Parliamentary Briefing: End Chemical Pollution

Wildlife and Countryside Link, July 2022

Wildlife and Countryside Link is a coalition of 65 organisations working for the protection of nature. Together we have the support of over eight million people in the UK and directly protect over 750,000 hectares of land and 800 miles of coastline. organisations that come together to form a powerful joint voice across a range of water-based issues.

Summary

- Chemical pollution is one of the key drivers of biodiversity loss worldwide.
- New research shows that chemical pollution is likely to have crossed beyond Earth's "planetary boundary", threatening to destabilise the ecosystems that sustain us.
- As Professor Ian Boyd, former DEFRA chief scientist, has argued: "Regulation is not designed to detect or understand these effects… there is a need for a much more precautionary approach to new chemicals and to the amount being emitted to the environment".

The UK Chemical Strategy presents an opportunity to reduce chemical pollution. Without an ambitious programme to stop the release of the most hazardous chemicals and to significantly reduce the release of other chemicals, delivery of statutory targets to halt nature's decline and improve water quality will not be met. As a result, the environment and human health will continue to be put at risk. The strategy should:

- **Commit to a phase-out of the most hazardous chemicals** from household and consumer items, from agricultural and amenity use, and for non-essential uses to protect the environment and human health.[1]
- **Include measures to reduce chemical pollution that are compatible with delivery of statutory environmental objectives,** including the Environment Act targets and Net Zero.
- **Accelerate the regulation of harmful chemicals** by establishing a new approach of regulating groups of chemicals with similar structures, rather than substance by substance (e.g. PFAS, Bisphenols, Phthalates).

At a Glance: What's the Problem with Chemical Pollution?

Cocktails of hazardous chemicals are polluting the UK's ecosystems, often harming wildlife and other organisms. Chemical pollution is one of the key drivers of the biodiversity crisis, and is also affecting human health. Scientists have warned that the planetary boundary for chemical pollution has largely been exceeded and have urged immediate action to reduce the production and release of human-made chemicals.[i]

However, with global chemical production growing exponentially and projected to double by 2030[ii], the release of chemical pollutants in the environment is set to increase. **The Chemicals Strategy is an important opportunity for the Government to avert the growing risk of chemicals pollution.**

In England, chemical pollution is rife in the environment. For example:

- **In the freshwater environment**: 0% of England's rivers met 'good chemical status' in 2019, with some extremely persistent and toxic 'forever chemicals' being ubiquitous in English waters.[iii]
- **In the marine and coastal environment:** There have been no new Orca calves in the UK in the last two decades, and the populations are trending towards a complete collapse within the next 100 years. Poisoning by PCBs (a chemical which was banned 40 years ago, but which is still be being released into the environment) is likely to be a significant factor in this local extinction.[iv]
- **In the terrestrial environment**: A 2019 study of UK soils found that 67% of the samples had multiple residues of hazardous chemicals, 25% had more than six, with around 4% containing traces of more than ten pesticides.[v]

There are some practical and in limited cases essential uses of hazardous chemicals. However, they are used too widely within the UK and can be found in numerous consumer products, including clothes, toys, cleaning products, electronics, furniture, food packaging, cosmetics and more. Chemical pesticides are also used widely and often unnecessarily in agricultural production and in urban spaces.[vi] Finally, hazardous chemicals are also routinely used in industrial processes such as waste treatment.

While pesticides are released intentionally, many of these other hazardous chemicals also find their way into the UK's natural environment, whether via sewage, leaching out of landfill, direct emissions from factories, runoff from fields and carparks, or deposits from the air. **The sum of these pollutants in UK's rivers, seas, soil and air constitute a toxic burden on wildlife and ecosystems.**

To avoid long-term, cumulative harm on people and nature, the Government should act now to reverse the burden of chemical pollution by tackling chemical pollution at source. Reducing and restricting chemicals **may come at a cost to industry, but this is likely to be less than the cumulative environmental, human health and financial cost of chemical pollution**. For example, **cleaning up PFAS chemicals from UK wastewater would cost the water industry £21bn**[vii].

