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Harlequin Ducks in Nunavut

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Abstract.—The distribution and abundance of the Harlequin Duck (*Histrionicus histrionicus*) is poorly known in Arctic Canada. The limited historical information on this species is summarized, and new field surveys and interviews with Inuit hunters in 1998-2002 were also conducted. Recent data confirmed that Harlequins still occur on Baffin Island and are breeding. The majority of new data on this duck come from the Kimmirut area of southeastern Baffin Island, where surveys in the 1930s also found the species. However, it occurs as far west as Cape Dorset, and as far north as Clyde River. Few birds were observed during recent field surveys, suggesting that the population on Baffin Island is small and dispersed. Future monitoring of Harlequin Ducks in Nunavut will probably be best accomplished using community-based surveys by hunters.

Key words.—abundance, distribution, Harlequin Duck, *Histrionicus histrionicus*, Nunavut, status.

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The eastern Harlequin Duck (*Histrionicus histrionicus*) is a small sea duck that frequents flowing streams and rivers during the breeding season, and overwinters along coastal rocky shorelines (Robertson and Goudie 1999). The breeding range of this species in eastern Canada, and particularly in the eastern Arctic is not well known, in large part attributable to the remoteness of many of these regions, and the associated expense of conducting surveys. Information from the 1930s indicated that this species previously bred on Baffin Island (Soper 1946). However, the occurrence of Harlequin Ducks on Baffin Island had not been confirmed since that time, and with declines in the eastern population, there was some question whether this breeding population was still extant (Robertson and Goudie 1999).

Although standard survey approaches are often cost-prohibitive in the Arctic, Inuit hunters travel long distances along coastlines and are astute observers of their environment (Nakashima and Murray 1988). The knowledge passed on through generations of hunters has many terms, but we refer to it as local ecological knowledge (LEK), or Inuit Qaujimajituqangit. The application of LEK to resource management is increasing internationally (Johannes 1989). It has proven to be a useful source of information to complement "western scientific" approaches to resource management (Berkes *et al.* 2000), and is an integral part of wildlife management in Arctic Canada (Duerden and Kuhn 1998).

To ascertain the status of Harlequin Ducks in Nunavut, two types of surveys in the southern Baffin Island region were undertaken. First, local ecological knowledge was gathered from interviews with hunters and elders in five communities in southern Baffin Island, as well as opportunistic observations from colleagues in the field. Second, boat-based surveys of coastlines known to previously support Harlequin Ducks were conducted. The results of these surveys, gaps in our knowledge of Harlequin Ducks in Nunavut, and recommended future approaches to monitoring are presented.

METHODS

Many LEK interviews took place informally while CWS staff was in the communities or in the field with Inuit hunters. However, structured interviews were carried out in Cape Dorset, Kimmirut, Iqaluit and Pangnirtung in 2000. These interviews of twelve hunters were conducted one-on-one with hunters (not group format) and covered a variety of species at risk (described in Mallory *et al.* 2001). For this paper, information on Harlequin Ducks, known to Inuit as "*turngaviaq*" or "*ivigaq*" was presented. Locations identified in the LEK interviews were targeted for survey work in 2001. Following the LEK interviews posters were placed in local wildlife offices in each community in southern Baffin Island.

These posters prompted those interested to submit reports of observations of Harlequin Ducks in 2004.

Field surveys for Harlequin Ducks were linked to surveys of Common Eider (*Somateria mollissima borealis*) colonies, and were carried out in various parts of the study area in July and August, 1998-2002 (Fontaine *et al.* 2001; Gilchrist unpubl. data; Fig. 1). Most searches were conducted from aluminum boats with crews of three or more people, and efforts were focused on islands and stream outfalls along coastlines of southern Baffin Island and northern Frobisher Bay (described in Fontaine *et al.* 2001). Note that surveys along the Foxe Peninsula and western parts of Frobisher Bay were focused more on islands, but are included here. Collectively more than 2,000 km of coastline were surveyed. A few stream surveys were also conducted on foot near Iqaluit and Kimmirut (Mallory *et al.* 2004), and unpublished information was collected from CWS biologists who conducted aerial surveys of streams on the Foxe and Meta Incognita Peninsulas during other studies.

