9.30)	12.00-14.50 (13.50)	11.32- 14.70 ( 12.85)
49.50	17.50	7.00	13.50	11.40
93.75 (88.29)	84.25-113.50 (97.60)	12.50-14.50 (13.16)	25.50-29.25 (28.16)	37.12- 46.90 ( 41.97)
86.00 (82.85)	73.75- 93.50 (86.40)	12.00-14.00 (12.70)	26.00-29.50 (27.40)	30.00- 43.70 ( 39.30)
89.00 (86.69)	93.00- 97.00 (95.23)	11.75-13.50 (12.30)	26.25-37.00 (28.59)	34.90- 45.90 ( 40.33)
85.75 (82.13)	88.75- 95.25 (91.62)	11.25-13.00 (12.19)	24.25-28.50 (27.32)	34.70- 47.40 ( 39.20)
76.50 (69.44)	47.50- 64.00 (53.27)	7.75-11.75 ( 9.04)	18.25-23.00 (20.69)	15.00 - 25.04 ( 18.73)
64.00 (61.82)	44.25- 47.00 (45.19)	11.00-12.25 (11.44)	19.00-20.25 (19.32)	17.53- 17.80 ( 17.67)
64.00 (59.31)	38.25- 45.25 (41.34)	9.25-11.25 (10.24)	17.25-20.75 (19.59)	14.00- 18.30 ( 16.09)
85.75 (80.05)	58.25- 71.00 (62.65)	9.25-11.50 (10.20)	19.50-21.75 (20.39)	22.10- 27.50 ( 24.23)
87.50 (76.99)	60.00- 74.50 (67.47)	7.75-11.25 ( 9.68)	17.50-23.00 (20.41)	16.00- 26.47 ( 20.94)
81.25 (75.96)	63.00- 75.00 (70.10)	8.00-10.00 ( 9.10)	18.75-22.50 (20.51)	17.40- 22.38 ( 19.59)
73.00 (69.05)	48.50- 64.75 (57.68)	6.75- 9.75 ( 8.21)	13.00-18.75 (16.54)	10.30- 16.70 ( 12.53)
73.25 (68.41)	45.00- 66.00 (58.13)	7.25- 9.75 ( 8.18)	14.50-20.00 (17.03)	10.30- 14.30 ( 12.01)
48.25 (46.25)	20.25	6.50	16.25-17.75 (17.00)	9.00- 10.90 ( 9.94)
65.00 (62.35)	52.00- 68.50 (63.40)	7.50- 9.00 ( 8.13)	16.00-19.25 (17.65)	10.60- 14.40 ( 12.57)
66.75 (63.31)	58.25- 69.50 (64.13)	7.75- 9.25 ( 8.32)	17.00-19.25 (18.12)	10.50- 14.60 ( 12.39)
81.25 (78.65)	69.00- 81.50 (75.04)	9.75-10.75 (10.11)	21.50-24.00 (22.65)	25.20- 35.75 ( 31.27)
83.25 (76.85)	68.50- 79.25 (74.43)	9.50-12.25 (10.32)	20.50-24.50 (23.07)	23.02- 32.50 ( 28.67)
78.25 (75.07)	73.00- 75.00 (74.25)	10.00-10.50 (10.25)	21.50-23.00 (22.13)	24.20- 29.62 ( 27.26)
79.25 (72.92)	50.75- 80.00 (73.22)	9.50-12.75 (10.17)	17.75-25.75 (23.28)	18.20- 34.50 ( 26.99)
93.50 (89.43)	71.50- 79.25 (75.38)	10.25-13.00 (11.22)	22.00-25.00 (23.75)	29.59- 47.38 ( 40.28)
93.50 (85.30)	67.75- 77.50 (73.23)	9.75-12.25 (11.09)	22.25-26.50 (24.71)	34.90- 52.10 ( 40.00)
65.00 (60.73)	55.00- 64.50 (57.45)	8.75-10.50 ( 9.67)	18.50-21.50 (19.89)	14.40- 19.28 ( 16.90)
63.50	64.75	9.50	20.25	....
66.75 (61.35)	56.00- 64.50 (59.81)	8.50-11.00 ( 9.79)	19.75-24.00 (21.77)	14.20- 21.50 ( 17.61)
70.75 (67.00)	59.00- 74.75 (67.56)	9.75-13.00 (11.25)	19.50-22.75 (21.03)	19.90- 24.80 ( 21.80)
53.50 (61.70)	57.00- 71.00 (62.61)	9.75-13.25 (11.24)	18.75-22.50 (20.65)	17.70- 24.20 ( 19.84)
72.00 (67.56)	65.00- 76.75 (69.46)	10.25-12.00 (10.90)	19.50-23.50 (21.19)	20.01- 28.00 ( 24.01)
72.00 (65.98)	57.50- 77.00 (67.81)	9.75-12.25 (10.58)	17.75-23.75 (21.42)	18.00- 25.60 ( 21.91)
68.00 (64.04)	49.50- 73.50 (64.87)	7.75-13.25 (10.54)	19.25-23.75 (21.25)	16.20- 23.50 ( 19.68)
45.75	12.75	9.50	22.25	15.20

All measurements in millimeters.

