

Swimming performance of a commercially important sand flathead (*Platycephalus bassensis*): implications for an Australian trawl fishery

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The sand flathead *Platycephalus bassensis* is most common in shallow coastal waters (< 100 m) off southern New South Wales, Victoria and Tasmania, in the latter two of which it is commercially important. The behavioural responses of the *P. bassensis* to a trawl towed at 3 knots were observed using 4 video cameras attached to a trawl. This system enabled simultaneous observations of the fish at several locations in the trawl as fish passed through the codend. The camera housing was also equipped with 4 laser lights set 25 cm apart. The laser beam dots intersecting the bottom of the sea or the fish body were used as a standard length scale. In this way we were able to assess any length based response to the trawl. *P. bassensis* (37–56 cm) were observed cruising in front of a trawl mouth for 128 s on average while using intermittent rapid swimming and coasting manoeuvres before entry into the trawl. Fifteen percent (15%) of these *P. bassensis* were excluded from underneath the bottom panel of a trawl, but others reached the codend within 12 s on average. Only 16% of the *P. bassensis* entering a trawl were observed orient themselves towards the trawl-mouth, but eventually reached the codend in 17 s on average, which was significantly longer than the average time (7 s) of the others that directly entered the codend ($P < 0.01$). These behavioural characteristics suggested that the reduction of undersize-bycatch of this species is not achieved without guiding the catch to the selection part in order to maximise the likelihood of their encountering the escape openings. This is the first study of its type in Australia; most knowledge of swimming performance and behaviour is based on studies from the northern hemisphere or anecdotal evidence presented by fishermen. In this study we discuss the implications of these results to current Australian fishing practices, such as an improvement of catching efficiency and an ability to exclude individuals that are unwanted, undersized, or in excess of the quota.

Keywords: swimming performance; bycatch; discards; selectivity; trawl; sand flathead; underwater observation.

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