

a continuous range. Olrog cited *A. s. strigiceps* as occurring in Entre Ríos, Santa Fe, and Córdoba, and *A. s. dabbenei* in Jujuy, Salta, and Tucumán. Actually, the two well-differentiated subspecies are isolated geographically, as suggested in the map presented by Navas (loc. cit.). That author gave localities in western Entre Ríos, northern Santa Fe, northern Córdoba, southern Chaco, and scattered about Santiago del Estero for *A. s. strigiceps*, and localities in Tucumán, western Salta, and Jujuy for *dabbenei*. *A. s. strigiceps*, the much smaller (no overlap in measurements) eastern form with especially small feet and bill, has less black on the lores and no black under the eyes, and is browner and less rusty dorsally. Its Argentine range extends from Lavalle (possibly winter visitor there), and Monte Quemado, Santiago del Estero, and Avia Terai and General Pinedo, Chaco, south to central Córdoba and central Santa Fe, and southeast to Entre Ríos (data from literature and specimens in AMNH). *A. s. dabbenei* is found in the "monte" scrub zone of the lower Andean slopes from Tucumán and western Salta to Jujuy. I am not certain of the basis for Formosa being ascribed to the range of the species, but it probably occurs there, and the subspecies involved is certain to represent the eastern lowland form, *A. s. strigiceps*. Representatives of the two forms have been taken in the breeding season (October to December) from localities as close as 190 km (Río del Valle, Salta, and Monte Quemado, Santiago del Estero) apart, but specimens I have examined show no indication of intermediacy.

The Paraguayan specimens reported herein are typical of *A. s. strigiceps* in all respects, and hence extend the range of that subspecies northward through central and eastern Formosa to the central Paraguayan Chaco (Lichtenau is approximately 170 km north of the Pilcomayo River, and 180 km west of Puerto Pinasco on the Paraguay River, see map 4, Steinbacher 1962, Abhandl. Seneckenberg. Naturforsch. Ges. 502: 12). This northward extension of the range of *A. strigiceps* is noteworthy in regard to the presumed dispersal of its ancestor into the region from the north. A xeric brushland-adapted species, its nearest relatives are the Peruvian *Aimophila* (*Rynchospiza*) *stolzmanni*, and Middle American *A. sumichrasti* (Short, 1975, Bull. Amer. Mus. Nat. Hist. 154: 319). This distribution finds a parallel in that of South American scrubland *Picoides* (*Dendrocoptes*) *mixtus* (and its Patagonian forest ally, *P. lignarius*) and in that woodpecker's probable relationship to Middle and North American *P. scalaris*, suggesting formerly more continuous xeric scrub connections (through arid Bolivian and Peruvian valleys, and west-coastal South America) between the Chaco region and Middle America.—LESTER L. SHORT, *American Museum of Natural History*, and *City University of New York, New York, New York 10024*. Accepted 3 Jan. 75.

Variation in Oldsquaw rectrix numbers.—While preparing Oldsquaw (*Clangula hyemalis*) carcasses for pesticide analysis, I noted considerable variation in the number of rectrices. The specimens were obtained from Lake Michigan commercial fishermen, who found them drowned in gill nets.

I fanned and counted the rectrices on each specimen, then carefully examined the base of the tail for broken or missing tail feathers. In the few instances where a rectrix had been removed or broken, even in the outermost quill, the absence was readily apparent from the empty space or the uneven length of opposite rectrices. Molt was not a problem in the Lake Michigan birds because the specimens were all taken during the winter and spring, and immatures retain their notched juvenile

TABLE 1
NUMBER OF RECTRICES IN DIFFERENT AGE AND SEX CLASSES OF OLDSQUAWS
COLLECTED ON LAKE MICHIGAN

Number rectrices	Immature males	Immature females	Adult males	Adult females	Total	Percent of total
12	4	7	5	9	25	1.9
13	5	14	5	12	36	2.8
14	322	339	215	281	1157	89.7
15	15	13	11	11	50	3.9
16	9	2	7	4	22	1.7
Total	355	375	243	317	1290	100.0

tail feathers until their second summer. Specimens were sexed and aged by several characters (Ellarson 1956).

The number of rectrices varied from 12 through 16 (Table 1). For the 1290 specimens examined, 133 (10.3%) had rectrices other than 14. The data appear normally distributed in each age and sex class. A series of Chi-square tests suggests some differences related to sex or age, but I could detect no meaningful biological relationships from these comparisons.

To check the Lake Michigan results, I examined a series of Oldsquaw skins in the National Museum of Natural History. The results from this sample were almost identical to the Lake Michigan data. Of the 230 museum skins examined 24 (10.4%) had tails with 12, 13, 15, and 16 rectrices. Percentages for each of these rectrix classes were 1.7, 3.0, 3.5, and 2.2 respectively, and are similar to the percentages for Lake Michigan Oldsquaws (Table 1). I found slightly more tails with 15 or 16 than with 12 or 13 rectrices in both the Lake Michigan and the museum samples (72 vs. 61 and 13 vs. 11 respectively). From these data, I conclude that loss of rectrices did not influence the results.

