Short Communications

Wilson Bull., 110(2), 1998, pp. 282–285

Discovery of a Harlequin Duck Nest in Eastern North America

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ABSTRACT.—Harlequin Ducks (*Histrionicus histrionicus*) were observed breeding on a tributary of the northwestern arm of Hebron Fiord, Labrador. Peak population numbers were 11 males and 13 females on 17 June; females consistently outnumbered males. Breeding was confirmed by the presence of a nest with eggs and the presence of downy chicks. *Received 10 Feb. 1997, accepted 22 Jan. 1998.*

Harlequin Ducks (*Histrionicus histrionicus*) have a disjunct, Holarctic distribution with distinct populations in northwestern North America and Asia, Iceland, Greenland, and eastern North America (Palmer 1976, Montevecchi et al. 1995). They are unique among northern hemispheric waterfowl in nesting primarily on swift-flowing streams located in undisturbed forested, montane, and tundra habitats at coastal and inland locations (Bengtson 1972, Dzinbal 1982, Cassirer and Groves 1991). In Iceland, most nests were within 5 m of the water on islands and riverbanks. Nesting occurred on the ground under dense willow (*Salix* spp.) shrub, and less frequently in rocky cavities and short vegetation and grasses (Bengtson 1972). The few known nest sites in North America have been on the ground, on woody debris, on cliff ledges, and in rock and tree cavities near stream banks or, in one case, on a small maritime island (Merriam 1883, Campbell et al. 1990, Cassirer et al. 1993).

In eastern North America, Harlequin Ducks may have declined to less than 1000 individuals (Vickery 1988, Goudie 1989) and have been listed as endangered by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC; Goudie 1991). We report here on the discovery of the first confirmed nest in Labrador (see Todd 1963). Nests have also been found for the first time in Québec (Robert 1996; S. Brodeur, pers. comm.). We also present information on brood amalgamation and breeding phenology, which, in addition to the nest-site description, will aid future research.

STUDY SITE AND METHODS

We conducted this study from 8 June to 14 August 1996 on "Harlequin Brook" (58° 09′ 40″ N, 63° 04′ 45″ W), a tributary of the Ikarut River in the northwestern arm of Hebron Fiord, Labrador. The brook extends 12 km from the estuary to a lake outlet at 200 m elevation. Canyons at 4–6 and 9.5–11 km above the estuary separate it into three distinct sections. Coastal tundra habitat in Hebron Fiord of rolling moorland rising to 400–700 m elevation with dense, shrub-covered sections along streams is similar to montane habitat in Iceland (Bengtson 1972).

The fiord was ice-bound and ice and snow covered river banks and islands in early June. By mid-June, much ice and snow was breaking off river banks and islands, but high spring water levels flooded much of the islands through the third week in June. Ice was retreating from the heads of the fiord by mid-June and the fiord was clear of ice on 27 June.

We kept regular records of Harlequin Ducks in the lower 2 km of the brook and explored the upper reaches every 2–3 weeks. Data presented here summarize maximum numbers of males and females counted per day. A total of 48 person-h were spent searching for nests. We focused our search efforts within 5 m of the stream on shrub covered banks and islands.

RESULTS

Maximum numbers of Harlequin Ducks counted on the entire brook were 11 males and 13 females on 17 June. Females generally outnumbered males throughout the period males were present. Pairs were more dispersed along upper than lower portions of the brook during the pre-laying period. Common sightings in the lower 2 km of the brook were of

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small groups on or in the vicinity of a well-used roosting site on a small gravel bar in smooth water 1.7 km from the estuary (e.g., 7M, 7F on 8 June; 8M, 10F on 11 June; 6M, 10F on 17 June; 5M, 7F on 30 June). A maximum of 3 males and 4 females (in groups of 2 pair, 1 pair, and 1 female), and 1 pair were counted above the first and second canyons, respectively, on 21 June. Similar numbers of males were present throughout June, after which one was seen on 4 July, and the last was seen on 12 July. Throughout July, 3–7 females that we concluded were failed breeders or non-breeders frequented roost sites and feeding areas at all times of day.

