

Appendix B: Scientific abalone (pāua, *Haliotis iris*) surveys

Edward R. Abraham¹ and Philipp Neubauer¹

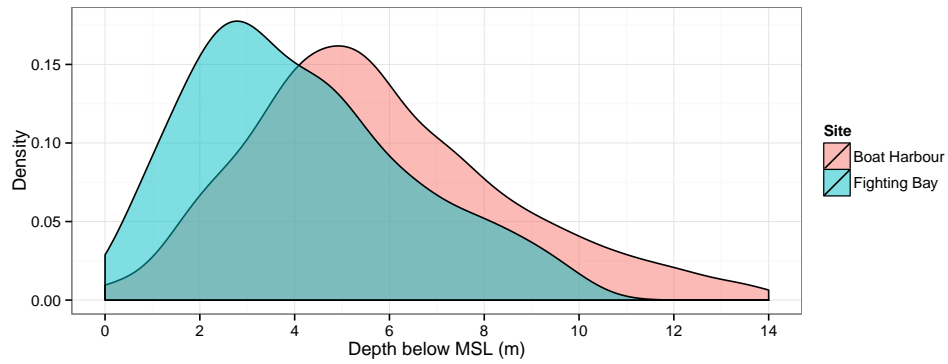
¹Dragonfly Data Science, PO Box 27535, Wellington 6141, New Zealand

Scientific dive surveys prior to the fish-down experiment assessed the abundance and size distribution of New Zealand abalone (pāua, *Haliotis iris*) at Fighting Bay (closed to fishing since 1996) and adjacent Boat Harbour (open to fishing) in December 2011. Pāua length and depth data were obtained from eight weighted line transects within the experimental fish-down site at Fighting Bay, and from ten weighted line transects at Boat Harbour (data were also collected on transect lines outside the Fighting Bay fish-down area, but are not presented here). The transects started at the shore, and depth was measured every 2 m along each transect. Depth data were subsequently corrected for tidal height to derive depth below mean sea level (MSL).

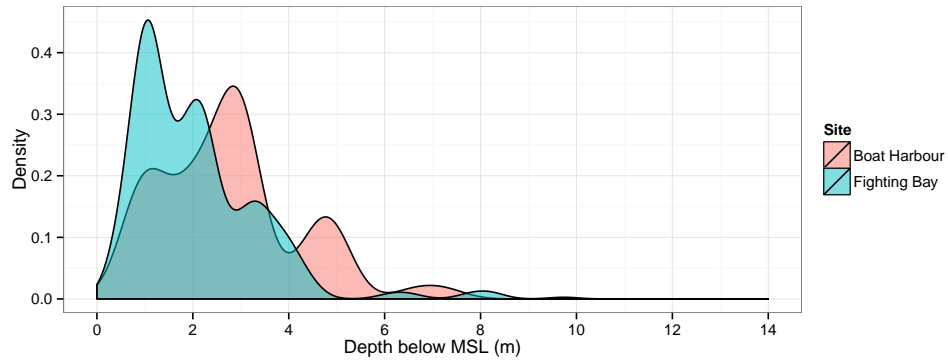
In Fighting Bay, the surveys showed that most of the protected area was between 2 and 4 m depth below MSL (Figure B-1a). At Boat Harbour, most of the survey area was slightly deeper at between 4 and 6 m depth below MSL.

At both sites, the distribution of pāua along the transects was predominantly concentrated at shallow depths, especially at Fighting Bay (Figure B-1b). At this unfished site, the median depth below MSL of pāua was 1.8 (95% c.i.: 0.5 to 4.5) m along the transects. At the fished site, Boat Harbour, the pāua were deeper, with a median depth below MSL of 2.9 (95% c.i.: 0.8 to 5.7) m.

A total of 545 pāua were measured during the initial site surveys, including 481 pāua at Fighting Bay, and 64 pāua at Boat Harbour (Figure B-2). At Fighting Bay, there were 43 individuals that were smaller than the legal size of 125 mm shell length, reflecting 8.9% of the total number of pāua at this site. At Boat Harbour, the number of pāua below the legal size was 50 individuals, reflecting 78.1% of measured individuals (Figure B-2). Although there were many more legal pāua within the Fighting Bay fishdown area, it appears from the transects that there was a lower density of sub-legal pāua.



(a) Depth distribution



(b) Pāua distribution

Figure B-1. Distribution of (a) bottom depth and (b) abalone (pāua, *Haliotis iris*) depth during the initial scientific surveys of the unfished site at Fighting Bay (closed to fishing in 1996) and the fished site at Boat Harbour. Depth data were corrected for tidal height and are relative to mean sea level (MSL).

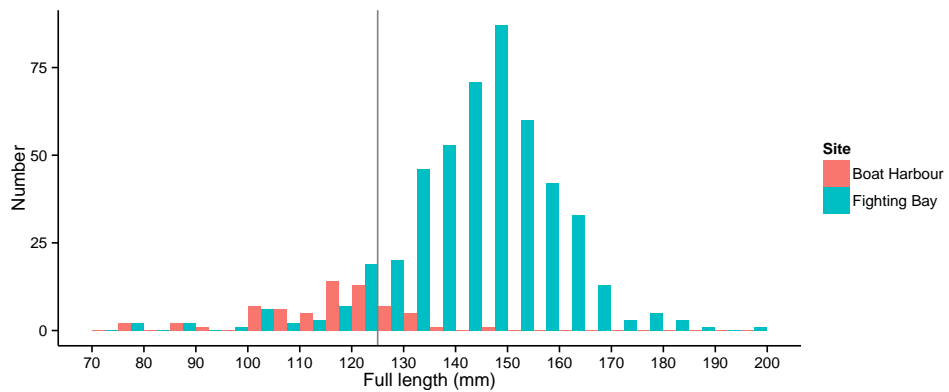


Figure B-2. Length-frequency data of abalone (pāua, *Haliotis iris*) from the initial scientific surveys at the unfished site at Fighting Bay (closed to fishing in 1996) and the fished site at Boat Harbour. Number of measured pāua in 5-mm length classes at the two sites, based on a total of 64 measured pāua at Boat Harbour, and 481 pāua measured at Fighting Bay (within the area of the fish-down experiment). Line at 125 mm length marks the legal size limit.