TABLE 1. Records of the House Finch (*Carpodacus mexicanus*) at Missoula, Montana.

Date	Number, sex, activity, etc.	Area	Observer
1–2 Nov. 1964	♀ with flock of goldfinches	Rural	Hand
24 May–8 June 1965	♂ singing almost daily	Residential	Hand
15–18 Mar. 1966	♂ singing daily	Residential	Hand
17 June 1966	A pair	Rural	Hand
18–20 Oct. 1966	5 or 6, all ♀ or juv.	Rural	Hand
28 Dec. 1966–29 Jan. 1967	1–9, both sexes; at least 4 adult ♂ ♂	Rural	Hand
5 Mar.–7 Apr. 1967	1–4, including singing ♂ ♂	Rural	Hand
Mar.–July 1967	Both sexes seen repeatedly, singing ♂ ♂	Residential	Wright
5 July 1967	♀ feeding young; juv. collected	Residential	Wright
4 Sept.–21 Dec. 1967	Frequent flocks to max. 35 (both sexes)	Rural	Hand
Jan.–Apr. 1968	Several, almost daily; both sexes; ♂ ♂ singing in spring	Residential	Wright
April 1968	1–3 occasional	Residential	Hand

this seemed to be the northern limit of their range for at least another decade. The eventual expansion that now extends throughout the Palouse Prairie country of northern Idaho and eastern Washington and into the Spokane area, while well known to local ornithologists, has apparently never been thoroughly documented.

There is now evidence that a similar invasion has reached the vicinity of Missoula in western Montana. The AOU Check-list (1957), in outlining the range of this species, mentions Montana only as follows: "In winter . . . casual north to Alberta (Topaz Lake) and Montana (Santon Lake)." Davis, in his check-list of the birds of Montana (Proc. Montana Acad. Sci. 16:5, 1956) mentions sight records of House Finches in Helena and Bozeman. Additional Montana records include the following by Dr. P. L. Wright, Department of Zoology, University of Montana, and myself. Wright's observations were near his home in southeastern Missoula, while mine included both residential and rural areas near the southern outskirts of the city (table 1). From these records there seems to be little doubt that the House Finch is well on the way toward becoming an established resident in this area.

Accepted for publication 21 May 1968.

A METHOD OF ESTIMATING CARCASS FAT AND FAT-FREE WEIGHTS IN MIGRANT BIRDS FROM WATER CONTENT OF SPECIMENS

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Previous studies by Odum et al. (Science 143:1037–1039, 1964) and Child (Auk, 86:327–338, 1969) have indicated that the ratio of water to non-fat weight in migrant birds is virtually a constant, and little affected by the degree of fatness, stage of migration, sex, season, species, or wing length. Accordingly, accurate estimates of the non-fat components of television tower kills or other specimens should be obtainable without tedious fat extraction. The weight of water divided by a predetermined water ratio would give an estimate of the fat-free weight and the estimated fat-free weight subtracted from the field weight would be an estimate of fat content.

To test the effectiveness of the water ratio method as a predictor of fat content, 11 species representing six families were assayed by both dehydration and fat extraction methods. Dual analyses were performed on the following species: Yellow-billed Cuckoo, *Coccyzus americanus* (fall); Catbird, *Dumetella carolinensis* (fall); Chestnut-sided Warbler, *Dendroica pensylvanica* (fall); Myrtle Warbler, *Dendroica coronata* (fall); Parula Warbler, *Parula americana* (spring); Veery, *Hylocichla fuscescens* (fall); Gray-cheeked Thrush, *Hylocichla minima* (spring); Swainson's Thrush, *Hylocichla ustulata* (spring, fall); Summer Tanager, *Piranga rubra* (spring, fall); White-throated Sparrow, *Zonotrichia albicollis* (fall); Indigo Bunting, *Passerina cyanea* (fall).

MATERIALS AND METHODS

A majority of the specimens were spring and fall nocturnal migrants that had collided with a television tower at Tallahassee, Florida. Others were netted in Panamá or along the gulf coast of the southeastern United States.