TABLE II

Common Name	Scientific Name	No. of Age-Sex Inds.	Locality from Which Birds were Taken	Wing	Tail	Exposed Culmen-Tarsus
Ridgway Wetherbee	Northern Downy Woodpecker	♂	3 Eastern Mass.	97.5	57.2	16.5
Ridgway Wetherbee	" "	♂	3 Mass. and Conn.	97.5	57.2	14.4
Ridgway Wetherbee	" "	♀	3 Eastern Mass.	96.5	56.3	14.7
Ridgway Wetherbee	Tree Swallow	♀	2 Mass. and Conn.	96.2	68.5	13.3
Ridgway Wetherbee	" "	♂	7 Eastern U. S.	118.4	55.0	12.3
Ridgway Wetherbee	" "	♂	12 Mass. and Conn.	117.9	58.5	6.9
Ridgway Wetherbee	" "	♀	6 Eastern U. S.	114.5	54.7	6.4
Ridgway Wetherbee	White-breasted Nuthatch	♀	18 Mass. and Conn.	115.8	57.4	6.5
Ridgway Wetherbee	" "	♂	7 Mass. and Conn.	92.3	48.8	10.4
Ridgway Wetherbee	" "	♂	3 Mass. to Minn.	90.7	50.1	17.9
Ridgway Wetherbee	" "	♀	10 Mass. to Nebraska	88.9	46.6	17.4
Ridgway Wetherbee	" "	♀	2 Mass. and Conn.	91.7	52	17.6
Ridgway Wetherbee	Eastern House Wren	♂	10 Eastern U. S. and Canada	50.7	42.2	12.4
Ridgway Wetherbee	" "	♀	11 Mass. and Conn.	52.1	48.8	12.1
Ridgway Wetherbee	" "	♀	6 Eastern U. S. and Canada	50.2	43.3	12.2
Ridgway Wetherbee	" "	♀	13 Mass. and Conn.	49.6	43.7	12.3
Ridgway Wetherbee	Eastern Robin	♂	8 Eastern & northern N. A.	134.3	102.2	20.1
Ridgway Wetherbee	" "	♀	2 Mass. and Conn.	129	101.4	20.4
Ridgway Wetherbee	" "	♀	2 Eastern & northern N. A.	127.2	94.7	20.5
Ridgway Wetherbee	Eastern Bluebird	♀	8 Mass. and Conn.	125.2	97.4	18.2
Ridgway Wetherbee	" "	♀	100.0	63.6	11.9	
Ridgway Wetherbee	" "	♀	10 D. C. to N. H.	98	64.7	11.4
Ridgway Wetherbee	" "	♀	10 Mass. and Conn.	96.7	60.2	12
Ridgway Wetherbee	Baltimore Oriole	♀	10 D. C. and Maryland	96.7	65.8	11.8
Ridgway Wetherbee	" "	♀	10 Mass. and Conn.	97	77	18
Ridgway Wetherbee	" "	♀	4 Atlantic States	95.5	75.3	18.5
Ridgway Wetherbee	" "	♀	4 Mass. and Conn.	88.1	68.6	17.5
Ridgway Wetherbee	Eastern Cowbird	♀	4 Atlantic States	109.5	74.7	18
Ridgway Wetherbee	" "	♀	10 East of Great Plains	112.3	75.9	16.7
Ridgway Wetherbee	" "	♀	10 Mass. and Conn.	97	66	15.7
Ridgway Wetherbee	Eastern Purple Finch	♀	10 East of Great Plains	96.8	67.7	13.3
Ridgway Wetherbee	" "	♀	83.31 Eastern N. A.	83.31	58.67	11.18
Ridgway Wetherbee	" "	♀	83.44 Eastern N. A.	83.44	59.71	17.78
Ridgway Wetherbee	" "	♀	80.26 Eastern N. A.	80.26	58.78	17.78
Ridgway Wetherbee	Eastern Goldfinch	♀	72 Mass. and Conn.	80.52	10.57	17.04
Ridgway Wetherbee	" "	♀	148 Eastern N. A.	73.41	48.01	10.16
Ridgway Wetherbee	Red-eyed Towhee	♀	9 Atlantic Coast States	9.30	13.00	13.40
Ridgway Wetherbee	" "	♀	6 Mass. and Conn.	9.30	13.97	9.91
Ridgway Wetherbee	" "	♀	5 Atlantic Coast States	68.58	43.69	9.30
Ridgway Wetherbee	" "	♀	69.68 Eastern U. S.	89.92	94.74	14.22
Ridgway Wetherbee	" "	♀	8 Mass. and Conn.	88.29	97.60	13.16
Ridgway Wetherbee	" "	♀	8 East of Alleghenies	81.63	85.85	13.97
Ridgway Wetherbee	" "	♀	7 East of Alleghenies	82.85	86.40	12.70
Ridgway Wetherbee	Eastern Song Sparrow	♀	13 Atlantic Coast	66.55	65.28	12.45
Ridgway Wetherbee	" "	♀	34 Mass. and Conn.	67.20	68.15	11.25
Ridgway Wetherbee	" "	♀	12 Atlantic Coast	64.52	64.52	12.45
Ridgway Wetherbee	" "	♀	21 Mass. and Conn.	61.70	62.61	11.24



