

Report of the Director of Place to the meeting of Regeneration and Environment Overview and Scrutiny Committee to be held on 31st January 2023

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Subject:

Report on the use of Glyphosate for weed control within Bradford Metropolitan District Council.

Summary statement:

This report presents information on the current use of glyphosate as the main form of weed control used within the Council and the implications and around reducing or stopping the use of the glyphosate.

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Portfolio: Health People and Places

**Overview & Scrutiny Area: Regeneration
and Environment**

1. SUMMARY

This report provides an update on the current situation with the use of the herbicide glyphosate as the primary method of weed control by the Council within the District and the potential alternative solutions and implications of reducing or stopping the use of glyphosate.

2. BACKGROUND

- 2.1 There is a widespread concern about the use of the chemical glyphosate found in sprays designed to help control weeds. Whilst glyphosate is still a legal product, it is possible the chemical will be banned in the near future ever since in 2015 the World Health Organisation research identified glyphosate “*as a probable human carcinogen*”. Since this time research has also revealed wide-ranging adverse environmental effects of glyphosate use on habitats and species.

In 2017 the European Union granted a 5-year extension for the use of glyphosate which expired in 15th December 2022. The decision upon the use of glyphosate was extended for a further year to December 2023, as the EU is currently assessing an 11,000-page research report prior to making a decision on the future of glyphosate. Most similar EU reports are around half that size, underlining the complexity and lack of certainty this issue currently presents decision-makers at all levels.

When the UK left the European Union, all EU laws were enshrined in UK legislation to ensure continuity during the transition. The only applicable change from EU legislation appears under The Plant Protection Products (Miscellaneous Amendments) (EU Exit) Regulations 2019, where it states that active substances which were due to expire in the EU within 3 years of the end of the transition period will be granted a 3-year extension for Great Britain. As a result, the use of glyphosate is permitted until 15th December 2025. The expiration date is important as it requires a formal decision to be made by the government to extend use of glyphosate, or by default the chemical is longer permitted for use.

The reason why the research and decision on glyphosate has become so important not only lies with the potential health risk and environmental risks, but because it remains the last proven chemical spray on the market for use in municipal weed control that hasn't been banned.

In 2019 Bayer AG (the parent group that hold the patent for glyphosate) announced it was committing \$5.6 billion to finding an alternative to Round-Up the most famous of the glyphosate based products; however, estimates for a replacement being discovered and brought to market vary between 5-15 years with weight of opinion being more likely to be at the top end.

This does suggest that without a government extension to the licence for glyphosate, spraying as a form of weed control will no longer be viable as of December 2025.

- 2.2 The Environment Act 2021 included an amendment to the general duty on public bodies, contained in the Natural Environment Rural Communities Act 2006, to

conserve biodiversity. This general duty on public bodies is now to “conserve and enhance” biodiversity. As such the council is required to consider how it could avoid adverse impacts and protect and enhance biodiversity.

The NERC Act 2006 is amended to:

40(A1) For the purposes of this section “the general biodiversity objective” is the conservation and enhancement of biodiversity in England through the exercise of functions in relation to England.

(1) A public authority which has any functions exercisable in relation to England must from time to time consider what action the authority can properly take, consistently with the proper exercise of its functions, to further the general biodiversity objective.

(1A) After that consideration the authority must (unless it concludes there is no new action it can properly take)—

(a) determine such policies and specific objectives as it considers appropriate for taking action to further the general biodiversity objective, and

(b) take such action as it considers appropriate, in the light of those policies and objectives, to further that objective.

(1B) The requirements of subsection (1A) (a) may be satisfied (to any extent) by revising any existing policies and specific objectives for taking action to further the general biodiversity objective.

2.3 A detailed explanation of the impact of glyphosate upon biodiversity has been provided in Appendix 1.

3. REPORT ISSUES

3.1 Weeds in the Environment

In a rural and urban environments native weed growth provides food and shelter for insect pollinators such as bumble bees and other species, enhancing biodiversity and supporting ecosystem services. In urban settings weed growth maybe the only available food resource for bees and pollinators. However, in an urban environment the presence of weeds can also cause problems for infrastructure

- damages highways surfaces
- increases trip/slip hazards
- creates litter-traps and hinder litter collection
- encourages detritus accumulations and impede surface-water drainage
- be aesthetically unappealing to some residents and visitors

In both the urban and rural environment the presence of Invasive Non-Native Species (INNS) such as Japanese knotweed or giant hogweed requires urgent targeted action to control and eradicate it where possible. Glyphosate is a useful tool for the management of INNS.

3.2 Current use of Glyphosate

Currently the Parks and Cleansing Service employ a contractor who provides three sprays per year to the public highway network. This spraying regime uses specialist

equipment that only targets actual weed growth rather than blanket spraying of the highway surface. This means only a few droplets are applied to the target plant and minimise the volume of spray used which provides both environmental and cost benefits. The contractor ensures their staff meet all legal requirements for using a glyphosate, and that the staff know when and where it is suitable to spray.

Parks and Cleansing staff have been trained to use glyphosate-based sprays for work on both the public highway, in parks and other land maintained by the Parks and Cleansing Service. Again staff are trained to utilise the sprays in the safest manner for both themselves and the public, and spraying is targeted at actual weed-growth as opposed to blanket coverage.

Hard surfaces within parks are sprayed with glyphosate twice a year. Soft or permeable surfaces are sprayed using another product that is not glyphosate based. Where possible, there has been an effort to reduce the use of glyphosate on land maintained by Parks staff using localised operational decisions. Note that these alternative sprays cannot be used on hard surfaces as they are not licensed for such use.

3.3 Changes in Demand

Historically weed control has been more effective when legacy weed sprays have been used. These provided longer-term weed control as residual concentrations helped suppress future weeds as well as any growth present at the time of spraying. After these sprays were banned due to evidence of causing water pollution and harm to human and animal life glyphosate based weed killers remains the only municipal spray left on the market.

Glyphosate-based sprays kill weeds that are currently present but have little to no long-term weed suppression effect which means that increased weed growth will occur except where the frequency of spraying has been increased.