DISTRIBUTION AND ABUNDANCE

Breeding

The breeding population size of Harlequin Ducks in Nunavut is unknown. There is abundant, apparently suitable habitat along the coastlines of southern and southeastern Baffin Island, most of which has never been surveyed and is sporadically visited by Inuit. LEK suggested that this species was uncommon near all communities, although clearly more people in Kimmirut know of this species than do people in any other southern Baffin location (Mallory *et al.* 2001). During five field seasons of surveys (Fig. 1), only three Harlequin Ducks were observed, all near Iqaluit but including both sexes. One dead bird was brought to the LEK interviews, and two females and a male were observed near Kimmirut the day after CWS field surveys were completed (Mallory *et al.* 2004). In 2004, a fisheries research team at Ogac Lake (62°52'N, 67°20'W) observed a female Harlequin Duck and brood, consistent with previously unreported observations of young Harlequin Ducks on that lake from 1965 (Ian McLaren, Dalhousie University, unpubl. data). Also in 2004, another biologist observed a female with a brood northwest of Ward Inlet (63°30'N, 67°30'W). This confirmed that the species breeds on Baffin Island.

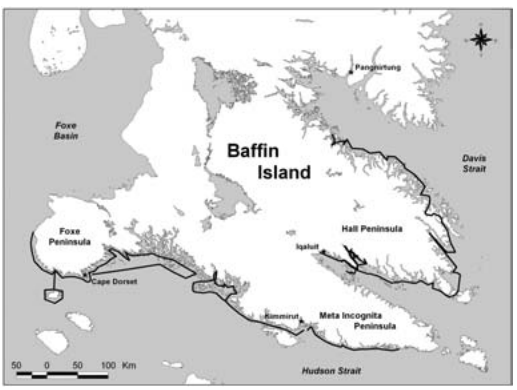

Figure 1. Boat survey routes for Harlequin Ducks in southern Baffin Island, 1998-2002.

The suspected breeding distribution of the Harlequin Duck in Nunavut (Godfrey 1986) was based principally on Soper's (1946) information from his surveys in 1928-1931. He reported that this species was known from Cumberland Sound, but that he found it nowhere in the southwestern part of Baffin Island (Foxe Peninsula). However, he recorded at least 24 individuals, males and females, including a hen with an ovary in egg development, from the Kimmirut area of the Meta Incognita Peninsula of southeastern Baffin Island, including Pleasant Inlet, McKellar Bay, and Soper Lake. LEK he gathered at this time suggested that the birds inhabited areas from White Strait to Gabriel Strait, as well as in Frobisher Bay. No additional data were reported during the infrequent wildlife surveys in this area since Soper's work (e.g., Macpherson and MacLaren 1959; Gaston and Cooch 1986; S. Wendt unpubl. data; S. Gilliland unpubl. data). However, recent LEK information as well as reports from government biologists suggested that this species occurs further west and further north than previously known (Fig. 2; Mallory *et al.* 2004). Birds have been reported near Cape Dorset, in central Markham Bay (near the former Amadjuak settlement), near Cape Dyer, and at Clyde River.

Molting

Molting locations for Harlequin Ducks breeding in Nunavut are unknown. LEK interviews reported evidence of females with broods (Mallory *et al.* 2001), but not of sites with flightless adults, so molting sites may be distant from communities. In 18 July 2004,

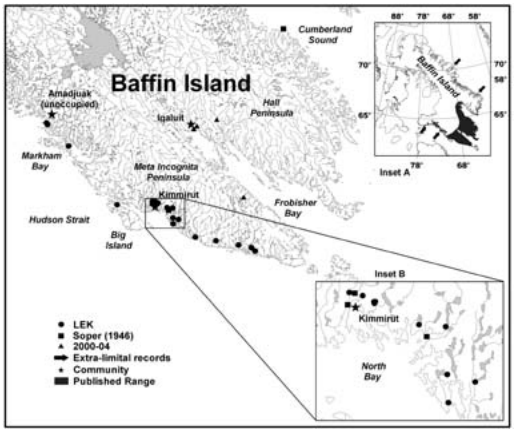

Figure 2. Current known range of the Harlequin Duck in Nunavut. Shaded areas (Inset A) represent published range of the species, with extralimital observations noted. Observations of breeding pairs or broods are noted by solid triangles, and data from local ecological knowledge interviews are denoted with solid circles or squares (from Mallory *et al.* 2004). Inset B identifies the region around Kimmirut, the community nearest to most reports of Harlequin Ducks.

