Public Perceptions of Greenspace Management Amongst County Durham Residents: A Report of Empirical Evidence for Durham County Council. Jack Hughes PhD.

Michael Lengieza PhD.





Contents

List of Figures	
List of Tables	4
Summary	5
Introduction	7
Background	8
Biodiversity	9
The Ecological Emergency	
The Problem with Mowing	
Damage to biodiversity	
Reduced climate change mitigation	
Impact on people	
County Greenspace	
Methodology	
Sample	
Survey	
Green Space Definitions	
Subjective Responses	
Mowing Perceptions	
Ecologically Conscious Land Management (ECLM) Preferences	
Concern Importance	
Perceptions of Others' Wilding Support	
Where to Mow	
Demographics	
Additional Comments	
Data Collection and Research Integrity	

Public Perceptions of the Council's Current Practices
Public Opinion on Ecologically Conscious Land Management (ECLM) Practices
Do People Support a Mowing Reduction and a Wilding Increase?
Does Support Differ by Geographic Region or Demographics?
How Accurate are Perceptions About Mowing Frequency?
Broader Perceptions of, and Concerns About, Mowing
What are the Primary Concerns and Perceptions that Predict Mowing/Wilding Preferences?
Perceptions of Mowing
Associations between general ECLM preferences and mowing perceptions (main effects)
Associations between specific ECLM preferences and mowing perceptions (interactions)
Greenspace Concerns
Associations between general ECLM preferences and greenspace concerns (main effects)
Associations between specific ECLM preferences and greenspace concerns (interactions)
Differences between type of greenspace
Differences between type of greenspace
Differences between type of greenspace
Differences between type of greenspace 37 Does the Type of Land Influence How Important People Feel Mowing is? 38 Does the Association Between Mowing Importance and Both Perceptions and Concerns Depend on Land Type? 40
Differences between type of greenspace
Differences between type of greenspace 37 Does the Type of Land Influence How Important People Feel Mowing is? 38 Does the Association Between Mowing Importance and Both Perceptions and Concerns Depend on 40 Greenspace Perceptions by Type of Greenspace 40 The overall association between greenspace perceptions and reported mowing importance (main
Differences between type of greenspace
Differences between type of greenspace
Differences between type of greenspace 37 Does the Type of Land Influence How Important People Feel Mowing is? 38 Does the Association Between Mowing Importance and Both Perceptions and Concerns Depend on 40 Land Type? 40 Greenspace Perceptions by Type of Greenspace 40 The overall association between greenspace perceptions and reported mowing importance (main effects) 40 The unique associations between greenspace perceptions and reported mowing importance for specific land types (interactions) 41
Differences between type of greenspace 37 Does the Type of Land Influence How Important People Feel Mowing is? 38 Does the Association Between Mowing Importance and Both Perceptions and Concerns Depend on 40 Land Type? 40 Greenspace Perceptions by Type of Greenspace 40 The overall association between greenspace perceptions and reported mowing importance (main effects) 40 The unique associations between greenspace perceptions and reported mowing importance for specific land types (interactions) 41 Greenspace Concerns by Type of Greenspace 44
Differences between type of greenspace 37 Does the Type of Land Influence How Important People Feel Mowing is? 38 Does the Association Between Mowing Importance and Both Perceptions and Concerns Depend on 40 Land Type? 40 Greenspace Perceptions by Type of Greenspace 40 The overall association between greenspace perceptions and reported mowing importance (main effects) 40 The unique associations between greenspace perceptions and reported mowing importance for specific land types (interactions) 41 Greenspace Concerns by Type of Greenspace 44 The overall association between greenspace concerns and reported mowing importance (main effects) 44
Differences between type of greenspace 37 Does the Type of Land Influence How Important People Feel Mowing is? 38 Does the Association Between Mowing Importance and Both Perceptions and Concerns Depend on 40 Land Type? 40 Greenspace Perceptions by Type of Greenspace 40 The overall association between greenspace perceptions and reported mowing importance (main effects) 40 The unique associations between greenspace perceptions and reported mowing importance for specific land types (interactions) 41 Greenspace Concerns by Type of Greenspace 44 The overall association between greenspace concerns and reported mowing importance (main effects) 44 The overall association between greenspace concerns and reported mowing importance (main effects) 44
Differences between type of greenspace

Do People's Perceptions of Norms Match the Actual Norm?	48
Descriptive Considerations	49
How are Mown Spaces Perceived?	50
In General	50
Differences between Demographic Groups	50
Differences between areas	50
Differences between genders	50
Differences between ages	50
Differences between levels of education	50
Practical Relevance	51
Levels of Concern	52
In General	52
Differences between Demographic Groups	52
Differences between areas	52
Differences between genders	52
Differences between ages	52
Differences between levels of education	52
Practical Relevance	53
Free Text Responses	54
What do People Say About the Councils Mowing Practices?	55
Conclusions	57
What are the Overall Findings and Conclusions?	58
Recommendations	60
What do the Results of this Report Mean for Durham County Council?	61
References	63

List of Figures

Figure 1. Countries with the highest biodiversity based on the Global Biodiversity Index
Figure 2. Species abundance relative to 1970s levels for priority species within the United Kingdom 10
Figure 3. Comparisons of lawns and meadows
Figure 4. Increases in carbon sequestration in soil as species richness increases in grasslands
Figure 5. Histograms for support for reduced mowing and support for increased wilding
Figure 6. Distribution of responses on the question: Now thinking of the county, how do you feel about
current mowing practices?
Figure 7. Histograms for support for reduced mowing and support for increased wilding
Figure 8. Reported importance to mow different land types
Figure 9. Distribution of responses related to how important people think wilding is personally and how
important they think it is to others

List of Tables

Table 1. Demographic information	17
Table 2. Occupation, qualifications, and income of sample	18
Table 3. Summary of research questions and analyses	25
Table 4. The influence of perceptions of ecological impact on reported mowing importance	41
Table 5. The influence of perceptions of prettiness on reported mowing importance	42
Table 6. The influence of perceptions of desirability on reported mowing importance	43
Table 7. The influence of concerns around eco-friendliness on reported mowing importance	45
Table 8. The influence of concerns around neatness on reported mowing importance	45
Table 9. The influence of concerns around aesthetics on reported mowing importance	46

SUMMARY

Biodiversity is in significant decline in the United Kingdom. This decline is detrimental to the UK economy, wellbeing of UK citizens, presence of nature in the famous UK countryside, and to the aim to reach net zero as a nation. In response to this, Durham County Council declared an ecological emergency in 2022 providing a fresh impetus for a re-evaluation of how the Council uses, maintains, and manages the greenspace under their jurisdiction. One of the potential remedies to declining biodiversity would be to curtail mowing practices for spaces manged by Durham County Council. Such curtailment, however, might be met with scepticism. For example, in the period of April 1st 2023 – March 31st 2024, the Council received complaints about unmown grass from 1404 people, suggesting that there may be serious opposition to any adoption of ecologically conscious land management practices. Yet, this is a sample of unsolicited complaints and, therefore, it is possible that the only individuals who are speaking up are those who have strong opinions. This theory is supported by some research in the field of how people discuss brands and companies which shows a U-shaped distribution with extreme voices significantly overrepresented (Hydock et al., 2020; Schoenmueller et al., 2019). Additionally, there is evidence that people may be more impacted by negative emotions, events, and outcomes, than positive ones (Baumeister et al., 2001). Thus, the research team at Durham University was interested in gaining a more representative view of what the residents of County Durham would like to see when it comes to green spaces. Therefore, the research team sought out to collaborate with Durham County Council on a survey sent to all County Durham residents asking them about their views on mowing and green space practices.

The key findings of this survey were:

- County Durham residents underestimate how much the Council mows.
- County Durham residents were slightly (but significantly) in favour of reducing the amount of mowing in County Durham even despite their subjective underestimations of how much the Council mows.
- County Durham residents were quite in favour of there being more wild spaces in County Durham.
- The two most important factors when considering opinions to increase or decrease mowing were beauty and environment. The more people cared about beauty the more regularly they wanted greenspace mown, whereas the more they cared about the environment the more they wanted greenspace left wild.

