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SHORT NOTE

Some seabird associations with dusky dolphins (*Lagenorhynchus obscurus*) at Kaikoura and with orca (*Orcinus orca*) at Nelson, New Zealand

D.J. HAWKE
J. DOBINSON
School of Science, Christchurch Polytechnic Institute of Technology, P.O. Box 22-095, Christchurch 8032

Seabird associations with whales and dolphins are well known (Evans 1982). In New Zealand, reported observations have focused on the endemic Hector's dolphin (Hawke 1994; Bräger 1998), with little information on other cetacean species. Here, we report results from a short series of observations of dusky dolphins (*Lagenorhynchus obscurus*) at Kaikoura, and a single opportunistic observation of orca (*Orcinus orca*) at Nelson.

The objective of the dusky dolphin observations was to compare associations with those reported in New Zealand for Hector's dolphins by Bräger (1998), and off Argentina for dusky dolphins by Würsig & Würsig (1979, 1980). The observation involving orca extends a brief comment in Visser (1999). It also adds to the overall picture of seabird – cetacean interactions, in that seabird associations with orca have rarely been documented (Evans 1982).

The data for dusky dolphins came from 8 observations made by DH between 18 December 1999 and 10 February 2000, 7 from Goose Bay lookout (42° 29.2'S, 173° 31.7'E; 70 m asl), 15 km south-west of Kaikoura Peninsula. The study area included a 130° arc starting from Pinnacle Rock, 6 km north of the Goose Bay lookout. The search procedure involved scanning the study area from Pinnacle Rock south using a 15 × 60 telescope, and working inshore. Waters close inshore were searched using 9 × 25 binoculars. A single observation was made from a boat in the same general area. All observations were in calm or light wind conditions.

When a dolphin group was observed, the dolphins and any associated seabirds were identified and counted. Seabirds were defined as being associated with dolphins if they closely followed the dolphin group, or interacted with other birds (such as skuas) associated with the dolphins. The group was observed until it left the study area. Changes in the seabird association were recorded continuously.

Associations with seabirds were observed on 5 of the 7 occasions when dusky dolphins were found. Seabird associations were observed for a total of 88 minutes (Table 1). In all associations the birds were feeding actively (except for the mollymawk described below). Although 6 species associated with dolphins at least once, white-fronted terns (*Sterna striata*) were always present.

Groups of 7–60 dusky dolphins were mostly in subgroups of 6–8 that occasionally merged and redispersed. Dusky dolphin behaviours included slow swimming at the surface (both directed movement and circling), jumping clear of the water, faster swimming with all or some of the group porpoising, and dives of varying duration. The only behaviour not linked with attendant seabirds was repeated and prolonged (1 min or more) diving, as on 18 January, when 2 associations (Table 1) were separated by 8 min of prolonged diving.

The most diverse association was on 26 December. At 0955, c. 30 dusky dolphins and a boat passed through a small group of shearwaters (probably Hutton's shearwaters *Puffinus huttoni* but possibly fluttering shearwaters *P. gavia*) sitting on the water. At 1000, the shearwaters were landing among the dolphins and by 1004 the association had grown to c. 40 shearwaters, 6 white-fronted terns, 2 *Procellaria* petrels (Westland petrels *P. westlandica* or white-chinned petrels *P. aequinoctialis*), and 1 white-capped mollymawk (*Diomedea cauta steadi*). All except the mollymawk appeared to be feeding. The mollymawk continually circled the periphery of the association, but did not alight. At 1010, a small skua (probably an Arctic skua *Stercorarius parasiticus*) was seen chasing a white-fronted tern. By 1021, when the

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Table 1 Percentage of observation time seabirds were associated with dusky dolphins near Kaikoura, and the maximum number of seabirds involved.

Date	% observation time	Max. no.
18 Dec 1999	0% (0/30 min)	Nil
21 Dec 1999[1]	17% (15/90 min)	6 white-fronted terns
24 Dec 1999	0% (0/11 min)	Nil
26 Dec 1999	75% (21/28 min)	c. 15 white-fronted terns, c. 15 Hutton's shearwaters, 2 *Procellaria* petrels, 1 white-capped mollymawk, 1 Arctic skua
12 Jan 2000	62% (18/29 min)	c. 15 white-fronted terns, c. 15 red-billed gulls
18 Jan 2000	30% (11/37 min)	(*a*) 2 white-fronted terns (2 min); (*b*) 4 white-fronted terns (9 min)
10 Feb 2000	100% (23/23 min)	c. 20 white-fronted terns, c. 5 Hutton's shearwaters, 2 Arctic skuas

[1] Shipboard observation

dolphins left the study area, the association consisted of c. 15 each of white-fronted terns and shearwaters.

