TABLE 1

SEX RATIOS OF SAW-WHET OWLS[a]

Year	HY males	HY females	U	χ^2	P
1976	46	16	35	14.5	<0.0002
1977	187	84	118	39.2	<0.0001
1978	54	23	46	12.5	<0.0005
Total	287	123	199	65.6	<0.0001
M and B	43	30	27	2.3	>0.10
Year	PHY males	PHY females	U	χ^2	P
1976	36	30	26	0.6	>0.45
1977	62	49	52	1.6	>0.20
1978	55	57	68	0.0	>0.95
Total	153	136	146	1.0	>0.30
M and B	16	30	22	4.3	<0.05

[a] Data from Weir et al. (1980) except for M and B which are from the sample used in Mueller and Berger (1967). Chi-square compares observed values with a 1:1 sex ratio.

Edwards, Weir and Stewart (Wilson Bull. 94:555–557, 1982) present calculations which suggest that if one considers the proportions of males and females in the unidentified category, the sex ratio of the total sample does not differ from unity. Their analysis evades the central issue of age differences by combining the age groups. If we use their estimates of the proportion of unidentified birds that are males (29%) and females (71%), apply this separately to the two age groups, and add the numbers of birds that were sexed, we obtain the following: HY: males—345, females—264, $P < 0.002$; PHY: males—195, females—240, $P < 0.04$. We have, thus, significantly biased sex ratios in both HY and PHY. This strongly suggests that the sexing method of Weir et al. (1980) is not sufficiently accurate for either age group.

We need data from a sufficient sample of known-age, known-sex Saw-whet Owls to establish a reasonable estimate of the true means, standard deviations, and hence the 95% confidence intervals for determining sex. The method of measurement should be described in detail. At present, we do not know the accuracy of the sexing method used by Weir et al. (1980).

Weir et al. (1980) conclude that Saw-whet Owls show sexual differences in the timing of migration. On the basis of the evidence presented above, it appears that their conclusions may be inconclusive.—HELMUT C. MUELLER, *Dept. Biology and Curriculum in Ecology, Univ. North Carolina, Chapel Hill, North Carolina 27514.* *Accepted 20 July 1982.*

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Comments on sexing Saw-whet Owls by wing chord.—Mueller (Wilson Bull. 94:554–555, 1982) feels it unbelievable that there are more identified males than identified Saw-whet Owl (*Aegolius acadius*) females in the work by Weir et al. (Wilson Bull. 92:475–488, 1980). However, it is entirely expected from the data of Earhart and Johnson (Condor 72:251–264,

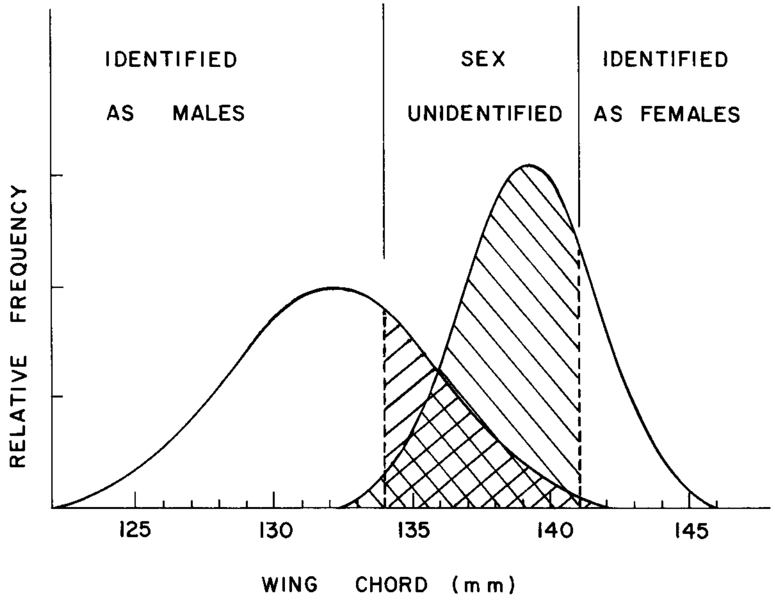

FIG. 1. Identification of sex of Saw-whet Owls, assuming normal distribution of male and female wing chords (Earhart and Johnson 1970), males 132.2 ± 3.83 mm, females 139.2 ± 2.45 mm.

1970), assuming a normal (Gaussian) sample population of males and females (mean wing chord of 132.2 ± 3.8 mm for males and 139.2 ± 2.4 mm for females).

