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TBT



TBT



## ASSESSING THE BIOLOGICAL EFFECTS OF MARINE POLLUTION

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# ASSESSING THE BIOLOGICAL EFFECTS OF MARINE POLLUTION

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In the 1980s, across Europe, farmers in the oyster industry observed abnormalities in their stock, higher than expected mortality, and a drop in yields. Questions were immediately raised about the root cause of this phenomenon. It quickly became apparent that an anti-biofouling agent, tri-butyl tin (TBT), was responsible. TBT was excellent at preventing the growth of barnacles and other organisms on the hulls of boats and on underwater structures but, as it leaked into the environment and was taken up into the marine ecosystem, it caused considerable biological harm. A closer look at other marine organisms such as marine gastropod molluscs (the dogwhelk *Nucella lapillus*), revealed more issues linked with TBT: a large proportion of whelks were classified as 'imposex', a consequence of female snails developing male sex organs. The clear evidence linking TBT to this phenomenon led to a ban on the use of TBT on most boats in Europe in 1987 and globally in 2008.

Over the past twenty-five years, six surveys have been run to assess and measure the level of imposex in dogwhelk populations around England and Wales. The surveys undertaken in 1992 and 1997 established baseline data in support of UK and EU legislation restricting the use of organotin compounds like TBT. The surveys conducted in 2004, 2007 and 2010 covered the period prior to and during the implementation of the maritime shipping industry worldwide ban and served as a time series allowing us to measure the effectiveness of the legislation. The 2014 survey took place 6 years after the global ban on TBT antifouling paints, and only at locations that failed assessment limits in 2010. The results of the 2014 survey clearly demonstrated a continuing reduction of the prevalence and severity of imposex since the TBT ban, demonstrating a significant improvement in environmental quality as a direct result of Cefas research.

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