A down-lined, 28 cm diameter nest containing 6 eggs was discovered on 21 July on a 12 × 45 m island densely covered with overhanging willow and alder (*Alnus crispa*) shrubs. The incubating female did not flush from the nest until we approached to within 2 m. The nest was situated among some small stones and a mound of dry leaf litter at the base of a clumped-stem, 2.3 m high alder. It was 0.5 m above water level in the middle of the tapered, upstream, northern end of the island, 4.4, 5.1, and 4.6 m from the north, east and west edges, respectively. Shrub canopy within a 5 m radius around the nest was 85% complete and 2.2 m high, and included 5 willow and 19 alder shrubs with an average of 16 (range 7–33) and 13 (range 2–32) stems per shrub, respectively. There was little understory vegetation adjacent to the nest, and ground cover within a 5 m radius was 10% moss, 30% herbaceous vegetation, and 60% bare ground and leaf litter. Shrubs overhung the brook by 0–0.6 m. Channels east (to the edge of the brook) and west (to an adjacent island) of the island were 20 and 4.1 m wide, 0.5–1.0 and less than 0.5 m deep, with some riffles, and flow rates of 1.25 and 1.11 m/s over boulder substrates, respectively. The island was one of about 20 similarly vegetated islands in a braided section of the brook with an overall width of 80 m (including islands) located 2.5 km from the estuary. All islands and adjacent stream banks in this area were searched for nests.

Eggs had been hatched for a few days when we revisited the nest on 2 August. Down and feathers from the edge of the nest had been carefully folded into the center completely covering the six hatched eggshells.

First broods of five and six ducklings were seen on 29 July on a nearby stream (58° 11′ 30″ N, 62° 47′ 20″ W), and broods of eight and six, three, and one ducklings were first seen on Harlequin Brook on 2, 3, and 4 August, respectively. All ducklings were small and downy (Ia-Ib) when first observed and estimated ages for those broods (Gollop and Marshall 1954) indicated hatching dates in the last week of July. All broods were diligently guarded by single females, except the single duckling which was observed feeding as far as 100 m upstream from a "neglecting" female. The broods of six and one ducklings were found 4 km upstream from the other broods beyond an intervening stretch of canyon with many waterfalls and rapids. The lone duckling was not seen again but the female and brood of six were observed gradually working their way upstream between 2 and 5 August, after which we conducted no further observations. The broods of eight and three ducklings were first observed in the same section of the brook where the nest had been found and we assumed that one of them had hatched from that nest. We saw those broods further downstream on 4 August, and the brood of three was seen at 1.2 km upstream from the estuary on 5 August. On 10 August, we found only one brood of 10 ducklings with a single female in this area, which was undoubtedly an amalgamation of the two broods. They were seen again on 11 and 13 August working their way up and down the lower 2 km of brook, always with only a single female.

DISCUSSION

Timing of hatching in the last week of July is 2–4 weeks later than dates reported for Idaho (Cassirer and Groves 1991), Montana (Kuchel 1977), and Alaska (Dzinbal 1982), and is similar to median dates in Iceland (Bengtson 1972) and Wyoming (Wallen 1987). Differences may be due to spring conditions and altitudinal and latitudinal effects on timing of snow melt (Bengtson 1972, Wallen 1987, Cassirer and Groves 1991). Laying (assuming a 28 d incubation period; Bengtson 1972) apparently peaked just after snow melt and recession of flood waters near the end of June on Harlequin Brook.

A maximum of 11 males and 13 females were observed in 1996. Our observations of

greater numbers of females than males is contrary to the dominance of males reported in other studies (Bengtson 1966, 1972; Kuchel 1977; Inglis et al. 1989). Reasons for this difference are unknown and possible sources of differential mortality should be considered. Assuming that the number of males corresponds to the number of breeding pairs yields a density estimate of 0.92 pairs/km, slightly less than the mean of 1.3 pairs/km reported for streams in Iceland (Bengtson 1972). Regular observations of 3–7 non-breeding females during July suggest that only half of the females present bred in 1996. Aerial surveys in Labrador also indicate high incidence of non-breeding females (Goudie et al. 1994; see also Bengtson and Ulfstrand 1971).