Species of birds are generally thought to have a constant number of tail feathers. A literature search indicated Oldsquaws are supposed to have 14 rectrices (Nitzsch 1866: 147; Coues 1903: 931; Forbush 1925: 255; Witherby 1948: 324; Dement'ev et al. 1952: 626). Witherby (1948) noted this species exceptionally has 16 rectrices.

In the family Anatidae, the number of rectrices, depending on the species, varies from 14 to 24. Witherby (1948) indicated practically all the members of this family have an even number of tail feathers but he reported for the Pink-footed Goose (*Anser fabalis brachyrhynchus* Baillon; p. 200) "with 16 to 18 feathers" and the Canada Goose (*Branta canadensis*; p. 218) with "16-18 feathers." From these data I could not conclude whether an odd number of rectrices (17) had been recorded or not. Elder (1946) examined 563 Canada Geese at Horse Shoe Lake, Illinois, and found the number of tail feathers to vary from 14-19; he definitely recorded individuals with 15, 17, and 19 rectrices.

Evidently the number of rectrices in Oldsquaws is not a constant 14 but varies from 12 through 16 and about 10% have more or fewer than 14. The only other documented large sample of anatids, Elder's Canada Geese, showed variation similar in scope to that of the Oldsquaw. Until a large series of specimens in other species of the Anatidae can be examined, the conservative assumption would be that rectrix numbers in anatids is more variable than hitherto realized, and not that Oldsquaws or Canada Geese are anomalous.

This project was funded by the National Oceanic and Atmospheric Administration's

Office of Sea Grant, Department of Commerce, through an institutional grant to the University of Wisconsin. I thank John Weske, U.S. Fish and Wildlife Service, and Richard Zusi, Smithsonian Institution, for allowing me to examine the museum material.

LITERATURE CITED

- COUES, E. 1903. Key to North American birds, vol. 2, fifth ed. Boston, Page Co.
- DEMENT'EV, G. P., N. A. GLADKOV, YU. A. ISAKOV, N. N. KARTASHEV, S. V. KIRIKOV, A. V. MIKHEEV, AND E. S. PTUSHENKO. 1952. Birds of the Soviet Union, vol. 4. Translated 1967 Israel Program for Sci. Transl., Jerusalem.
- ELDER, W. H. 1946. Age and sex criteria and weights of Canada geese. *J. Wildl. Mgmt.* 10: 93-111.
- ELLARSON, R. S. 1956. A study of the old-squaw duck on Lake Michigan. Unpublished Ph.D. dissertation, Madison, Univ. Wisconsin.
- FORBUSH, E. H. 1925. Birds of Massachusetts and other New England states, vol. 1. Massachusetts Dept. Agr.
- NITZSCH, C. L. 1866. Pterylography. London, Ray Soc.
- WITHERBY, H. F. 1948. The handbook of British birds, vol. 3. London, H. F. & G. Witherby Ltd.

STEVEN R. PETERSON, *Department of Wildlife Resources, University of Idaho, Moscow 83843*. Accepted 13 Jan. 75.

Reevaluation of "activity clustering" by male grouse.¹—Several years ago, based on some 10 years' data, I interpreted the distribution pattern of drumming male Ruffed Grouse (*Bonasa umbellus*) on the Cloquet Forestry Center in east central Minnesota as suggesting the use of communal display grounds or "expanded leks" (Gullion 1967).

At that time (1965) we were only beginning to appreciate the close relationship between the occurrence of Ruffed Grouse and the aspens (*Populus* sp.) (Gullion and Svoboda 1972, Gullion 1972). The "activity clusters" identified in that paper (Fig. 1, p. 104) we now recognize as being those portions of the Cloquet Forestry Center that had or have the proper interspersions of secure vertical cover and mature male aspen (the preferred winter food resource—Svoboda and Gullion 1972). These are also the areas where coniferous cover is least prevalent, thereby providing less cover for the raptors, which here are the major predators upon these grouse (Gullion and Marshall 1968).

It seems apparent now that these "clusters" of drumming male Ruffed Grouse reflect the clumping of adequate habitat resources, not social interaction. During the recent (1970-71) population peak in northern Minnesota, drumming male Ruffed Grouse were quite evenly distributed throughout suitable habitats on the Cloquet Forest. In the best quality habitats breeding grouse densities averaged a male per 6 acres in 1970-71, and the distribution of more than 250 drumming males over a 14-square-mile study area was closely related to the presence of mature (35+ year-old) male aspens in the forest canopy, not to the presence of other drumming male grouse on the forest floor. Even during the peak years here there were forested tracts of 75 to over 200 acres where aspen was absent and which were also devoid of breeding grouse. In some instances only a fence line, denoting different forest

¹ Paper No. 9002, Scientific Journal Series, University of Minnesota Agricultural Experiment Station, St. Paul, Minnesota 55108.