OWL WEIGHTS IN THE LITERATURE: A REVIEW

John B. Dunning, Jr.

Abstract - Published mean body weights of 18 species of North American owls are presented and reviewed. Adequate data are lacking for virtually all species. A pattern of increased weight lability in small owl species is suggested by several studies of captive and wild birds. One source with large samples of weight data is rejected as its means deviate from virtually all other published sources.

Mean body weight is an important descriptive statistic used in many avian studies. Often, however, researchers do not handle large numbers of individual birds, and must rely on published mean weights for the species they are studying. This is especially true in the case of owls, which are difficult to capture and weigh in large numbers. In the course of compiling available weight data for all North American birds, I searched the literature for owl weights and noted some inconsistencies. The purpose of this paper is to review the published data, assess the reliability of different sources, and discuss general trends apparent from the data.

Major Sources

Most studies reporting owl weights contain very small samples, often only a single weight. Two sources do present weights of all or almost all North American species. Earhart and Johnson (1970) (hereafter, E&J) analyzed patterns of size dimorphism and food habits in owls. They presented weights (Table 1) and wing lengths for all North American owls except the Elf Owl (*Micrathene whitneyi*). E&J included 5 subspecies of the Great Horned Owl (*Bubo virginianus*) and 8 subspecies of Eastern and Western Screech-Owl (*Otus asio* and *O. kennicottii*). These weights were compiled from various museum collections. The sample sizes were often the largest reliable weight samples available for each species. E&J used these data to calculate the degree of sexual dimorphism for each species, and examined how various ecological parameters vary with body size. Snyder and Wiley (1976) also used this same data set to examine food stress and female nest defense as factors influencing reversed sexual dimorphism in hawks and owls. The data presented in E&J included sample size, mean and range for both sexes.

The second source with a large series of owl weights was Karalus and Eckert (1974) (hereafter, K&E). This is essentially a "coffee table book" with species accounts of all North American owls. It differs from the usual book of this type by including detailed information of species' and subspecies' range, weight, linear measurements, voice and general behavior. The measurements initially seem attractive since they are based on large samples, sometimes larger than E&J (Table 1). Unfortunately, the data in this book appear to be completely unreliable. The acknowledgments imply that most measurements were taken from museum specimens, but no sources are cited. K&E also presented sample size, mean and range for at least 1 subspecies of each species, while an "average weight" was given for most other subspecies.

Species Accounts

Tyto alba — Single weights of the Common Barn-Owl are given in Imler (1937) (475g, unsexed fall bird from Kansas) and Stewart (1952) (457g, unsexed fall bird from Ohio). Jackson and Dakin (1982) gave weights of 2 ♂♂ from Mississippi (492, 512g). Poole (1938) reported the mean of 2 birds as 505g, while Haverschmidt (1948) listed the weights of 1 ♂ (485g) and 3 ♀♀ (446, 498, 558g) from Surinam. Hartman (1961) collected 4 ♀♀ ($\bar{x}$ = 516g) and 4 ♂♂ ($\bar{x}$ = 439g). His birds were from Panama, Florida and Ohio, so weights cannot be ascribed to any one locality with confidence. Marks and Marti (1984) gave the mean of 78 birds as 511g. All these weights were within the range given by E&J.

Large samples are in Steenhof (1983) and Marti and Wagner (1985) (Table 1). Steenhof (1983) cited unpublished data. Her means were substantially higher, but within the range presented in E&J. Marti and Wagner (1985) presented data for live (Table 1), trauma-killed, and starved owls from northern Utah in winter. Both starved (♀ $\bar{x}$ = 392g, N = 25; ♂ $\bar{x}$ = 335g, N = 28) and trauma-killed (♀ $\bar{x}$ = 434g, N = 14; ♂ $\bar{x}$ = 361g, N = 7) birds weighed less than live trapped owls. In addition, the starved birds weighed less than the trauma-killed, demonstrating that the manner in which weight data is collected can affect means recorded for a sample. K&E's data were similar to

Table 1. Large samples of published weights (g) for North American owls. Data are presented as: $\bar{x}$ (sample size) range.