All specimens were weighed, dehydrated, and extracted of fat according to the laboratory procedures outlined by Rogers and Odum (Auk 81:505–513, 1964). To facilitate drying, the body cavity was opened and the pectoral muscles macerated. Individuals were vacuum dried at 40° C for a minimum of three days to a constant weight.

After dehydration and extraction, the data for each species were randomly divided into two sub-groups,

TABLE 1. Actual mean fat-free weights (FFW) of 11 migrant species compared with estimates.

Species[a]	Sub-group A					Sub-group B				
	n	$\bar{x}$ g	C.I.[b]	t	% bias	n	$\bar{x}$ g	C.I.[b]	t	% bias
Yellow-billed Cuckoo										
Actual FFW	28	48.77	0.83			26	46.47	1.72		
Estimated FFW	28	48.75	0.90	0.01	0.04	26	46.52	1.97	0.05	0.10
Catbird										
Actual FFW	45	31.91	0.32			49	32.31	0.62		
Estimated FFW	45	31.83	0.38	0.16	0.25	49	32.41	0.70	0.28	0.30
Chestnut-sided Warbler										
Actual FFW	31	8.01	0.08			37	8.02	0.19		
Estimated FFW	31	8.03	0.10	0.12	0.24	37	7.91	0.22	1.03	1.37
Myrtle Warbler										
Actual FFW	64	10.29	0.10			64	10.26	0.19		
Estimated FFW	64	10.24	0.11	0.36	0.48	64	10.32	0.24	0.55	0.58
Parula Warbler (spring)										
Actual FFW	77	5.60	0.05			77	6.16	0.13		
Estimated FFW	77	5.68	0.06	0.97	1.42	77	6.08	0.13	1.14	1.29
Veery										
Actual FFW	62	27.03	0.32			58	26.27	0.80		
Estimated FFW	62	27.41	0.39	0.75	1.40	58	26.00	0.96	0.58	1.02
Gray-cheeked Thrush (spring)										
Actual FFW	40	23.86	0.27			40	23.92	0.62		
Estimated FFW	40	23.86	0.29	0.00	0.00	40	23.92	0.68	0.02	0.00
Swainson's Thrush										
Actual FFW	55	25.38	0.25			55	24.75	0.82		
Estimated FFW	55	25.18	0.27	0.55	0.78	55	24.96	0.88	0.49	0.84
Swainson's Thrush (spring)										
Actual FFW	67	22.98	0.18			72	22.96	0.56		
Estimated FFW	67	22.96	0.19	0.10	0.08	72	23.00	0.64	0.13	0.17
Summer Tanager										
Actual FFW	15	24.20	0.40			16	25.87	1.24		
Estimated FFW	15	24.25	0.47	0.09	0.20	16	25.84	1.56	0.03	0.11
Summer Tanager (spring)										
Actual FFW	15	26.21	0.35			15	24.98	1.15		
Estimated FFW	15	26.68	0.37	0.93	1.79	15	24.54	1.09	0.83	1.76
White-throated Sparrow										
Actual FFW	47	21.44	0.32			43	20.85	0.76		
Estimated FFW	47	21.46	0.39	0.09	0.09	43	20.84	0.84	0.01	0.04
Indigo Bunting										
Actual FFW	56	12.23	0.12			57	12.58	0.27		
Estimated FFW	56	12.24	0.13	0.05	0.08	57	12.57	0.27	0.06	0.07

[a] All fall samples unless (spring) indicated.
[b] 99 per cent confidence interval of the mean.

designated A and B. Mean water ratios (water as a percentage of fat-free weight) were computed for both sub-groups. Estimates of the fat-free and fat weights of individuals in sub-group A were computed using the mean water ratio of sub-group B (of the same species) and vice versa for individuals in sub-group B. Fat-free weight was estimated by the formula

$$FFW' = W/WR, \qquad (1)$$

where FFW′=estimated fat-free weight; W=weight of water as determined by dehydration; and WR= mean water ratio. Fat weight of an individual was estimated by

$$FW' = WW - FFW', \qquad (2)$$

where FW′=estimated fat weight of an individual; and WW=wet weight.

