Revised Paper on Glyphosate to the Swansea City and County Council Natural Environment Performance Panel at their meeting at 10 am on 16 December 2019

In March 2006, we attended a conference about the declining numbers of birds in Wales. The changes in Welsh Agriculture from arable to livestock had resulted in a scarcity of fields to provide winter seed feeding for finches. We were asked to consider establishing a sacrificial crop of seeds (e.g. sunflower/barley/linseed/triticale). In the first year 2006 we sowed sunflower/barley and linseed. In July 2006 we commissioned a professional naturalist to do a moth count with three moth traps. He set the moths traps the evening before. When he came at 6 am the following morning we were amazed at the numbers and diversity of moths that the powerful lights had attracted from many miles away. He recorded (and we photographed) 143 species, in numbers up to 500. We asked him whether it was as a result of the sunflowers we had sown. He said no: it was associated with the numbers of insignificant wildflowers (agricultural weeds) that had grown up that weren't being killed by pesticides.

In 2010, we published two photo-journals: *Speckled Bush Crickets* and *The Year of the Bumblebee*. Between 2006 and 2010 we documented huge numbers of insects that seemed to appear from now-where, as if by magic. It was miraculous. I think those 4 years were the happiest and most productive of my life. We photographed moths, butterflies, bumblebees (seven types), hoverflies, beetles, wasps, lady birds, solitary bees, four types of bush cricket, shield bugs, spiders, in particular the orb web spider and her mating strategy. There were two bat species that benefitted from the profusion of insects, and many swallows, house martins and swifts flew over the fields.

When we sent the book *Speckled Bush Crickets* to an expert on grasshoppers and bush crickets in the Natural History Museum, she said it was the first monograph that had been published on a single species.

Then in 2011, I noticed subtle changes. These were changes that only I could detect, having walked the reserve many times daily for more than 5 years. The orb web spider had disappeared from its position between the hedge and the fence, there were fewer moths and fewer ladybirds.
By 2013 I knew there was something seriously wrong. Glyphosate-based herbicides (GBH) were being sprayed on Japanese Knotweed in the valley below us and we were pretty certain they were responsible.

But we had to have proof. In August 2013, we sent samples of river water from areas that had been sprayed with GBH and tap water to the Veterinary University at Leipzig. The level of glyphosate in tap water was 30 ppt. On 18 September 2013 our then Assembly member, Edwina Hart had received a letter from Richard Staton, Head of the Parks Department Re: Glyphosate (Roundup) usage and its potential dangers to human health confirming that they used glyphosate-based products. That it was one of many herbicides approved by DEFRA and until they had a letter from the Health and Safety instructing them otherwise they would continue to use it. He said they didn't have the manpower and resources to remove the invasive weed manually. He suggested that we raised the matter with DEFRA and HSE.

We repeated the analysis a year later in August 2014. The concentrations of glyphosate in tap water had increased ten-fold from 30 ppt to 300 ppt. These were the orders of concentrations of glyphosate that in the laboratory promoted the growth of breast cancer cells.

Between February 2014 and October 2017, I wrote to HSE and DEFRA to ask them to contact the Council and request them to stop spraying GBH because it was poisoning our nature reserve, but they refused to do so. They argued that GBH were still legal. The number of insects in our nature

reserve continued to decline. In 2019, the few butterflies that remained flew around aimlessly not knowing which flowers to take nectar from. They appeared to be brain damaged.

Roundup was introduced in 1975: Japanese Knotweed became Roundup-resistant in the 1980s
Monsanto was invited by the Westminster Government in 1949 to set up a factory in Newport, Wales, to manufacture chemicals for use in engineering and agriculture.

