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## Ross's Gulls in the Central Arctic Ocean

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**ABSTRACT.** The central Arctic Ocean is difficult to access. As a result, the bird fauna of the area, with its potential input from all around the circumpolar perimeter, is still only little known. The present paper contributes observations on the distribution of Ross's gull (*Rhodostethia rosea*) made during the Arctic Ocean 96 expedition from mid-July to mid-September 1996, from the Swedish icebreaker *Oden*. Ross's gull was the most common bird in the central parts of the Arctic Ocean, with a grand total of at least 131 individuals seen up to 87°30'N. Its absence further north was judged as due to an early freeze-up. A marked concentration was noted at the shelf-break north of Franz Josef Land in late July. Most Ross's gulls were observed as single birds or two together, but some small flocks were seen, the largest consisting of 10 birds. Most birds were adults, the proportion of immature (second-year) birds being no more than 10–15%.

**Key words:** Arctic Ocean, birds, Ross's gull, *Rhodostethia rosea*, Arctic Ocean 96 expedition

**RÉSUMÉ.** Vu qu'il est difficile d'accéder à la partie centrale de l'océan Arctique, la faune aviaire de la région ainsi que l'apport à celle-ci venant de tout le périmètre circumpolaire sont relativement peu connus. Cet article présente des observations sur la distribution de la mouette rosée (*Rhodostethia rosea*) faites de la mi-juillet à la mi-septembre 1996 dans le cadre de l'expédition Océan Arctique 96 réalisée par le brise-glace suédois *Oden*. La mouette rosée était l'oiseau le plus répandu dans les régions centrales de l'océan Arctique, avec un total global d'au moins 131 individus observés jusqu'à 87° 30' de latit. N. On a interprété son absence plus au nord comme étant la conséquence d'un engel précoce. On a remarqué une forte concentration à la rupture de pente au nord de l'archipel François-Joseph à la fin juillet. La plupart des mouettes rosées ont été observées en solitaires ou en paires, mais on a aussi vu quelques petites volées dont la plus importante comptait 10 oiseaux. La plupart des mouettes étaient des adultes, la proportion des oiseaux immatures (dans leur deuxième année) ne représentant pas plus de 10 à 15 p. cent.

**Mots clés:** océan Arctique, mouette rosée, *Rhodostethia rosea*, expédition Océan Arctique 96

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## INTRODUCTION

Ross's gull *Rhodostethia rosea*, a circumpolar species, breeds in Subarctic, Low Arctic, and High Arctic areas, although probably 95% or more of its breeding population is found in northeastern Siberia, between the Chukotka and Taymyr Peninsulas (Blomqvist and Elander, 1981; Hjort, 1982; Zubakin et al., 1990). A northeast-directed autumn passage of the gulls seen at Point Barrow, Alaska was earlier thought to indicate that they wintered in the Arctic Ocean (Murdoch, 1885; Fisher and Lockley, 1954); but this has since been disproven (Divoky et al., 1988), as it was shown that after only a few weeks, in connection with the freeze-up, the gulls return westward and proceed south via Bering Strait to winter quarters in the Bering Sea and the Sea of Okhotsk (Degtyarev et al., 1987; Zubakin et al., 1990).

However, during the summer nonbreeding Ross's gulls utilize the vast drift-ice areas north of the archipelagoes fringing the Arctic Ocean. Their presence was first noted by Parry (1828) during his attempt to reach the North Pole in

1827. It was confirmed by Nansen's drift expedition with the *Fram* in 1893–96 (Collett and Nansen, 1900), by the *Jeannette* expedition in 1879–81 (e.g., Newcomb, 1882), and by Andrée and his co-expeditionists in 1897 (Lönnberg, 1931).

Much later, in the summer of 1980, the Swedish icebreaker *Ymer* made a thorough survey of the ice-covered areas between Franz Josef Land, Svalbard, and Greenland, and north of that area to c. 82°30'N (Meltote et al., 1981). At that time well over a thousand nonbreeding Ross's gulls were observed; they were found to move into this region from the southeast in July and leave it again in September. The movement of nonbreeders into these summer foraging areas in the northern drift-ice seems to start from the Siberian breeding region around the end of June (Degtyarev et al., 1987; Zubakin et al., 1990; Hjort et al., 1995).