list we find tarsi averages, and frequently bill averages too, given somewhat longer than those of live birds. Were it *vice versa*, we should expect that bill and tarsi had shrunk in drying. But I am unable to account for these longer bill and tarsi of skins.

The discrepancy in wing-measurements is particularly noticeable. But, to quote from Ridgway, "determination of sex by collectors is not always to be relied on, measurements of one sex sometimes almost certainly figuring among those of the other." This is readily seen in the Song Sparrow measurements in the list, upon which perhaps more work has been done than upon any other species. As measurements of nesting live Song Sparrows alone are given, and sex absolutely determined by song or behavior, and as also a greater number of live birds than of skins has been measured, it is reasonable to assume that average measurements of live birds in this case are far more accurate than those given by Ridgway.

As the list of average measurements of skins and live birds is studied and comparisons are made, more and more apparent to the bird-student are the inadequateness and inequality of such a list. One cannot help but marvel at the vast amount of work done by Ridgway. However, comparisons of measurements taken from skins and live birds, even made in a small way, prove, to the writer at least, the errors evident in measurements of skins. That more banders, especially those banding quantities of birds, will become interested in obtaining measurements and also weights of all birds banded, is the sincere hope of the writer.

The average measurements and weights of 34 nesting male Song Sparrows in comparison with 34 migrant Song Sparrows, regardless of sex, is: length, nesting males 150.90 mm., migrants 154.01 mm.; wing, nesting males 67.20 mm., migrants 68.21 mm.; tail, nesting males 68.15 mm., migrants 70.27 mm.; bill, nesting males 11.25 mm., migrant 10.88 mm.; tarsus, nesting males 21.01 mm., migrants 21.53 mm.; weight, nesting males 21.97 grams, migrants 25.35 grams. On account of the length of wing of these migrants they would all be considered males, and so I have compared them with nesting males, though I believe that both sexes are included in the migrants, and that average measurements of males alone would have been larger. The 34 migrant Song Sparrows included 23 spring migrants and 11 fall migrants. The wing, tail and length measurements of fall migrants, on account of unabraded plumage, are naturally greater than the spring measurements,

but as two-thirds of the birds were spring migrants, it is believed that the average is as nearly true as can be. Then, too, no measurements of nesting males with noticeably worn plumage were given, as stated above.

The measurements of migrants very likely include some individuals nesting only a little way to the north and thus the averages would be too low for a northern race if it exists.

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## THE OPPORTUNITY OF BIRD-BANDING

By MARGARET MORSE NICE

WE now have a means of studying wild birds undreamed of a few years ago. In the first place we can actually handle our subjects. In the second place by means of both colored and aluminum bands we can follow the activity of known individuals in freedom throughout a season or perhaps for years.

Yet too many bird-banders have not progressed beyond the earliest stage—before the invention of traps or colored bands—apparently believing that banding is merely a means of studying migration. So they capture as many birds as they possibly can, simply attaching the numbered band and that is the last they see or hear of the vast majority of their subjects.

Important as banding a large number of birds is, banders could add greatly to our knowledge of bird-life if they would also study a few birds carefully.

Two things are necessary if we are going to make adequate use of our opportunities: first, a clear idea of problems to be studied; second, a knowledge of what others are doing.

### THE BIRD IN THE HAND

Every bird captured should be carefully examined and its sex and age determined if possible. Wing and tail measurements often serve as indices of sex (Nice, '32). In the nesting season the incubation patch should be looked for; its presence or absence may tell the bird's sex, or perhaps give us new information as to the habits of the species, since the share of the sexes in incubation is not certainly known with many even of our common birds. The gradual appearance of these bare spots should be studied in relation to the laying of the eggs.

Sometimes young birds have pointed tail-feathers in contrast to rounded feathers in adults. In the Song Sparrow