The Solutions: Strengthening the UK system

The UK's current regime for regulating chemicals does not provide the necessary protection for human and environmental health, and should be strengthened significantly. Below are 10 problems with the current system, and their solutions:

PROBLEM	SOLUTION
Very hazardous chemicals continue to be used for non-essential purposes, such as in cosmetics or food packaging. 73 Highly Hazardous Pesticides are still approved for use in UK agriculture.	**Commit to a phase-out of the use of the most hazardous chemicals** from household and consumer items, from agricultural and amenity use, and for non-essential uses.[viii]
As yet, there is no clear link between chemical regulation and achieving environmental targets.	**Include measures to reduce chemical pollution that are compatible with delivery of statutory environmental objectives,** including the Environment Act targets and Net Zero.
Chemicals are currently assessed and regulated one by one. When one chemical is banned or restricted, it is often simply replaced with another chemical with similar properties that is not restricted. This is known as 'regrettable substitution'.	**Accelerate the regulation of harmful chemicals** by regulating groups of chemicals with similar structures together, rather than substance by substance (e.g. PFAS, Bisphenols, Phthalates)**.**
Even where government knows there is a risk from some chemicals to human and/or environmental health, many remain in use. There is not a strong enough emphasis on the precautionary principle in the management and control of chemicals.	**Prioritise prevention and precaution** in the regulation and use of chemicals**.**

Chemical regulation currently underestimates the risks from cumulative exposure to multiple chemicals in the environment.

Address the 'cocktail effect' to assess and avert the impact of mixtures of different chemicals coming together in the environment**.**

The role of nature-based solutions for reducing chemical dependency is not recognised enough in UK policy e.g. farming policy.

Foster nature-based solutions as alternatives for chemical use for instance for river catchments, soil management and other crucial ecosystems.

While there is an initial monitoring and alert system being developed by the Environment Agency, it does not yet give a full picture of chemical pollution in the environment.

Build an effective monitoring and alert system for chemicals in the environment**.**

Many chemicals that have already been banned continue to pollute the environment, with little funding and resourcing to clean them up.

Resource the 'clean up' of legacy chemical pollutants that are already banned, but which still persist in the environment**.**

In More Depth: Chemicals in the Environment

Chemicals in the Freshwater Environment

The Government's 25 Year Environment Plan commits to deliver cleaner water to protect threatened species and to provide richer wildlife habitats. The Government is also developing targets for water quality under the Environment Act.

Despite commitments, recent figures from the Environment Agency show that 0% of English rivers meet good chemical status.[ix] A recent report into water quality in rivers, shows an increasing pressure on freshwater environments from exposure to toxic cocktails of chemicals.[x] **To stop the build-up of hazardous chemicals in the UK's waterways, the Chemical Strategy must address the problem at source, by restricting the use of hazardous chemicals in products and in agriculture. It should also address the cocktail effect to assess the impact of mixtures of different chemicals coming together in the environment.**

CASE STUDY: TOXIC PESTICIDES WASHING INTO A CHALK STREAM

While surveying river quality in 2018, Salmon & Trout Conservation discovered that pesticides from a salad washing factory owned by Bakkavör Group Plc—a major supplier of fresh food and salads to UK supermarkets—were polluting rivers in the Upper Itchen river basin, presenting a serious threat to aquatic and invertebrate life on a highly protected English chalk stream.

Subsequent monitoring found 37 pesticides, including Acetamiprid, from the neonicotinoid group of chemical substances, which were being washed off salad leaves and entering the river via discharge water.

Diversity and overall abundance of freshwater invertebrates are significantly reduced in water chronically polluted with pesticides.[11] For example, continued exposure to low levels of neonicotinoids over several weeks affects the mobility and feeding activity of freshwater shrimps, leading to increased mortality.[12]

Prior to the survey by Salmon & Trout Conservation, the Environment Agency had not been monitoring the river for pesticides and other pollutants near to the Bakkavor plant as the permit to discharge wastewater was issued without recognition that this wastewater would contain potentially harmful pesticides.