As to the more central parts of the Arctic Ocean, Uspenskii (1984), summarizing earlier observations including many from Russian drift-ice stations, concluded that Ross's gulls appear up to at least 85°N from late June to late August. Recently Vuilleumier (1996), on a cruise with a Russian

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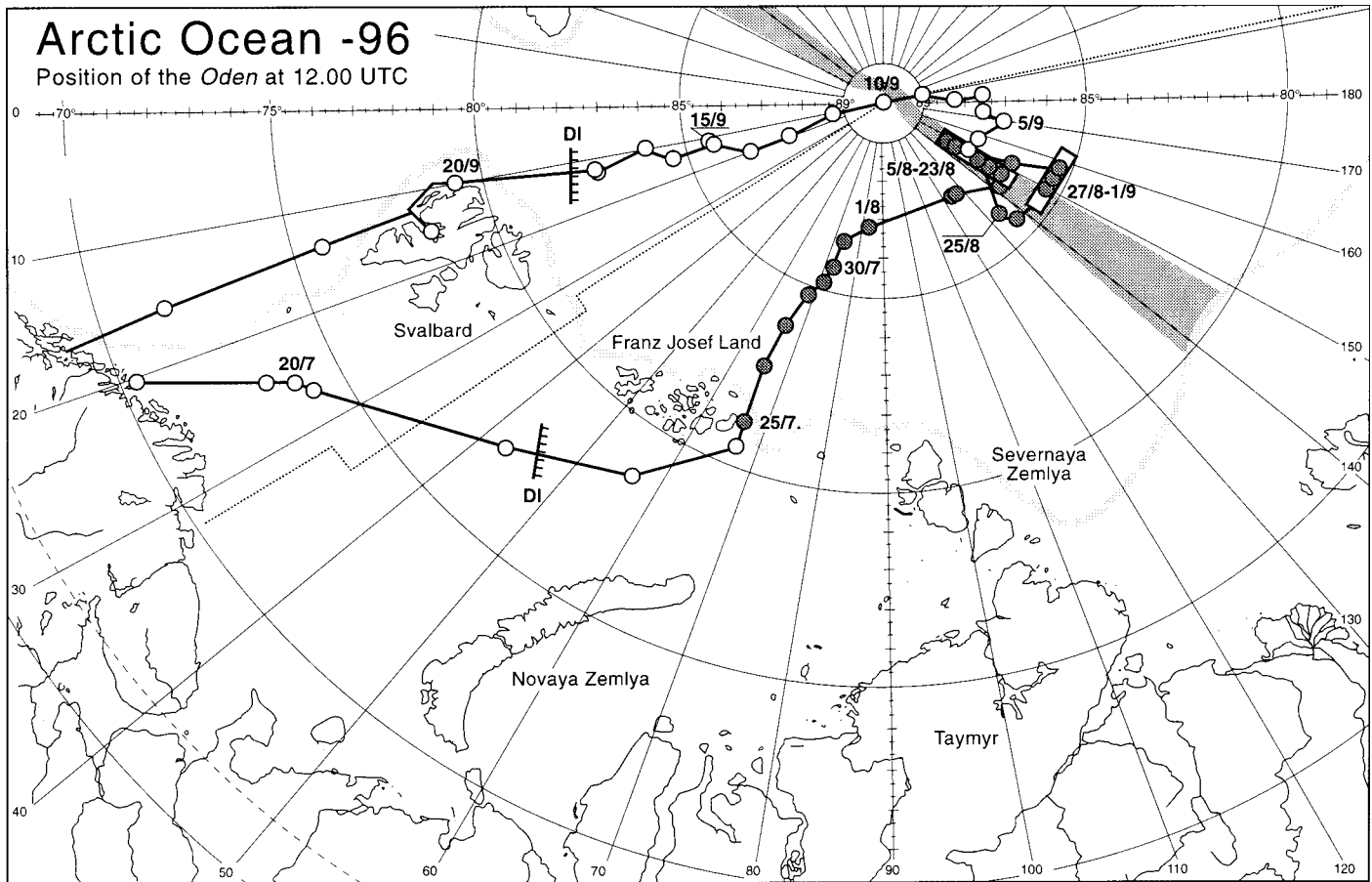


FIG. 1. The route of the icebreaker *Oden* during the Arctic Ocean 96 expedition. Mid-day positions (UTC time) are shown by circles, and the dark shaded circles indicate days with Ross's gull observations. The shelf edge is delimited by a shadowed line. The entry into the drift ice on 19 September and the return into open water on 20 September are indicated by short hatched lines marked DI. The shaded area across the central Arctic Ocean shows the Lomonosov Ridge, and the two "boxes" delimit areas where the ship remained for extended periods.

icebreaker in July 1994, extended the summer range of Ross's gull to the North Pole (but Parmelee and Parmelee [1994], on a similar cruise in 1993, noted no Ross's gulls at all).

