

Weddell seals make more kinds of sounds than any other seal. At Davis station alone, Weddell seals have been recorded using 50 distinct underwater call types, including what are colloquially described as ‘trills’, ‘tones’, ‘mews’, ‘whistles’, ‘chirps’, ‘chugs’, ‘grunts’, ‘roars’, ‘knocks’ and ‘clicks’.

For the past 15 years our team at the University of New Brunswick has been studying Weddell seal vocal behaviours in collaboration with the AAD, to understand how the seals communicate and as an indicator of broader behaviours. An understanding of call types, for example, may help us determine seal distribution and which populations are isolated from each other. By understanding the normal vocal behaviours we may also be able to monitor seal responses to humans or other disturbances.

Our research has shown that most calls are made between 10 and 40 m under the ice, to avoid transmission interference associated with the under-surface of the ice. This relatively shallow calling depth indicates that most social interactions occur near the surface and that during the day many of the seals would be able to see the intended recipient of their call.

Calls are produced in the larynx and do not change with depth. The maximum calling depth in deep water off Mawson was 126 m. Calls are also broadcast in a very directional manner, beaming downward and forward from the throat. This should give seals an opportunity to direct their calls towards specific listeners.

The loudest calls are trills (long pure tones or frequency modulated whistles), that start out at a high frequency (often above 20 kHz) and drop down to 80 Hz. These calls can theoretically be detected over 25 km away, if the water is deep and covered by sea ice. Trills have been linked to male seals, but other common call types are made by both males and females. Males use trills to defend breathing holes during the

winter and breeding territories in the spring. Some males produce highly stereotyped sets of call sequences (songs) which may enable them to identify themselves on an individual basis.

Weddell seals tend to remain near where they were born. This has led to the formation of ‘dialects’ and the seals at Casey, Davis and Mawson all exhibit a few different call types and usage patterns. These differences suggest that some aspects of the calls are learned and that the seal groups are not interbreeding.