This case uncovered systemic problems in the regulation and monitoring of chemicals in England. Firstly, the mixture of chemicals was shown to have an impact on wildlife in the river. However, the Government have not set out any formal process for monitoring and regulating the synergistic and/or additive effects of chemicals.

Secondly, the Environment Agency permitting regime for discharging water relies on companies self-reporting that they are discharging water containing chemicals and other pollutants.

Finally, current river monitoring for chemicals covers only a tiny fraction of the chemicals entering waterways, without considering some biological impacts and mixture effects of many chemicals that are potentially damaging to wildlife.

Chemicals in the Marine Environment

Many chemicals affect the marine environment, many of which are still in use in the UK. Chemicals travel through several pathways to end up in the ocean. For instance, water washed down a household drain might contain hazardous chemicals which cannot be filtered out, even in wastewater treatment processes, so find their way into rivers and eventually the ocean.

An example of a problem chemical group found in the ocean is Polychlorinated biphenyls (PCBs). PCBs are highly toxic chemical compounds that have demonstrable impacts on some marine life.[xi] They were used in a wide range of products from plastics and paints to electrical equipment and sealants

and were banned in Europe in the 1980s, and globally in 2001 Though banned decades ago, they are extremely persistent in the environment. They still get into UK rivers and seas through leakage from improper disposal, paint flakes getting into waterways and dredging contaminated sediments.

In addition to the legacy impact from these chemicals, other chemicals are still in use that are extremely persistent. Chemicals like those in the PFAS (per and poly-fluoroalkyl substances) group are highly persistent and present in a wide range of applications. Beyond PCBs and PFAS, there are many more human-made chemicals found in marine waters, sediments and wildlife.

It is important that the UK Chemical Strategy resources the clean-up of pollution from legacy chemicals that are already banned, but which still persist in the environment. It is also vital that the Government learns from past mistakes and prevents further persistent chemicals from polluting rivers and the ocean by urgently phasing out the use of all very persistent chemicals, starting with PFAS.

CASE STUDY: BANNED PERSISTENT CHEMICALS THREATENING THE SURVIVAL OF KILLER WHALES

PCBs build up through the food chain, with the highest levels and worst effects seen in top predators like killer whales, dolphins and porpoises. High levels of PCBs are known to harm breeding success by causing sterility and suppress the immune system of killer whales and dolphins.

The West Coast Orca Community, the UK's only orca pod, was reduced to just eight individuals in 2016 following the death of Lulu, a female who died after becoming entangled in fishing gear. This pod has not had a single recorded birth in over 25 years, so Lulu's body gave scientists a valuable opportunity to assess what role pollutants are playing in the demise of her pod.

Credit: SMASS

The level of PCB contamination in Lulu was 100 times higher than the estimated safe level which put her as one of the most contaminated animals on the planet in terms of PCB burden and raised serious questions for the long-term survivability of this group of UK orcas. Extinction is now a very real threat for this particular community of orcas due to PCBs that were banned long ago.

One of the major problems with PCBs is their persistence. This has enabled them to build up in the environment for decades without breaking down. Persistence is never good news as we have seen with visual reminders of plastics and microplastics. These persistent chemicals, although invisible, have shown impacts that will affect generations to come.

Chemicals in the Soil Environment

Toxic chemicals are leaching into soils from a range of sources, including the heavy use of pesticides, veterinary medicine and fertiliser (including through spreading of sewage sludge), degrading the surrounding habitat and affecting the nutrition of the soil.[xii]

In particular, pesticide use has risen in recent years. Between 1990 and 2016, the area of land treated with all pesticides rose by 63%, the area treated with fungicides by 69% and herbicides by 60%[xiii]. In the same time period, while insecticide use fell by 13%, the percentage of cereals treated more than four times with pesticides in one growing season increased from 30% to 55%, oilseed rape went from 21% to 80% and
potatoes from 83% to 95%.[xiv]

Pollinators are estimated to provide around £690 million in benefits to the UK economy per year, yet multiple scientific studies have cited the overuse of pesticides as a key causal factor in insect decline[xv]. A 30% decline in pollinators in recent years has been estimated to lower yield, costing the UK over £188m per year[xvi].