SPECIES	EARHART & JOHNSON 1970	KARALUS & ECKERT 1974	OTHER SOURCES
Tyto alba	♀ 490(21) 382-580	♀ 500(50) 383-573	♀ 571(109) Marti & Wagner 1985
	♂ 442(16) 299-580	♂ 384(46) 312-508	♂ 476(53)
			♀ 561(50) Steenhof 1983
			♂ 461(28)
Otus flammeolus	♀ 57.2(9) 51-63	♀ 137(7) 122-149	♀ 69.2(2) 60.3-78.2 Johnson & Russell 1962
	♂ 53.9(56) 45-63	♂ 126(6) 114-143	♂ 55.9(11) 48.8-66.1
Otus asio naevius	♀ 184(36) 126-252	♀ 208(49) 174-222	♀ 194(66) 150-235 Henny & VanCamp 1979
	♂ 160(38) 99-229	♂ 200(38) 166-212	♂ 167(31) 140-210
O. a. mccallii	♀ 131(10) 115-162	182 ave.	
	♂ 125(12) 94-154		
Otus kennicottii inyoensis	♀ 155(12) 135-173	204 ave.	
	♂ 132(10) 119-149		
O. k. cinerascens	♀ 123(18) 92-160	166 ave.	
	♂ 111(35) 88-137		
O. k. kennicottii	♀ 186(11) 152-215	236 ave.	
	♂ 152(14) 130-178		
O. k. bendirei	♀ 157(23) 100-223	216 ave.	
	♂ 141(49) 100-173		
O. k. quercinus	♀ 152(10) 130-164	216 ave.	
	♂ 134(26) 108-170		
Otus trichopsis	♀ 92.2(8) 79-121	♀ 170(7) 156-187	
	♂ 84.5(23) 70-104	♂ 161(4) 146-174	
Bubo virginianus wapacuthu	♀ 1556(12) 1357-2000		
	♂ 1239(10) 1035-1389		
B. v. virginianus	♀ 1768(29) 1417-2503	♀ 1597(51) 1454-1876	♀ 1758(209) 1197-2313 Langenbach & McDowell 1939
B. v. virginianus	♂ 1318(22) 985-1588	♂ 1449(33) 1383-1692	♂ 1343(206) 703-1703
B. v. occidentalis	♀ 1555(18) 1112-2046		♀ 1559(9) 1505-1652 Imler 1937
	♂ 1154(18) 865-1460		♂ 1269(4) 1230-1360
			U 1460(14) Jaksic & Marti 1984
B. v. pacificus	♀ 1312(23) 825-1668	1384 ave.	U 1166(30) Jaksic & Marti 1984
	♂ 992(26) 680-1272		
B. v. pallescens	♀ 1142(12) 801-1550		
	♂ 914(18) 724-1257.		

(Table 1 Cont'd)

(Table 1 continued)

(Continuation of Table 1.)

