

COURTSHIP FEEDING AND COPULATION BY HARTLAUB'S GULLS *LARUS HARTLAUBII* AND
PROBABLE HARTLAUB'S X GREYHEADED GULL *L. CIRROCEPHALUS* HYBRIDS

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Received 22 January 1988, accepted 9 January 1989

The Hartlaub's Gull *Larus hartlaubii* is a small, dark-eyed, "hooded" gull endemic to the southwestern coast of Africa where it breeds between Swakopmund (22 36S 14 31E) in Namibia and Strandfontein (34 06S 18 32E) in the southern Cape Province of South Africa (Maclean 1984). A small coastal population of the predominantly inland breeding and pale-eyed Greyheaded Gull *L. cirrocephalus* breeds sympatrically and in shared colonies with Hartlaub's Gulls (Zoutendyk & Feely 1953, Tinbergen & Broekhuysen 1954, Sinclair 1977, pers. obs.). At shared colonies inter-specific courtship behaviour and mating may occur between individuals of the two species (Zoutendyk & Feely 1953, Tinbergen & Broekhuysen 1954) and mixed pairs sometimes produce offspring (Sinclair 1977) so hybrids between these two gull species may occur. The only study of the breeding behaviour of Hartlaub's Gulls is that of Tinbergen & Broekhuysen (1954) which was carried out at a time when the study colony contained chicks and consequently courtship behaviour and copulation were seldom seen and not described.

This note describes the courtship feeding and copulation behaviour of Hartlaub's Gulls and the relationship during such behaviour of distinctly coloured individuals, presumed to be hybrid Hartlaub's x Greyheaded Gulls, with Hartlaub's Gulls. The observations were made at the Swakopmund Sewage Works (22 36S 14 31E) on 29 and 30 April 1986 between 13h00 and 14h00 local time on each day. On 29 April there were 227 Hartlaub's Gulls with dark eyes, seven Greyheaded Gulls with full grey hoods, and twelve hoodless

pale-eyed birds thought to be hybrids. The colony was on bare, open, relatively flat ground with short, protruding, old, brown stems of *Phragmites* reeds. Where frequency of behaviour patterns has been studied in gulls, courtship feeding and copulation have been shown to occur at maximum frequency in the two to three weeks immediately prior to egg-laying (e.g. Brown 1967, Niebuhr 1981, Tasker & Mills 1981). That courtship feeding and copulation are also frequent immediately prior to laying is suggested for Hartlaub's Gulls by the presence of two fresh "dumped" eggs in the study colony. The individuals watched could not be sexed with certainty. Sex was assumed on the basis of the general behavioural roles taken based on what is known of the behaviour in other species of gulls (Cramp & Simmons 1983). Birds which solicited food were considered females and those which fed them were considered males. In all cases where copulation followed courtship feeding the birds kept to the role of the assumed sex, i.e. those which fed mounted their partner and those which begged were mounted.

Courtship feeding

Presumed females assumed hunched postures with their necks retracted and heads held low and close to the body. They then approached their partner while repeatedly moving their bills up to an almost vertical position and then quickly down again in a flicking action. The flicking action became faster as the begging bird closed with, and began to touch the side or base of the bill of, the partner. Bill flicking was accompanied by a begging call which

sounded like "klew-klew" or alternately "crew-crew". In one case a presumed male responded to flicking by pecking at the female's bill. The female then raised her neck with the head and bill held slightly downward in what Tinbergen & Broekhuysen (1954, Fig. 7) describe as the Aggressive Upright posture. Most males responded to female begging either by moving away from the begging bird or by regurgitating a food bolus into their bill or onto the ground where it was then taken and eaten by the begging female. On one occasion the food bolus was stolen by a neighbouring bird while a territorial dispute in which they were involved distracted the courtship feeding pair.

Copulation

Courtship feeding was often followed by copulation. One presumed male regurgitated two small fish but swallowed them again before the female could take them. The female again begged and the male regurgitated and again swallowed the food. Then, as the female remained in the hunched posture, the male hopped onto her back and twice pecked down at her bill as she kept bill flicking. The presumed female then moved and the male fell off her without copulating. Presumed females which were actually fed were more receptive of presumed males. Males on their partners' backs flapped their wings for balance while the bill was held open as they gave the copulation call: a loud, rhythmic "kokoko". During copulation the females usually continued to raise their head as when begging. Presumed males raised the feathers on their crown into a slight crest as they bent forward to bring their bill against that of the female.

Copulation, whether fully achieved or not, was ended by the female walking off so that the male slipped off her or, in a few cases, by the female taking flight from under the male. If the pair remained close together after copulation both assumed an "erect-necked posture" in which the bill was turned away from the partner and down towards the side, the Aggressive Upright stance of other gulls (Cramp & Simmons 1983), or they

stood still. In three cases the male moved to a presumed nest-site and made a brief coughing action, presumed to be equivalent to "Choking" *sensu* Tinbergen (1953), and the female followed, begging.