It has been noticeable over the past decade how the visibility of weeds as an issue on public highways has increased, though this may not all be down to the shift from legacy sprays to glyphosate-based sprays.

The reduction in mechanical sweeping resources may well have also contributed to the increased prevalence of weeds as mechanical sweeping both removes detritus, which allows weeds a medium in which to grow, as well as scrubbing any weed growth emerging from cracks in the highway surface. The use of flags, setts or other stones for highway surfaces is often preferred for cosmetic reasons, however they do require much more maintenance with regards weed control. The examples in Appendix 2 show no detritus present, but weed growth has become established in the cracks that are common place in these types of surfaces.

Changes in climate has also provided optimal conditions for weed growth. The data shown in Appendix 3 is based on 20-year rolling average of data collected by the Met Office from the station in Bradford. This data shows that the district is experiencing:

- An upward trend in maximum temperatures being recorded

- An upward trend in the number of 'sunshine hours' recorded
- Fairly consistent levels of rainfall
- A downward trend in the number of air-frost days recorded

Prolonged volumes of stronger sunlight, increased temperatures and adequate rainfall are all beneficial for most plant growth. The reduced incidents of prolonged air-frost suggest that weeds are less likely to be experiencing four-or-more consecutive days of sub-zero temperatures that can help destroy the root structures and prevent regrowth the following year.

There is no data to attribute the weight of impact any of these issues have had upon current levels of weed growth evident within the district, however they are all likely contributors to the pressure upon the service to deliver some form of weed control solution. Measuring complaints isn't particularly effective as the pattern is one of fluctuation however in 2019/20, the last full year of surveying carried out, the results were:

- 4.3% of sampled streets completely free of weeds
- 6.7% of sampled streets failing on weeds
- 88.3% of sampled streets with an acceptable level of weed presence

Whilst that those results are relatively good, the concern is around how fine the margins are between a street with 'acceptable' level of weed control and one that is failing i.e. a street where there is established weed growth turning into one where it is abundant.

3.4 Alternative Methodologies

The debate around glyphosate has been monitored by the Parks and Cleansing Service over many years' now, and there is no objection to using alternative methods, however the service has so far failed to find a solution that delivers similar levels of control without a significant increase in cost, leaving the use of glyphosate as the only practical option on the table.

Exploring contacts within the industry as well as via networking organisations like APSE (Association for Public Service Excellence), the service has found no strong advocates for any of the alternative solutions. Several authorities have trialled different techniques but haven't switched over often citing costs or lack of effectiveness as significant obstacles in moving away from glyphosate. Enquiries about whether any other authorities are using alternative treatments often feature in relevant forums indicating the general uncertainty within the industry.

Without conducting local trials within the district it isn't possible to establish the cost implications for each of the alternative methodologies such as:

- Hot water / foam treatment
- Flame treatment
- Acetic acid treatment

These treatments have other potential impacts due to the use of large amounts of gas / diesel for heating and the increased frequencies of treatment required to

deliver a similar level of control, based on industry feedback on lower effectiveness levels. The Parks and Cleansing service is aware of two authorities within the Yorkshire and Humber region that switched to alternative methods of weed control but have recently reverted back to glyphosate-based sprays to some extent, highlighting the difficulty in making this transition,

In the case of manual weed removal, a basic level of service could be delivered with one team per Area Constituency which would equate to a service operating budget of approximately £400,000 compared to the existing budget of approximately £150,000. The use of manual 'grubbing out' is labour intensive and strenuous work which would require detailed risk assessments to ensure how sustainable it is for long-term employee well-being, and it may be necessary to provide these teams with small machinery that can reduce the risk of developing long term health issues.

Some municipalities in Europe have experimented with the idea of letting weeds grow unaddressed as part of a wider biodiversity project. This is an solution that requires a plan driven by biodiversity specialists and expertise from several different services as it would affect highway design, cleansing policy, planning services etc and would require a policy to support what the districts urban environment will look like if this solution is adopted. This would lead to a significant increase in complaints as people 'adjusted' to a new normal of weed growth and it would also increase the costs of resurfacing etc as the weeds would start to lift pavement edges etc.

3.5 Other Local Authorities

Benchmarking and enquiries to date have not established any clear success stories amongst other authorities moving away from glyphosate. Many have carried out trials and reported either poor performance or excessive costs as barriers to permanent adoption of alternative treatments; some authorities that did stop using glyphosate have indicated that they have had to reintroduce the use of glyphosate to some extent.

The Parks and Cleansing service plans to make further contact with some of the responding local authorities that have introduced reduced-use policies, to establish if there any practices that could be adopted.

3.6 Insecticides and Fungicides

The Parks and Cleansing service do not use any insecticides at all. The use of fungicides is limited to specific outbreaks that require targeted action; there is no other use of fungicides. Occasionally a herbicide targeting moss is used on stone work, though the preferred and most common method of treatment is jet-washing.

4. FINANCIAL & RESOURCE APPRAISAL

- 4.1 There is a direct financial consequence of adopting another form of weed control either at the current time, if a council decision is made, or in December 2025 when there may well be no extension granted to glyphosate as a permitted form of weed control.

All alternative treatments are likely to be considerably more expensive than the use of glyphosate, primarily because of the need to visit sites at a higher frequency to deliver a similar level of control, or to cover the investments in machinery, labour and consumables such as heating and water.

Precise costings for alternatives would require specific trialling and a commitment as to what level of control is desired by the council which could provide a check for the specification.

The solution of no weed control measures will see a saving of around £150,000 p/a, however long term impacts on highways infrastructure and slips-and-trips claims are likely to prove significant though this may not manifest itself in the short term until weed growth becomes more established. In the longer term it is highly likely that this will see a considerable increase in highways maintenance costs, outweighing the short term saving by ending all weed control.

- 4.2 There are many research papers that show the adverse effects glyphosate, it's metabolites and co-formulants have on habitats and species. These habitats and species contribute to the ecosystem services the natural environment provides such as carbon sequestration, flood water management and pollination.