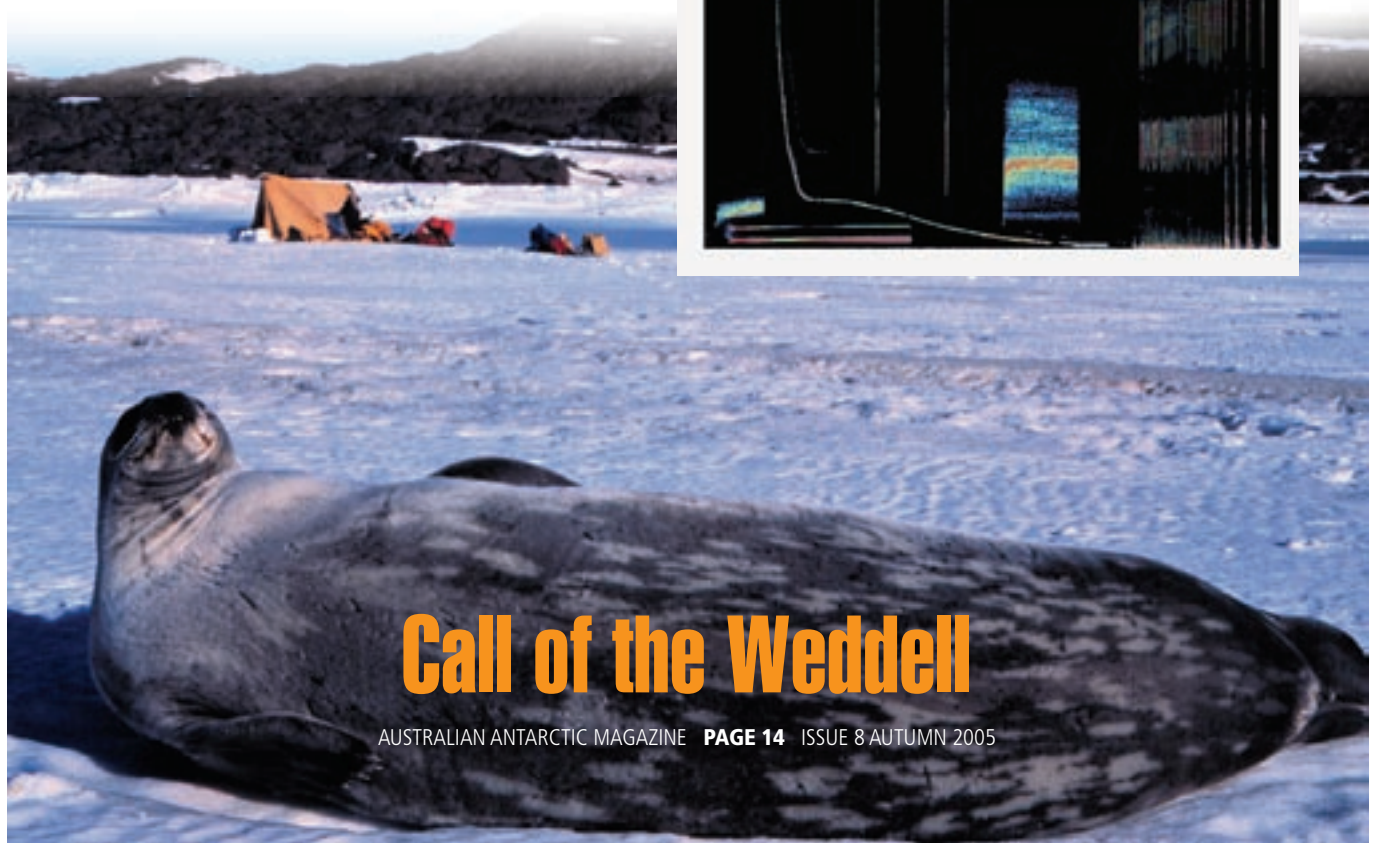
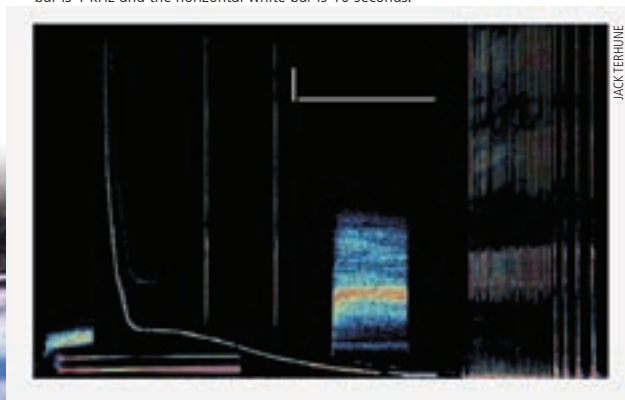
Despite the large number of calls at some breeding sites, seals do not ‘jam’ or ‘mask’ each other’s calls. Rather, they space the timing and/or pitch of their calls so that they do not overlap each other. Like king penguins calling for their mates, Weddell seals are ‘courteous’ and do not call at the same time, or pitch, when a neighbour is calling.

One difficulty of studying Weddell seal vocal behaviours is that we usually cannot see the seals that are making the calls, or the behavioural situation that is occurring. By continuing to eavesdrop and, in the future, by including underwater video and on-ice observations, we hope to learn more about what the seals are doing and where and ultimately, determine the relationship between vocalisations, natural behaviours, distribution and population numbers.

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A sound spectrogram showing the different underwater calls made by Weddell seals. The call types are, from left, a middle roar, tone (horizontal lines), trill, two ascending whistles, high roar, 28 ascending whistles and four pairs of ascending whistles and grunts. The amplitude of the call is depicted by the colour. The frequency (Y axis) goes from 0-10.9 kHz. The X axis shows the duration of each call. The vertical white bar is 1 kHz and the horizontal white bar is 10 seconds.



Call of the Weddell