Copulation by presumed hybrids

In fourteen copulations in which the eye colour of both participants could be recorded there were eight cases of dark-eyed male on dark-eyed female; six cases of pale-eyed male on dark-eyed female; and no cases of dark-eyed male on pale-eyed female. No copulations were seen in which a hooded Greyheaded Gull copulated with a dark-eyed Hartlaub's Gull. All plumage characters indicated that dark-eyed birds were pure-bred Hartlaub's Gulls. If the pale-eyed, hood-less birds were hybrids, then the copulation observations indicate that such hybrids are dominant over dark-eyed birds during courtship either because pale-eyed birds are males or, though less likely, because though female they dominate dark-eyed birds and this leads them to take a male role in copulation.

Discussion

The courtship feeding and copulatory behaviour reported here is similar to that of the Blackheaded Gull *L. ridibundus*, Redbilled Gull *L. novaehollandiae scopulinus*, Lesser Blackbacked Gull *L. fuscus*, Herring Gull *L. argentatus* and other gulls (Brown 1967, Niebuhr 1981, Tasker & Mills 1981, Cramp & Simmons 1983). The apparent close similarity in these behaviour patterns in the Laridae probably helps enable matings between birds of different gull species. Interbreeding of gulls has been reported in various species of gulls (e.g. Voous 1960, Tinbergen 1953, Gray 1958, Gurr 1967). Factors which restrict interbreeding must relate not to the gross behaviour but to "details" such as the presence or absence of a hood, the colour and shape of the hood, eye-ring and iris colouration, bill colour, and probably to the calls which accompany begging and copulation.

From a conservation point of view the apparently ready hybridization of Greyheaded and Hartlaub's Gulls is somewhat disturbing. Greyheaded Gulls breed widely at inland wetlands in tropical and subtropical Africa and in South America (Harrison 1983). As noted above, Hartlaub's Gulls are endemic to a restricted area of southwestern Africa. Within this restricted distribution the total breeding population is about 8 000 pairs (Cooper *et al.* 1984) which is very small compared with that of most gull species (A.J. Williams unpublished compilation). Furthermore, the subregional population of Hartlaub's Gulls in the Swakopmund district experiences very poor breeding success (Braine & Loutit 1987, K. Owen-Smith pers. comm., pers. obs.) and there is concern over the long-term future of this endemic in the subregion (Williams & Brown 1985).

Hybridization is most likely to occur in a situation where one of the two species is a "pioneer" population in which local numbers are small so that birds are denied mates in full breeding condition, with the result that they attempt to breed with the most similar available birds (Tinbergen 1953, Gur 1967).

The apparent dominance of Greyheaded Gulls over Hartlaub's Gulls supports Johnstone's (1982) suggestion that *L. hartlaubii* is derived from an initial population of *L. cirrocephalus* and that the current African race *L. c. poiocephalus* represents a recent re-invasion of Africa from South America. It is worth noting that in the first description of a mixed pair of Hartlaub's x Greyheaded Gulls the mating was also by a "male" Greyheaded Gull on a "female" Hartlaub's Gull (Zoutendyk & Feely 1953).

Much further work is now needed on the behaviour of Hartlaub's and Greyheaded Gulls and their presumed hybrids. Research should consider which plumage and softpart colourations and which calls control mating and, especially, should consider the sexual and dominance status of the presumed hybrids. Such work would provide information not

only of academic interest but which should also help conservation organizations with management decisions.

ACKNOWLEDGEMENTS

I thank officials of the Swakopmund Municipality for permission to drive into the sewage works complex and make observations using my vehicle as a hide and R.D. Wooller for constructive comments on a previous draft of this note.

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Note added in proof

On 4 and 5 March 1989 interactions between fully plumaged adult Greyheaded Gulls and Hartlaub's Gulls were observed at a breeding colony at Alexander Bay (28 38S, 16 27E). The colony, which was on an inaccessible island, contained about 700 pairs of Hartlaub's Gulls and between ten and twenty individual Greyheaded Gulls. Observations of two individual Greyheaded Gulls totalling four hours during two days indicated that Greyheaded Gulls each kept to a discrete part of the colony and did not try to group with other Greyheaded Gulls. Judged from the high rate of copulatory activity, indicated by copulatory wing flagging and copulation calls, most birds in the colony were in a late stage of pair formation. Both the watched

Greyheaded Gulls interacted sexually with Hartlaub's Gulls and in both cases the behaviour indicated that the Greyheaded Gulls were males. On both days a Hartlaub's Gull begged from one of the Greyheaded Gulls which regurgitated food for it on one occasion but avoided its begging on another occasion. The other Greyheaded Gull was seen to mount and copulate with a Hartlaub's Gull. In an additional 53 observed copulations in which both partners could be identified by species all were Hartlaub's Gulls.

These observations, and that of Zoutendyk & Feely (1953), suggest that Greyheaded Gulls which occur as pioneers in coastal localities are predominantly males and further suggest that female Hartlaub's Gulls may actually "prefer" male Greyheaded Gulls to males of their own species.