

### Rape Behavior in Blue-winged Teal

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Rape has been recorded in reproductively active wild Mallards (*Anas platyrhynchos*) (Weidmann 1956, Lebrecht 1961, McKinney 1965, Dzubin 1955) and Pintails (*A. acuta*) (Smith 1968), but it has been reported rarely in Gadwall (*A. strepera*) (Gates 1958, Dwyer 1974), Shoveler (*A. clypeata*) (McKinney 1965, Seymour 1974), and Blue-winged Teal (*A. discors*) (McKinney 1965). We report eight incidents of attempted rapes by marked and unmarked Blue-winged Teal in the Minnedosa Pothole and Delta Marsh areas of Manitoba. Each observation was made separately by one of us during waterfowl studies in the two areas. Although the reproductive status of participants was not known in every case, the breeding phase (pre-laying, laying, incubation) of the population was known. The first four cases involved unpaired males which chased a paired female. The last four cases involved attempted rape by paired males on paired females other than their mates. Detailed accounts are presented since description of this behavior for Blue-winged Teal is lacking and interpretation of rape behavior is difficult without precise information on individuals and what happened in each case.

Observations 1–6 were made on roadside ditches within 4 km of Delta; 7 and 8 were made on potholes 6 km and 3.5 km south of Minnedosa. The stage of the breeding cycle for the local Blue-winged Teal population, based on nesting studies, is noted in each case. Names for displays are from McKinney (1970). Numbered nasal saddles (Bartonek and Dane 1964) were used to identify the marked birds.

(1) 18 May 1971. *Early laying period. 0600.*—A paired male, followed by his mate, swam away from two marked unpaired males and another male which kept following the pair. Turn-back-of-head and Repeated Calls by these males suggested that the teal were courting. The paired male Hostile Pumped and gave associated calls. The female remained close to him, Incited and Hostile Pumped twice. The three males peeped briefly and Hostile Pumped when near the paired male, yet they remained close to the female, often approaching to within 1 m of her. After about 5 min, one marked unpaired male rushed at her, grabbed her by the nape and tried unsuccessfully to mount her. The paired male grabbed at the back and flanks of this male, the female flapped at the surface for 2–3 sec and then dived. After surfacing, she joined her mate and they swam away from the males, which did not follow.

(2) 21 May 1971. *Laying period. 1320.*—After a twisting flight, seven males and one female landed in the ditch. The males immediately pressed around the female. Repeated Calls were heard and Turn-back-of-head and Lateral Dabbling were observed. Within 30 sec of landing, one male seized the female by the nape and attempted to mount her. She swam away from him, gave a little jump, and another flight began. Again the birds landed in the ditch, and the males pressed about the female. The flight resumed and moved elsewhere in the marsh. Two of the males were marked unpaired males but the status of the female and other males was unknown. The male that attempted to mount the female was unmarked.

(3) 26 May 1971. *Late laying or early incubation. 0630.*—Two males, one a marked unpaired male, swam up to the female of a pair, the male of which was marked. Each male, in turn, grabbed at the female's neck and tried to mount her. No courtship display or pre-copulatory postures were seen. The paired male Hostile Pumped and gave associated calls, then grabbed at them as they tried to mount the female. The two males abruptly left the pair and flew to another pair on an adjacent flooded meadow. During the encounter the female Hostile Pumped and apparently tried to follow her mate as he swam away from the other males.

(4) 23 May 1973. *Early laying period. 0920.*—After an erratic pursuit flight, nine males and one female landed on a ditch and the female was quickly surrounded by the males. All birds held their heads high, necks stretched, and bills tilted upwards. Males gave peeping calls incessantly as they crowded against the female and several attempted to seize her by the nape. Precopulatory Head Pumping was not observed. Males that tried to mount the female were chased by others and none of the many attempts to mount appeared to be successful. In most attempts a single male mounted the female; however, on one occasion three males mounted simultaneously. One male, apparently the female's mate, tried to keep the other males away from her and vigorously fought any male attempting to mount her. These fights involved wing-beating and feather-pulling, lasted 10–35 sec, and the paired male often left one male to chase another that tried to mount the female. Circular fighting was not observed and Hostile Pumping was

recorded only once. The female dived, emerged, and was joined by the defending male, then by the other males. The paired male threatened and Hostile Pumped as the other males approached. The female dived seven times to escape the males. First dives were 10–15 m in length but they became progressively shorter. After each dive the female emerged near shore with only her bill protruding from the water. Males did not dive after her; instead they searched the adjacent shoreline and, when they found her, flew to her and continued the pursuit. The female did not try to fly nor did she Incite or assume the Repulsion posture. The bank was steep and shoreline vegetation sparse, and the female had no chance of escape until she reached a stretch of shoreline with a gentle slope. At 0946 she dived and did not reappear. She may have reached shore but a search of the shoreline did not reveal her. The males remained in the water and continued to patrol the shoreline. Seven males were still in the vicinity at 0950.

In 1973, 22% of 41 clutches found had been initiated by 23 May, so this incident occurred just before the peak of laying. Frequent roadside counts prior to 23 May revealed 0.50 unpaired males per pair.

(5) 7 May 1971. *Pre-laying period*. 0630.—Two pairs were on the ditch about 45 m apart. Pair 1 flew and landed near pair 2 in the latter's territory. Male 2 (a marked bird) flew to female 1 and mounted her twice for 3–4 sec each time. Male 1 grabbed at the back of male 2 and successfully knocked him from the female. Then both males alternately chased each other over the water and male 2 attempted again to mount female 1. Pair 1 eventually left the ditch. Both males Hostile Pumped and gave associated calls throughout the encounter and once they fought briefly (1–2 sec). The females remained apart throughout and moved to the vegetation at the ditch edge. Female 2 subsequently nested in the adjacent meadow.