Detailed information about the value of these ecosystem services within Bradford has not been calculated and quantifying the financial cost of depletion of these services resulting from glyphosate use would be complex. However, any assessment of cost implications should take into account the substantial investment that is being made to increase carbon sequestration through tree planting and habitat improvements on our peatland habitats; natural flood management through habitat improvement and soil restoration and creation of wildflower meadows and other wildflower areas to support pollinators such as bumble bees (which are priority species in Bradford). Continued use of glyphosate is likely to be undermining these efforts to improve ecosystem services.

5. RISK MANAGEMENT AND GOVERNANCE ISSUES

- 5.1 As glyphosate is currently deemed a '*probable carcinogen*' there is potentially a risk to the health to staff or occupants of the district. The extent of this risk is subject to wide international debate as outlined at the beginning of this document.

The council adheres to the strict training and guidance around the use of glyphosate to ensure that, like all chemicals used within the organisation, they are used only where needed and with health and safety being of the utmost importance.

We are becoming increasingly aware of the adverse effects of glyphosate on biodiversity and the services a healthy environment provides to citizens and industry. Research is revealing the extent of the environmental impacts, previously unknown or overlooked. Continued use therefore is associated with environmental risks.

- 5.2 The council is currently tendering for a weed control contract; the process closes on

23rd January and enters the evaluation period. Once awarded the council will be tied in to a minimum 2-year contract with options to extend if both desired and permissible.

6. LEGAL APPRAISAL

- 6.1 All products containing glyphosate have previously had to be registered and approved by the European Pesticides Commission having been subjected to a rigorous scrutiny process. From 1 January 2021, an independent pesticides regulatory regime is in operation and new decisions taken under the EU regime will not apply in Great Britain, with the Health and Safety Executive (HSE) the national regulator for the whole of the UK.
- 6.2 Authorised use of glyphosate has a current EU expiry date of 15 December 2022, but the legislation introduced post-Brexit means active substance (glyphosate) approvals due to expire before December 2023 now allows extension for 3 years to allow time to plan and implement the GB review programme. The Plant Protection Products (Miscellaneous Amendments) (EU Exit) Regulations 2019, invokes a 3-year extension where active substances were due to expire in the EU within 3 years of the end of the transition period. The extension authorises use of glyphosate until December 2025, unless the Health and Safety Executive exercises its power to review this approval at any time, should new evidence identify any concerns to human health or the environment.
- 6.3 Irrespective of which weed control methodology is adopted, the council has a duty of care to the public, including ensuring weeds do not pose a hazard or impede use by any sector of society. The council and its contractors must comply with current legislation in the use of herbicides. Any change to processes and procedures must ensure that a review is undertaken of the agreements in place with relevant contractors responsible for the maintenance of public spaces.

7. OTHER IMPLICATIONS

7.1 SUSTAINABILITY IMPLICATIONS

- 7.1.1 The continued use of glyphosate may be unsustainable; it is a '*probable carcinogen*' and its use within Great Britain will end in December 2025 without any government intervention to extend its use. This means that it is highly probable that the Council needs to look to an alternative method within the next 3 years if no definitive decision is made before that date.
- 7.1.2 A separate annex has been provided to this report specifically addressing the subject of biodiversity in detail.

7.2 GREENHOUSE GAS EMISSIONS IMPACTS

- 7.2.1 Cessation of spraying with no alternative control method put in place may see a small reduction in greenhouse gas emissions based on less travelling by the contractor; however almost all forms of alternative treatments will require more staff and a higher frequency of treatment seeing a net increase in travelling throughout the district. The main alternative treatments also come with their own environmental

concerns:

- one of the alternative treatments requires heating of large volumes of water on site using a gas/diesel generator which would increase the greenhouse gas emissions significantly
- another alternative treatment uses flame to kill the weeds and requires the use of portable gas cylinders
- manual removal will require increased number of vehicles and staff to be working across the district, though this could possibly be mitigated by purchasing electric vehicles as these teams may not need to carry heavier payloads

7.2.2 Use of glyphosate is associated with ecological changes which reduce the ability of plants, fungi, micro-organisms and the habitats they function within to store carbon. So to some extent, glyphosate use undermines efforts to reduce emissions.

7.3 COMMUNITY SAFETY IMPLICATIONS

7.3.1 The international debate about the use of glyphosate is driven by the concerns to its risk to humans in particular, therefore its use does have potential community safety implications. Whilst the product remains in use by the Council and its contractor, all legal guidelines around its use are upheld.

7.3.2 Whilst unlikely there is a risk to cessation of spraying, where members of the public may start to treat the highways outside their house with domestic weed killers that are often glyphosate-based and such use will be by people who have not received the training in how to minimise use or understand the risks about use of chemicals in a public space.

7.4 HUMAN RIGHTS ACT

7.4.1 None specific

7.5 TRADE UNION

7.5.1 Staff using glyphosate are fully trained and certified in two nationally defined qualifications and the specific procedures that cover the use of the relevant chemicals and equipment.

7.5.2 Changes to policy or method may require revision of procedures and training for staff, particularly where manual removal becomes the main form of weed control as its highly intensive work that increases the risk of long term injury to staff.

7.6 WARD IMPLICATIONS

7.6.1 The current use of glyphosate affects all Wards in the district, change in future policy would need to be an executive decision.

7.7 AREA COMMITTEE ACTION PLAN IMPLICATIONS

7.7.1 Area Committees could decide upon local actions upon this issue, but weed control

outside of parks is delivered via a district wide sub-contract.

7.8 IMPLICATIONS FOR CHILDREN AND YOUNG PEOPLE

7.8.1 None specific

7.9 ISSUES ARISING FROM PRIVACY IMPACT ASSESMENT

7.9.1 None specific

8. NOT FOR PUBLICATION DOCUMENTS

8.1 None specific

9. OPTIONS

9.1 Solution 1 - Cessation of glyphosate spraying and no resourcing of alternative method

The cessation of all spraying with no resourcing for alternative methods will see the proliferation of weeds on the public highway:

- potentially increasing local biodiversity
- saving of an estimated £150,000 on external contractor and internal consumables
- split public opinion on visual amenity
- potentially increased slips-and-trips claims
- longer-term impact on highways infrastructure maintenance budgets
- exception made for use on controlling non-native invasive species e.g. Japanese Knotweed and sports pitches where necessary
- a likely increase in complaints about weed growth on pavements in urban areas

The impact on Parks will be less significant than on the public highways as parks are mainly soft surfaces where some form of weed-growth is normal and can be maintained by strimming or manual grubbing out however it may mean that staff that operate within parks may need to spend a greater proportion of their time on weed control rather than other duties.

