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## **Pollution threatens to wipe out half of all orca communities**



*Troubled waters ahead*

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By Andy Coghlan

Marine chemical pollution that concentrates in the blubber of orcas – also known as killer whales – could wipe out half of all known populations within a century, marine biologists have warned. Polychlorinated biphenyls, or PCBs, threaten orcas by potentially disrupting reproduction, physically blocking reproductive organs and reducing sperm counts, leading to dwindling birth rates in exposed populations.

“What we see in [other species](#) is that PCBs affect reproductive organs,” says Jean-Pierre Desforges of Aarhus University in Denmark, and head of the analysis. “In Baltic ring seals, for example, they cause physical blockages in the womb, and also

cause endocrine disrupting effects that are more subtle.”

Up to 1.5 million tonnes of PCBs were manufactured globally between 1933 and 1993, when they began to be phased out because of emerging evidence they disrupt reproduction in wildlife. They were widely used as heat-resistant fluids in electrical equipment, and as stabilisers in paints, sealants and solvents.

They became widespread pollutants, and because of their chemical inertness, they remain for decades in the environment. They concentrate disproportionately in body fat of mammals at the top of the food chain, including orcas.

## Blubber samples

Desforges wanted to find out which of 19 orca populations were most contaminated, and how this might affect their reproductive fate over the next century. He and his colleagues measured PCB content of samples of blubber and skin from 351 orcas across the study populations. The tiny samples were obtained from animals using small, painless recoverable arrows fired by researchers.

Using estimates from previous studies in different animals of how different concentrations of PCBs affect reproductive success, Desforges then worked out how the different orca populations would fare over the next 100 years, based on the average levels of PCB contamination found in the blubber samples. He concluded that 10 of the 19 populations could be wiped out by the 2100s.

Unsurprisingly, the most heavily contaminated populations are those that inhabit the most polluted marine zones, particularly those around the UK, Brazil, Japan, the Strait of Gibraltar off Spain, and Greenland. Some individuals had levels of 1300 milligrams of PCBs per kilogram of blubber, 26 times the level known from other species to disrupt fertility and damage immunity.

Their fate is compounded by diet. Orcas with the highest levels tended to eat large animals such as [seals](#), tuna and sharks, which themselves already have PCB-rich flesh and fat. PCBs are also passed in milk from mothers to their young. Orcas eating predominantly smaller fish had much lower levels.

The populations in best shape, predicted to double their populations in the next 100 years, were in relatively unpolluted waters of the Arctic and Antarctic. Here, blubber concentrations were as low as 10 milligrams per kilogram, although evidence is mounting of [PCB contamination at the poles](#).

Desforges says the only hope for the worst-affected populations is for accelerated destruction of the waste containing PCBs, 80 per cent of which still awaits safe disposal. But he doubts whether countries which signed the UN's [Stockholm Convention on Persistent Organic Pollutants](#) in 2004 will meet its target of disposing of all PCB-tainted equipment by 2025.

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