Mitochondrial DNA

http://informahealthcare.com/mdn
ISSN: 1940-1736 (print), 1940-1744 (electronic)

Mitochondrial DNA, Early Online: 1–4
 DOI: 10.3109/19401736.2014.989499

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healthcare

SHORT COMMUNICATION

Conservation genetics of high-arctic Gull species at risk: II. Diversity in the mtDNA control region of Threatened Ross's Gull (*Rhodostethia rosea*)

Stephanie Royston and Steven M. Carr

Genetics, Evolution and Molecular Systematics Laboratory, Department of Biology, Memorial University of Newfoundland, St John's, NL, Canada

Abstract

Ross's Gull (*Rhodostethia rosea*) is the rarest of Canadian high-arctic gulls, and is listed as Threatened under Canada's Species-At-Risk Act. The large majority of birds breed in Siberia: the origins and affinities of four extremely small breeding colonies observed since 1978 in the Canadian high arctic are unknown. We compared a 515-bp region of the mtDNA Control Region amplified from material in museum collections taken from non-breeding birds in Canada ($n = 8$) and Alaska ($n = 6$), the latter passage migrants from the Siberian populations. The Alaskan birds all have distinct haplotypes that differ by as many as six SNPs: Canadian birds taken in the vicinity of the breeding colonies show only two of these. We hypothesize the origins of the Canadian breeding colonies as recent founder events by small numbers of passage migrants from Siberia via Alaska. Ross's Gull maintains a very tenuous breeding presence in the Canadian high Arctic.

Keywords

Conservation genetics, COSEWIC, mtDNA, Ross's Gull, Threatened species

History

Received 7 August 2014
Revised 12 November 2014
Accepted 16 November 2014
Published online 26 December 2014

Introduction

Ross's Gull (*Rhodostethia rosea* (MacGillivray, 1842)) is the rarest species of gull breeding in North America, and in Canada is classified as Threatened by COSEWIC (Committee on the Status of Endangered Wildlife in Canada) due to its low population numbers and low productivity (Alvo et al., 1996). The species' holotype, a Canadian bird, was collected in June 1823 on the east coast of the Melville Peninsula in what is now Nunavut (Blomqvist & Elander, 1981). Breeding populations were first observed in 1978: only four Canadian breeding locations have been confirmed, at Churchill in Manitoba (Chartier & Cooke, 1980), and three locations in Nunavat, at the Cheyne Islands (MacDonald, 1978), Prince Charles Island (Bechet et al., 2000), and a small island east of Bathurst Island (Mallory et al., 2006) (Figure 1). It is possible that some sites remain undiscovered (Mallory et al., 2006). None of these locations includes more than five breeding pairs. Ross's Gull appears to have nested almost every year from 1980 to 1994 in Churchill and the Cheyne Islands; it is unknown if this involves return migrants (Alvo et al., 1996). Breeding success has historically been low, due to bad weather and predation by foxes, wolves, and other gulls (Densley, 1999). Disturbance of nest sites is an increasing problem, especially in Churchill (Alvo et al., 1996). The species is believed never to have existed in large numbers in Canada (Alvo et al., 1996; Buturlin, 1906), and for this reason was assessed by COSEWIC as a rare Threatened species rather than as a formerly more abundant Endangered one, as is the case with the more numerous but now Endangered high-arctic Ivory Gull (Royston & Carr, 2015).

The main distribution of Ross's Gull is in northeastern Siberia, between the Chukotka and Taymyr Peninsulas (Zubakin & Avdanin, 1983; Zubakin et al., 1990). Estimates place numbers as high as 50–100,000 individuals (Alvo et al., 1996), and a survey of northern Yakutia indicates that the species is more widespread than previously assumed (CAFF, 2004). The highly productive polar ice that borders the Barents and Greenland Seas serves as an important summer feeding and molting area for non-breeding birds (Meltofte et al., 1981). Ross's Gulls seem to be the most common bird in the Central Arctic Ocean north of 85° N (Hjort et al., 1997).

Ross's gulls in Siberia breed in late summer. They undertake an annual post-breeding migration, first from the Chukchi Sea to the vicinity of Point Barrow, Alaska, and then to the Beaufort Sea. Population aggregations in the near-shore zone of Chukchi and Beaufort Seas are thought to include as many as 20–40,000 birds. A major conservation concern is the potential for devastation of this aggregation by pollution from nearby oil drilling (Alvo et al., 1996). After freeze-up in October, there is a return movement to the Chukchi Sea (Degtyarev et al., 1987; Divoky et al., 1988).

The origin and affinities of the Canadian breeding colonies of Ross's Gulls are unknown. Extremely low breeding numbers in Canada, and the conservation threats faced by the breeding

Correspondence: Steven M. Carr, Genetics, Evolution and Molecular Systematics Laboratory, Department of Biology, Memorial University of Newfoundland, St John's, NL, Canada A1B 3X9. Tel: +1 709 864 4776. E-mail: scarr@mun.ca