9.2 Solution 2 – Reduced usage of glyphosate

Accepting there is no immediate like-for-like solution, but a requirement for some form of weed control remains in place:

- The service can work with officers working on biodiversity issues on identifying critical public highway locations where spraying needs to be avoided
- A trial involving no use (or exceptional use) of glyphosate within 2 parks within the Shipley ward is planned for 2023
- Cessation (or very limited use) use on land managed by Parks, Bereavement Services and other Council services maintaining land

- Provide a future report with both estimated costings of adopting alternative methods and feedback from sites where the use of glyphosate has been discontinued

9.3 Solution 3 – Reduced usage of glyphosate and commissioning of trials for alternative methods of weed control

Similar to Solution 2 but with the commissioning of trials of alternative treatments, this would require the provision of a one-off budget to cover the costs of external contractors providing the treatments.

- The service can work with officers working on biodiversity issues on identifying critical public highway locations where spraying needs to be avoided
- A trial involving no use (or exceptional use) of glyphosate within 2 parks within the Shipley ward is planned for 2023
- Cessation (or very limited use) use on land managed by Parks, Bereavement Services and other Council services maintaining land
- Commissioning some trials to evaluate effectiveness of alternative weed control methods here on streets within the district
- Provide a future report with both costings of adopting alternative methods and feedback from sites where the use of glyphosate has been discontinued

9.4 Solution 4 – Cessation of glyphosate spraying and adoption of alternative weed control

Without extensive trialling to establish costings and an understanding of effectiveness the only form of alternative weed control that could be adopted is manual removal.

- Cessation of use on public highways, parks and any land managed by council services and their contractors
- Increased funding to provide five Area teams (15 staff and 5 vehicles) to carry out manual weed removal (minimum £400,000 p/a)
- Recover savings from weed spraying of estimated £150,000 p/a
- exception made for use on controlling non-native invasive species e.g. Japanese Knotweed and sports pitches where necessary
- Provide a future report with an update as to how the new process is working

This solution is unbudgeted and if selected, would need additional financial commitment before it could be implemented.

9.5 Solution 5 – Allowing weed growth within the urban environment as part of a specific biodiversity policy

Moving decisions about weed control from an operational delivery service into a wider biodiversity policy that provides a joined-up approach to:

- Planning
- highways design and maintenance
- estate management
- public-demand management.

This would require a change in emphasis and priorities for all services involved and there may be cost implications to this.

10. RECOMMENDATIONS

- 10.1 In light of the demand for weed removal, the risks of no control on Highways budgets and no viable solutions without significantly increased budgets the service is recommending Solution 2 which will see a reduction in the usage of glyphosate, primarily by avoiding those areas of highest environmental sensitivity, whilst allowing for some form of weed control on the rest of the highway network.

11. APPENDICES

- 11.1 Appendix 1 – Explanation of Glyphosates Impact on Biodiversity
- 11.2 Appendix 2 – Examples of weed growth where no detritus is present
- 11.3 Appendix 3 - 20 year rolling averages of Met office Data (Bradford station)

12. BACKGROUND DOCUMENTS

- 12.1 None

Appendix 1 – Detailed Impacts of Glyphosate on Biodiversity

Provided by David Campbell, Biodiversity Officer, Department of Place

Legislative Background

The Environment Act 2021 included an amendment to the general duty on public bodies, contained in the Natural Environment Rural Communities Act 2006, to conserve biodiversity. This general duty on public bodies is now to “conserve and enhance” biodiversity.

The NERC Act 2006 is amended to:

40(A1) For the purposes of this section “the general biodiversity objective” is the conservation and enhancement of biodiversity in England through the exercise of functions in relation to England.

(1) A public authority which has any functions exercisable in relation to England must from time to time consider what action the authority can properly take, consistently with the proper exercise of its functions, to further the general biodiversity objective.

(1A) After that consideration the authority must (unless it concludes there is no new action it can properly take)—

(a) determine such policies and specific objectives as it considers appropriate for taking action to further the general biodiversity objective, and

(b) take such action as it considers appropriate, in the light of those policies and objectives, to further that objective.

(1B) The requirements of subsection (1A)(a) may be satisfied (to any extent) by revising any existing policies and specific objectives for taking action to further the general biodiversity objective.

As such, just over a year since the assent of the Environment Act resulted in this amendment, it is a good time to assess Bradford MDC’s use of glyphosate-based herbicides.

Introduction

Glyphosate is widely used for managing undesirable plants (“weeds” – a plant in the wrong place) in agriculture and in public spaces and gardens. It is used in conservation to eliminate robust undesirable plants which dominate habitats where less robust plant species are desired, so it is often used to prepare lands and soils prior to the creation of wildflower meadows. It is also used to remove Invasive Non-Native Species (INNS) such as Japanese knotweed and giant hogweed (both of which occur in the Bradford District).

The popularity of glyphosate is based on the understanding that it inhibits a biochemical process present in plants that is not present in animals. It is also known to be broken down by naturally occurring organisms and adsorbed to (attached to) soil particles, reducing its ability to move out of the treated area and into the wider environment. As such it is considered to be a relatively safe chemical for weed and habitat management.

However, increasing amounts of data now exists which shows that glyphosate and the other chemicals used in products such as Roundup have adverse effects on animals; that metabolites (products made by the breakdown of glyphosate by organisms in the environment) can have equally severe adverse effects on micro-organisms and higher organisms such as mammals, fish, earthworms and pollinators such as honey and bumbles bees (a Bradford Biodiversity Action Plan group of species)¹. It has also become evident that its persistence in soils and water allows it to be freed back into the wider environment from the original treatment location. The effect of glyphosate, to remove weeds also has effects on ecosystems, reducing food abundance for animals, increasing nutrients and altering species composition and diversity.