#### THE ARCTIC OCEAN 96 EXPEDITION

The Arctic Ocean 96 expedition was a joint multipurpose venture by the Swedish icebreaker *Oden* and its German counterpart *Polarstern*, which took place between mid-July and mid-September 1996. Ornithological observations were carried out from the *Oden*; the ship's route is shown in Fig. 1. The *Oden* spent almost two months in the central Arctic Ocean, entering it east of Franz Josef Land around 25 July and leaving it west of Svalbard around 20 September. During about 80% of that time, the ship worked north of 85°N. The North Pole itself was passed on 10 September.

#### METHODS

Although conventional, visual ornithological observations were not part of the formal research program on board, such observations could still be carried out for a total of several hours each day by the three authors, with input from other

researchers and some members of the crew. The observations were made from various decks, and sometimes even from the ice, though mostly from the bridge, c. 30 m above sea level.

The general scarcity of birds made it inappropriate to use formalized survey techniques, so all birds seen, in any direction and at any distance, were noted. Fewer than five birds per day, all species included, was often the rule, and some totally bird-free days were also experienced.

Unlike northern fulmars (*Fulmarus glacialis*), which are very visible and often make sweeps around the bridge, Ross's gulls are much less conspicuous and don't follow ships. We spotted them mostly by carefully scanning the ice and open leads with binoculars, or when they were flushed out by the approaching ship.

Our data thus present a qualitative, rather than a quantitative, picture of the occurrence of Ross's gulls in the areas visited by the expedition. However, some quantitative patterns are evident and will be briefly discussed.

#### GEOGRAPHICAL DISTRIBUTION

Figure 1 shows the route of the *Oden*, its positions at mid-day (UTC time), and the days when Ross's gulls were

TABLE 1. Observations of Ross's gulls during the Arctic Ocean 96 expedition. The ship entered the drift-ice southeast of Franz Josef Land on 22 July and left it northwest of Svalbard on 19 September. Between 5 and 9, 11 and 19, and 29 and 31 August, and from 3 September onward, no Ross's gulls were seen. The freeze-up proceeded rapidly from c. 25 August.

Date	Position at 12.00 UTC	Total	Seen as	Comments
25.7	81°27'N 66°30'E	2	2	2 adults
26.7	82°43'N 65°41'E	40-50	groups of 4-5	10-15% 2nd yr
27.7	83°46'N 66°07'E	1		adult
28.7	84°41'N 68°51'E	1		
29.7	85°07'N 70°32'E	2	1 + 1	
30.7	85°34'N 72°17'E	8	1 + 2 + 2 + 1 + 1 + 1	1 2nd yr
31.7	86°20'N 74°37'E	1		
1.8	86°44'N 82°60'E	3	2 + 1	1 (+) adults
2.8	87°03'N 124°46'E	20	1 + 2 + 10 + 1 + 6	15 (+) adults, 1 (+) 2nd yr
3.8	87°05'N 129°30'E	6	6	
4.8	86°24'N 140°45'E	6	3 + 1 + 1 + 1	
10.8	87°33'N 145°36'E	1		
20.8	87°08'N 145°57'E	2		2 adults
21.8	87°11'N 144°57'E	4	1 + 3	4 adults
22.8	87°08'N 144°34'E	1		adult
23.8	87°11'N 144°35'E	1		
24.8	86°29'N 130°16'E	7	3 + 4	1 2nd yr
25.8	86°30'N 130°00'E	7		
26.8	86°05'N 135°50'E	3		
27.8	85°27'N 141°41'E	4	1 + 2 + 1	2 (+) adults
28.8	85°24'N 145°06'E	1		
1.9	85°39'N 160°31'E	1		
2.9	86°57'N 152°54'E	9	2 + 1 + 2 + 2 + 1 + 1	
<b>Total</b>		<b>&gt; 131</b>		

observed. At least 131 individuals were observed (Table 1).

Although the first loose drift-ice was encountered on 22 July, no Ross's gulls were seen until 25 July, when we left the polynya east of Franz Josef Land and entered heavy, partly multiyear ice. A marked concentration (40–50 birds) was encountered on 26 July, on the bathymetric corner between the shelf-break and the St. Anna Trough. This is the same area where Nansen and Johansen, on their way south towards Franz Josef Land after leaving the *Fram*, found the gulls to be common and locally numerous in July and August 1895 (Collett and Nansen, 1900). Tomkovich (1984), in his paper on the birds of Graham Bell Island (the easternmost island in Franz Josef Land), also noted Ross's gulls in the same area.