Student's t test was used to compare any two means, and analysis of variance to test for the affects of season, sex, family, and body size (Steel and Torrie, Principles and Procedures of Statistics, McGraw-Hill, 1960). Statistical significance was accepted at the 0.01 level of probability, and confidence

TABLE 2. Actual mean fat weights of 11 migrant species compared with estimates.

	Sub-group A					Sub-group B				
Species[a]	n	$\bar{x}$ g	C.I.[b]	t	% bias	n	$\bar{x}$ g	C.I.[b]	t	% bias
Yellow-billed cuckoo										
Actual fat	28	23.53	2.39			26	33.61	6.02		
Estimated fat	28	23.54	2.57	0.00	0.04	26	33.56	6.57	0.01	0.14
Catbird										
Actual fat	45	5.80	0.47			49	5.10	1.00		
Estimated fat	45	5.88	0.47	0.12	1.37	49	4.99	1.10	0.20	2.15
Chestnut-sided Warbler										
Actual fat	31	5.10	0.10			37	4.62	0.58		
Estimated fat	31	5.08	0.11	0.10	0.39	37	4.73	0.61	0.37	2.38
Myrtle Warbler										
Actual fat	64	1.77	0.11			64	2.01	0.32		
Estimated fat	64	1.82	0.12	0.32	2.82	64	1.95	0.35	0.37	2.98
Parula Warbler (spring)										
Actual fat	77	0.99	0.04			77	1.03	0.11		
Estimated fat	77	0.92	0.04	1.23	7.07	77	1.11	0.13	1.28	7.76
Veery										
Actual fat	62	8.56	0.76			58	12.64	2.18		
Estimated fat	62	8.17	0.82	0.36	4.55	58	12.90	2.34	0.22	2.05
Gray-cheeked Thrush (spring)										
Actual fat	40	5.92	0.28			40	5.74	0.49		
Estimated fat	40	5.92	0.29	0.00	0.00	40	5.73	0.51	0.01	0.17
Swainson's Thrush										
Actual fat	55	13.86	0.64			55	11.78	2.21		
Estimated fat	55	14.06	0.68	0.22	1.44	55	11.56	2.23	0.18	1.86
Swainson's Thrush (spring)										
Actual fat	67	3.98	0.28			72	4.00	0.59		
Estimated fat	67	4.01	0.30	0.06	0.75	72	3.96	0.61	0.13	1.00
Summer Tanager										
Actual fat	15	16.37	0.89			16	12.53	3.92		
Estimated fat	15	16.32	0.89	0.05	0.30	16	12.55	4.13	0.01	0.15
Summer Tanager (spring)										
Actual fat	15	4.07	0.25			15	4.42	1.27		
Estimated fat	15	3.60	0.26	1.33	11.54	15	4.86	1.27	0.73	9.95
White-throated Sparrow										
Actual fat	47	1.94	0.17			43	2.13	0.43		
Estimated fat	47	1.91	0.18	0.10	1.54	43	2.14	0.38	0.03	0.46
Indigo Bunting										
Actual fat	56	3.50	0.28			57	3.00	0.85		
Estimated fat	56	3.49	0.29	0.02	0.28	57	2.99	0.85	0.01	0.33

[a] All fall samples unless (spring) indicated.
[b] 99% confidence interval of the mean.

intervals of the mean are reported at the 99 per cent level.

RESULTS AND DISCUSSION

The results of estimating fat-free and fat weights are summarized in tables 1 and 2, respectively. Within all the species sub-groups, no significant difference by t was found between the actual and estimated values of fat-free weight or fat. The per cent bias was also determined ([(estimated mean − actual mean)/actual mean] × 100) as a means of comparing actual and estimated values. The mean per cent bias for estimated fat-free weights was 0.56 (range, 0.00–1.79) and for the estimated fat, 2.44 (range 0.00–11.54).