Biodiversity Emergency and Species Loss

The UK is one of the most nature depleted countries in the world. The 2019 State of Nature Report² highlighted that 41% of UK species had declined due to continued clearance of land for development, agricultural intensification and climate change. Declines of invertebrate abundance across Europe and North America are likely in excess of 75% in protected areas³. Large areas of habitats have been lost with 99.7% of fens, 97% of species-rich grasslands, 80% of lowland heathlands, up to 70% of ancient woodlands and up to 85% of saltmarshes destroyed or degraded⁴. These declines are catastrophic in their own right but also represent a threat to human society and economies as the ecosystem services or natural capital they provided is essential to food production and the maintenance of human standards of living.

Natural Capital and Ecosystem Services

The following is taken from the UK Parliamentary Officer for Science and Technology POSTNOTE 619 March 2020 UK Insect Decline and Extinctions⁵:

“The economic value of pollination to UK crop production is approximately £500 million a year. Dung beetles are estimated to be saving the UK cattle industry £367 million each year and £37.42 per cow through reducing flies and increasing nutrients in the soil. Natural pest control (by ground beetles and parasitoid wasps) of widespread aphid pests is worth up to £2.3 million per year in South East England wheat fields alone. Freshwater insects in their larval stage, such as dragonflies or mayflies, can also filter water, remove pollutants and provide food for bats, birds and fish (such as salmon and trout). These are services on which economic research has been done, many more are yet to be measured and assessed.”

Whilst the direct and indirect impacts of glyphosate use can have adverse effects on habitats and ecosystems themselves, there is also potential for the ecosystem services, such as pollination, natural flood management and carbon capture to be adversely affected by the presence of glyphosate in the environment.

¹ K. Gandhi, S. Khan, M. Patrikar et al. 2021. Exposure risk and environmental impacts of glyphosate: Highlights on the toxicity of herbicide co-formulants. Environmental Challenges 4 (2021)

² <http://www.nbn.org.uk/stateofnature2019>

³ : Hallmann CA, Sorg M, Jongejans E, Siepel H, Hofland N, Schwan H, et al. (2017) More than 75 percent decline over 27 years in total flying insect biomass in protected areas. PLoS ONE 12 (10): e0185809

⁴ Environment Agency, Chief Scientist’s Group. (2022). Working with nature.

⁵ <https://post.parliament.uk/research-briefings/post-pn-0619/>

Whilst the extent of this impact within Bradford District has not been calculated, these ecosystem services are intrinsic elements of life in Bradford District and provide protection from negative impacts on residents and property and are essential elements of agriculture and other industries with social and economic benefits.

In comparison with other pesticides, glyphosate and the products it is used in are currently understood to generate lower adverse environmental effects however, the extensive use and sheer quantities used increases the abundance in the environment and therefore increases their potential for and severity of adverse effects on biodiversity.

Ecological Effects of Glyphosate Use in Bradford District

Whilst the majority of scientific studies focus on agricultural use of glyphosate, where it is used in quantity to treat large areas of arable land, use in Bradford by City of Bradford MDC is likely to cause similar effects on a smaller scale but will result in an overall increase in glyphosate, the chemicals it is combined with and the chemicals it is broken down to, in the environment.

Glyphosate and its metabolite AMPA (Aminomethylphosphonic acid) can be found in honey, soy sauce, cereals, wine and fruit juice as a result of agricultural use. So any additional glyphosate we spray will add to the environmental, wildlife and human levels of exposure. Glyphosate and its side effects have become a major concern due to widespread use and its concentration in edible products⁶.

Urban and Suburban Environment

As well as use for agriculture and urban and suburban street weed management glyphosate products are available to the public in products such as Roundup and can be used in uncontrolled and unmonitored quantities, increasing the amount of glyphosate, the chemicals it is combined with and the chemicals it breaks down into in the environment, where the risk of interaction with valuable habitats and species is increased.

One direct impact of glyphosate use in urban settings is a result of the intended effect: the removal of flowering plants which, in this setting are often referred to as weeds. Whilst they may often be undesirable in an urban setting these plants provide a valuable resource for pollinating insects often in places without many other sources of food. Whilst food availability for pollinators in urban settings is reduced, these habitats do still have a valuable role to play in wildlife conservation, particularly for bee species.⁷ So with the biodiversity duty of public bodies in mind, it is pursuant on the local authority to consider its use of a pesticide in relation to its likely adverse effect in urban habitats.

The adverse effects of glyphosate on pollinators have been shown by studies such as Motta, E. V. S., Raymann, K., and Moran N. A.. Glyphosate perturbs the gut microbiota of honey bees. PNAS (Proceedings of the National Academy of Sciences). October 9, 2018. vol. 115, no. 41, 10305 – 10310. This study found that while glyphosate does not act directly on honey bees, its main pathway of effect can act on the microbes present in

⁶ Tarazona, J.V., Court-Marques, D., Tiramani, M., Reich, H., Pfeil, R., Istace, F., Crivellente, F., 2017. Glyphosate toxicity and carcinogenicity: a review of the scientific basis of the European Union assessment and its differences with IARC. Arch. Toxicol. 91 (8), 2723–2743. doi: 10.1007/s00204-017-1962-5 .

⁷ Baldock, K.C.R., *et al.* 2015 *Where is the UK's pollinator biodiversity? The importance of urban areas for flower-visiting insects.* Proc. R. Soc. B 282: 20142849

honey and bumble bee guts. These microbes were shown to provide protection for bees from disease pathogens and the reduced abundance in the gut of bees exposed to glyphosate, made bees more susceptible to disease and subject to higher levels of mortality than those not exposed to glyphosate. In addition, the study indicates that the depleted gut biota makes bees more susceptible to poor nutrition. One cause of poor nutrition in bees is low food availability which is contributed to by the removal of nectar-bearing plants which is the intended effect of glyphosate use. The absence of nectar-bearing plants is a feature of urban environments and is compounded by the removal of “weeds” for aesthetic purposes.

