Notes on behaviour of Ruddy Ducks during the brood period

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The paucity of information on the breeding biology of the Ruddy Duck *Oxyura jamaicensis* has been offset to some extent in recent years (Siegfried 1976a, b; Siegfried *et al.* 1976). However, the literature contains very little information for the species during the brood period. The data reported here were gathered during June–August 1971 in the pothole region near Minnedosa and the Delta marsh in south-western Manitoba. Descriptions of these areas and their use by waterfowl appear in Hochbaum (1944), Evans *et al.* (1952), Bird (1961) and Dzubin (1969).

Based on observations at one nest, hatching occurs 24 hours after the duckling can be heard vocalizing in the egg and about six hours after the egg is pipped. The duckling dries in about five hours. The brood leaves the nest between 12 and 24 hours after hatching, depending upon time of day (three nests observed). The female calls softly and persistently in leading the ducklings off the nest.

The ducklings respond to the female's broody vocalizations by bunching together and by uttering soft, cheeping calls. When alarmed the female cocks her tail, exposing conspicuously the white undertail 'flash', and leads the tightly bunched brood away from the source of disturbance. The female's tail flash may be an important device for reinforcing the ducklings' following response. Depending on the stimulus, the female, and her newly-hatched ducklings as well, can perform head-bobbing and bubbling displays in signalling alarm and intention to dive (Siegfried 1973a, 1976a). Stronger alarm situations, which occur when the female is surprised by the sudden and close proximity of a predator or human, can result in the female performing a broken-wing distraction display combined with aggressive behaviour such as beak-gaping. Incubating females perform such distraction displays when surprised and 'flushed' at their nests. However, the broken-wing display is seldom observed, since Ruddy Ducks normally leave their nests, or lead their young, well ahead of an advancing human. This may have led to the supposition that Ruddy Ducks lack injury feigning behaviour (Weller 1959).

Only females accompanied broods (Table 1). I frequently observed brood-accompanying females reacting aggressively to the close approach of males, of which some were the fathers of their broods. (The birds had been marked individually with nasal-saddles.) While this was the condition in my study area, it appears that in other areas and seasons certain male parents associate closely with their mates and young ducklings (Oring 1964; Dzubin 1969). Females invariably remained with their broods until the young were at least four weeks old. Most broods older than five weeks had been deserted by their parents (Table 1). Ruddy Ducks normally first fly when about seven weeks old (Siegfried 1973a). Oring (1964) also found that Ruddy Ducks deserted their broods before the young could fly. The members of deserted broods remain together at least until they attain the flying stage. Broods older than four weeks were less cohesive than young ones, with ducklings being spaced relatively far apart during bouts of foraging activity (Table 2).

The ducklings obtained their food by

Table 1. Size of broods and attendance by parents.

Age (weeks) of ducklings	No. ducklings $\bar{x}$	S.D.	Range	No. broods Accompanied by female parent	Accompanied by both parents	Alone
0–1	6·2	2·2	2–14	46	0	0
1–2	6·3	2·2	1–14	64	0	0
2–3	5·8	1·7	1–9	34	0	0
3–4	5·2	2·8	1–14	31	0	0
4–5	5·1	1·8	2–8	2	0	8
5–6	4·3	1·8	2–7	7	0	10

Table 2. Mean distance (metres) ± its standard deviation and range separating ducklings in broods busy foraging.

Age (weeks) of ducklings	Nearest neighbour	Farthest neighbour	No. broods observed
0–2	0·7 ± 0·6 (0·3 – 2·4)	3·3 ± 3·5 (0·3 – 9·1)	11
2–4	1·3 ± 0·7 (0·6 – 2·4)	6·1 ± 3·6 (2·4 – 12·2)	7
4–6	4·9 ± 3·7 (1·2 – 10·6)	16·7 ± 11·4 (1·5 – 30·5)	5

Table 3. Number of broods observed foraging in each distance interval (metres) from the emergent vegetation edge.

Age (weeks) of ducklings	0–2	2–4	4–6	6–8	8–10	10–12	12–20
0–2	5	5	1	3	2	2	2
2–4	4	7	2	2			1
4–6		2	1	1	2	4	1
	9	14	4	6	4	6	4

diving to the bottoms of ponds (Siegfried 1973b). They normally foraged in areas of open water (Table 3) often more than 20 m from the margins of shallow ponds (0·5–1·0 m deep). Pond depth appeared to be an important factor influencing the distribution of broods, and probably also the distribution of nests, since diving becomes energetically less economical with increasing depth of water. Ruddy Duck broods do not normally move overland from one pond to another (Evans *et al.* 1952), and I observed many broods reared from hatching to flying on the same body of water.

Ruddy Duck broods seldom foraged in stands of rushes, reeds and other emergent vegetation. Although I did not gather quantitative information on the foraging behaviour of broods of other species of diving ducks, I frequently observed Canvasback *Aythya valisineria* and Redhead *A. americana* ducklings foraging in stands of emergent vegetation. Compared with the Ruddy Duck, the young of these two species are less dependent on diving. It is possible that vocal communication between mother and young in the Canvasback and the Redhead, and in many dabbling ducks, is well developed as an adaptation for foraging in emergent cover. In the Ruddy Duck, whose ducklings tend to forage in areas of open water, visual communication between mother and young may be relatively more important, as evidenced by the female's white tail flash and the bubbling displays of both parent and young. Both parent and young are less vocal (in frequency and loudness of utterance) than most anatids (Siegfried 1973a).

Two females were observed first on 5th August to be replacing their remiges while still accompanying broods of three and seven ducklings aged three and four weeks respectively. At this time in the season relatively many males but few females were observed to be moulting their flight feathers (Siegfried 1973c).

Summary

Only female Ruddy Ducks *Oxyura jamaicensis* accompanied broods. Maternal vocalizations and injury feigning are reported. Females remained with their broods until the young were at least four weeks old. Broods older than four weeks were less cohesive than young ones. Broods seldom foraged in emergent vegetation. Two females moulted their remiges while accompanying broods.

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Climbing aboard! A Black-necked Swan *Cygnus melanocoryphus* gives a ride to one of its cygnets. (*Joe B. Blossom*).