Along the route northwards to the Lomonosov Ridge, with ice cover normally at or exceeding 9/10 but with sizeable systems of open leads, Ross's gulls were seen continually, in numbers varying from 1 to 20 per day (Table 1). Usually single birds or two together were observed, but sometimes small flocks were seen. The largest, seen on 2 August, contained 10 birds.

For a long period (from 5 to 19 August), when we were working on the Lomonosov Ridge between c. 86°30' and 87°30'N and between 142° and 146°E, only one Ross's gull was seen. But from 20 August onward, they appeared again. More birds (up to 9, on 2 September) were seen when we moved slightly southwards, making a west-east transect across the Lomonosov Ridge between 85° and 86°N.

After 2 September, no Ross's gulls were seen. Following that date, the ship went into the Makarov Basin east of the Lomonosov Ridge, crossed back over the ridge via the North Pole on 10 September, and then sailed south towards Svalbard. But by then—in fact, already from c. 25 August onward—daily mean temperatures had fallen to well below -5°C, with -10°C or lower at night, and new ice formation on the leads was so heavy and rapid that foraging must have become difficult for the gulls. As a result they probably left, and none were seen even in those areas north of Svalbard where in 1980 the *Ymer* expedition had noted a pronounced southeasterly migration up to 19 September (Meltofte et al., 1981). This early freeze-up in 1996 was the logical end of an unusually cold summer when, for example, almost no meltponds formed on the ice in the central Arctic Ocean.

#### AGE STRUCTURE

Of the 40–50 Ross's gulls seen off Franz Josef Land on 26 July, only 10–15% were immatures. This is similar to the 12% given by Meltofte et al. (1981). Relatively few birds were aged with certainty thereafter, and as summer moult proceeded, the second-year birds were increasingly difficult to differentiate. But their numbers farther north seemed to stay below 10%. The small number of second-year birds may simply mirror a generally low reproduction rate. According to Zubakin et al. (1990), the mean fledging success is only c. 25%.

#### FOOD

Studies of the seawater, carried out on board for the purpose of monitoring radioactive elements and pesticides, revealed very low biological activity (as measured by chlorophyll content) in the central Arctic Ocean. Only about 10% of what had been measured in the productive Barents Sea some weeks earlier was found over the Lomonosov Ridge (D. Josefson and H. Kylin, pers. comm. 1996). Although nutrients and phytoplankton may have already been depleted at this time of the season, and the energy transferred to zooplankton and upwards in the nutritional chain, it seemed that the basis for a rich bird life was generally lacking. Some potential did exist, as exemplified by the amphipod *Gammarus wilkitschki*, which was observed at several stations; however, what the Ross's gulls were actually feeding on, picking it off the water's surface, could not be ascertained. But both amphipods and small polar cod (*Boreogadus saida*) were likely prey.

A case of scavenging, a behaviour not common in this species (e.g., Hjort, 1982), was noted on 25 August. After a crayfish (*Astacus astacus*) party for scientists and crew on board, the empty shells were thrown overboard. No less than seven Ross's gulls gathered to utilize these spoils.

## CONCLUSIONS

The conclusion derived from earlier observations (e.g., Meltofte et al., 1981; Uspenskii, 1984; Vuilleumier, 1996) and from the present study, is that, in summer, nonbreeding Ross's gulls occur in the Arctic Ocean all the way to the North Pole, at least within the Atlantic-Eurasian sector. They begin entering this region at the end of June, become more common in July, and gradually leave again at freeze-up, from late August through September.

Our observations, which seem to cover the most extended period so far of dedicated studies north of 85°N, suggest that Ross's gull is the most common bird in the central Arctic Ocean. Although the numbers of northern fulmars, black-legged kittiwakes (*Rissa tridactyla*), ivory gulls (*Pagophila eburnea*), black guillemots (*Cephus grylle*), and thick-billed murre (*Uria lomvia*), which were also regularly observed, were not always recorded in the same consistent way as were Ross's gulls, it was clear that their numbers fell short of those for the latter species.

The high number of Ross's gulls at the shelf-break north of Franz Josef Land agrees with the suggestion by Hjort et al. (1995) that the shelf-break area, because the upwelling there has positive effects on food production, constitutes a main route for the nonbreeding Ross's gulls that move northwest from Siberia in July. They pass north of Severnaya Zemlya, Franz Josef Land, and Svalbard towards northeasternmost Greenland, where they may be quite common around the Northeast Water polynya in summer (e.g., Falk, 1996; Falk et al., 1997), and then fly back the same way in September (Meltofte et al., 1981; Zubakin et al., 1990).

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