

CONCERTED SMALL-GROUP FORAGING BEHAVIOR IN GENTOO PENGUINS *PYGOSCELIS PAPUA*

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Synchronous or social foraging behavior has been observed and studied in many different species of organisms. Murphy reported groups of Gentoo Penguins *Pygoscelis papua* feeding together “on the whaling banks” near South Georgia as early as 1936 (Murphy 1936). Much recent work has focused on the foraging behavior of many different penguin species (Trivelpiece *et al.* 1986, Wilson & Peters 1999) and synchronous diving by Adélie Penguins *Pygoscelis adeliae* and Rockhopper Penguins *Eudyptes chrysocome moseleyi* (Tremblay & Cherel 1999; Takahashi 2004a, 2004b). In fact, aggregations of individuals of the same species can be found in many different organisms, including marine mammals and terrestrial birds (Sharp 2001, Fernández-Juricic *et al.* 2003, Gazi & Passino 2004). Some, such as the Humpback Whale *Megaptera novaeangliae* exhibit true social foraging (Sharpe 2001); others are synchronized only with respect to the timing of their dives. A description of the surface activity observed in a flock of Gentoo Penguins near Booth Island, Antarctic Peninsula, follows.

In December 2006, Lindblad Expedition’s vessel, *MS National Geographic Endeavour* was visiting multiple sites on and near the Antarctic Peninsula. On 14 December 2006, the ship was anchored in Port Charcot (65°04.2’S, 64°02.5’W) between Booth and Pleneau Islands at the southern end of the Lemaire Channel. The tides that day for Lemaire Channel showed a high of 134 cm at 13h08 and a low of 117 cm at 18h10. Skies were partly cloudy, and the

temperature was mild (estimated to be about 2°C). The seas were quite calm, stirred only by the slightest breeze, and the water was clear enough to visualize objects below the surface. Six to eight Zodiacs were in the water in this region from 15h00 to 17h00.

During this time, the staff and guests of the *MS National Geographic Endeavour* observed concerted feeding behavior of a population of Gentoo Penguins that continued for a period of at least two hours and involved multiple groups of 12–100 individuals each.

Although all three species of pygoscelid penguins nest in the area, Gentoos predominate according to data collected by Oceanites’ researchers (pers. comm.). A sounding team from the ship reported water depths of 30–50 m in a basin surrounded by zero- to seven-metre shoals.

Some 25 separate groups of Gentoos, each composed of 12–100 birds, gathered at the surface in tight, roughly triangular formations (Fig. 1). Each group dove independently for one to two minutes, reappearing close to where they had disappeared. Each regrouped tightly before diving again. On the whole, they were silent, although occasionally one or two would be calling. In very short order, the entire group would dive down and disappear from view. Looking into the water, bubbles could be seen rising from beneath and krill carapaces and fragments floated to the surface.



Fig. 1. Phalanx formation of foraging Gentoo Penguins *Pygoscelis papua* exhibited just prior to each diving event. (Photographer: August Miller)



Fig. 2. Semicircular pursuit patterns of foraging Gentoo Penguins *Pygoscelis papua*. (Photographer: August Miller)

After about one to two minutes, each group would reappear in the same general vicinity of where they had disappeared, but fanning out into a wide semicircle, each individual rapidly porpoising away from a central point (Fig. 2). The birds would then regroup and repeat the behavior. Groups did not mix or interact in any way, and there seemed to be no relationship between the timing of the dives between the groups. Although several naturalists aboard had significant experience working in Antarctic waters (3–20+ years each), none had ever observed this type of behavior before.

I concluded that a large swarm of krill was present in the bay and that the Gentoos feeding on them were attacking in small, discrete groups rather than individually or en masse. Although Gentoos, like other penguins, are often reported to travel in groups and even to feed in groups, this pattern of closely-concerted feeding within small groups has not to my knowledge been recorded in recent times.

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