SPECIES	EARHART & JOHNSON 1970	KARALUS & ECKERT 1974	OTHER SOURCES
Nyctea scandiaca	♀ 1963(30) 1550-2690	♀ 1707(40) 1593-2003	
	♂ 1642(27) 1320-2013	♂ 1613(34) 1448-1840	
Surnia ulula	♀ 345(14) 306-392	♀ 252(9) 202-274	
	♂ 299(16) 273-326	♂ 226(19) 194-266	
Glaucidium gnoma	♀ 73.0(10) 64-87	♀ 44.8(8) 36.9-50.7	
	♂ 61.9(42) 54-74	♂ 40.8(8) 34.6-46.8	
Glaucidium brasilianum	♀ 75.1(16) 62-95	♀ 82.2(5) 71.4-88.2	
	♂ 61.4(29) 46-74	♂ 78.5(2) 65.5-85.1	
Micrathene whitneyi		♀ 26.1(30) 17.3-30.6	U 41.0(20) 35.9-44.1 Walters 1981
		♂ 25.2(11) 17.0-28.9	
Athene cunicularia	♀ 151(15) 129-185	♀ 214(21) 195-223	U 147(11) summer, Coulombe 1970 6 MMA
	♂ 159(31) 120-228	♂ 203(18) 181-212	U 186(11) winter
			♀ 168(10) 126-210 Thomsen 1971
			♂ 172(12) 145-191
			♀ 149(5) Hartman 1961
			♂ 147(6)
Strix occidentalis	♀ 637(10) 548-760	♀ 502(13) 384-591	
	♂ 582(10) 518-694	♂ 391(11) 312-514	
Strix varia	♀ 801(24) 610-1051	♀ 506(12) 388-651	
	♂ 632(20) 468-774	♂ 396(9) 330-569	
Strix nebulosa	♀ 1298(6) 1144-1454	♀ 1391(8) 1078-1524	
	♂ 935(7) 790-1030	♂ 1289(5) 1057-1385	
Asio otus	♀ 279(28) 210-342	♀ 282(16) 227-333	
	♂ 245(38) 178-314	♂ 258(11) 215-299	
Asio flammeus	♀ 378(27) 284-475	♀ 336(6) 276-429	♀ 379(8) 323-441 Clark & Ward 1974
	♂ 315(20) 206-368	♂ 287(3) 261-346	♂ 325(9) 294-368
Aegolius funereus	♀ 140(4) 121-160	♀ 224(23) 199-235	♀ 167(96) 126-194 Glutz et al. 1979
	♂ 102(5) 85-119	♂ 211(26) 193-227	♂ 101(74) 90-113
Aegolius acadicus	♀ 90.8(18) 65-124	♀ 107(31) 87.9-124	U 91.2(68) 72-112 Mueller & Berger 1967
	♂ 74.9(27) 54-96	♂ 102(37) 84.3-119	

E&J for females, but underestimated the male weight by 13%. As is true of most other species, too few data have been published to examine geographical variation.

Otus flammeolus — Johnson and Russell (1962) presented mean weights for 13 Flammulated Owls from California and Nevada (Table 1). The mean for 11 ♂♂ is similar to E&J's mean for 56 ♂♂. The female mean in Johnson and Russell is substantially higher, but sample sizes are small. K&E's data are widely divergent from both of the above sources, deviating from E&J by 130 - 140%.

Otus asio and ***O. kennicottii*** — Eastern and Western Screech-Owls contain 16 subspecies combined that are widely divergent in size (A.O.U. 1957, but see Marshall 1967). The only source covering all 16 subspecies is K&E, but as has been shown for most other species, these weights are at odds with virtually all other available sources. E&J provided weights for 2 subspecies of Eastern Screech-Owl (*naevius, mccallii*) and 5 subspecies of Western Screech-Owl (*inyoensis, cinerascens, kennicottii, bendirei, quercinus*). A large degree of geographic variation is apparent from this data set.

Other sources of screech-owl weights are few. I found no data for *aikeni, asio, brewsteri, hasbroucki, maxwelliae,* and *swenki*. Johnson and Russell (1962) collected 1 ♀ *macfarlanei* in California weighing 177g. Miller and Miller (1951) presented data from Arizona and California for 3 southwestern subspecies: *yumanensis* (6 ♂♂, $\bar{x}$ = 103g±11.4S.D.), *inyoensis* (2 ♀♀, $\bar{x}$ = 157g); 8 ♂♂, $\bar{x}$ = 131g±9.2), and *quercinus* (7 ♂♂, $\bar{x}$ = 117g). Miller and Miller's *inyoensis* data were similar to E&J, while the *quercinus* mean of Miller and Miller was less.