(6) 18 May 1971. *Early laying period*. 0525.—A marked paired male which had defended a section of ditch for several days chased and attempted to mount the female of an intruding pair. Prior to this both males Hostile Pumped and gave associated calls but there was no contact. After the intruding pair flew away the resident male swam to his mate (who was in the early egg laying phase) and mounted her briefly (2–3 sec) without precopulatory display.

(7) 23 June 1974. *Incubation period*. 2030.—Two pairs fed, loafed and preened in separate potholes on either side of a narrow road. At 2100 pair 1 flew to the other pothole and landed 25 m away from pair 2. Immediately both males began Hostile Pumping and calling, left their mates and swam toward one another. Male 2 rushed across the water and chased male 1 to the north end of the pothole. The members of pair 1 were then separated by 40 m with male 2 in the middle where female 2 rejoined him. All four birds Hostile Pumped and peeped for 10–15 sec while female 1 slowly swam toward her mate in the north end of the pond. When she was within 7 m of pair 2, male 2 flew to her, seized her by the nape, mounted, and attempted to copulate. The copulation behavior was different from that normally observed between pair members. No precopulatory displays were given and there was much wing-beating and splashing as the female tried to escape. About 45 sec later, male 1 flew from the north end of the pothole and landed on top of male 2 who was still on female 1. After 3 or 4 sec of wing-beating, male 2 was knocked from the female and then the members of each pair were reunited about 8 m apart, all four birds giving Hostile Pumping. About 15 sec later, female 1, followed by male 1, flew back to the original pothole. Upon landing, male 1 swam to the female, both birds performed head-pumping movements (bills pointing downwards as in precopulatory pumping) and the male gave ritualized Bathe and Wing-flap displays. Female 1 climbed onto a log and preened. Pair 2 remained on the other pond.

(8) 7 July 1974. *Late incubation period*. 2100.—Two pairs were on a pothole. Male 1 Hostile Pumped and gave associated calls, pair 2 flew, and male 1 flew after them. Female 2 landed after flying about 7 m but male 1 continued vigorously pursuing male 2 for 36 sec, as male 2 circled the pothole. Male 1 then returned to his female and male 2 was joined by his female at the other end of the pothole 45 m away from pair 1. Male 1 performed head-pumping movements (bill tilted downwards) with his female and after 10 sec he flew back to pair 2. Male 1 chased female 2 for 24 sec, making short flights (3–5 m) and rushes across the water after her. Male 2 followed, but did not at first appear to defend his female. Then male 1 flew at male 2 and chased him for 16 sec; Circular Fighting was observed during this chase. Male 2 became separated from his mate. Male 1 flew to female 2, chased her vigorously, grasped her nape and mounted her for 5 sec. There was no precopulatory display. The female struggled free, flew to her mate, and the pair flew to another pothole nearby while male 1 returned to his mate.

Weekly censuses of a 1 mi<sup>2</sup> (2.6 km<sup>2</sup>) study area close to the interactions described in cases (7) and (8) during the breeding season revealed 0.20 males per pair. Of 40 clutches, 95% were initiated by 23 June, most between 26 May and 2 June.

Our observations show that rape in Blue-winged Teal is not as rare as previously believed (McKinney 1965) and that behavior involved in rape attempts differs from that described for other *Anas* species. In Pintail (Smith 1968), Green-winged Teal (*A. crecca*) (McKinney 1965, 1975), Mallard (Dzubin 1955, Lebreton 1961, McKinney 1965), and Gadwall (Gates 1958), rape may occur when the female alights after

long energetic pursuit flights involving many drakes. The Blue-winged Teal and Shoveler do not generally engage in these spectacular attempted rape flights and this may be related to defense of small, discrete territories and the strong residency patterns in these species (McKinney 1975, Seymour 1974).

The performance of courtship displays by unpaired males in observations 1 and 2 suggests that formation of a pair bond was their main objective. These unpaired males were observed to be mobile, moving from pair to pair in the same manner as described for unmated Gadwall drakes (Dwyer 1974). Rape by unpaired males has not been documented in any *Anas* species and, in the Blue-winged Teal, attempts would likely be thwarted by mate defense by the paired male. Attempts to mount the female (e.g. incident 4) appeared to be socially facilitated (Weidmann 1956) and perhaps unpaired drakes could be successful in instances where they greatly outnumber the paired male. However, our observations suggest that mounting attempts by unpaired males were always unsuccessful.

In the Blue-winged Teal, rape attempts by paired males may occur at any time during the breeding season and are not necessarily associated with weakening pair bonds as suggested by McKinney (1965). Rape chasing could benefit paired males in two ways: (1) stolen copulations may result in fertilization of some eggs (McKinney 1975), and (2) intruding pairs are removed from the territory.

Paired males defend their females by attacking those males which are attempting to mount the female, as has been documented in the Mallard (Weidmann 1956) and Gadwall (Dwyer 1974). In all cases, females tried to escape from harassing drakes through flight and/or diving and females never appeared to solicit copulation from harassing drakes.

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#### A Device for Measuring Egg Volumes

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McNicholl (1973, *Auk* 90: 915) pointed out the difficulties of obtaining data on bird egg volumes under field conditions. The various shapes of eggs, even of a given species, make it difficult to derive a formula that will give volume from simple measurements of length and breadth, even for all the eggs in a single clutch (Preston 1974, *Auk* 91: 134). The simple direct method of immersing the egg in a graduated cylinder