• Participants indicated indifference toward mowing for most types of green spaces. The only places with a clear indication that mowing was important were graveyards, parks, sports pitches, and footpath borders. Mowing was seen as decidedly unimportant for unused spaces, in particular.

These findings indicate several potential recommendations. The three most relevant ones are:

- 1. The council would likely be supported in at least partially reducing their mowing practices, especially for specific locations, as detailed next.
- 2. In areas such as unused space, roundabouts, motorway and road borders, council grounds, and open green spaces, reductions in mowing may avoid significant opposition as, on average, mowing was not seen as decidedly important for these spaces.
- 3. Aesthetic was reportedly important to perceptions of whether an area should be mown. Therefore, interventions highlighting the improved beauty of a less mown area may be more palatable than highlighting the environmental impact. However, without behavioural research it cannot be said for certain which predictor will be most fruitful to target to change perceptions. Therefore, it would be advisable to highlight the positive impact on all three of the most important predictors of aesthetic, social desirability, and environmental impact until further research using randomised controlled trials can identify which produces the strongest results.

INTRODUCTION

This report begins with a brief outline of current greenspace management practices and their impact on the environment. This is followed by an explanation of the methodology and results of a research team at Durham University led study on what people think about greenspace management practices. Finally, ending with brief conclusions and recommendations of how Durham County Council can use these insights to address the ecological emergency.

The following pages consist of a brief discussion of the ecological emergency, the importance of wild space, and the previous understanding from academic research of the public's views of mowing practices. After the presentation of this background knowledge, a summary of existing Council greenspaces will be given followed by listing the current Council greenspace policies that are public knowledge. After the preamble, this report will outline the methodology of our research, present the statistical analysis results, explain the findings, and will conclude with an assessment of the key takeaways and the recommendations we believe are implied by the discoveries of this research.

The reader might find it helpful to know that the key conclusions from each section are summarized in boxes at the end of every section. If pressed for time or the mental bandwidth to juggle the details of this report, they may wish to skim these summary boxes first.

BACKGROUND

Biodiversity

Planet Earth is home to an estimated 8.7 million different species of plants and animals (Díaz et al., 2009; Mora et al., 2011). Biodiversity refers to this variation and is used to reference the number of distinct species contained within a specific area, this can be globally, within a country, or within a specific region (National Geographic, 2024). Put plainly, biodiversity is essential to plant, animal, and human life. More biodiverse habitats support more life (Chase et al., 2020; Klein et al., 2012), produce more resources (Parks & Mulligan, 2010), store more carbon (Daba & Dejene, 2018), and create more resilient habitats (Vasiliev, 2022). If biodiversity declines, ecosystems collapse (MacDougall et al., 2013). Without these ecosystems we cannot harvest food (Díaz et al., 2006), produce medicine (Neergheen-Bhujun et al., 2017), or have habitable land (Díaz et al., 2006). Additionally the World Economic Forum has estimated 44 trillion US dollars, more than half the world's total GDP, is expected to be lost due to ecosystem collapse (*Half of World's GDP Moderately or Highly Dependent on Nature, Says New Report*, 2020). Thus, biodiversity is an integral part of a habitable planet and humanity's survival, and significant biodiversity loss has catastrophic consequences.



Figure 1. Countries with the highest biodiversity based on the Global Biodiversity Index

Note. Image taken from <u>https://theswiftest.com/biodiversity-index/</u>. Based on the data informing this graphic, the United Kingdom is the 142nd most biodiverse country in the world (out of 195 countries).

The Ecological Emergency

It has been recognised by at least 78 local authorities within the United Kingdom, including Durham County Council, that we are in an ecological emergency (Duckles, 2021; Durham County Council, 2022; The Council and Climate Crisis, 2024), this means that nature is in decline globally. A report by the United Nations in 2019 estimated that around a million species may become extinct within the coming decades (Martin, 2019). According to the State of Nature report, the UK is one of the most nature-depleted countries on the planet. Nearly one in six species are under threat of becoming extinct on Britain's shores. UK species have already seen an average decline of 19% since 1970 (State of Nature 2023 - Report on the UK's Current Biodiversity, 2023). In other words, on average, every single species in the UK has lost one-fifth of their population. In this same time period over half of all plants have stopped existing in areas they once thrived (Pescott et al., 2015; Walker et al., 2023). Specifically, 54% of all flowering plants and 59% of bryophytes (mosses and liverworts) can now be found in fewer places than they could be in 1970. Importantly, 1970 was by no means the gold standard of ecological protection or biodiversity. We compare current nature to that of 1970 because this is when widespread data gathering began, however in order to truly protect and conserve nature, biodiversity levels need to improve beyond 1970s levels. Given the importance of biodiversity for the planet and humanity, and the significant decline in biodiversity in the UK, there is an urgent need to identify areas where biodiversity can be restored. Greenspace management (mowing in particular) is one such area where biodiversity is significantly impacted and, therefore, can potentially be addressed.



Figure 2. Species abundance relative to 1970s levels for priority species within the United Kingdom

Note. Taken from <u>a UK Government Report</u>. Priority species are defined as species of high conservation concern for any reason, species must also appear on one or more of the biodiversity lists of each UK country.

The Problem with Mowing

To the extent that apparent declines in biodiversity are something that we ought to address, then it is important to recognize the deleterious effects that over-mowing can have on biodiversity levels. Importantly over-mowing has detrimental impacts to multiple aspects of human and planetary existence, impacting biodiversity, climate change, and public life. The following sub sections will briefly describe research that demonstrates this connection.

Damage to biodiversity

The most obvious negative impact of mowing is the effect it has on biodiversity. Mowing kills flowers, plants, insects, and other invertebrates that make grasslands their homes (Sehrt et al., 2020; Watson et al., 2020).

Indeed, a meta-analysis of 14 studies on the biodiversity of mown spaces found that biodiversity is significantly depleted in intensively mown lawns compared to unmown or minimally mown lawns (Watson et al., 2020). This meta-analysis highlighted that a reduction in mowing would prevent losses of insect and plant species and provided strong evidence for multiple negative impacts caused by mowing intensity on plant and insect diversity.





Note. Graphs taken from Sehrt et al., (2020). Graph (A) presents the increase in species present in meadows compared to lawns. Graph (B) presents how similar lawns are to each other compared to how similar meadows are to each other within one city. All comparisons were significantly different with the meadow performing better on all measures of biodiversity compared to the lawn. Additionally, a study of the plant diversity of urban grasslands where mowing had been significantly reduced showed that within six years of management changes there were 30% more plant species present in the green space (Sehrt et al., 2020; see

Figure **3**). This study both demonstrated that mowing can prevent the biodiversity growth of urban green spaces and, more importantly, that changes in greenspace management practices can yield dramatic changes in biodiversity.

Finally, a randomised controlled trial comparing multiple mowing regimes found that mowing every 2 weeks lead to 3 to 5 times less biodiversity than not mowing, and significantly less biodiversity than when mowing every two weeks with a summer period (June to September) of zero mowing (Garbuzov et al., 2015). As the studies in this section outline there is significant evidence that regular mowing has a damaging impact on biodiversity and there is strong empirical research demonstrating the positive impact of Ecologically Conscious Land Management practices (ECLM practices).

Reduced climate change mitigation

In order for the UK to reduce CO₂ levels in the atmosphere it is necessary that our natural land and carbon capture technologies are storing more carbon than we produce (*How Much Carbon Dioxide Would We Have to Remove from the Air to Counteract Climate Change?*, n.d.) and evidence has shown that reduced mowing of green spaces can improve carbon sequestration capacity of the landscape.

