AGE DETERMINATION OF BLUE JAYS

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Dater (1970) reported successive changes in color and barring of dorsal wing coverts in the Blue Jay (*Cyanocitta cristata*). Our plumage records of recaptured, known-age jays indicate that enough exceptions to the general pattern of change require the use of additional characters when attempting to age Blue Jays.

METHODS

In the course of banding about 3,000 Blue Jays in Michigan we recorded the following information about their plumage and pigmentation: the presence or absence of bright blue color and black bars on secondary feathers 8, 9, and 10, on the greater secondary coverts, alulars and greater primary coverts; the extent of black pigmentation (using a scale of 0–5) on the inner surfaces of the bill, on the tongue, and on the interior portions of the mouth around the glottis.

Our records of 92 individuals are suitable for determining whether these characteristics are indicative of specific ages. First- and second-winter plumage data were taken from 61 birds which we banded when their postjuvenal molt was still incomplete, and so were of known age when banded and again when recaptured. The data for third-winter and all subsequent plumages, which we lumped as "adult plumage," are from birds of unknown age when banded, but known to be in at least their third-winter plumage when recaptured.

Because changes in pigmentation might be associated with seasonal differences in hormone levels, we used data only from recaptures in the spring or summer.

RESULTS

Feather Colors

The leading vanes of secondary feather 10 and of the greater secondary coverts were dull blue in juvenal plumage (41 of 46 birds). During the postjuvenal molt bright blue feathers replace them, but not every bird completes this molt (Pitelka, 1945, 1946, 1961). Of the birds we examined which were in their first-winter plumage, 6 of 47 still had some dull blue greater secondary coverts or secondary feather 10.

The only jays with bright blue alulars or greater primary coverts were those in the second-winter or adult plumages. But since 24 of 69 birds in these plumages did not have bright blue alulars or greater primary coverts, the character is of value for aging jays only when it is present.

Black Bars

The black bars on jay wing feathers vary in appearance. Some were dark and broad; others were faint, narrow, or spotty. Barring appeared on all the greater secondary coverts and secondary feathers in all plumages after completion of the postjuvenal molt. The alulars of jays in

second-winter and adult plumages were usually barred (50 of 65 birds) as were their greater primary coverts (38 of 69 birds). But some birds in juvenal and first-winter plumage already had barred alulars (21 of 92 birds) or barred greater primary coverts (5 of 47 birds). Thus barred alulars or greater primary coverts are not, in themselves, reliable aging criteria.

Mouth and Tongue Pigmentation

Nichols (1955) and Laskey (1958) reported that the color of the inside of a young jay's bill changes from mostly white to almost all black by its first spring. We observed this change in 37 juveniles. We also noted that juveniles had pink tongues whereas most first- and second-winter birds had moderately black or all black tongues. But 17 of 43 adult birds had tongues scored 3 (i.e. more than half black) or less; one had a dramatic reduction in tongue pigmentation from a score of 5 (i.e. all black) to a score of 2 (i.e. less than half black). Two other jays had tongues that were consistently scored 3 or less over a four-year period. The extent of pigmentation on the fleshy area around the glottis also varied. Three of 46 adults had very little pigmentation in that area.

Age Key

Our observations confirm, in a general way, the pattern of change in Blue Jay plumage which Dater reported. But applying the Dater aging criteria to our sample of 172 plumage records of known-age jays yielded the correct age only 62% of the time. We have constructed a key for aging Blue Jays (Table 1) which relegates birds with ambiguous plumage patterns to the "unknown age" category. When applied to our records, 27% of the birds fell into this category. Only 2% of the birds were incorrectly aged; in each case the bird incorrectly aged was in its first-winter plumage, but had bars on its greater primary wing coverts.

TABLE 1

A key for aging the Blue Jay

1a.	Inside surfaces of the bill less than half black	2
1b.	Inside surfaces of the bill mostly black	3
2a.	All the greater secondary coverts and secondary feather 10 dull blue and not barred	HY
2b.	At least some bright blue and barred	3
3a.	Black bars and bright blue color on only the proximal greater secondary coverts and/or secondary feathers except for 10	Aug–Dec: HY Jan–July: SY
3b.	All greater secondary coverts and secondary feathers with black bars and bright blue color	4
4a.	At least one of the greater primary coverts with black bars	AHY
4b.	None with black bars	5
5a.	At least one of the alulars and/or one of the greater primary coverts is bright blue	AHY
5b.	All are dull blue	6
6a.	Jan–July	AHY
6b.	Aug–Dec	U

DISCUSSION

Although our plumage and pigmentation records were extensive, they suffered in that each of us was making qualitative judgments of the color of the feathers, the presence of black bars on the feathers, and the extent of black pigmentation on several areas. Our most inconsistent reporting probably involved the presence or absence of black bars in those cases where the bars were very faint, or appeared only on a few of the feathers in an area. We estimate that as many as 10% of the birds we examined might have been judged inconsistently in this regard. On the other hand, our most reliable judgment probably was in distinguishing between dull blue and bright blue feathers. Here again, however, some inconsistency in our reporting might have occurred because a variety of shades of blue occurs and some might have been called dull blue because of poor light.

Our data from known-age jays show that Wood's reliance (1969) on barring of the alulars and greater primary coverts is not satisfactory because this characteristic is so variable. Our data also show that the U.S. Fish and Wildlife Service's (Anonymous, 1976) prohibition of using barring on "post-juvenal coverts and alula" is too broad. We found that the lack of bars on some greater secondary coverts is a reliable characteristic for identifying HY birds and some SY birds.

SUMMARY

The records of 92 Blue Jays of known age were analyzed for age-related patterns in wing feathers and mouth pigmentation. Based on those records a key for aging the Blue Jay is presented.

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LITERATURE CITED

ANONYMOUS. 1976. North American Bird Banding Manual. U.S. Fish and Wildlife Service.

DATER, E. 1970. Dorsal wing coverts of Blue Jay (*Cyanocitta cristata*). Guide to age. *EBBA News*, **33**(3): 125–129.

LASKEY, A. R. 1958. Blue Jays at Nashville, Tennessee: movements, nesting, age. *Bird-Banding*, **26:** 211–218.

NICHOLS, J. T. 1955. A criterion for young-of-the-year in Blue Jay. *Bird-Banding*, **26:** 27.

PITELKA, F. A. 1945. Pterylography, molt and age determination of American jays of the genus *Aphelocoma*. *Condor*, **47:** 229–261.

———. 1946. Age in relation to migration in the Blue Jay. *Auk*, **63:** 82–84.

———. 1961. A curtailed postjuvenal molt in the Steller Jay. *Auk*, **78:** 634–636.

WOOD, M. 1969. A Bird-bander's guide to determination of age and sex of selected species. University Park, PA, Pennsylvania State Univ.

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