two biologists visiting eider colonies by boat observed an estimated 80 Harlequin Ducks 19 km east of Cape Dorset. The flock included both sexes and all individuals were capable of flight, so this may have been a pre-molting aggregation. The observations of single birds near Cape Dyer and Clyde River may also indicate molting sites (Fig. 2). No mention of molting birds is made in the earlier account (Soper 1946). Recent satellite telemetry work does not show any Harlequin Ducks molting in Nunavut (Robert *et al.* 2008). Enhanced surveys or telemetry studies will be required to determine if or where Harlequin Ducks molt in Nunavut.

Wintering

No Harlequin Ducks are known to overwinter in Nunavut. Birds breeding in Nunavut probably migrate to Greenland to winter (Brodeur *et al.* 2002), as do Common Eiders that breed in the same area (Mosbech *et al.* 2006).

POPULATION TRENDS

There are insufficient survey data on birds in Nunavut to assess population trends. Birds breed in remote areas, are well dispersed, and are observed by Inuit when hunters are after seals or eiders. Hence, Inuit hunters indicated that this species is too uncommon for them to be able to assess trends reliably (Mallory *et al.* 2001).

KNOWN THREATS

Subsistence harvest by Inuit in Nunavut is insignificant and does not appear to be a threat to the local Harlequin Duck breeding population (Priest and Usher 2004). Birds are taken only incidentally when hunters are after other, preferred prey. Increased levels of shipping (supply and cruise ships; Hall and Johnston 1995), and the concomitant increase in the chance of fuel spills or pollution discharge are a concern for any marine birds breeding along coastlines of southern Baffin Island (Mallory and Fontaine 2004). Similarly, the potential for hydrocarbon exploration in Davis Strait presents a real possibility of oil spills that could deleteriously affect coastal species (Mallory and Fontaine 2004).

KNOWLEDGE GAPS

Little is known about Harlequin Ducks in Nunavut. Information on their distribution comes from non-systematic surveys, and thus limits on the breeding range cannot be confidently placed. All other aspects of their annual cycle or population parameters (population size and trend, movements, reproductive success, molt, migration, wintering grounds) have not been studied.

CONCLUSIONS

Both Inuit community knowledge and ground-based surveys confirm that the Harlequin Duck still occurs on Baffin Island, and in fact LEK information suggests that it breeds here. Information derived for LEK suggests that spring (pre-laying) or autumn are the best time to observe Harlequin Ducks in Nunavut, when birds have moved to the coast before or after their time on streams in breeding areas. Total numbers of

birds on Baffin Island are unknown, and with so few data we cannot even estimate breeding population size or trend in Nunavut. Only three Harlequin Ducks were observed in five years of surveys covering 2,000 km through apparently suitable habitat (Mallory *et al.* 2004). No Harlequin Ducks were observed during boat surveys designed specifically for this species near Kimmirut at a time of year when LEK suggested the birds should be visible. Thus, the population on Baffin Island is probably small and dispersed.

Brodeur *et al.* (2002) have recently identified previously unknown migration pathways, and many birds that breed in Québec or Labrador pass close to Baffin Island on their way to molt or winter in Greenland. We consider it likely that birds breeding in Nunavut overwinter in Greenland, and it will likely be studies at the wintering grounds that will help determine population size and trends in Nunavut. Future monitoring in Nunavut is probably best accomplished through community-based surveys by hunters, as aerial surveys are cost-prohibitive, and boat surveys are highly dependent on ice conditions that are very unpredictable between years.

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