In a review paper produced in 2018 (Daba & Dejene, 2018) it was found that increased biodiversity plays an important role in increasing the amount of carbon being sequestered. Plants take carbon from the air during photosynthesis and store that carbon either in their bodies or in the soil, thereby reducing the amount of carbon in the atmosphere (Robinson, 2007; Schindler et al., 2010). The significant role biodiversity plays in carbon sequestration is theorised to be due to the variety of species leading to varied ways to utilise nutrients and resources, this makes biodiverse habitats more efficient and productive, thereby increasing the habitats' capacity to sequester carbon (Hooper et al., 2005; Loreau & Hector, 2001; Weiskopf et al., 2024). Additionally, diverse habitats are more likely to have the most effective carbon storing plants due to the sheer volume of plants in the habitat (Aarssen, 1997; Hooper, 1998). It is therefore essential to maximise biodiversity within the green space available.

A 5-year field experiment looking at the impacts of mowing and nitrogen introduction showed that mowing was detrimental to the carbon intake of lawns and green space (Wang et al., 2020). In a multiyear study of grassland in China, the less mowing was undertaken the higher the amount of carbon stored within the green space. With 'no mowing' schemes sequestering the largest amount of carbon. Additionally, a 22-year

experiment in the United States found that biodiverse habitats stored 178% more carbon in their soil than the monocultures they were compared to, and it was demonstrated that the more biodiverse a habitat the higher the amount of carbon stored in the soil, as can be seen in Figure 4 (Yang et al., 2019).



Figure 4. Increases in carbon sequestration in soil as species richness increases in grasslands.

Note. Graphs taken from Yang et al., (2019). Graph (a) presents the amount of carbon stored in the first 20cm of soil in the first 13 years of a habitat compared to the 13th to 22nd year for areas with different numbers of species. Graph (b) presents this same data but for the first 60 cm of soil. Graph (c) shows the relationship found between variety of species and amount of carbon stored in the first 20cm of soil over time. Error bars represent standard errors (SE).

In an assessment of the intervention to create a wildflower meadow on Kings College Cambridge's back lawn, meadows were found to have reduced carbon emissions due to the reduction in maintenance and fertilising and reduced costs. The research estimated that GHG emissions are 112 times higher for lawns than they are for meadows and that lawns are 132 times more expensive to maintain than meadows (Marshall et al., 2023).

Impact on people

The link between green space and wellbeing is well established (see Liu et al., 2023; Zhang et al., 2020 reviews) and will not be addressed here as it is largely incidental to the primary purpose of the report. However, the specific impact of wild or biodiverse green space is less well known and more relevant to this report. Hence the following section will outline three seminal pieces of research that highlight the value for individuals of wild green spaces.

Biodiversity may increase satisfaction and happiness.

In one piece of research (Southon et al., 2017) participants were presented with various types of perennial meadow ranging in species richness (i.e., variety of species present) and structural height (height of the plants present). The intention was to identify what was the preferred type of green space and what effect that had on satisfaction and appreciation for the area. This study found evidence that highly species rich

grassland was considered preferable and made people feel more satisfaction and appreciation for the area than grassland of lower species richness. In other words, the more biodiverse the green space (achieved in the study through reduced mowing) the happier it made people feel about the area.

Biodiversity may ameliorate stress.

In a study conducted in Bradford UK, an epidemiological study was conducted that assessed whether the biodiversity of parks predicted the wellbeing of the park's users (Wood et al., 2018). Specifically, this research aimed to see if biodiversity had a restorative effect on people, helping them to escape from everyday life and recover from its stresses. After analysing the biodiversity of 12 parks and running surveys with park users, they then analysed whether the restorative capacity of the park had any relation to the richness of plant species present within the park. The results of this study found that the restorative effects of the park were indeed greater the more biodiverse the parks green space.

Biodiversity may ameliorate depression and adverse blood pressure.

Finally, a systematic review and bibliometric analysis synthesised results from 5 review papers and 17 experimental studies that were focused on the relationship between biodiversity and health (Houlden et al., 2021). Whilst many of these studies took different measures of biodiversity (species richness, wildlife abundance, diversity of flora and fauna, or simply the number of species) there were far too few studies to give definitive answers. However, studies contained within this review provided variable evidence for a link between intermediate species richness and reduced blood pressure; and for biodiversity having psychologically restorative effects; improving general wellbeing; and reducing symptoms of depression. It is however important to note that these studies were often stand alone and do not benefit from the usual consensus provided by systematic reviews and the combining of multiple studies on the same topic.

In summary, experimental, epidemiological, and systematic review papers have all demonstrated that increased biodiversity can lead to increased satisfaction and happiness in relation to the biodiverse area; can reduce stress and have restorative effects for mental health; can reduce blood pressure and depression; and improve general wellbeing.

County Greenspace

When looking at overall green space the North East of England has 8,371 hectares of green space. Compared to other regions of the United Kingdom this number is much lower than, for example the neighbouring North West's 20,207 hectares, Yorkshire and The Humber's 14,782 hectares, and even London's 17,458 hectares (*Green Space Index*, n.d.). In County Durham, Durham County Council maintains 20,780,833.35m² or 2078 hectares of green space, making it the council with the third highest land ownership in England

('What Land Is Owned by Councils?', 2020). This encapsulates anything from roadside verges to public parks, and from graveyards to wild spaces. The Council currently aims to mow this vast swathe of land every two weeks during the mowing season, resulting in 16 cuts per year. To decide whether this massive and costly task is worth undertaking, it is essential for the council to know whether the residents of County Durham support it (or would, instead, support mowing reduction). The purpose of this report is to address this and several related questions to gauge the mowing preferences, perceptions, and concerns of County Durham residents.

Section Summary

The world is currently facing an ecological emergency with significant deterioration in nature and biodiversity.

Reduced biodiversity has potentially catastrophic impacts to habitat survival, economic growth, resource production, and climate change.

High levels of biodiversity are associated with climate change mitigation, habitat stability, and improved psychological wellbeing.

Mowing causes significant damage to biodiversity and ecology and Ecologically Conscious Land Management (ECLM) can have a powerful effect on reversing this damage.

Durham County Council mows a large amount of land but is unsure if the residents of County Durham are supportive.

METHODOLOGY



Sample

The Council and University teams collaborated on sharing the survey across the entirety of County Durham, with participants approached through mailing lists, internal university systems, internal council systems, a press release, and through the research being featured in the April 2024 edition of the 'County News' magazine which is sent to all households in County Durham. As a result of this concerted effort, 1560 responses were received. However, some of these responses were from non-residents as it was agreed with the council that, in the interest of inclusivity, anyone interested in the survey would be allowed to complete it and non-residents would be filtered out after the fact. Accordingly, the sample was subsequently reduced to the 712 participants who indicated that they lived in County Durham.

Of the 712 residents who took part, three were removed from the final analysis. Two residents were removed for taking more than 24 hours to complete the survey and 1 resident was removed for completing the survey in less than one third of the median time for the overall sample, indicating a rushed response. Specifically, this individual took less than 4 minutes to complete the survey whereas 75% of the sample took at least 8.71 minutes to complete the survey.

Of these 709 residents in the final dataset 64.7% identified as women, and 94.5% classed themselves as white. The average age of participants was 51.7 years old and ranged from 18 - 81 years. Most importantly the sample was a good reflection of the variety of residents of County Durham with similar proportions of age and ethnicity (See Table 1).

	Sample (<i>n</i> =709)	County Durham (2021)
Gender		
Female	64.7%	51.1%
Male	37.3%	48.9%
Age		
Mean age in years:	51.7	41.7ª
Ethnicity		
White	94.5%	96.8%
Any other ethnicity	5.5%	3.2%

Table 1. Demographic information

Note: ^acensus provides median age for people over 18 years old.

Whilst the sample is representative in terms of age and ethnicity, it is important to recognise the dimensions where this sample seemed not to mirror the County population. The sample of this research had a slight over-representation of women. It was also predominantly a sample of medium to high earners with some level of qualifications and reasonably high-status occupations. In total, 72% of those who responded to the survey work in supervisory, clerical and junior managerial, administrative and professional roles or higher. However, there is also a reasonable proportion of skilled manual workers and unemployed individuals (18%). The most underrepresented group is semi-skilled and unskilled manual workers with only 1% of respondents identifying themselves as belonging to this group. For a detailed breakdown of occupations, qualifications, and household incomes of the sample see Table 2 below.

