

Boat paint to blame for Norfolk Broads' desolation

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One of the main culprits behind an environmental catastrophe that desolated one of Britain's most important wildlife habitats has finally been identified in a study led by researchers from UCL (University College London) and Acroloxus Wetlands Consultancy Ltd, Canada.

In the current issue of the journal *Environmental Science & Technology*, they reveal that introduction of the compound tributyltin (TBT) as a biocide in boat paint in the 1960s resulted in a dramatic and sudden loss of aquatic vegetation from most of the 50 or so Norfolk Broads lakes.

At the time, scientists pointed the finger at contamination from sewage works and fertiliser run-off from farmland, despite suggestions from the local community that the burgeoning leisure boating industry might be to blame.

Though the use of TBT was banned in freshwater systems in the UK in 1987, the researchers say 40 years on from TBT's introduction the fragile ecosystem remains shattered despite expensive attempts to restore it.

Dr Carl Sayer, of the UCL Environmental Change Research Centre, who co-led the study, says: "For too long TBT has been neglected as a driver of environmental destruction in freshwater wetlands and even though it is no longer in use in UK inland waterways, TBT contamination and its negative effects are still being reported all over the world.

"Real concerns have been raised about TBT derived from industrial and ship breaking activities in several major river systems including the Ganges, Brahmaputra and Yangtze – all of which are connected to shallow lakes. In the case of the Yangtze, the linked shallow lakes are some of the largest in the world and, like the Broads, have experienced problems with plant loss on a large scale."

TBT was originally designed for use on the hulls of large ocean-going ships to reduce the build-up of barnacles. Since the 1970s it has been linked to a host of negative effects in the marine environment including mutations in shellfish. An aggressive marketing programme in the 1960s saw its use fashionably worldwide on much smaller craft both in the oceans and within inland waterways.

"TBT is extremely toxic and highly persistent in the environment, earning it the controversial title as the most toxic substance ever introduced deliberately by man into the aquatic environment," explains Dr Sayer.

"In freshwaters, once TBT is released from an antifouling coating it is rapidly absorbed by bacteria and algae, and eventually works its way up the food chain. Within a short period of time after the paint's introduction to the Broads, it knocked out many of the small invertebrates which are a part of the life support system for water plants – turning the waters of the Broads green with algae."

To investigate levels of TBT in the Broads the researchers took sediment cores from two lakes, one close to the centre of the boating industry and the other half a kilometre away. Results show an abrupt decline in plant and invertebrate populations at the precise time that a strong TBT signature was detected.

"The irony of the tale is that the paint was designed to stop barnacles

attaching to boats – which you don't get in freshwater. By simply lifting boats out of the water once a year and using a bit of elbow grease, one of Britain's areas of outstanding natural beauty might still be intact rather than on the long road to recovery."

Source: University College London

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