Clench and Leberman (1978) gave a mean of 163g (range 153-176g) for 8 *naevius* banded in Pennsylvania. Other *naevius* weights include Stewart (1937) (206, 228g unsexed adults) and Poole (1938) (2 birds averaging 178g). Kelso (1938) gave weights for *naevius* (2 ♂♂, 133, 156g; 9 ♀♀, $\bar{x}$ = 201g, range 148-244g, New York, some birds starved), *floridans* (1 ♂, 111g, Florida), and 5 starved unsexed birds from Indiana ($\bar{x}$ = 139g, range 114-162g), which Kelso attributes to *swenki* but considering the range must be *naevius* (A.O.U. 1957). Finally, Imler (1937) collected 4 individuals in western Kansas ($\bar{x}$ = 152g, range 153-176g) which could be either *aikeni* or *swenki*.

The only complete analysis of seasonal weight variation in screech-owls is the Henny and VanCamp (1979) study of *O. asio naevius* in Ohio. Their means of all birds captured were slightly higher than E&J for this subspecies (Table 1). Henny and VanCamp documented a seasonal weight cycle peaking in late fall. They suggest that this weight gain reflects an increase in fat reserves which aid winter survival. They also noted a wide range of body weights within seasons, suggesting that body weight was relatively labile. The same possibility has been discussed in studies of several other small owls.

Otus trichopsis — The only additional weight published for the Whiskered Screech-Owl is an estimate of 120g (Zar 1969). This figure differs substantially from E&J. It could be that this estimate (which Zar did not make himself) was based on the incorrect assumption that Whiskered Screech-Owls should weigh approximately the same as the sympatric subspecies of Western Screech-Owl (*Otus kennicottii cinerascens*). K&E overestimated female and male means by 84 and 90%, respectively.

Bubo virginianus — With the exception of E&J, surprisingly little data have been published on Great Horned Owls. E&J presented weights for 5 of the 9 North American subspecies. Other published weights are mostly of *virginianus*, the eastern subspecies. Hartman (1955) collected 1 ♀ (1248g) and 1 ♂ (1040g) from Ohio. The female weight was substantially lower than E&J's minimum for this subspecies. Poole (1938) gave the mean of 2 *virginianus* ♀♀ as 1446g. Langenbach and McDowell (1939) reported large samples of Pennsylvanian birds (Table 1). They noted a substantial difference between specimens with full stomachs (Table 1) and with empty stomachs (♀ $\bar{x}$ = 1644g, N = 94; ♂ $\bar{x}$ = 1263g, N = 142). The means from birds with full stomachs closely approximates E&J. The lower means for birds with empty stomachs show the amount of error that can be introduced if this factor is not accounted for.

For the other races, only scattered data are available. Irving (1960) collected a male *lagophonus* from Alaska weighing 1445g, while Williamson (1957) reported an Alaskan female *algistus* weighed 2000g. Poole (1938) gave one unsexed *pacificus* as 1480g. Imler (1937) listed a small sample of *occidentalis* from western Kansas (Table 1), while Jaksic and Marti (1984) presented samples for both *pacificus* and *occidentalis* (Table 1). In addition, Siegfried et al. (1975) gave the mean weight of 2 ♀♀ as 1425g. These were from zoos and unidentified to subspecies.

By far the most surprising pattern is the lack of published data. Great Horned Owls are common throughout North America, and are often among the most common birds brought to raptor rehabilitation centers and museum collections. A large amount of unpublished data must exist on the various subspecies. No reliable data were found for the subspecies *saturatus* and *heterocnemis*.

Nyctea scandiaca — Irving (1960) gave the weight of 1 Snowy Owl collected in Alaska as 2267g, while Siegfried et al. (1975) listed 1 unsexed captive from Minnesota at 1916g. Poole (1938) reported a single male weighing 1404g, while Hagen (1942) gave a mean of 2003g for 7 Norwegian birds. Gessaman (1978) gave weights of 3 captive ♀♀ during the winter as 1928, 2175 and 2392g. The largest of these lost 80g during a 5-d fast. All these weights fall within the range given by E&J.

K&E's mean for males is close to E&J, but the female mean in K&E underestimates E&J by 13%. Even considering the weight loss recorded by Gessaman (1978) in a healthy fasting bird, this difference still may be real.