Table 2. Occupation, qualifications, and income of sample

Occupation	%
Higher managerial, administrative and professional	18%
Intermediate managerial, administrative and professional	32%
Supervisory, clerical and junior managerial, administrative and professional	22%
Skilled manual worker	9%
Semi-skilled and unskilled manual worker	1%
State pensioner, casual and lowest grade worker, unemployed with state benefits only, student	9%
Prefer not to say	7%
Skipped	1%
None	1%
Qualifications	
One to four GCSE passes ^a and any other GCSEs at other grades, or equivalent qualifications	3%
Five or more GCSE passes ^a or equivalent qualifications or apprenticeships	7%
Two or more A Levels or equivalent qualifications	17%
Higher National Certificate, Higher National Diploma, Bachelor's degree, or PG qualifications	64%
Other vocational/work-related qualifications	6%
Prefer not to say	3%
Income	
Up to £17,499 a year	10%
Up to £29,999 a year	15%
Up to £49,999 a year	23%
Up to £99,999 a year	26%
£100,000 or more	5%
Prefer not to say	8%
Skipped	12%

Note: ^{*a*} Passes were specified to be grade A^* to C or grade 4 and above. PG = Post-graduate.

Survey

The research carried out for this report consisted of a short survey asking respondents a series of questions about their perceptions of green spaces. No images of grasslands, lawns, or nature were shown to participants at any point in the survey, to avoid biasing responses. This survey is detailed below.

Green Space Definitions

After a brief information sheet and consent form, the first section presented participants with a definition of green space:

For the purposes of this research "Green space" is defined as: Anything that supports the development of a healthy environment in harmony with the natural world. Green space is a type of land use which has notable contributions to urban environments in terms of ecology, aesthetics or public health, but which basically serves human needs and uses. It could include, but is not limited to parks, motorway borders, cemeteries, gardens, verges, hedgerows and roundabouts. Simply put, any natural area can be considered a green space.

Some green spaces are frequently mown or taken care of. So, for this research we use "mown green spaces" to refer to any area of green space that is regularly mown or otherwise actively managed.

Other green spaces are still managed, but are generally allowed to exist in a more wild state. So, for this research we use "**managed wild green spaces**" to refer to any area of green space that is infrequently mown, or is managed in a more passive way."

Subjective Responses

After reading the definitions of greenspaces, participants answered a number of survey items based on their subjective impressions and preferences. The questions asked in the survey were split into 6 broad sections relevant for this report.

- Mowing perceptions
- ECLM preferences
- Concern importance
- Where to mow
- Demographics
- Additional comments

Mowing Perceptions

Following the definition of green space, respondents' perceptions of mown green space was measured using 11 questions. Participants were asked to indicate how much they "agree with the following statements comparing mown green spaces to managed wild green spaces." They answered by indicating their agreement or disagreement on a five-point scale from "strongly disagree" to "strongly agree" with the centre point being "neither agree or disagree" The statements in question were:

- Mown green spaces are neater
- Mown green spaces are more attractive
- Mown green spaces are better for the environment
- Mown green spaces are more expensive to maintain
- Mown green spaces discourage littering
- Mown green spaces improve my local area
- Mown green spaces add value to my area
- Mown green spaces are important for my community
- Mown green spaces are more clean
- Mown green spaces are more pleasing to be in
- Mown green spaces discourage antisocial behaviour

Subsequently respondents were asked to "Think of the green space you have to look at most often in your day-to-day life, please indicate how many times a month you estimate the council mows that space" possible answers ranged from 1 - 20+ with an additional option for "never".

Based on reliability analysis completed after data collection, perceived attractiveness, neatness, and pleasantness of mown spaces were combined into an index of prettiness (α = .83). Perceived importance, value, and improvement were combined into an index of social desirability (α = .90). Finally, lack of litter, perceived cleanliness, and lack of antisocial behavior were combined into an index of anti-social buffering (α = .82).

Ecologically Conscious Land Management (ECLM) Preferences

We also asked participants to indicate their preferences for a relative increase or decrease in mowing practices and wilding. Specifically, we asked "Now thinking of the county, how do you feel about current mowing practices? (use your mouse to drag the slider)" and "Now thinking of the county, how do you feel about the current wildness of existing greenspace? (use your mouse to drag the slider)" These questions took the form of two sliders ranging from -100 "absolutely needs to decrease" to +100 "absolutely needs to increase" with a midpoint of 0 "no change". The slider started at the midpoint and participants were forced to provide a response or explicitly indicate they wished to skip the question by checking a box on the side

that said "skip". This was done to separate people who did not wish to respond from those who specifically meant to indicate 0.

It is important to note that the question about mowing was reverse coded to reflect a preference for mowing reduction. Both values for mowing and wilding used later were coded such that *higher* numbers indicate a *greater preference* for ECLM practices.

While these two items could have been combined into a single index for some of our research questions, namely—whether perceptions and priorities predicted land management preferences—we chose to leave them separate given the correlation between the two preference types was below the 50% overlap point (i.e., |r| < .70) and the obvious difference between the distributions (see Figure 5).



Figure 5. Histograms for support for reduced mowing and support for increased wilding

Note. Blue line represents mean of responses.

Concern Importance

We then wished to understand different concerns people might have when thinking about green space management, in order to do this we asked participants to consider green space management practices and indicate how important each of several concerns were to them. Respondents indicated the importance on a 5-point scale from "Not at all important" to "Very important" with a midpoint of "Neither important nor unimportant". We then listed the potential concerns as follows:

- Cost of management
- Accessibility of the space
- Neatness of the space
- Littering
- Local biodiversity

- Aesthetic of the space
- Climate change
- Safety of the space
- Local wildlife

In contrast to the perception items, apart from the eco concern items, the concern importance items did not associate as expected. The importance of climate, wildlife, and biodiversity impact were combined into a single score reflecting ecological-impact importance (α = .73).

We attempted to combine neatness, aesthetics, and lack of litter (α = .54) and cost, access, and safety (α = .39) into a single score for the importance of prettiness and social impact, respectively. Both sets of items fell well below the standard for reliability. None of these items correlated strongly enough to warrant combining any of them (r < .42; items all overlapped less than 18%) and were therefore not combined.

Perceptions of Others' Wilding Support

The concern importance questions were followed on the same page by two questions gauging how important they felt it was that space be wild, and how important they believed wild spaces were to others:

"When considering green space how important is it to you that spaces are allowed to be wild".

"When considering green space how important do you think it is to other people in your community that spaces are allowed to be wild".

Where to Mow

We were then interested in which land types the public felt it was important to mow. Respondents were asked to indicate how important they thought it was to mow 10 different land types using a scale of 1-5 (1 = Not at all important to 5 = Very important, with a midpoint of "Neither important nor unimportant"). The types of green spaces we asked about were:

- Roadside verges
- Cemeteries
- Parks
- Open green spaces
- Motorway and road borders
- Council grounds
- Public footpath borders
- Roundabouts
- Sports pitches
- Unused fields

Demographics

Finally, participants completed demographic questions concerning gender, age, ethnic group, qualifications, occupational status, and income. Additionally, we asked whether people lived, worked, visited, or studied in County Durham, and we asked people to input the first half of their postcode so we could identify whether they lived in the County. The exact questions are outlined below.

Gender: "What gender do you most identify with?" Male/Female/Other/Prefer not to say.

Age: "How old are you?"

Ethnic group: "What is your ethnic group?" White/Mixed or multiple ethnic groups/Asian or Asian British/ Black, African, Caribbean, Black British/Other ethnic group. With subcategories within each option.

Qualifications: "What is the highest qualification you have achieved?" None/Up to 4 GCSEs/5 or more GCSEs or 1 A level/2 or more A levels/Bachelor's degree/Post-Graduate degree or qualification/Other vocational/Work related qualifications.

