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Underwater observations of Pandalus borealis in the NW Barents Sea

by

R. W. Blacker
Fisheries Laboratory, Lowestoft

During a cruise of the RV ERNEST HOLT to the Barents Sea in 1969 an automatic underwater camera was used at several stations. The camera unit was attached at the centre of the headline of a Granton trawl and was aimed downwards to photograph the sea bed. The camera was a Robot Star II Industrial model fitted with a Wray 35 mm focal length lens corrected for use in water. Illumination was by a Mecablitz electronic flash. Photographs were taken automatically at one minute intervals. The height of the headline was about 2 m, giving a picture area of approximately 1 m^2.

At one station 40 miles west of Hope Island (Fig. 1) numerous photographs of Pandalus borealis were obtained. Pandalus were visible on 38 out of 53 clear photographs of the sea bed. The sea bed, which was very uniform throughout the tow, appeared to be the fine grey-brown mud characteristic of the deeper parts of the Barents Sea. A total of 81 Pandalus were photographed which gives an average of about 1.5 per m^2, but the number ranged from 0 to 9. At a density of 1.5 per m^2 the population of the area would be 2 250 000 per km^2. The size of the prawns was estimated at 5 to 8 cm total length.

Other benthic animals on the photographs included small numbers of Asteroids, Ophiuroids, Pycnogonids, Coelenterates (Actinians and Eunephthya) and Polyzoa. Although the trawl catch included 600 kg of cod no cod were photographed, probably because the film was used up before the end of the haul. A few fish were photographed and identified as Long Rough Dabs (Hippoglossoides platessoides), Lumpenus lumpetraeformis and Leptoclinus maculatus.

An interesting feature of the photographs is that most of the prawns were orientated at compass bearings between 080° and 200°, with 75 per cent of them between 100° and 140°. The trawl was being towed at 270° (Fig. 1). Most roundfish seem to react to trawls by swimming in the same direction as the gear, that is, 270° in this case, even before the headline has overtaken them. Pandalus might be expected to react in the same way - moving away

frontwards or backwards, that is, heading at 270° or 090° respectively, but it is possible that, in the photographed area, they were too far in front of the groundrope to respond to the gear. Most of the prawns were heading at 10° to 50° or more away from the direction of the tow, which may indicate that they were responding to water movements or some other stimulus and not to the presence of the fishing gear.