Surnia ulula — Small samples of Northern Hawk-Owl weights were found in Irving (1960), Campbell (1969) and Johnson and Collins (1975). Campbell (1969) collected 3 ♂♂ (317, 319, 346g) and 1 ♀ (418g) from Alaska, while Irving (1960) collected 2 Alaskan ♂♂ (322, 350g) and 4 ♀♀ (310, 336, 350, 384g). These were slightly heavier than the ranges in E&J. However, Johnson and Collins (1975) found a single captive bird's weight varied from 293-375g. Thus the above samples agree fairly well. K&E underestimated male and female weights by 24 % and 27%, respectively. The variation recorded by Johnson and Collins reflects the pattern of weight lability found in smaller owls.

Glaucidium gnoma — Several subspecies of Northern Pygmy-Owl occur in North America. Little data are available and it is impossible to determine if the wide differences reported are due to geographic variation or error. Johnson and Russell (1962) give weights of 8 ♂♂ ($\bar{X}$ = 62.8g, range 57.3-68.0g) for the subspecies *californicum*, which agrees with the *californicum* weights of E&J. K&E weights are 34-38% lower than E&J, but are from a different subspecies (*pinacola*). Zar (1969) estimated Northern Pygmy-Owl weights at 54g, substantially under the *californicum* samples, but without reliable data for the other subspecies, this estimate cannot be evaluated.

Glaucidium brasilianum — Little additional data exist for Ferruginous Pygmy-Owls. Prange et al. (1979) gave the weight of 1 bird as 61.0g. Russell (1964) collected 2 ♂♂ (60.5, 62.6g) and 4 ♀♀ (64.4, 74.6, 77.7, 94.8g) in Belize. These data agree closely with E&J. K&E overestimate female and male means by 10 and 28%, respectively. The wide range of values given by Russell (1964) and E&J may reflect weight lability in this species.

Micrathene whitneyi — E&J gave no weights for the Elf Owl. Zar (1969) estimated mean weight as 46g, only slightly larger than the large series mean of 41.0g in Walters (1981). Lasiewski and Dawson (1967) estimated the mean as 37.7g, while Ligon (1967) gave a range of 35-55g. Johnson (1968) listed 1 ♂ and 1 ♀ averaging 37.0g. Finally, Walters (1981) published a large series of weights based on banded, unsexed Arizona birds (Table 1).

Athene cunicularia — More data exists for Burrowing Owls than for any other North American owl. Two subspecies are represented: *hypugaea* in the west and *floridana* in Florida. Some published weights cannot be safely ascribed to subspecies. For example, Marti (1974) assembled 8 weights from literature and museum specimens ($\bar{X}$ = 140g), but did not describe his sources more fully.

Most published samples are of *hypugaea*. Imler (1937) gave the mean of 7 Kansas birds as 149g (range 114-171g). Coulombe (1970) presents summer and winter weights from the same Californian population (Table 1). His samples show wide seasonal variation. Thomsen (1971) presents weights for breeding California birds (Table 1), that were heavier than E&J by less than 10%. K&E, on the other hand, overestimate E&J by 28-42%, probably a very real difference.

Of the published *floridana* weights, Prange et al. (1979) listed weights of 3 individuals (179, 182, 185g). Hartman (1955) included weights of 4 ♀♀ (130, 150, 157, 170g) and 4 ♂♂ (130, 150, 170, 170g), while Hartman (1961) listed weights of 5 ♀♀ and 6 ♂♂ (Table 1), possibly including the same data as the earlier paper. Little difference between the means for the 2 subspecies can be seen.

Strix occidentalis — Johnson and Russell (1962) collected 2 female Spotted Owls in California weighing 616 and 648g. No other published weights were located except for E&J and K&E. K&E underestimated female weight by 21% and male weight by 33%. This difference appears very substantial, but could reflect subspecific differences. K&E's sample was based on *occidentalis*, while E&J did not give subspecific identification. Three subspecies of Spotted Owl occur in North America.