Occupational Status: "Using the classification of the National Readership Survey please indicate the occupational status of the Chief Income Earner in your household. The person in the household with the largest income is the Chief Income Earner, however this income is obtained. If the Chief Income Earner is retired and has an occupational pension, please select according to their previous occupation." Higher managerial, administrative and professional/Intermediate managerial, administrative and professional/Supervisory, clerical and junior managerial, administrative and professional/Skilled manual worker/Semi-skilled and unskilled manual worker/State pensioner, casual and lowest grade worker, unemployed with state benefits only, student.

Income: "Please select the letter for the row in which you would place your total household income per year, from all sources, before tax and other deductions" with letters corresponding to incomes presented in a table ranging from A = up to £4,499 a year to O = £100,000 or more.

Relationship to Durham: "Please select which of the following are most applicable to you (please select all that apply)". The options were: I live in County Durham/I work in County Durham/I visit County Durham/I study in County Durham.

Postcode: "Please input the first part of the postcode which you reside in for more than half of the year". Participants could type in the first part of their postcode into a free text box below this instruction.

Additional Comments

In order to allow participants to voice opinions not captured in our study design or to make specific comments to the council about mowing practices we included a free response question asking, "If you have any additional comments at all to make about the survey or the councils management of green spaces, please take this opportunity to detail your thoughts below." This was followed by a free text box.

After items were combined a series of statistical tests were run to investigate our research questions (See Table 3).

Section Summary

For the skimmer, the following methodological points are important to note:

Participants indicated how much they supported mowing reductions and wilding increases. For both scores used in the report, *higher numbers indicate greater ecologically conscious land management (ECLM) preferences.*

Participants indicated how important mowing was for specific types of land. *Higher numbers indicated that mowing was seen as more important.*

Participants indicated how they perceived mown spaces (relative to unmown spaces). *Higher numbers indicated that mown spaces were seen as more attractive, more socially desirable, better buffers against antisocial behaviour, and more environmentally beneficial.*

Participants indicated how important a number of greenspace-relevant concerns were to them. *Higher numbers indicate that neatness, environmental impact, aesthetics, amount of litter, cost, access, and safety are more important.*

Research Question	Analysis	Comparisons	Outliers
Do People Support a Mowing Reduction and a Wilding Increase?	Two one-sample t- tests	Tested whether preference for mowing reduction, and for wilding increase, differed significantly from a preference for no change (i.e., from 0).	No outliers removed
Does Preference Differ by Geographic Region or Demographics?	A one-way between subjects ANOVAs	Tested whether preference for mowing reduction, and for wilding increase, was predicted by any of the demographic variables.	No outliers removed
How Accurate are Perceptions About Mowing Frequency?	One-sample t-test	Tested whether estimated frequency differed from the actual frequency (i.e., twice a month).	Two obvious outliers ^a
What are the Primary Concerns and Perceptions that Predict Mowing/Wilding Preferences?	A multi-level regression	Tested which concerns and perceptions significantly predicted preference for mowing reduction and for wilding increase.	No outliers removed
Does The Type of Land Influence How Important People Feel Mowing Is?	A one-way repeated measures ANOVA	Tested whether perceived importance of mowing differed based on the type of space.	No outliers removed
Does The Association Between Mowing Preference and Both Perceptions and Concerns Depend on Land Type?	Two multilevel models	Tested whether certain perceptions, and certain concerns, of mown spaces were more important for mowing preferences for certain types of spaces.	No outliers removed
Do People's Perceptions of Norms Match the Norm?	Correlation and a paired t-test	Compared people's attitudes towards wilding and estimates of other people's attitudes towards wildling.	No outliers removed

 Table 3. Summary of research questions and analyses

Note. ^a These individuals indicated they believed the council mowed twenty times a month, which indicated they believed the same space was mown more

than every other day. These values were more than 10 SD above the mean indicating they were clear outliers.

Data Collection and Research Integrity

The sample tested in this research provided a broad spread across occupation, qualifications, and income, and was broadly representative of the population in County Durham in terms of gender, age, and ethnicity. The mean age of the sample was 51.7 years old compared to the median age of 41.7 years old reported in the 2021 census. Importantly census data includes people under 18 thus, our sample, which was restricted to over 18 year olds, may have simply been higher because it did not include minors. The gender split was weighted towards females with 64.7% of our sample being female compared to 51.1% of the County Durham population. Ethnicity was similar to the county breakdown with 94.5% of the sample identifying as white compared to 96.8% of the County Durham population. For additional details on the sample see Table 1 in the "Sample" section on page 17.

The survey was disseminated through multiple channels, but the majority of participants were ultimately recruited in response to the council's media posts, press release, and inclusion of the study in the County News Magazine sent to all households in County Durham (85.8%). A small portion came from the student subject pool (6.9%) and the rest came from university communication channels (5.6%).

The research also contained a reasonable range of opinions which were normally distributed, giving us greater confidence that the sample did not capture only those people who held strong opinions which would have instead revealed a bi-modal distribution.





PUBLIC PERCEPTIONS OF THE COUNCIL'S CURRENT PRACTICES

Public Opinion on Ecologically Conscious Land Management (ECLM) Practices

The key question we were interested in was whether people supported an increase or decrease in mowing practices (or preferred they remained the same). As a parallel to this, we were also interested in levels of support for an increase or decrease in wilding of greenspaces in the county (or a preference for them to remain the same). Together, we refer to support for mowing reduction and wilding increase as a preference for ecologically conscious land management practices (ECLM).

Do People Support a Mowing Reduction and a Wilding Increase?

One-sample t-tests revealed that the sample average indicated a slight, but significant, preference for reduced mowing (M = 9.75, SD = 54.48), t(604) = 4.40, p < .001, and a congruent-but considerably larger-preference for greater wilding (M = 54.48, SD = 42.28), t(605) = 25.00, p < .001. The two preference items were strongly correlated, r(547) = .60, p < .001. As preference for less mowing increased, so did preference for wilding.



Figure 7. Histograms for support for reduced mowing and support for increased wilding

Note. Blue line represents mean of responses.

It is interesting to note that the support for wilding is much stronger than the support for decreased mowing. There are a number of reasons this might have occurred. For one, it is possible that individuals support wilding without connecting it to specific land management practices. Alternatively, it could indicate that some individuals support wilding only if it can be achieved without impacting spaces that are currently mown (similar to NIMBY arguments), or it is possible that this simply reflects participants supporting wilding efforts in name without any consideration of what that would imply.

Section Summary:

There is a slight (but significant) desire to reduce the amount of mowing in the county.

There is a large (and significant) desire to increase the amount of wild space in the county.

Does Support Differ by Geographic Region or Demographics?

It is important to understand if different areas of County Durham were more or less supportive and if other individual characteristics such as age and gender predicted differences in opinion of altering mowing practices or wilding. This understanding of who is supportive of reduced mowing and who is not can inform council decision-making and allow the council to anticipate where in the county they might receive the most opposition if they were to adopt ecologically conscious land management practices. We therefore ran a series of ANOVAs to compare support for reduced mowing (and support for wilding) by postcode, age, gender, occupational status, and education:

- Post code predicted *neither* support for reduced mowing, *F*(5, 586) = 1.21, *p* = .305, R² = .000, nor increased wilding, *F*(5, 588) = 1.40, *p* = .222, R² = .00.
- Age predicted *neither* support for reduced mowing, β = 0.01, t(589) = 0.32, SE = .14, p = .753, nor increased wilding, β = 0.01, t(589) = 0.32, SE = .14, p = .753.
- Men (M = 1.19, SD = 53.00), relative to women (M = 13.93, SD = 54.79), tended to support a mowing reduction less, t(414.87) = -2.76, p = .006. This was to the point that men did not significantly support nor did they oppose a mowing reduction, t(201) = .32, p = .75, whereas women still supported a reduction, t(401) = 5.10, p < .001.
- Men (*M* = 37.56, *SD* = 42.16), relative to women (*M* = 45.49, *SD* = 42.19), also tended to support a wilding increase less, t(387.7) = -2.17, *p* = .031. Still, both men, t(196) = 12.50, *p* < .001, and women, t(407) = 21.78, *p* < .001, clearly supported an increase in wilding.