In 1975, Monsanto's test bed for its flagship herbicide Roundup was in Swansea, former centre of the mining industry where Japanese Knotweed grows freely in disturbed soil. Herbicides have turned weeds into invasive weeds. Japanese knotweed *Reynoutrie japonica* (syn. *Polygonum cuspidatum*) was introduced into Europe in the mid-16th Century by an amateur botanist from the Netherlands, Van Reynoutrie (syn: Karel van Sint Omaars). The myth that it was brought in by the Victorians in the late 19th Century, as stated by BBC Wales, has been deliberately spread (presumably by the pesticides industry). For about 500 years it appears to have caused minimal trouble, until the introduction of chemical herbicides in the early 1900s. However, even in the 1969 edition of the Marshall Cavendish Illustrated *Encyclopedia of Gardening*, knotweed was still being recommended as a suitable plant for gardens. In fact, with regard to the compact variety: "*It is the most desirable garden form having received the RHS's Award of Merit*." A member of the Balsam species *Impatiens royalei* (syn: *I glandulifera*) that was similarly recommended for garden cultivation has also become a monster on waste ground in urban situations.

Japanese Knotweed began to become Roundup-Resistant in the 1980s. **That means it cannot be killed however much chemical is applied**. But Roundup sprayed each month poisons insects, birds that are dependent on insects to raise their young, and mammals. It also damages human health.

The areas surrounding our small nature reserve in Wales are not the only areas that have become biological deserts. There have been apocalyptic declines in global wildlife, presumably because Roundup has been sprayed on farmland, waterways and cities around the world. Areas of farmland in the US growing Roundup-Ready Corn and Soy have become biological deserts with few insects.

Roundup is the most used herbicide in the world. Global Chemicals Outlook II published in 2018 found that glyphosate was No 1 of the top 10 products by volume sprayed on major crops between 1968 and 2016 in the US and its use was increasing.

Helsinki 15 March 2017 The European Chemicals Agency (ECHA) Committee for Risk Assessment (RAC) agrees to maintain the current harmonised classification of glyphosate as a substance causing serious eye damage and being toxic to aquatic life with long-lasting effects.
RAC concluded that the available scientific evidence did not meet the criteria to classify glyphosate as a carcinogen, as a mutagen or as toxic for reproduction.
The committee concluded that the scientific evidence available at the moment warrants the following classifications for glyphosate according to the CLP Regulation:

- Eye Damage 1; H318 (Causes serious eye damage)
- Aquatic Chronic 2; H411 (Toxic to aquatic life with long lasting effects)

https://echa.europa.eu/-/glyphosate-not-classified-as-a-carcinogen-by-echa

Almost 35,000 people at risk of permanent sight loss are waiting too long for eye care, according to new statistics from the Welsh Government
In Wales, 35,000 patients are at risk of going blind from macular degeneration and glaucoma while on the waiting list. *"It has introduced a new target aimed at prioritising the most urgent patients and preventing those with treatable conditions losing their sight. The figures mean almost 35% of all patients in the highest risk category waited longer than the target time. No health board met the*

target to see 95% of the most serious cases on time. The worst-performing health board was Cardiff and the Vale where 48.6% of patients at risk of irreversible sight loss waited longer."
https://www.bbc.co.uk/news/uk-wales-48585767

ECHA classifies glyphosate as a substance that is toxic to aquatic life with long lasting effects
Lesley Griffiths, Minister for the Environment, Energy and Rural Affairs in Wales backs ByeLaws to protect declining salmon and sea trout stocks at the Local Inquiry published on 16 July 2019.
"*It is clear to see, from the Report, the depth of feeling and passion on both sides of the debate and to see there is common ground between Natural Resources Wales (NRW) and objectors that salmon and sea trout stocks in Wales are suffering an ongoing decline. It is, therefore, generally agreed there is a problem. It is also accepted stock levels must not fall to unsafe levels and should be increased as a matter of urgency. The report recognises many anglers already operate voluntary catch and release and, therefore, the Byelaws will not have an impact on them… The effects of agricultural pollution have a significant impact on the mortality of these stocks. I intend to bring into force regulations to tackle agricultural pollution in January 2020, aligning with the introduction of the Byelaws."*

https://gov.wales/written-statement-outcome-local-inquiry-natural-resources-wales-proposed-all-wales-salmon-and-sea

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