

A behaviour-based modelling approach to reducing shorebird-shellfish conflicts.

Caldow, R.W.G.¹⁻⁶, Beadman, H.A.², McGrorty, S.¹, Stillman, R.A.¹, Goss-Custard, J.D.³, Durrell, S.E.A. le V. dit¹, West, A.D., Kaiser², M.J., Mould⁴, K., Wilson, A⁵

¹*Centre for Ecology and Hydrology, CEH Dorset, Winfrith Technology Centre, Winfrith Newburgh, Dorchester, Dorset DT2 8ZD UK*

²*School of Ocean Sciences, University of Wales, Bangor, Menai Bridge, LL59 5AB UK*

³*30, The Strand, Topsham, Exeter, Devon EX3 0AY UK*

⁴*Myti Mussels Limited, Port Penrhyn, Bangor, Gwynedd LL57 4NH UK*

⁵*Deep Dock Limited, Bwythn Y Mor, Llanfaethlu, Holyhead, Anglesey LL56 4HD UK*

ABSTRACT

Bottom cultivation of mussels on intertidal flats is practiced throughout the world. This often generates conflicts between commercial interests and competing birds such as oystercatchers. At the Menai Strait, United Kingdom, the overwinter consumption of 242 tonnes (1 metric tonne = 1000 kg) of commercially harvestable mussels (>40 mm) by oystercatchers in 1999-2000 was worth £133 000 (\$226 000 U.S. dollars). This represents 19% of the value of the landings. We used a behaviour-based simulation model to predict the extent to which such losses can be reduced by novel commercial management practices, and to explore the consequences for the oystercatcher population. Simulations of novel lay management practices indicated that the losses of commercially harvestable mussels to oystercatchers can be considerably reduced by altering the shore level and/or extent of the commercial lays. We propose a novel management strategy for the bottom cultivation of mussels in intertidal areas. Seed mussels (15-20 mm) should be laid relatively far up shore, where losses to oystercatchers will be minimal. As the mussels grow over the next 2-3 years, they should be moved progressively further down shore such that the largest mussels spend their last season prior to harvest in a relatively small area, lower on the shore than all mussels earlier in the cultivation cycle. Support for the effectiveness of this proposed management strategy can be found in the reports of commercial operators who have incorporated this management strategy in new management practices in the last few years. They report an increase in the ratio of the live mass of harvested to seeded mussels from the previous norm of 1:1 to 4:1. By accepting greater losses of mussels earlier in the cultivation cycle, rather than later, the feeding conditions for oystercatchers might even be improved under this system. With appropriate management, the interest of shellfish growers and competing shorebirds need not conflict.

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fisheries@bangor.ac.uk