- Higher levels of education predicted support for reduced mowing, $\beta = 0.21$, t(588) = 5.11, SE = 1.41, p < .001, and increased wilding, $\beta = 0.11$, t(588) = 2.67, SE = 1.09, p = .008.
- Higher levels of occupational status did not predict support for reduced mowing, $\beta = 0.06$, t(554) = 1.35, SE = 1.55, p = .176, and increased wilding, $\beta = 0.06$, t(553) = 1.52, SE = 1.17, p = .13.

Section Summary:

Men neither support nor oppose reduced mowing, whereas women support significantly less mowing.

Women are more supportive of increasing wild spaces than men, but both are still very supportive.

The more educated respondents were, the more they supported ECLM practices.

There was no difference in support for ECLM practices between different postcodes, ages, or occupations.

How Accurate are Perceptions About Mowing Frequency?

We were also interested in the extent to which participants had accurate perceptions of mowing frequencies per month. Two responses were removed for being outliers, they indicated they believed the council mowed more than twenty times a month (as noted in Table 3, on page 25). The test revealed that the sample seems to under-estimate the frequency of mowing (M = 1.61, SD = 1.38), relative to the objective frequency (i.e., twice a month), t(692) = -7.46, p < .001.¹

Whilst not a dramatic difference, it is clear that, on average, people think less mowing is happening across the county than is actually the case. This is especially interesting to note as, on average, the sample indicated a slight preference for reduced mowing practices even though they already think less mowing is

¹ This analysis was performed under the assumption that respondents estimates did not adjust for lack of mowing in winter months. While it is possible that participants (1) made the judgement that, lately, they have been seeing the council mow X times a month, (2) recognized that the council only mows $y \pm 1$ months a year and (3) subsequently adjusted their estimate to reflect X*($y \pm 1/12$), this seems rather unlikely. It is more likely that participants would have simply used an unadjusted estimate from the last few months (data was collected exclusively during mowing season). That said, it is true that, in retrospect, a more carefully-worded question—specifying 'during the mowing months'—would have rendered this discussion moot.

happening than is reflected by reality. In other words, even with most participants thinking that the council only mows approximately once every two and a half weeks, the sample still indicates a slight preference for a further reduction in mowing. This would tentatively suggest that the council could potentially adopt a mowing schedule of once every three weeks (instead of every two weeks) without a public pushback.

Section Summary:

On average people think the council mows less than the 2 times a month the council aims for.

This underestimation is statistically significant but not necessarily a dramatic underestimation.

BROADER PERCEPTIONS OF, AND CONCERNS ABOUT, MOWING

What are the Primary Concerns and Perceptions that Predict Mowing/Wilding Preferences?

As noted above, instead of combining the two ECLM scores into a single index, here, we left them as two separate scores and treated them as repeated measures in a multi-level regression which tested for an interaction between preference type and perceptions. This effectively allowed us to test the association between perceptions and management preferences when collapsing them into a single score (main effects in the first order model), which is the same as what we would have accomplished had we averaged the two scores. Yet, by leaving them separate, we were still able to account for possible differences in associations depending on preference type (interactions in the second-order model). That is, put as plainly as possible, our approach lets us know (a) what predicts preferences for ECLM practices *in general* and (b) what things might predict mowing preferences more or less than wilding preferences.

Perceptions of Mowing

Associations between general ECLM preferences and mowing perceptions (main effects)

Consistent with the visual pattern in the distributions in Figure 7 on page 28, the first-order multi-level model indicated that there was moderately more support for wilding compared to mowing reduction, $\beta = .29$, t(597) = 16.51, SE = 1.83, p < .001. More importantly, the model indicated that perceptions of mowing practices influenced preferences for ECLM practices. When ignoring the type of preference, the more mowing was seen as environmentally friendly, $\beta = -.14$, t(616) = -4.72, SE = 1.46, p < .001, as visually appealing, $\beta = -.20$, t(637) = -5.15, SE = 1.98, p < .001, as desirable, $\beta = -.27$, t(622) = -7.73, SE = 1.77, p < .001, and as something that buffers against antisocial outcomes, $\beta = -.13$, t(613) = -4.11, SE = 1.68, p < .001, the more participants disagreed with more ECLM practices. In other words, to summarise the general trend, the more mowing was seen as leading to positive outcomes, the more people tended to oppose ECLM practices—when people see mowing as positive, they want more mowing.

While the above conclusion is rather intuitive, what is more valuable to note is that the only non-significant predictor of preferences was the cost-effectiveness of mowing, $\beta = -.04$, t(605) = -1.60, SE = 1.31, p = .109. In other words, put quite literally, people who saw mowing as expensive had statistically equivalent ECLM preferences as people who saw mowing as inexpensive—perceptions of cost did not influence ECLM preferences. This is valuable as it highlights that attempting to change peoples' conception that mowing is (or is not) cheaper is unlikely to be a fruitful avenue if trying to change the publics' support for mowing

practices. These results also potentially indicate that a messaging campaign designed to highlight the beauty of unmown areas and the potential social value in unmown areas—with these being the two strongest predictors of preferences—may induce more support for ECLM practices. Additionally, campaigns educating people about the environmental damage of mowing might also prove effective. These possibilities, however, should be investigated empirically.

Section Summary:

When combining preferences for mowing practices with preferences for wild spaces into one score, there were many factors that effected peoples individual scores. People were less in favour of ECLM practices if they saw mowing as environmentally friendly, visually appealing, desirable, and protective against antisocial behaviour.

The only thing that did not affect people's preferences for ecologically conscious land management practices was their perceptions of how cost-effective mowing was.

Associations between specific ECLM preferences and mowing perceptions (interactions)

The next step in this analysis was testing whether the association between specific perceptions and preferences depended on the type of preference. In other words, we tested whether visual appeal, for example, was stronger for mowing reduction compared to wilding. The second-order model testing this revealed an interaction between type of preference and perceptions of both ecological impact, $\beta = .09$, t(592) = 2.31, SE = 2.25, p = .021, and perceptions of desirability, $\beta = .15$, t(606) = 4.16, SE = 2.63, p < .001, indicating that for both perceptions, their association was stronger for mowing reduction relative to wilding. That is, for mowing reduction, environmental impact had a small negative association with support, $\beta = -.19$, t(1138) = -5.19, SE = 1.82, p < .001, whereas, environmental impact of mowing had a trivial, but still significant, negative association with support for wilding, $\beta = -.09$, t(1146) = -2.30, SE = 1.85, p = .022. This seems to indicate a disconnect between perceptions of the environmental impact that mowing has and its impact on the wildness of an area.

Similarly, for mowing reduction, desirability of mowing had a moderate negative association with support, β = -.37, t(1124) = -8.72, SE = 2.19, p < .001, whereas, desirability of mowing had a small, but still significant, negative association with support for wilding β = -.16, t(1128) = -3.70, SE = 2.20, p < .001. In other words, desirability of mowing feeds into preferences for wilding less than it does for preferences for mowing reductions. The major conclusion from this subsection is that, on the whole, the evidence indicates that what predicts preferences for mowing also tends to predict preferences for wilding in largely the same way (i.e., even the two predictors that had differential associations with mowing preferences and wilding preferences still had largely the same trends across the two preferences). Thus, we can be more confident that whether the adoption of mowing reduction practices is framed as a 'mowing reduction' or a 'wilding increase', it will *not* impact the relevance of any given underlying lever to a meaningful degree.

Section Summary:

Perceptions of ecological impact and desirability are slightly more relevant for mowing reduction than for wilding.

Desirability of mown space is more important for reduced mowing than it is for increased wilding.

Overall, perceptions of mown spaces seem to predict mowing and wilding quite similarly.