Spraying with glyphosate has some potential to drift away from the application site, potentially affecting neighbouring sites. This means that the spraying of pavements and roadsides in proximity to ornamental planting beds or parks, gardens or other green space such as woodland or river corridors has the potential to affect bees and other pollinators which are drawn to flowering plants. Whilst, the mode of application; spraying with a wand at close proximity to the target plant does reduce opportunity for drift in the air to occur, glyphosate sprayed on hard surfaces can still be carried to more sensitive areas in surface water run-off.

Use of glyphosate close to flowering plants and where it can enter the soil or groundwater increases the risk that it, its co-formulants or metabolites will come into contact with desirable plant species, invertebrates, fish and other animals in the terrestrial or aquatic environment.

Rural Environment Use and Use in Proximity to Valuable Habitats

The main pathway which may result in contact with non-target habitats, plants and animals is through spraying in proximity when particles are carried on the air or transported through groundwater and surface water away from the target area. This is accentuated in windy and wet conditions.

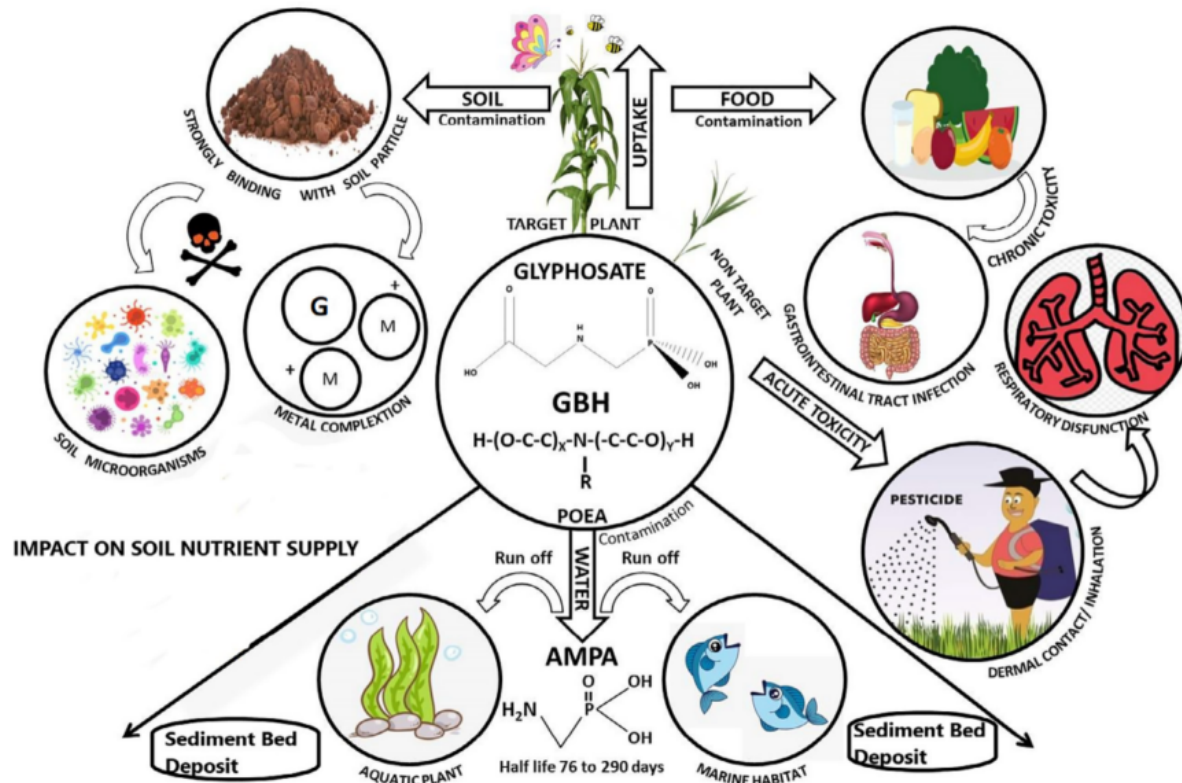
Persistence in soil is dependent on soil condition and oxygen availability, so some of our more valuable Bradford District habitats such as blanket bog (such as those on the South Pennine Moors SAC) and mire (such as at Bingley South Bog SSSI) are more susceptible to adverse effects due to the increased persistence of glyphosate and the increased mobility in wet habitats.

Due to its low persistence and mobility relative to other pesticides, it is often used close to water and is a useful tool for treating INNS such as Japanese knotweed and giant hogweed in these habitats. However, break down is slower in water than in soils due to reduced oxygen and microorganisms in these habitats. This means that there is potential for co-formulants and metabolites from various sources to accumulate in waterbodies where it can result in adverse impacts on fish and amphibians. Treatment of INNS in Bradford is usually carried out by injecting the stems of the plant, reducing the risk of release into the wider environment.

When glyphosate is broken down the resulting compounds have been shown to result in increases of phosphates and nitrates, which can lead to nutrient enrichment altering aquatic and wetland ecosystems, resulting in increased algal blooms. This is a particular risk to valuable habitats in the Bradford District where low nutrient levels are characteristic of the bog and mire habitats.

In rural settings, there are the same risks to habitats and species such as bees from exposure to glyphosate such as in urban habitats.

Figure 1. Shows the fate of glyphosate following application in different settings for various uses



Environmental contamination of glyphosate
 G: Glyphosate, M: Metal ion, GBH: Glyphosate Based Herbicide, POEA: Polyoxyethyleneamine, AMPA: Aminomethylphosphonic acid.

From K. Gandhi, S. Khan, M. Patrikar et al. 2021. Exposure risk and environmental impacts of glyphosate: Highlights on the toxicity of herbicide co-formulants. Environmental Challenges 4 (2021)

Glyphosate use in conservation

Invasive Non-Native Species of plants such as Japanese knotweed and giant hogweed dominate the places they grow to the detriment of native species; they reduce the biodiversity of habitats by excluding other species. They cause damage to property (Japanese knotweed) and are can injure people (giant hogweed). INNS of plants, including the two mentioned here are notoriously difficult to eradicate and prevent the spread of due to the resilience and persistence of their rhizomes (Japanese knotweed) and the effective spread of seeds (giant hogweed).