Extensive single and mixed species aggregations of red-billed gulls (*Larus novaehollandiae*), white-fronted terns, and Hutton's shearwaters were common in the study area during December and early January, but the dolphins never associated with these aggregations. No dolphins were seen associating with seabird aggregations in other, casual observations. This contrasts with observations off Argentina where Würsig & Würsig (1979) concluded that feeding seabirds and dusky dolphins were mutually attracted so that spotting seabird aggregations was an efficient way of finding dusky dolphins.

Terns, gulls, shearwaters, petrels, albatrosses, cormorants, and skuas were observed in association with dusky dolphins off Argentina by Würsig & Würsig (1979). Gill *et al.* (2000) observed dolphins in company with short-tailed shearwaters (*Puffinus tenuirostris*) off Tasmania. With the exception of cormorants, the associations off Argentina and Tasmania contained the same groups of seabirds reported here. Although pied shags (*Phalacrocorax varius*) and spotted shags (*Stictocarbo punctatus*) were present at Kaikoura, no shags were seen with dusky dolphins. Although spotted shags have been reported associating with Hector's dolphins, this was only near operating trawlers (Hawke 1994; Bräger 1998).

The mean (standard error) of the proportion of time dusky dolphins had associated seabirds was 41% (15 %; n = 7), as against 6.7% for associations with Hector's dolphins from December – February at locations around the South Island (Bräger 1998). The 34 associations seen by Bräger (1998) always included white-fronted terns, although other species (especially Hutton's shearwaters) were present occasionally. The similarity between dusky dolphin and Hector's dolphin (Bräger 1998) association with white-fronted terns, and the relatively high rates of attendance by the terns suggests a common cause. Successful breeding of terns depends on weather and sea conditions (Dunn 1975). Bräger (1998) concluded that the energy intake of white-fronted terns that attend Hector's dolphins might be significantly enhanced, particularly during breeding when energy demands are high. Our results suggest that such a benefit could also accrue from association with dusky dolphins. Further, feeding opportunities provided by small or medium-sized dolphins *in general* may therefore contribute significantly to energy requirements of white-fronted terns.

JD observed seabirds associating with a group of 1 adult male, 1 probable adult female, and 2 smaller orca on 5 January 2000 within Nelson Haven (41° 16'S, 173° 16'E). The orca were observed for c. 40 min as they swam clockwise around Nelson Haven from near the harbour entrance. The orca swam slowly at the surface, making many dives lasting 10 – 15 s. They were accompanied continuously by c. 40 red-billed gulls, some flying and some alighting on the surface.

Visser (1999) reported orca benthic foraging for eagle rays (*Myliobatis tenuicaudatus*) and stingrays (*Dasyatis* sp.) in harbours or embayments in northern New Zealand, during which gulls often followed the orca to scavenge remains. The short dives of the orca seen by JD were consistent with demersal or benthic feeding in the shallow harbour (≤11 m at high tide), with the red-billed gulls scavenging prey fragments or debris stirred up by the orca. Stingrays are common in Nelson coastal waters (*pers. obs.*). The association with orca by red-billed gulls was almost certainly opportunistic, which is typical behaviour in red-billed gulls. In contrast, for Parkinson's petrel (*Procellaria parkinsoni*) cetacean feeding debris is a near–exclusive food source (Pitman & Balance 1992).

The seabird–dolphin associations we observed probably assisted the seabirds in finding prey, but the associations gave no obvious benefit to the dolphins. Hence, the association appears to be one of facultative commensalism, as Bräger (1998) concluded from his observations of seabirds attending Hector's dolphins.

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Review

Whittow, G.C. (*ed.*). 2000. *Sturkie's Avian physiology, 5th Edition.*

Academic Press, San Diego. ISBN *0-12-747605-9.*
pp. 685. Hardback, 220 x 280 x 35mm.
$US89.95 £Stg 62.95

When Sturkie's *Avian physiology* came out in 1934 it was the first work solely devoted to the physiology of birds. That book, based as much of it was on laboratory experiments, was mainly about domesticated species — the fowl, ducks, pigeon, etc. In this new edition, work on such species still predominates but the range of other birds involved is extensive — from penguins and albatrosses to parrots and passerines. It also contains about 3 times the information of that in the 1954 one.

The 26 chapters extending from 'Vision' to 'Immunophysiology' are written by experts and cover all the organ systems. The writing is compact, with masses of supporting tables and figures. This should be the first choice for anyone wishing for an insight into a specific topic in aviary physiology. The many references end about 1996. Highly recommended.

John Warham