Greenspace Concerns

Associations between general ECLM preferences and greenspace concerns (main effects)

Parallelling the above analyses, we tested how concerns about greenspace management practices impact ECLM preferences. The first-order model revealed that concerns around neatness, $\beta = -.42$, t(627) = -14.10, SE = 1.35, p < .001, concerns around safety, $\beta = -.13$, t(619) = -4.75, SE = 2.00, p < .001, and concerns around the ecological impact, $\beta = .28$, t(636) = 1.40, SE = 2.30, p < .001, all predicted desire for increased ecologically conscious land management practices. Specifically, as neatness became more of a concern, people supported ecologically conscious land management considerably less. This was likewise true, but to a lesser extent, as safety became more of a concern. Finally, as ecological impact became more of a concern, people supported ecologically conscious land management more. Thus, taking into consideration people's concerns around neatness, safety, and ecological impact will likely impact the effectiveness of any specific campaigns. This would generally indicate that it would be wise to directly assess these concerns in specific areas (or with specific audiences) where mowing reductions are being considered.

Section Summary:

When combining ECLM preferences into one score, neatness and ecological impact emerged as the most influential concerns that impacted ECLM preferences.

Safety concerns also predicted ECLM preferences, just to a noticeably weaker extent.

Associations between specific ECLM preferences and greenspace concerns (interactions)

The second-order model revealed that the association between ECLM preference and concerns around neatness was the only one that depended on the type of preference, β = .17, t(589) = 6.14, SE = 1.77, p < .001. Specifically, neatness concern was more predictive for mowing reduction than it was for wilding.

That is, for mowing reduction, neatness concern had a strong negative association with support, β = -.55, t(1066) = -15.19, SE = 1.62, p < .001, whereas, for wilding, neatness concern had a moderate negative association with support, β = -.30, t(1058) = -8.53, SE = 1.60, p < .001. In other words, concerns about neatness feed into preferences for wilding less than they do for preferences for mowing reductions.

As above, the major conclusion from this subsection is that the evidence indicates what predicts preferences for mowing also tends to predict preferences for wilding in largely the same way (i.e., even neatness still had largely the same trends across the two preferences, just to slightly different degrees). Thus, we can be more confident that whether a mowing reduction is framed as a mowing reduction or a wilding increase will *not* impact the relevance of any given underlying lever to a meaningful degree.

Section Summary:

The three most influential concerns in peoples ECLM preferences are concerns about neatness, safety, and ecological impact.

The more people emphasize concerns about neatness, safety, and ecological impact, the less supportive they are of ecologically conscious land management practices.

Neatness concerns specifically were found to be more important for people's preferences for mowing than they were for their preference for wild spaces. In other words, concerns about neatness are most relevant to people's preferences about whether to mow, granted they are still quite relevant to people's preferences about wilding.

Overall, practically speaking, the same set of concerns seem to predict mowing and wilding preferences.

DIFFERENCES BETWEEN TYPE OF GREENSPACE

Does the Type of Land Influence How Important People Feel Mowing is?

We were interested in which types of green spaces participants felt were most in need of mowing. Thus, we conducted a one-way repeated measures ANOVA predicting the perceived importance of mowing from the type of space. The model indicated that the assumption of sphericity was violated, therefore a Greenhouse Geisser correction was used. The adjusted model indicated that the importance of mowing was significantly influenced by type of greenspace, in other words the type of area determined how important participants felt mowing was, $F(7.04, 3841.94) = 338.84, p < .001, \eta^2 = .25$.



Figure 8. Reported importance to mow different land types.

Note. The dashed line represents the point at which importance of mowing would have been significantly greater than neutral.

Given the number of significant comparisons, it is easier and more efficient to describe only the nonsignificant comparisons. Post-hoc pairwise comparisons with a Bonferroni correction, indicated that mowing was seen as equally important for roundabouts (M = -0.14, SD = 1.33) and road borders (M = -0.11, SD = 1.33), t(546) = -.62, p = 1.00, and council grounds (M = -0.10, SD = 1.07), t(546) = -.78, p = 1.00. The latter two were also statistically equivalent, t(546) = -.19, p = 1.00. Mowing was no more important for council grounds compared to verges, (M = 0.06, SD = 1.33), t(546) = -2.96, p = .145, nor was it more important for graves (M = 0.64, SD = 1.07) relative to parks (M = 0.72, SD = 0.97), t(546) = -1.87, p = 1.00. More informatively, however, a series of one sample t-tests testing the average reported mowing importance for a piece of given land against perfect ambivalence (i.e., against zero) revealed that pitches (t = 4.73, p < .001), parks (t = 17.36, p < .001), graveyards (t = 14.13, p < .001), and footpath borders (t = 6.02, p < .001) were the only places where mowing was deemed significantly important (i.e., significantly above neutral). Verges were largely neutral (t = 1.13, p = .26)² as were road borders (t = -1.97, p = .049)³. Whereas council grounds (t = -2.19, p = .029), roundabouts (t = -2.51, p = .012), and both open (t = -7.22, p < .001) and unused spaces (t = -29.05, p < .001), were all places where mowing was deemed significantly unimportant (i.e., significantly lower than neutral), granted, the effects for council grounds and roundabouts were very small.

Thus, these analyses indicate that mowing *is* seen as more important for some spaces than others. Yet, for many spaces, mowing was not seen as especially important.

Section Summary:

People's preferences for changes in mowing vary depending on the green space they are asked about. On average people have no strong opinions about the mowing of any green space, either for or against, even the average importance of mowing sports pitches was closer to just 'important' than it was to 'very important'.

In general, the *only* places where people clearly felt mowing was important (as opposed to neutral or unimportant) were pitches, parks, graveyards, and footpath borders.

² Inspection of the distribution of responses for verges suggests this neutrality is largely due to ratings following a bimodal distribution (i.e., people's rating sat toward either extreme with few individual responses indicating true neutrality). Put simply, a roughly equal number of people think mowing is unimportant and important for verges. Footpath borders were also bimodally distributed but more people deemed it important to mow these areas than those who felt it unimportant. The inverse was true for road borders and roundabouts—more people deemed it unimportant to mow these areas than those who felt it important.

³ Given the sample size, the result for road borders is unwise to interpret (p = .049) as meaningfully significant.

Does the Association Between Mowing Importance and Both Perceptions and Concerns Depend on Land Type?

It is likely that certain perceptions and priorities are only relevant for particular types of greenspaces. For example, neatness might not be especially important for unused spaces whereas it might be very important for verges. Therefore, we tested two multilevel models, one predicting reported importance of mowing from type of greenspace, mowing perceptions, and their interaction, and another using greenspace concerns instead of mowing perceptions. These analyses also provide a test of the association between both mowing perceptions and concerns and the importance they ascribe to mowing in the aggregate (i.e., collapsing across types of green space).

Greenspace Perceptions by Type of Greenspace

The overall association between greenspace perceptions and reported mowing importance (main effects)

Consistent with the earlier analyses, the first-order model revealed that individuals who saw mowing as more environmentally friendly, $\beta = .12$, t(703) = 5.94, SE = .02, p < .001, as prettier, $\beta = .15$, t(703) = 5.85, SE = .03, p < .001, and as more socially desirable, $\beta = .18$, t(703) = 7.68, SE = .02, p < .001, all tended to rate mowing as more important on average (i.e., when collapsing across type of greenspace). In contrast to the analyses above, the more individuals saw mowing as inexpensive, the more they saw mowing as important, on average, $\beta = .04$, t(703) = 2.34, SE = .02, p = .02. This, however, was a virtually negligible effect. Also, in contrast to the prior analyses, the extent to which they saw mowing as buffering against antisocial behaviour had no effect on average importance, $\beta = .04$, t(703) = 1.76, SE = .02, p = .078.

As with the analogous analyses reported earlier, these results are rather intuitive; if an individual sees mowing as cheap, pretty, eco-friendly, and desirable it makes sense they would consider it important that everywhere is mown. This may imply that altering these perceptions might allow for a reduction in how important people think it is to mow. For example, demonstrating that mowing is environmentally damaging, unattractive, and not desirable, may also reduce how important residents think it is to mow. Importantly these findings are about how important they think it is to mow green spaces, not about whether they want mowing to increase or decrease. Section Summary:

Mowing was seen as more important on average amongst people who thought mowing was environmentally friendly, pretty, and socially desirable.