Strix varia — Weights are available for 2 subspecies of Barred Owl. For subspecies *varia*, Hartman (1955) listed weights of 2 ♀♀ from Ohio (681, 771g) and 1 ♂ (642g), while Poole (1938) gave the weight of 1 unsexed bird as 510g. Both E&J and K&E samples are of this subspecies. K&E again seriously underestimated the E&J weights by 37% (both sexes). Siegfried et al. (1975) gave the weight of a single captive from Minnesota as 748g.

Hartman (1955, 1961) also gave weights for *georgica* ("*alleni*" in the 1961 paper). Hartman (1955) listed 1 ♀ (875g) and 3 ♂♂ from Florida (681, 750, 800g). Hartman (1961) gave 2 ♀♀ weights as 850, 875g, and the mean of 6 ♂♂ as 718+35.1S.E. These few weights suggest that *georgica* might be heavier than *varia*, but sample sizes are much too small for firm conclusions.

Strix nebulosa — Very little data exist for the Great Gray Owl. Irving (1960) collected 1 ♀ (1092g) in Alaska, while Bent (1938) stated that weights of 4 birds ranged "from 1 lb. 15 oz. to 2 lb. 14.5 oz." K&E's male means are substantially overestimated by 38%, compared to E&J.

Asio otus — Graber (1962) gave the weight of a captive female and a captive male from Illinois as 310g and 252g, respectively. Poole (1938) listed 2 ♀♀ as averaging 288g, while Hagen (1942) reported a mean of 285g for 3 Norwegian birds. Marti (1974) compiled a mean of 262g from 7 weights found in the literature and museum specimens, and Marks and Marti (1984) gave a mean of 254g for 20 birds. All these weights fall within the range reported by E&J.

Asio flammeus — A number of studies report the weight of a single Short-eared Owl. Irving (1960) collected 1 ♀ weighing 400g from Alaska. Imler (1937) found one unsexed bird in western Kansas weighed 270g. Campbell (1969) collected an Alaskan male weighing 337g. A captive in California averaged 385g over 14 d (Page and Whitacre 1975), while another captive in Illinois averaged 406g over 24 h (Graber 1962). In addition to these single reports, Clark (1975) reported the mean of 2 ♀♀ as 392g and 2 ♂♂ as 304g, while Hagen (1942) gave the mean of 11 Norwegian birds as 371g. Clark and Ward (1974) compiled a relatively large sample for both sexes (Table 1) which agree closely with E&J.

Aegolius funereus — Irving (1960) collected an Alaskan male Boreal Owl (*A. f. richardsoni*) weighing 116g, while Campbell (1969) reported a very fat Alaskan female weighing 194g. E&J gave weights of only 9 birds. K&E have a much larger sample, but their data deviate from E&J by 60% for females and 107% for males and cannot be considered reliable. The best available sample for this species is Glutz von Blotzheim et al. (1980). Their sample (Table 1) is of the European subspecies *A. f. funereus*, however, the means and ranges overlap widely with E&J's small sample.

Aegolius acadicus — Several small samples of weights were published for Northern Saw-whet Owls. Zar (1969) estimated a weight of 124g, which is very high compared to the following. Single weights were given by Gatehouse and Markham (1970) (82.9g, 1 captive ♂), Poole (1938) (108g, unsexed), and Murray and Jehl (1964) (89.6g, 1 New Jersey migrant). Graber (1962) weighed 2 captive birds, 1 ♀ (96g) and 1 ♂ (75g). Clench and Leberman (1978) banded 5 unsexed migrants in Pennsylvania ($\bar{x}$ = 86.0g, range 72.6-97.6g), while Walkinshaw (1965) banded 10 migrants in Michigan weighing 95.2g (range 85.1-114g). All these weights agree closely with E&J's values.