The close agreement between the actual and estimated values, and the lack of significant differences, indicate that the dehydration procedure is an accurate means of estimating fat and fat-free components of migrant bird specimens, and thus avoids tedious extraction.

The mean water ratios for all sub-groups are listed in table 3. Although most coefficients of variation are less than 4.0 per cent and the extreme means differ only by 2.5 per cent, an analysis of variance showed that these means are not homo-

TABLE 3. Mean water ratios (water as a percentage of fat-free weight) for 11 migrant species.

Species	Sub-group	Season	n	$\bar{x}$ ratio	C.I.[a]	V[b]
Yellow-billed Cuckoo	A	fall	28	67.14	0.83	2.34
	B	fall	26	67.19	1.55	4.26
Catbird	A	fall	45	69.25	0.59	2.14
	B	fall	49	69.47	0.54	2.05
Chestnut-sided Warbler	A	fall	31	67.89	0.50	1.62
	B	fall	37	67.98	0.54	1.66
Myrtle Warbler	A	fall	64	68.53	0.56	2.44
	B	fall	64	68.93	0.56	2.46
Parula Warbler	A	spring	77	69.15	0.45	2.18
	B	spring	77	68.26	0.29	1.43
Veery	A	fall	62	69.67	0.72	3.03
	B	fall	58	68.84	0.67	2.74
Gray-cheeked Thrush	A	spring	40	68.05	0.46	1.53
	B	spring	40	68.05	0.32	1.07
Swainson's Thrush	A	fall	55	68.82	0.48	1.96
	B	fall	55	69.41	0.43	1.75
	A	spring	67	67.00	0.43	1.91
	B	spring	72	69.27	0.37	1.74
Summer Tanager	A	fall	15	68.04	0.97	1.86
	B	fall	16	67.92	1.31	2.67
	A	spring	15	69.52	0.47	0.91
	B	spring	15	68.29	0.62	1.16
White-throated Sparrow	A	fall	47	67.87	0.54	2.05
	B	fall	43	67.83	0.51	1.87
Indigo Bunting	A	fall	56	68.94	0.43	1.73
	B	fall	57	68.89	0.45	1.82

[a] 99% confidence interval of the mean.
[b] coefficient of variation.

geneous. No consistent effect due to sex, season, family or general body size was found to explain these differences. We suggest, however, that in practice a water ratio of 68.7 ± 0.11 per cent could be used for other species of adult migrant birds within the range of body size covered in this study.

This work was supported by a grant from the National Institutes of Health (HE 08294-MET) to the University of Georgia, under the direction of E. P. Odum.

Accepted for publication 14 August 1968.

A BREEDING RECORD FOR THE GRAY-HOODED GULL, *LARUS CIRROCEPHALUS*, ON THE PERUVIAN COAST

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So far as we are aware, there are no published records of the breeding of the Gray-hooded Gull (*Larus cirrocephalus*) west of the Andes. De Schauensee (1966), in summarizing the known distribution of the South American population, indicated that the species breeds in the southern half of the continent both on the Atlantic coast and in the interior east of the Andes. In the west, he said only that it occurs occasionally, perhaps regularly, on the coast of Perú and even Ecuador. In the course of studies on Peruvian sea birds during the past few years we have had occasion to visit a number of coastal localities previously little studied by ornithologists. On 10 May 1967 Tovar found a small colony of *L. cirrocephalus* breeding in a saline coastal lagoon, locally called Laguna Chica (fig. 1), in the desert (14° 11′ S, 76° 17′ W). The locality is about 1 km SW of Laguna Grande, at the north end of the Bahía de Independencia, Departamento de Ica, Perú.

On 11 May the colony was examined more closely, and was found to consist of two nests containing three eggs each, one nest containing two eggs (from which a single egg was collected), and one nest empty but occupied by a pair of birds. The nests were on tiny islets (about 50 cm in diameter) and were constructed of feathers of Chilean Flamingos (*Phoenicopterus chilensis*), which are commonly present in the lagoon. At the time of the discovery of the colony the water around the nests was about