Shown in Fig. 1 are the normal curves for these distributions together with the cut-off limits (wing chord ≤134 mm for males and ≥141 for females). The area under the curve to the left of 134 mm represents the fraction of the total population of males that can be identified and the area under the curve to the right of 141 mm represents the fraction of the total population of females that can be identified. This procedure permits 68% of the males to be identified as males and 23% of the females to be identified as females. We therefore expect to fail to identify more females (77%) than males (32%). Thus, the unidentified (U) category is expected to contain 29% males (i.e., 32/[32 + 77]) and 71% females (77/[32 + 77]). The essence of Mueller's (1982) misconception is that he expected equal fractions of males and females to be identifiable.

One can, in fact, calculate the numbers of males and females expected in the unidentifiable category by assigning sex as 29% males and 71% females. Such an assignment for the 345 unidentified birds in the data of Weir et al. (1980) as listed in their Table 2 and included in Mueller's (1982) Table 1 (above) leads to an overall total (HY and PHY) for 1976, 1977, and 1978 of 531 males, 503 females, or 51% male, 49% female. This is clearly not far from expectation of equal fractions in the overall population.

Weir et al. (1980) were anxious not to misidentify as to sex hence the conservative criteria used (only 1.7% of the females should have wing chords ≤134 mm, and only 1.1% of the males ≥141), and the inclusion of the unidentified category. Their analysis clearly stated that the findings related to timing of migration apply to the owls of known sex.

Mueller is of course correct that there are small age-dependent size differences between HY and PHY birds. Including such age difference would split each of the peaks in the unaged distribution shown in Fig. 1 into two peaks, but consistent data were not available to us at the time of writing. We have been acquiring such data ourselves, and have measured 2588 birds to date. Our statistical analysis (unpubl.) yields mean wing chords of 131.8 ± 3.6 mm for HY males, 133.1 ± 3.3 mm for PHY males, 139.3 ± 3.6 mm for HY females, and 140.8 ± 3.3 mm for PHY females. Clearly, the age-dependent differences of 1.3 mm for males and 1.5 mm for females are much smaller than the sex-dependent differences of 7.4 mm for HY birds and 7.7 mm for PHY birds.—MARTIN H. EDWARDS, *Dept. Physics,* RON D. WEIR, *Dept. Chemistry and Chemical Engineering, Royal Military College of Canada, Kingston, Ontario K7L 2W3, Canada,* AND ROBERT B. STEWART, *Dept. Microbiology, Queen's Univ., Kingston, Ontario K7L 3N6, Canada.* *Accepted 27 July 1982.*

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Use of two habitats related to changes in prey availability in a population of Ospreys in northeastern Nova Scotia.—Reproductive success of altricial birds may depend largely on the ability of adults to find and bring sufficient food from foraging sites to their nestlings. In particular, large raptorial birds that forage for seasonally fluctuating and patchily distributed prey may encounter problems in obtaining enough food for both themselves and the rearing of their young. Presumably the feeding and nesting strategies developed by a species reflect the abundance, distribution, and availability of prey for the predator.

Time budget studies of nest-site activities of Ospreys (*Pandion haliaetus*) have been limited (Green, Ibis 118:475–490, 1976; Stinson, Oecologia 36:127–139, 1978; Levenson, M.S. thesis, Humboldt State Univ., Arcata, California, 1976). Even today relatively little is known about details of Osprey nesting activity, especially relative differences in time budgets between adults of a pair.

Ospreys in Antigonish County, Nova Scotia, use two different habitats: nesting within 3.5 km of estuaries and capturing winter flounder (*Pseudopleuronectes americanus*) in the estuaries; and nesting inland, usually beside lakes and/or streams and feeding primarily on white sucker (*Catostomus commersonei*), alewife (*Alosa pseudoharengus*), and blueback herring (*A. aestivalis*). Prévost (M.Sc. thesis, MacDonald College, McGill Univ., Montreal, Quebec, 1977) suggested that inland nesters feed on the latter two species in that portion of the nestling period coinciding with the spawning migration of these fish. He also noted these birds might have to shift foraging locations from lakes and/or streams to estuaries in years that the herring migration ceases before their young fledge.

In our study we attempt to identify major breeding activities of inland and coastal nesting pairs and to determine the extent of changes in relative time devoted to hunting by males throughout stages of the breeding cycle.

Use of the two anadromous herring species by inland nesters and the possible significance of a shift in foraging locations during the nestling period are assessed. Also, we have hypothesized that the length of time of hunting by coastal birds would be less variable than that of inland birds since flounders in the two estuaries used by the study population are available to Ospreys throughout the breeding season (Prévost 1977).

Study site and methods.—This study was conducted within the watersheds of Antigonish and Pomquet estuaries in northeastern Nova Scotia (Fig. 1). The West and South rivers are the two major watershed systems emptying into Antigonish Estuary and water from shallow, eutrophic Gaspereaux Lake meets the West River about 11 km from Antigonish estuary.