Collins (1963) reported several series of Northern Saw-whet Owl weights. Eleven birds of both sexes from the University of Michigan collection averaged 81.8g (range 54.2-124g), while 7 banded birds weighed 82.7g (range 67.5-113g). Collins also kept 2 ♀♀ (106, 108g) and 1 ♂ (80g) in captivity. He noted that the weight of the lighter female varied daily from 74.1g to 114g, suggesting weight lability in this species.

Mueller and Berger (1967) weighed a large series of migrants in Wisconsin (Table 1). They documented a significant weight difference between adult and immature birds, and discussed weight change after banding. Their means and ranges for the unsexed birds agree relatively well with E&J. K&E overestimated female means by 18% and male means by 36% compared to E&J.

DISCUSSION

The most apparent pattern in the preceding species accounts is the lack of published data even for common species and subspecies of owls. E&J provide a basic reference sample for most species. E&J's data were taken from specimens from several museums, and are probably adequate if a representative mean weight is needed, as in their study of owl food habits. But since individual specimens in a collection are often obtained in a wide variety of ways, the heterogeneity found in these samples precludes their use in many studies. A single sample like E&J's cannot express the seasonal (Coulombe 1970; Henny and VanCamp 1979), daily (Collins 1963) and geographic (Miller and Miller 1951) variation present in owls. Owls could provide a good test of ecotypic variation such as Bergmann's rule, as they are often permanent residents and have wide geographic ranges, but the available data simply do not allow such analyses. Published accounts typically are of small sample size or do not consider such variables as stomach content (Langenbach and McDowell 1939) or manner of collection (Marti and Wagner 1985). Thus, published series of weights within and between seasons for birds handled in a consistent manner are needed for virtually every species.

This situation is not unique to owls. In a compilation of weight data for all North American birds (Dunning 1984), I found that adequate data are lacking for a surprising number of species. This is especially true for western and southwestern species. However, I often found that pertinent data existed in some bander's log or researcher's notebook, but remained unpublished. A single example of the value of more published data will suffice. Henny and VanCamp (1979) proposed that the increase in mean body weight recorded in the fall reflects an increase in fat reserves allowing greater winter survival for a population of Eastern Screech-Owls in northern Ohio. One way to test this hypothesis would be to examine seasonal weight cycles in more southerly screech-owl populations. If a similar fall peak in body weight were found in screech-owls that lived in a more mild climate, an alternative explanation might be required. However, this test is presently impossible to do, as I could find no weights at all for the more southerly subspecies in the eastern United States, *O. a. asio*!

A second pattern of great interest is that of increased weight lability in small owl species. Collins (1963) reported that the weight of a single captive female Northern Saw-whet Owl varied from 74.1g to 114g, a variation of 30% from the median. Similarly, Johnson and Collins (1975) reported weight of a female captive Northern Hawk-Owl varied from 293g to 375g "without apparent ill effect." In comparison, Gessaman (1978) found that a female Snowy Owl lost only 80g (3.3% of this individual's mean weight of 2392g) during a 5-d fast. If this weight loss had been in the same proportion as the Northern Saw-whet Owl reported by Collins, the female Snowy Owl could have lost up to 718g. With these captivity studies in mind, the wide within-season range of Eastern Screech-Owl weights reported by Henny and VanCamp (1979) and the large between-season variation in Burrowing Owl weights reported by Coulombe (1970) suggest that weight lability may be common in many smaller owls.

Finally, it is apparent from this review that Karalus and Eckert (1974) is totally unreliable. The mean weights presented in this work deviate from virtually all other samples by as much as 140%. The weight lability just discussed could lead to widely divergent weights sometimes being reported for a small owl. But the K&E data are supposedly based on large samples, and the deviations are present in both large and small species. A spot check of some of the linear measurements presented for each species shows that these, too, deviate from published references by as much as 20%. Since other reviewers have found fault with the text, terminology, bibliography (Martin 1976) and maps (Bock 1976) in this work, it is apparent that this book cannot be used as a reliable source of any information on owls.

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Department of Ecology and Evolutionary Biology, Univ. of Arizona, Tucson, AZ 85721.

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