The nest site and clutch size were similar to those described in Iceland (Bengtson 1972). Although our single nest find supports the merit of searching through dense shrub habitat, other possible nest sites, such as rock cavities and cliff ledges, should not be ignored.

Behavior of adults and broods differed in the upper and lower brook. In the lower brook, adults tended to gather at a communal loafing site or "club" (Bengtson 1966) below the nesting area, especially before egg-laying (see also Kuchel 1977). Pairs were dispersed along the upper brook at that time. The canyon may have presented a barrier to brood movement because ducklings hatched above the canyon tended to move upstream, while broods below the canyon worked their way up and down the lower 2–3 km of brook and made some use of the estuary for feeding.

Brood amalgamation is common in waterfowl when broods hatch synchronously and brood-rearing habitats overlap (Afton and Paulis 1992), as was the case in the lower section of Harlequin Brook. Brood amalgamation following abandonment of older ducklings, and groups of 2–3 females sharing mixed-age younger broods with no indications of one female "robbing" ducklings from another have been reported in Iceland (Bengtson 1966, 1972). Only one female accompanied the amalgamated brood of 10 downy ducklings over the three days that we observed them. We did not observe her interacting with other females in the area. One female appeared to have abandoned her brood. We suspected partial amalgamation had occurred when we first observed the broods of three and eight ducklings because one brood probably came from the nest we located with six eggs; hatching success is normally high (Bengtson 1972).

Implications for survey times in northern Labrador indicate that pair counts are probably best carried out in mid-June before egg-laying and the departure of males at the end of June. Brood counts should be conducted in early August.

ACKNOWLEDGMENTS

This study was funded by Canadian Wildlife Service, Endangered Species Recovery Fund of the World Wildlife Fund, and a Northern Studies Training Grant awarded to WAM. Scott Gilliland and Bruce Turner helped with designing and organizing the study. We thank Jacko Merkuratsuk for assistance in establishing the field camp.

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Wilson Bull., 110(2), 1998, pp. 285–288

Maturation and Variation of Head Characteristics in Sandhill Cranes

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ABSTRACT.—We evaluated eye color, bill color, and head plumage characteristics in 836 known-age Sandhill Cranes (*Grus canadensis*) captured in Florida between 1974 and 1995. Eighty-three birds were recaptured 1–16 years later. There were noticeable variations in eye color and head plumage among individuals and between birds 20 months or less of age and those 21 months and older. These variations may be representative of the relatively high genetic diversity in Sandhill Cranes and be criteria for mate selection. *Received 10 August 1997, accepted 29 Oct. 1997.*

Birds that exhibit delayed onset of reproduction may go through a series of plumage changes before attaining their characteristic adult appearance. Sandhill Cranes (*Grus canadensis*) are sexually mature at two to three years, but gross plumage characteristics distinguish juveniles from adults only in their first year (Tacha et al. 1992). Adults are pale mouse gray to ashy slate gray with a gull gray to white cheek, an unfeathered crown of begonia rose, and a pallid to mouse gray nape (Ridgway and Friedmann 1941) that may be darker in some populations. The mikado brown natal plumage is gradually replaced with pale mouse gray plumage through fall and winter of the first year (Tacha and Vohs 1984, Tacha et al. 1992). Iris color at hatching is dark raw umber, changing during the first year to orange (Tacha et al. 1992). The flesh-colored bill of hatchlings changes to a dark drab gray, fading to olive gray in the mid-mandibular area in adults (Tacha et al. 1992).

After January of their first year, juveniles cannot be easily distinguished at a distance from older birds (Lewis 1979). In hand, how-

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