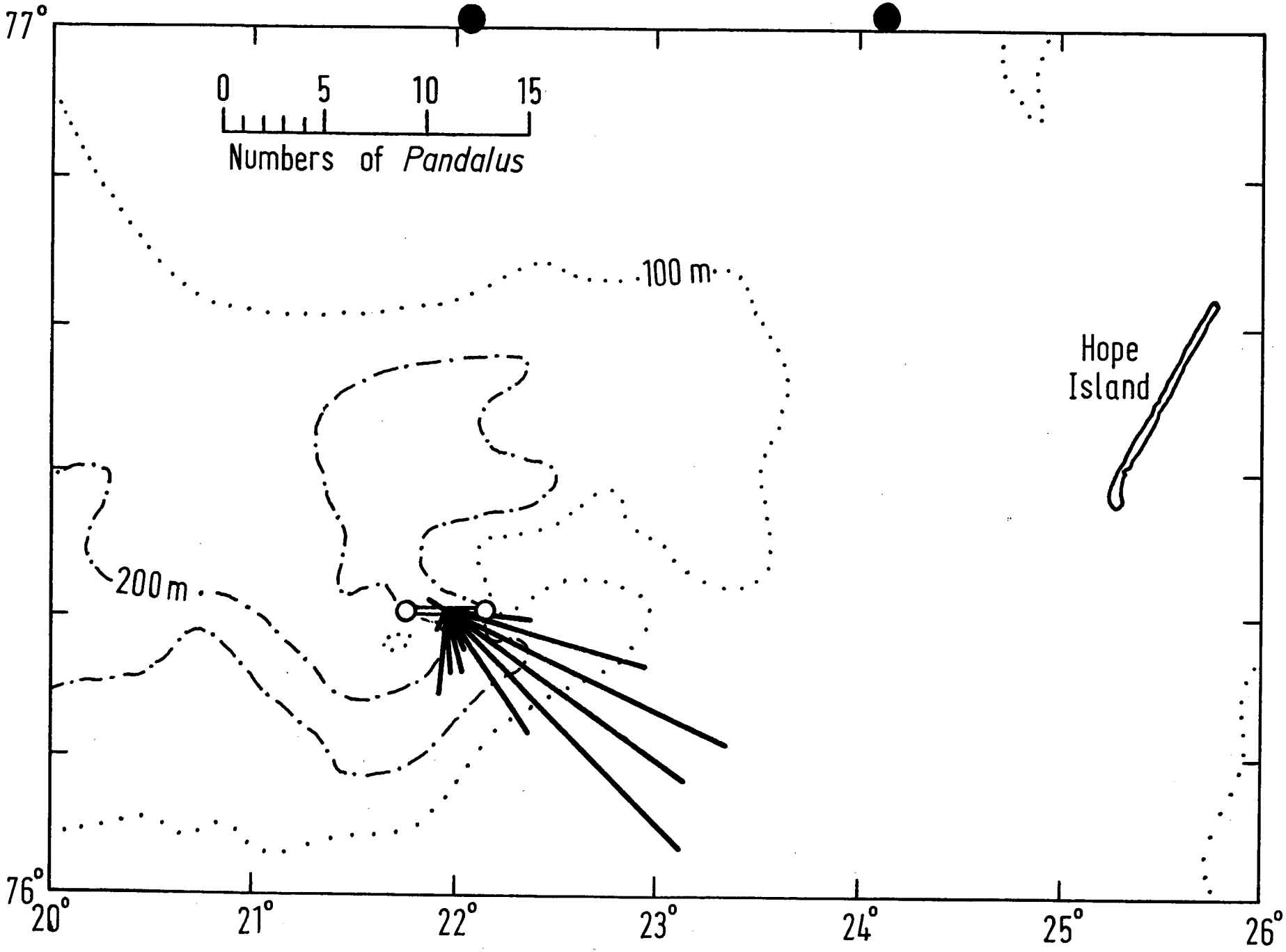

Figure 1 The position of the underwater camera station. The direction of heading of all photographed Pandalus is shown for each 10° sector (0-9°, 10-19°, etc.), the length of the line being proportional to the number of Pandalus at each heading.

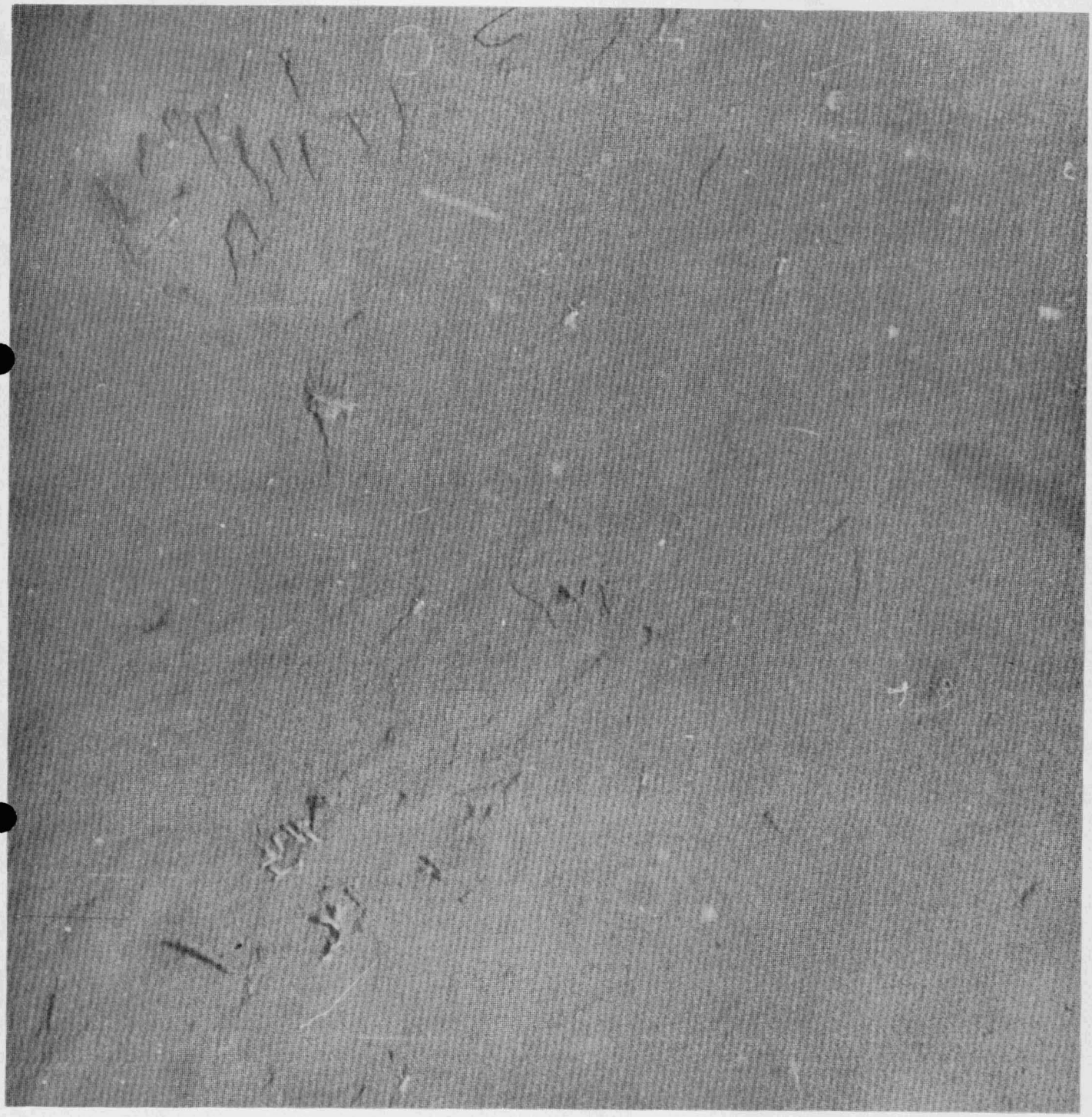

Figure 2 Pandalus borealis on the sea bed. At least nine prawns are easily visible, and there are possibly four or more juveniles in the picture. Picture area approximately 1 square metre.