The adverse ecological effects of glyphosate use to remove these and other species has to be weighed against the adverse ecological effects that these species would cause if untreated or removed by other, less effective means. The main mode of application of glyphosate on INNS is injection. Injecting glyphosate into stems presents a lower risk of spreading glyphosate through air and groundwater.

Summary

It is becoming increasingly clear the widespread and often unmonitored use of glyphosate products is having damaging effects on habitats and species worldwide and in the UK. Bradford District is likely seeing some of these adverse effects on habitats, plants and animal species including bees, other pollinators and fish. Unmitigated use of glyphosate to treat roadside and urban weeds and weeds in parks and other green spaces will contribute to ecological damage of terrestrial and aquatic habitats and species.

The extensive use of glyphosate and its adverse effects on biodiversity will be contributing to the erosion of essential ecosystem services that support human agriculture, health and well-being and the economy. This will be true to some extent within Bradford District. Glyphosate is known to cause increased mortality in honey and bumble bees. Bumble bees are a Biodiversity Action Plan group in Bradford District and with other pollinators provide an essential function.

Glyphosate spraying on roads and footpaths and in green spaces has the potential to alter some of Bradford's most valuable protected habitats in Special Areas of Conservation, Special Protection Areas, Sites of Special Scientific Interest, Local Nature Reserves and Local Wildlife Sites through airborne drift and in surface and groundwater.

Recommendations of the Biodiversity Officer

It is the recommendation of the biodiversity officer that City of Bradford MDC should make efforts to cease the use of glyphosate by the council in most circumstances. The extensive use of glyphosate across the district is liable to be contributing to the continued loss of biodiversity in the district, particularly affecting invertebrate pollinators such as bumblebees.

Considering the extent of glyphosate use for maintenance of public space we understand that there would be difficulties in ceasing use entirely and we would support its continued use as a method for managing Invasive Non-Native Species.

With the above in mind we recommend that glyphosate use is restricted to urban, hard-surfaced areas away from sensitive ecological features, flowerbeds and ornamental planting beds, parks and wildflower areas and hedgerows that attract honey and bumblebees and other pollinators and where glyphosate may enter the soil and come into contact with earthworms. Its use should be restricted in locations close to watercourses and/ or where surface water runoff would carry mobile glyphosate products into watercourses. The exception to this should be in cases where glyphosate can be directly applied by injection to Invasive Non-Native Species as the conservation benefits of use in this situation and the relative low risk of transport of the pesticide mean it would be an overall benefit.

In order to establish the public reaction to a complete moratorium of use by the council for street scene maintenance, pilot areas should be identified. Local residents should be consulted and involved in the pilot and expectations of changes to the street scene, with an increase in weeds, managed and promoted as a positive step for biodiversity and sustainability.

A decision to pro-actively reduce glyphosate use and work with Bradford residents towards

cessation of use across the district aligns with legislative requirements of the Environment Act 2021 and the updated Biodiversity Duty in the NERC Act 2006 as well as Bradford's Clean Growth agenda and would respond to the critical situation we are facing with regards biodiversity loss.

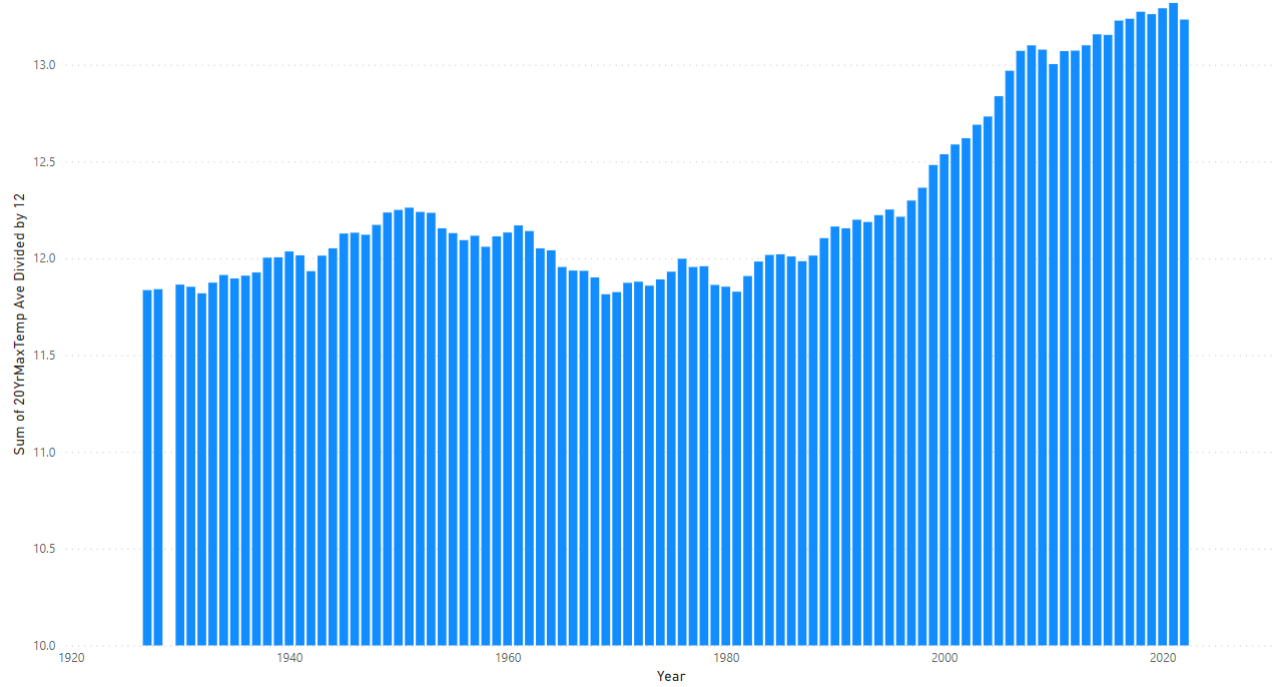
Appendix 2 – Examples of weed growth where no detritus is present



Appendix 3 - 20 year rolling averages of Met office Data (Bradford Station)

