# Eye-colour changes in flightless ducklings of Lesser and Greater Scaup *Aythya affinis* and *Aythya marila*

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*Both Scaup species have eye-colour that is some shade of olive at hatching, both have some shade of yellow as adults, and both show little change in chroma of eye-colour but an increase in value. However, there is a marked change in the hue of eye-colour between Lesser and Greater Scaup at the late downy stage. Ducklings can be distinguished at this late downy stage by eye-colour; blue-eyed birds are all Greater Scaup, while the eyes of young Lesser Scaup always have a yellow element.*

*Keywords: Lesser Scaup, Greater Scaup, Duckling Development, Eye-colour, Ageing, Identification*

Eye-colours of large numbers of wild-caught, known-age female Lesser Scaup *Aythya affinis*, although quite variable, were first documented in the Munsell colour system by Trauger (1974). He found that eye-colours, which are under hormonal control, may be used as criteria for ageing flying Lesser Scaup females. These colours may vary from dark brown (10YR 3/3) or a shade of olive-brown (2.5Y 4/4, 2.5Y 5/6) in a one-year-old female to yellow (5Y 7/8) in one five-year-old (see Trauger 1974: **Figure 1** and page 245, **Table 1**). Trauger also found yellow eye-colour in flying female Greater Scaup *Aythya marila nearctica*, but he was unable to document the eye-colour of flying male Lesser and Greater Scaup because few males returned to their natal area.

The objective of this paper is to document the changes in colour attributes (hue, value, and chroma) occurring in small numbers of hand-reared, flightless ducklings of both Scaup species (59 Lesser Scaup, 22 Greater; see **Figures 1-6**). Of the three colour attributes, hue is the most important. Although both Scaup have olive or neutral eye-colour at hatching (rarely, the eye of Lesser Scaup at hatching is greenish yellow) and yellow eyes as adults, changes of eye-colour hue are more evident in the Greater Scaup (see **Figure 4**). To use Trauger's words, "The blue-eyed ones are Greater Scaup" (Trauger pers.comm.1974). While looking for a way to distinguish Greater from Lesser Scaup, I was able to confirm not only the presence of blue eyes in the Greater Scaup (both palaearctic and nearctic subspecies have similar eye-colour changes), but also the absence of blue eyes in the Lesser. Eye-colours occurring prior to fledging have not been documented for either Scaup species.

I used Lesser Scaup hatched from eggs wild-gathered in Manitoba and Saskatchewan and Greater Scaup hatched from eggs wild-gathered in Manitoba and the Northwest Territories. I followed the nomenclature of Banks (1986) and the sexing method of Hochbaum (1942). I noted eye-colour from the Atlas de los Colores (Villalobos-Dominguez & Villalobos 1947) in 1972 and from the Munsell Soil Colour Charts (Munsell Colour Company 1973), with addition of seven colours, in 1974-76. I used the larger, more convenient perforations of the painted Munsell Soil

Colour Charts rather than the smaller, less convenient perforations of the printed Villalobos Colour system for evaluating the ducklings eyes (See Bowers 1956). In 1972, I used white-shaded east daylight and in 1974, unshaded north daylight. From 1974 onward, I used the smaller noon daylight lamp-booth at Delta and the larger north daylight lamp-booth at the museum. Both lamp-booths are described in Nelson (1982). I used the larger lamp-booth and a second observer to prepare a colour synonymy. I translated Villalobos terms into Munsell terminology using the colour synonymy. At all times I was the sole evaluator of Scaup eye-colour. I found no significant differences among the available kinds of daylight used to evaluate eye-colour.

**Table 1.**

| Munsell | Villalobos | Ridgway |
|---|---|---|
| | *Neutrals, Blues, & Bluish Colours* | |
| N 4.4 | N 6 | LIII NG Neutral Grey |
| 10G 6/1 | E-11-4° | XXXIII [GB-G] Montpelier Green |
| 2.5BG 6.4/0.8 | T-12-1° | XLVII [GB-G] Dark Glaucous Grey<br>XLII [Green] Hathi Grey |
| 5BG 7/2 | TC-14-3° | XLII [BB-G] Light Glaucous Blue |
| 5B 6/1 | C-12-3° | XXXIV [GB] Glaucous Blue |
| 2.5PB 5.5/2.0 | UUC-10-3° | XLVIII [BG-B] Deep Green-Blue Grey |
| 10BG 6/1 | T-12-3° | XLII [BB-G] Greenish Glaucous Blue |
| 2.5GY 6/2 | LLY-10-3° | XXXI [GG-Y] Light Cress Green |
| 5GY 6/2 | LLY-10-2° | XXXI [GG-Y] Light Cress Green |
| | *Browns, Olives and Yellows* | |
| 10YR 3.5/3 | OOS (5/6) 4° | XL [O-Y] Olive Brown x Buffy Brown |
| 2.5Y 4/2 | O (6/7) 2° | XLVI [O-Y] Hair Brown |
| 5Y 5/2.5 | (OOY/OY) (9/10) 2° | XXX [O-YY] Buffy Olive |
| 7.5Y 5/2 | OOY-8-1° | XLVI [O-YY] Greyish Olive |
| 10Y 5/1 | (Y/YYL) 8-1° | LI [Yellow] Deep Olive Grey |

