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**Radial distance sampling with passive acoustics: The prospect of**  
**estimating absolute densities of cetaceans from static acoustic**  
**datalogger data**

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Recording animal vocalisations with a static acoustic datalogger can be viewed as a form of point transect sampling and results analysed within the framework of distance sampling theory. The key element is the radial detection function, which specifies the probability of detecting a vocalisation as a function of distance from the datalogger. This function can be modelled theoretically or preferably determined experimentally and from it the efficient radial detection distance can be determined. Radial detection functions were determined for two different harbour porpoise dataloggers (T-PODs, version 1 and version 3) by means of concurrent visual tracking of porpoises. 52% and 82% of the porpoises within 100 m from the T-PODs were detected by the V1 and V3 T-POD, respectively and 11% and 30%, respectively were detected between 100 and 200 m from the T-PODs. Effective detection radius (EDR) was 97 m and 150 m for the two T-PODs, respectively. Porpoises echolocate almost continuously. If it is assumed that silent periods rarely exceeds 1 minute in duration an average detection rate on the version 3 T-POD for the study site of 2.7 detection positive minutes per hour can be converted into a density estimate of 0.69 porpoises/km<sup>2</sup>.