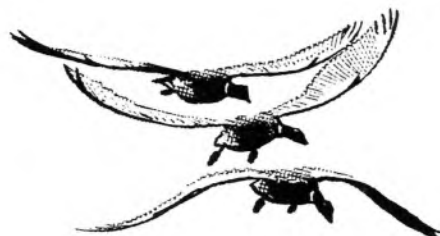


Gulls associating with flocks of Brent Geese *Branta bernicla* on farmland

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Black-headed Gulls (median n 15) and Common Gulls (3.5) associated with Brent Geese (median flock size 725) grazing winter wheat and grassland in winter and fed on invertebrates disturbed by the geese. The number of gulls was larger in bigger flocks of geese. On two days, more gulls were present in the late afternoon compared with the rest of the day. Most (77%) of the gulls fed while walking among the geese whilst others searched the ground during a slow flight over the flock; their diet on winter wheat was worms, beetles, fly larvae and spiders.

Dark-bellied Brent Geese *Branta b. bernicla* have been using farmland since the winter of 1973-74 (St Joseph 1979) grazing on winter wheat, grass and oil seed rape (Summers & Critchley 1990). Since the development of this new feeding habit, gulls have formed an association with the grazing flocks of geese. This study describes the numbers of gulls associated with flocks of geese, their behaviour and diet.

Methods

The study was carried out during Novem-

ber count per day was made mostly between 10.00 and 15.00 h during surveys of the Brent Goose population (Summers & Critchley 1990). On two days, 24 November 1986 and 2 December 1986, repeated counts of Brent Geese and gulls were made from dawn to dusk on the wheat fields. All changes in the numbers of geese were recorded but gulls were counted only every 20 minutes.

On 6 February 1987, the dietary items taken by gulls on fields of winter wheat was determined by observing gulls with a telescope, classified as "worms" or "unidentified". Gull droppings were collected on a field of winter wheat on 7 January

Table 1. The median (and quartiles) number of gulls with flocks of Brent Geese on fields of winter wheat and grass.

	Winter wheat		Grass	
	Median	(Quartiles)	Median	(Quartiles)
Brent Geese	550	223-2000	900	375-1900
Black-headed Gulls	19	3-49	13	4-23
Common Gulls	3	1-7	4	0-7

ber to March of 1986-87 and 1987-88 in north Norfolk on fields of winter wheat at Burnham Deepdale (UK grid ref. TF810447) and grass fields at Burnham Norton (TF830447) and Burnham Overy (TF855447). Brent Geese in flocks were counted, either individually if the flock sizes were less than c.200, or estimated in blocks of 50 if greater than c.200. Gull numbers and species were recorded whether on the ground or in flight. One

1987, and items identified under a dissecting microscope.

Results

The number of Brent Geese in the flocks ranged from 50 to 3200 (median 725, $n = 60$). The median numbers of Black-headed Gulls *Larus ridibundus* and Common Gulls *L. canus* were 15 (range 0-186) and 3.5

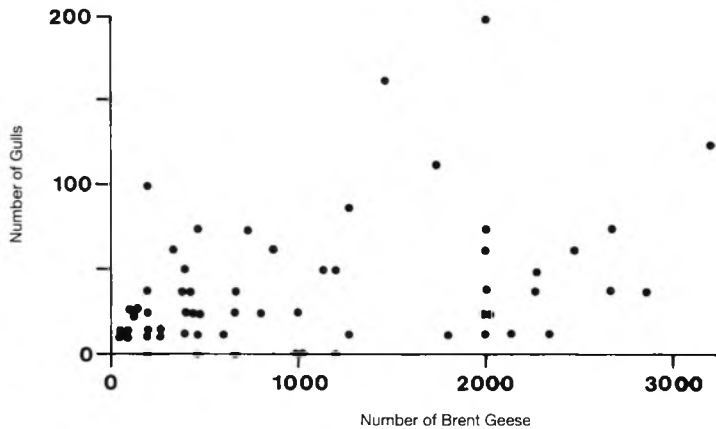


Figure 1. The relationship between the number of gulls and Brent Geese on farmland. Spearman correlation coefficient = 0.36, $P < 0.05$, $n = 60$.

(range 0-32) respectively. There was no significant difference in the numbers of geese and gulls on the two crop types (winter wheat and grass) (Mann Whitney U tests) (Table 1). The number of gulls was greater in larger flocks of geese (Fig. 1).