**Figure 1. Lesser Scaup, *Aythya affinis* - changes in eye-colour hue.**

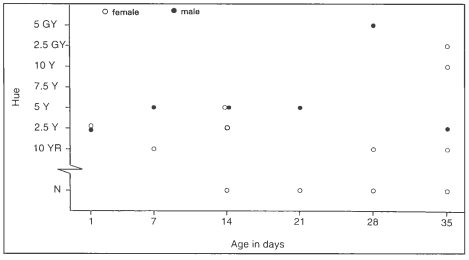



**Figure 2. Lesser Scaup, *Aythya affinis* - changes in eye-colour value.**

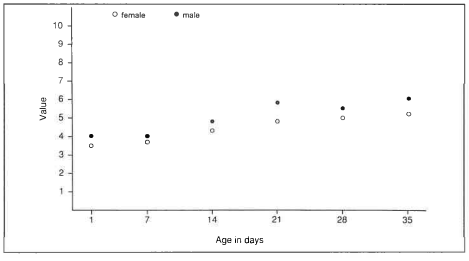
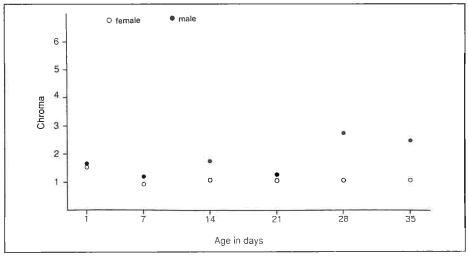



**Figure 3. Lesser Scaup, *Aythya affinis* - changes in eye-colour chroma.**




In general, the eyes of male Lesser Scaup become lighter and brighter earlier (usually, by 21 days) than the eyes of female Lesser Scaup. Eye-colours of females are more neutral while those of males are more chromatic. Although sex differences in eye-colour may be discernible in a few newly-hatched individuals of both Scaup species, these differences become more apparent when the ducklings are about ten days old (Nelson 1993). The eye-colour of Lesser Scaup of both sexes usually retains a yellow element from hatching to flying (see **Figures 1-3**).

**Figure 4. Greater Scaup, *Aythya marila nearctica* - changes in eye-colour hue.**

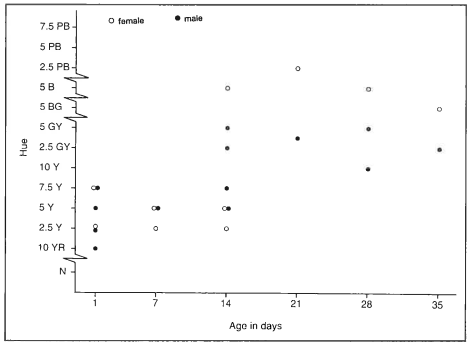



**Figure 5. Greater Scaup, *Aythya marila nearctica* - changes in eye-colour value**

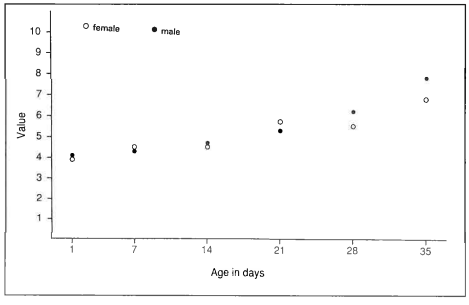
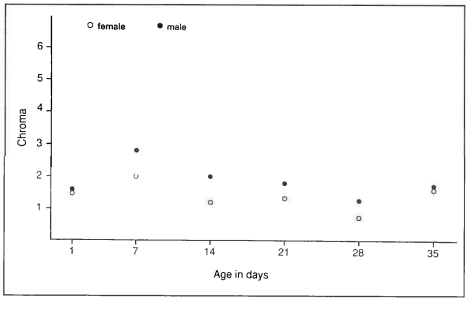



**Figure 6. Greater Scaup, *Aythya marila nearctica* - changes in eye-colour chroma.**




On the other hand, the eye colours of both male and female Greater Scaup become lighter but not brighter. Although neither sex of the Greater Scaup shows the intense blue eye-colour known in downy Goldeneyes (Nelson 1983), the eye-colour of Greater Scaup of both sexes appears unmistakably blue (most females, a few males) or 'bluish' (most males, a few females) between hatching and flying (usually from about ten days to three or four weeks; see **Figures 4-6**).

In conclusion, blue-eyed birds are all Greater Scaup. Usually, the eye-colour hues of most females are blue whereas they eye-colour hues of most males are 'bluish'. Regardless of the sex, however, the eyes appear quite blue against the dark, greyish brown down of the flightless duckling.

Regrettably, eye-colour hue cannot be used for ageing Greater Scaup ducklings because, while the beginning of blue eye-colouring is apparent, its ending is not. Live Lesser Scaup, on the other hand, have no blue eye-colour at any age, but always have a yellow element which is dull in females and brighter in males (see **Figure 3**). Flightless ducklings of the Lesser Scaup also have dark, greyish brown down. Females of both species have a wide brownish area around the iris, which, however, does not occlude its true colour. This brownish area appears first when the ducklings are about three days old.

**Appendix**

A synonymy of representative eye-colours of Scaup ducklings in three colour notations systems.

Original evaluation in Munsell (1973). Equivalents or close equivalents given in two other colour notations systems. Villalobos and Villalobos-Dominquez (1947), and Rigeway (1912).

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