

Dog Whelks and TBT

The Dog-whelk (*Nucella lapillus*) is a predatory mollusc found on rocky shores, breakwaters and pier piles. It feeds mainly on barnacles and mussels and can survive at least 7 years. Eggs are internally fertilized and laid in crevices or beneath boulders during the autumn and early spring. There is no planktonic larval stage and young 'crawlaways' hatch from the egg capsules in late spring. Around the Isle of Wight, fully grown animals have a shell length of between 3 – 4 cm.

In the mid-1980s, there was a noticeable decline of populations in the vicinity of ports and marinas around the British Isles. Many females had developed male reproductive organs – a phenomenon known as imposex. Experimental work implicated exposure of these populations to water contaminated with tributyltin (TBT) antifouling paints. Exposure of TBT at 1 ng/l can initiate imposex and at 4-5ng/l, imposex can cause blockage of the oviduct and the build-up of unlaidd eggs can cause the death of the female. Concentrations above 500 ng/l were recorded in Solent estuaries in the 1980s. In 1987, a survey around the Isle of Wight revealed that while still common on the south coast, populations on the Solent shores had either become extinct or reached dangerously low levels. Moreover the degree of imposex was higher in populations closer to the Solent.

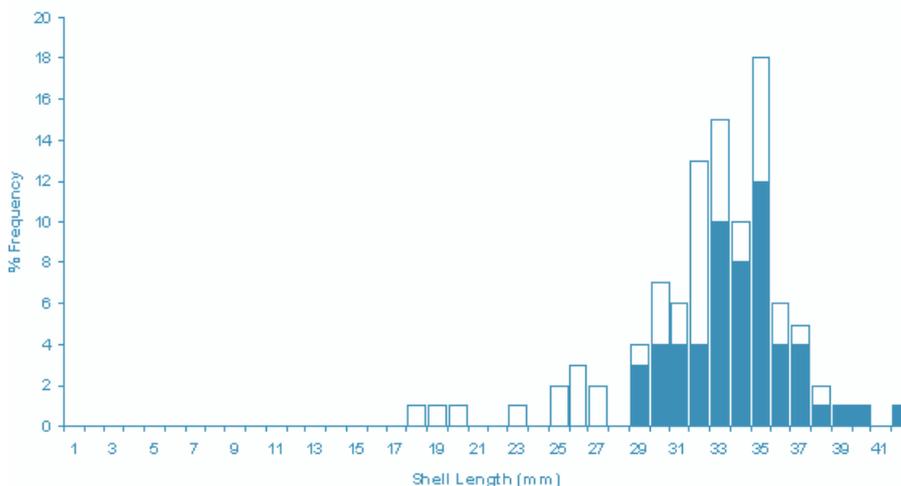
In July 1987, TBT paints were banned for use on small craft under 25m, but are still widely used on larger commercial vessels.

Survey work in 1997, ten years after the implementation of legislation, showed some evidence of recovery on the Solent coast of the IOW, yet surprisingly, populations were smaller on the south-east coast near Ventnor and around St. Catherines Point.



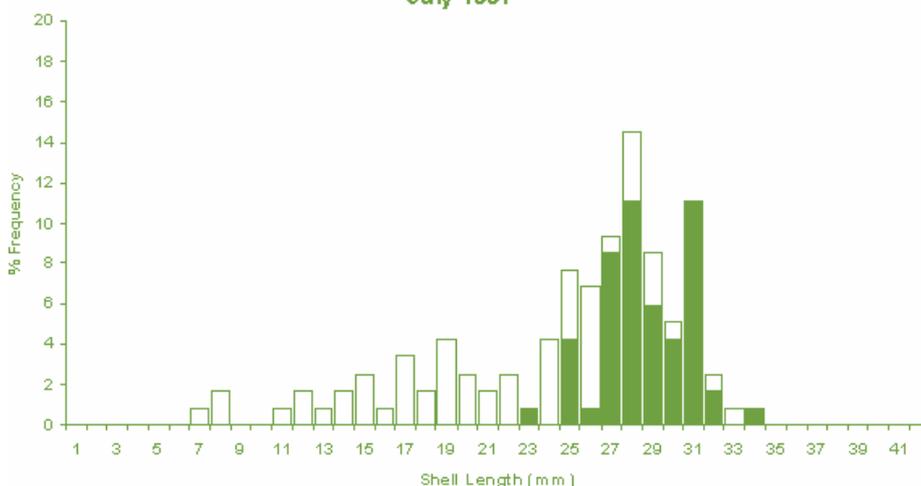
n = 100

July 1987



n = 117

July 1997



The histograms shown above indicate that in 1987, the population primarily consisted of large and older animals with little recent recruitment. By 1997, the histogram is tri-modal, with younger animals more evident, indicating more successful reproduction.

Isle of Wight dog-whelk populations continue to be monitored to determine the rate of re-colonisation, especially on the east coast of the Island. The hydrography of the region is complex and it is likely that contaminated sediments transported out of the Solent become caught up in gyres at either end of the Island. This may have compounded recent problems of food availability due to low barnacle settlement and contributed to population decline along the south-east coast.

References

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