The Chemicals Strategy should phase-out the use of the all Highly Hazardous Pesticides. The role of nature in reducing pesticide, fertiliser and other chemical uses must be recognised and fostered as part of the UK Chemicals Strategy**.**

CASE STUDY: USING FUNGI TO REDUCE PESTICIDE USE

Tim Parton, from Brewood Park Farm, Staffordshire, has been working with nature to increase profitability and resilience for the business. Tackling problems, such as long-term damage to droughty soils, pesticide resistance and yields that have plateaued has needed a whole farm 'systems approach' that works with nature, especially as climate change and regulations for water bring new requirements to the business.

The work Tim Parton has carried out on Brewood Park Farm demonstrates that investing in nature-based solutions can improve the productivity of the UK agriculture sector whilst reducing the need for pesticides.

As well as killing pests, insecticides also kill non-target species, including important biodiversity such as pollinators and natural pest predators. Protecting these important species can help to control pest species, and drastically reduce the need for pesticides. Creating habitat that will attract beneficial biodiversity is a key way to work with nature on farms to reduce reliance on chemicals.

Another crucially important element of nature-based pest control, is to maintain healthy soils with good fungal populations. Applying fungicides risks damaging these valuable soil fungal networks which provide the crops with nutrition – therefore helping them to be more resistant to pests and diseases.

Tim says:

"I realised that fungicides weren't doing my soil any good. I wanted the plant's natural immune system to kick in. So I started using more nutrition and more products to protect the plant using its own

immune system. As the soil gets healthier, I don't get the same weed problems, so I don't need to use as many herbicides.

Now you never see any sort of erosion in my drains, they are gin clear. I'm not losing the soil, I'm not losing nutrients. It's all stopping where it should be because once you get all that mycorrhizal fungi going, you get the glomalin glue that mycorrhizal fungi forms, which is holding all that nutrition together. And that glomalin can hold it there for 40 years just waiting to be used by a plant. And that's working with nature. That's what we've forgotten about in farming."

Chemicals and Climate Change

Chemical pollution can make wildlife and ecosystems more sensitive to the impacts of climate change, affecting their chances of survival.[xvii] Climate change is also amplifying the release of hazardous chemicals in the environment.

Changes in external parameters such as temperature, salinity and acidity induced by global climate change can alter the way chemicals interact with organisms, and therefore alter their toxicity.[xviii] For instance, ocean acidification could increase the toxicity of contaminated marine sediments, harming ocean floor ecosystems.[xix]

Finally, the chemicals industry is fuelling the climate crisis, as the first industrial user of fossil fuel for feedstocks and energy, and the third largest industrial emitter of CO_2.[xx]

Reducing the toxic burden of chemicals on nature is also an essential component of an effective climate change adaptation strategy.

CASE STUDY - THE IMPACTS OF CLIMATE CHANGE ON POLAR BEARS ARE EXACERBATED BY CHEMICAL POLLUTION

A study from 2017 shows that the combination of sea ice decline and exposure to pollutants has a dramatic impact on polar bears' ability to store energy via fat to survive through periods of food scarcity and reproductive fasting. [xxi]

Environmental changes catalysed by climate change, such as rising temperatures, extreme weather events, melting ice sheets and rising sea levels, also have the potential to amplify the release of chemical pollutants.

Chemicals are now leaching from icecaps into the ocean and freshwater. For instance, PFAS chemicals are leaching from melting glaciers in the Tibetan Plateau, contaminating downstream lakes and streams. Climate change is also expected to increase risk of diseases, infections, and toxicants, in turn likely to lead to increased pharmaceutical use. This increases the chemical load in the environment[20].

The combination of multiple stressors, climate change and chemical pollution, put polar bears, one of the earth's most vulnerable species, at risk.

Increases in temperature can also lead to an increase in toxicity from pesticides or PCBs, exacerbating the harmful impacts these substances have on the environment. For species that are already heavily affected by climate change, toxic chemicals are an additional critical stressor reducing their chances of survival.

What you can do?

We are asking MPs to urge the Government to take up the recommendations in this briefing, making the UK Chemicals Strategy as strong as possible to help safeguard the future of the planet.

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