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Weights and Measurements for American Kestrels, Barn Owls, and Loggerhead Shrikes in California

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AMERICAN KESTREL *Falco sparverius*

I banded American Kestrels from Jan 1996 to Jan 2007 in eleven counties in California (Alameda, Contra Costa, Merced, Los Angeles, Monterey, Sacramento, San Diego, San Joaquin, Santa Barbara, Solano, and Yolo). I captured the birds using a Bal-chatri or a modified Potter's trap of my own design. Weights were taken with a 300-g-capacity Pesola® to the nearest 1 g. Wing chord was measured using a 30-cm stainless steel wing rule to the nearest 0.5 mm (Avinet®) along the length of the wing resting in a normal, unflattened, and folded position from the tip of the longest primary to the most forward edge of the wing. Kestrels were sexed by plumage.

American Kestrel	Sex	N	Mean	±	s.d.	Range
Weight (g)	ALL	146	118.9	±	10.8	95 - 148
	M	51	112.2	±	8.4	97 - 135
	F	95	122.4	±	10.3	95 - 148
Wing Chord (mm)	ALL	131	192.6	±	8.0	174 - 240
	M	43	186.3	±	5.9	174 - 202
	F	88	195.6	±	7.0	181 - 240

Mean weights were similar but slightly higher than those measured by Bloom (1973) and reported by Dunning (2008) for male (n =69, mean =110.7 g, s.d. = 9.3) and female (n =111, mean =119.8 g, s.d. = 9.2) kestrels from southern California.

To compare to published wingspans of American Kestrels as measured by Bird and Palmer (1988), 23 male and 24 female kestrels in which I measured both wing chord and wingspan were used to derive an equation for estimating wingspan in kestrels- (r^2 = 0.64, P = <0.001): Wingspan (mm) = ((4.7342) × (Wing Chord [cm]$^{0.8495}$)) × 10.

The estimated mean wingspans for kestrels I calculated based on chord measurements were 572.7 mm (n = 40, range = 551.6 – 595.5 mm) for males and 587.4 mm (n = 58, range = 538.5 – 618.6 mm) for females. Bird and Palmer (1988) reported wingspans for kestrels of 510 – 560 mm for males, which is slightly smaller than males I measured, and 570 – 610 mm for females.

BARN OWL *Tyto alba*

I banded Barn Owls from Jul 1995 to Mar 2001 in two counties (Merced and Yolo) in California. I captured the birds using a Bal-chatri or in the nest box. Weights were taken with a 1000-g-capacity Pesola® to the nearest 5 g. Wing chord was measured as above using a Lufkin® 3-m engineers' metric tape measured to the nearest 1 mm. The owls were sexed by plumage (Pyle 1997).

Barn Owl	Sex	N	Mean	±	s.d.	Range
Weight (g)	ALL	41	482.4	±	62.2	380 - 635
	M	16	434.1	±	26.5	380 - 475
	F	25	513.4	±	58.7	410 - 635
Wing Chord (mm)	ALL	41	312.4	±	9.8	297 - 335
	M	16	312.3	±	8..6	300 - 325
	F	25	312.5	±	10.7	297 - 335

Barn Owls from the Central Valley of California were generally lighter than male (Utah, n =112, mean =473.5 g, s.d. = 32.3; New Jersey, n =41, mean =475 g, s.d. = 33) and female (Utah, n =166, mean = 566.4 g, s.d. = 57.0; New Jersey, n =54, mean =569 g, s.d. = 50) Barn Owls measured in Utah (Marti 1990) and New Jersey (Colvin 1984) as reported in Marti et al. (2005). Unflattened wing chord was also shorter for male (n =102, mean = 327.2 mm, s.d. = 8.5) and female (n =155, mean = 328.4 mm, s.d. = 8.5) Barn Owls measured in Utah (Marti 1990).

LOGGERHEAD SHRIKE *Lanius ludovicianus*

I trapped and banded 200 Loggerhead Shrikes from Jan 1996 to Jan 2013 in 15 California counties (Alameda, Contra Costa, Fresno, Los Angeles, Merced, Orange, Sacramento, San Benito, San Diego, Santa Barbara, Santa Clara, Solano,

Weights were taken with a 100-g-capacity Pesola® to the nearest 1.0 g. Wing chord was measured as above and the tail was measured from the base of the tail (i.e., at the point of insertion of the feathers) between the two central rectrices to the tips, as described in Pyle (1997) using a Mitutoyo® digital micrometer to the nearest 0.1 mm. Of the 200 individuals, a subset of 63 shrikes was sexed by Trent University, Ontario, using DNA from blood samples I collected. Although there was a great deal of overlap, tail length was the only measurement taken that was significantly different between the sexes ($n = 47$, $P = 0.042$).

Loggerhead Shrike	Sex	N	Mean	±	s.d.	Range
Weight (g)	ALL	63	50.5	±	3.0	41 - 58.5
	Male	37	50.5	±	3.1	41 - 58.5
	Female	26	50.5	±	2.9	42 - 55.5
Tail (mm)	ALL	47	99.4	±	3.0	93 - 109
	Male	27	100.0	±	3.1	95 - 109
	Female	20	98.3	±	2.6	93 - 102
Wing Chord (mm)	ALL	62	93.3	±	1.96	91 - 102
	Male	36	96.7	±	1.98	93 - 102
	Female	26	95.9	±	1.88	91 - 99

Measurements reported by Pyle (1997) for shrikes (*L. l. mexicanus*) sexed by brood patch or cloacal protuberance (i.e., Feb – Aug) were similar but had a greater range for tail measurements (n = 100, range = 89 – 106 mm; n = 95, range = 88 – 104 mm) and wing measurements were similar for males (n = 100, range = 94 – 102 mm) and slightly longer for females (n = 87, range = 92 – 101 mm) than measurements of shrikes I collected during the winter.

Using the measurements reported here and by Pyle (1997), Loggerhead Shrikes with tails measuring less than 89 mm are likely females and those with tails longer than 104 mm are likely males. Using this criterion, of the 138 Loggerhead Shrikes that I measured that were not sexed by DNA, two were female (tail lengths = 85.6 and 88 mm) and 19 were male (tail lengths ranged from 104.1 to120 mm), so only about 15% of the shrikes I collected could be sexed using tail measurements.

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