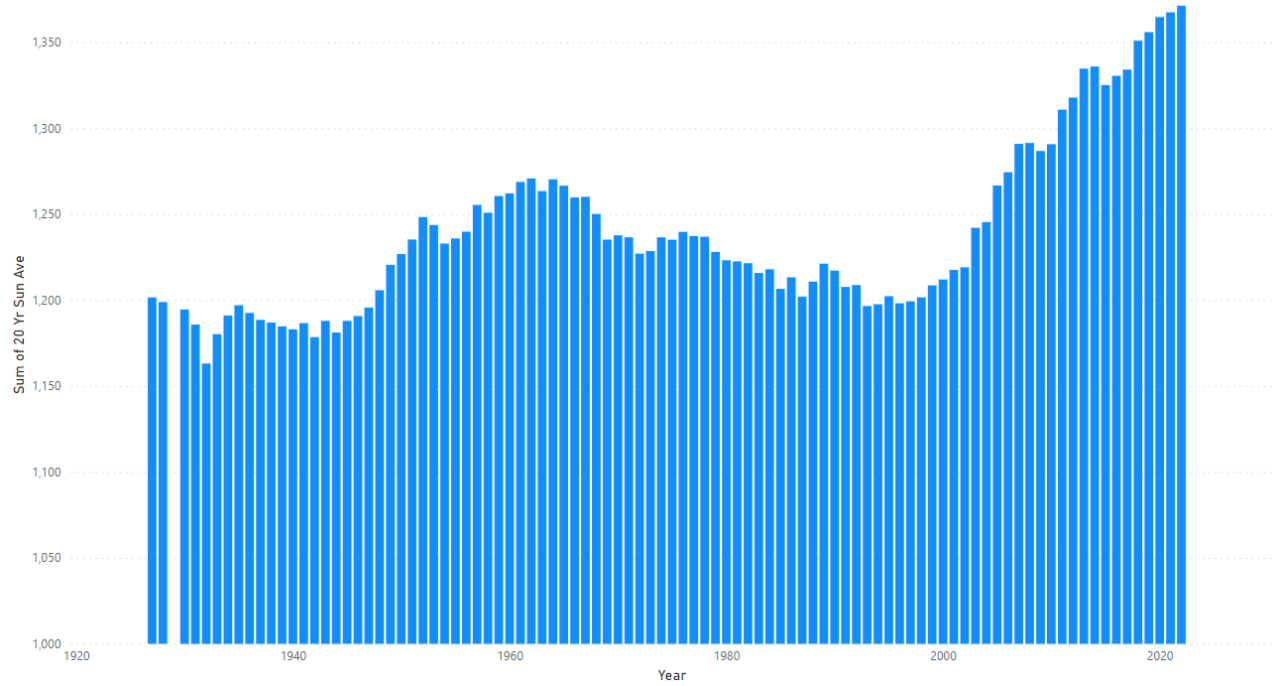
20 Year Rolling Average of Recorded Maximum Temperature Per Year

Monthly Maximum Temperature Expressed as Annual Average - 20 Yr Rolling Average



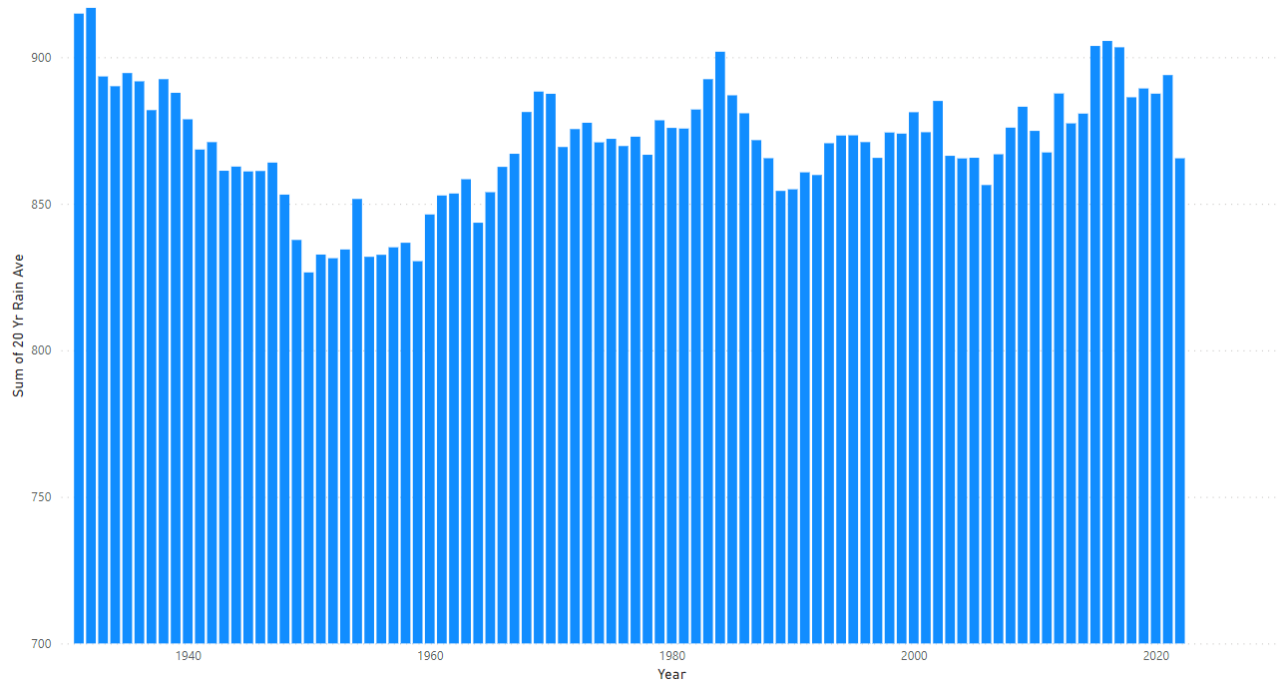
20 Year Rolling Average of Number of Sunlight Hours Recorded Per Year

Annual Sun Hours - 20 Year Rolling Average



20 Year Rolling Average of Total Rainfall Recorded Per Year

Annual Rainfall (mm) - 20 Year Rolling Average



20 Year Rolling Average of Air-frost Days Recorded Per Year

Number of Airfrost Days - 20 Year Rolling Average