On two all-day watches of geese and gulls on fields of winter wheat the numbers of Brent Geese increased during the morning and remained stable during the afternoon (except when shot at) until all departed for the roost at dusk. In contrast, the numbers of gulls increased towards the end of the day. They departed shortly after the geese left (Fig. 2).

Feeding Brent Geese are highly aggregated at the front edge of the flock. Most walking gulls were concentrated behind this dense vanguard of geese. Towards

the rear of the flock the density of geese and gulls was less and feeding activity lower. Gulls also flew slowly over the flock at a height of 1-3 metres searching the ground. After making a slow flight across the top of the flock the gulls would turn and rapidly fly back to resume another search path dropping down to capture prey items. The percentage of gulls flying ranged from 0% to 54% (median 23%). For Black-headed Gulls it was 0% to 62% (median 22%) and for Common Gulls 0% to 50% (median 14%).

Thirty-five food items were observed being eaten and five identified as earthworms. The others were too small to be identified. Nine droppings were examined and fragments of fly larvae (Tipulidae and Chironomidae), beetles (Staphylinidae, Carabidae, Lathridiidae, Phalacridae and Helophoridae) and a

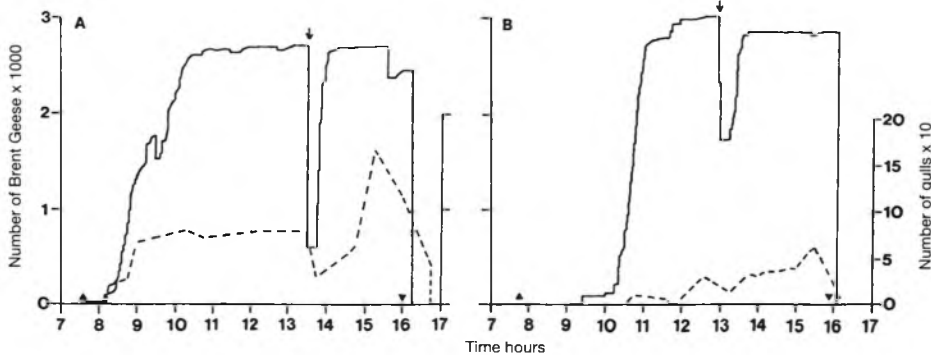


Figure 2. Diurnal changes in the total numbers of Brent Geese (—) and gulls (---) on wheat fields at Burnham Deepdale on 24 November (A) and 2 December 1986 (B). The times when geese were shot at are arrowed, and times of sunrise (▲) and sunset (▼) are shown.

spider found. Chaetae of earthworms were present in all droppings.

Discussion

Black-headed and Common Gulls follow the plough to feed on exposed worms. However, the association of gulls with geese on farmland is a recently acquired behaviour since Brent Geese started feeding on farmland only in the early 1970s (St Joseph 1979). It is not a habit that developed on their traditional inter tidal habitats since gulls do not associate with feeding flocks of Brent Geese on saltmarsh or *Enteromorpha* sp. beds (pers. obs.). Gulls

rarely associate with grey geese *Anser* spp. on farmland (pers. obs.), perhaps because these geese form less dense feeding flocks and so disturb fewer invertebrates.

The Brent Geese presumably disturb insects when walking and perhaps make the invertebrates more visible by removing some of the vegetation cover. Also, their treading may cause worms to rise to the surface (Sparks 1961).

The build up of numbers of gulls in late afternoon was based on only two days of observation and requires further attention. This may have been due to the arrival of gulls which had fed further inland and were *en route* to the coast where there is a large night-time roost.

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References

- St Joseph, A.K.M. 1979. The development of inland feeding by *Branta bernicla bernicla* in southeastern England. In: *Proceedings of the First Technical Meeting on Western Palearctic Migratory Bird Management* (Ed. M. Smart) pp. 132-139. IWRB, Slimbridge.
- Sparks, J.H. 1961. The relationship between foot-movements and feeding in shore birds. *British Birds* 54:337-340.
- Summers, R.W. & Critchley, C.N.R. 1990. Use of grassland and field selection by Brent Geese *Branta bernicla*. *Journal of Applied Ecology* 27:834-846.

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