Cost and safety showed effects inconsistent with prior analyses. Given both the size and consistency of the effects, these are unlikely to be fruitful areas for further attention (i.e., they are not important levers).

The unique associations between greenspace perceptions and reported mowing importance for specific land types (interactions)

The omnibus test for the second-order model revealed that the importance of mowing depended significantly on the interaction between type of greenspace and perceptions of mowing as ecofriendly, F(9, 6323) = 6.35, p < .001, as pretty, F(9, 6323) = 2.43, p = .009, and as desirable F(9, 6323) = 3.69, p < .001. The interaction between type of greenspace and perceptions of cost, F(9, 6323) = 1.69, p = .086, and buffering against anti-social behaviour, F(9, 6323) = 1.72, p = .080, were both not significant. Moreover, these perceptions of cost and antisocial buffering were not meaningful predictors for any land type. The following tables show how much the relevant perceptions influenced mowing importance for specific land types (in order from most to least important). For comprehensiveness, all simple slopes for each land type are reported in Appendix A.

Land Type	β	SE	df	t	p
Unused Spaces	.21	.04	5044.64	5.85	< .001
Council Grounds	.20	.04	5053.23	5.34	< .001
Roundabouts	.19	.04	5044.64	5.18	< .001
Road Borders	.16	.04	5044.64	4.49	< .001
Open Spaces	.13	.04	5044.64	3.59	< .001
Verges	.11	.04	5049.34	3.07	.002
Graveyards	.09	.04	5049.34	2.56	.010
Footpath Borders	.08	.04	5044.64	2.27	.023
Parks	.04	.04	5044.64	1.04	.300
Sports Pitches	05	.04	5044.64	-1.48	.139

Table 4. The influence of perceptions of ecological impact on reported mowing importance

As can be seen in Table 4, taking into account both the size and significance of the effect, the more people saw mowing as ecologically friendly, the more important they felt it was to mow unused spaces, council grounds, roundabouts, road borders, open spaces and verges. In contrast perceptions of eco-friendliness had trivial associations with reported mowing importance for, graveyards, footpath borders, parks, and sports pitches.

In other words, people who saw mown spaces as detrimental for the environment tended to feel it was less important for most spaces to be mown but this was strongest for unused spaces, council grounds, and roundabouts.

Land Type	β	SE	df	t	p
Footpath Borders	.23	.05	5044.64	4.81	< .001
Roundabouts	.22	.05	5044.64	4.59	< .001
Parks	.20	.05	5044.64	4.06	< .001
Open Spaces	.19	.05	5044.64	4.03	< .001
Verges	.17	.05	5048.15	3.53	< .001
Road Borders	.16	.05	5044.64	3.27	.001
Graveyards	.14	.05	5048.15	2.90	.004
Council Grounds	.10	.05	5045.06	2.09	.037
Unused Spaces	.08	.05	5044.64	1.68	.093
Sports Pitches	.02	.05	5044.64	0.45	.656

Table 5. The influence of perceptions of prettiness on reported mowing importance

As can be seen in Table 5, taking into account both the size and significance of the effect, the more people saw mowing as pretty, the more important they felt it was to mow footpath borders, roundabouts, parks, open spaces, verges, road borders, and graveyards. In contrast perceptions of prettiness had trivial associations with reported mowing importance for council grounds, unused spaces, and sports pitches.

In other words, people who saw mown spaces as prettier tended to feel it was more important to mow most spaces, but this was strongest for footpath borders, roundabouts, parks, and open spaces.

Land Type	β	SE	df	t	р
Graveyards	.25	.04	5045.18	5.81	< .001
Open Spaces	.25	.04	5044.64	5.78	< .001
Parks	.25	.04	5044.64	5.79	< .001
Footpath Borders	.24	.04	5044.64	5.70	< .001
Council Grounds	.19	.04	5047.66	4.53	< .001
Verges	.18	.04	5045.18	4.26	< .001
Sports Pitches	.15	.04	5044.64	3.39	.001
Unused	.11	.04	5044.64	2.56	.010
Roundabouts	.09	.04	5044.64	2.21	.027
Road borders	.05	.04	5044.64	1.19	.233

Table 6. The influence of perceptions of desirability on reported mowing importance

As can be seen in Table 6, taking into account both the size and significance of the effect, the more people saw mowing as desirable, the more important they felt it was to mow graveyards, open spaces, parks, footpath borders, council grounds, verges, sports pitches and unused spaces. In contrast perceptions of desirability had trivial associations with reported mowing importance for roundabouts and road borders.

In other words, people who saw mown spaces as more desirable tended to feel it was more important to mow nearly all spaces (except for roundabouts and road borders), granted, this was not quite as strong for verges, sports pitches, and unused spaces.

Section Summary

Desirability, eco-friendliness, and prettiness seemed to matter for most land areas.

If mown space was seen as ecologically harmful, people thought it was less important to mow, especially for unused spaces, council grounds, and roundabouts.

If mown space was seen as pretty, people thought it was more important to mow, especially for footpath borders, roundabouts, parks, and open spaces.

If mown space was seen as more desirable, people thought it was important to mow, especially graveyards, open spaces, parks, footpath borders, and council grounds.

Greenspace Concerns by Type of Greenspace

The overall association between greenspace concerns and reported mowing importance (main effects)

The first-order model predicting reported mowing importance from greenspace concerns revealed a pattern of results largely consistent with those reported in earlier analyses. Specifically, this model revealed that people who felt that neatness was important, $\beta = .29$, t(700) = 14.69, SE = .02, p < .001, and who felt that safety was important, $\beta = .06$, t(700) = 3.33, SE = .02, p = .001, tended to see mowing as more important. However, people who felt that ecological impact was important, $\beta = -.15$, t(700) = -8.50, SE = .02, p < .001, tended to see mowing as less important. In contrast to previous analyses, however, people who felt access was important, $\beta = .03$, t(700) = 2.00, SE = .02, p = .045, and who felt lack of litter was important, $\beta = .04$, t(700) = 2.43, SE = .02, p = .015, tended to view mowing as more important, granted, these were virtually negligible effects.

Section Summary

Mowing was seen as less important to people who were less concerned about the neatness and safety of greenspaces.

Mowing was seen as more important to people who were more concerned about the ecological impact of mown green spaces.

The unique associations between greenspace concerns and reported mowing importance for

specific land types (interactions)

The omnibus test for the second-order model revealed that the importance of mowing depended significantly on the interaction between type of greenspace and the importance of eco-friendliness, F(9, 6296) = 5.64, p < .001, neatness, F(9, 6297) = 9.13, p < .001, aesthetics, F(9, 6296) = 4.48, p < .001, and access, F(9, 6296) = 1.98, p = .037.

The interaction between type of greenspace and the importance of cost, F(9, 6296) = .39, p = .939, buffering against litter, F(9, 6297) = 1.65, p = .094, and safety, F(9, 6297) = 1.27, p = .246, were all not significant. Moreover, cost, litter buffering, and safety concerns (with the exception of safety for roundabouts) were not meaningful predictors of mowing importance for any type of greenspace. However, for comprehensiveness all simple slopes are reported in Appendix A.

Land Type	β	SE	df	t	p
Roundabouts	22	.03	4802.29	-6.88	< .001
Verges	21	.03	4802.30	-6.60	< .001
Road Borders	20	.03	4802.29	-6.39	< .001
Open Spaces	19	.03	4802.29	-5.97	< .001
Graveyards	16	.03	4802.30	-4.86	< .001
Unused Spaces	16	.03	4802.29	-5.08	< .001
Footpath Borders	14	.03	4802.29	-4.39	< .001
Parks	12	.03	4802.29	-3.82	< .001
Council Grounds	09	.03	4811.59	-2.75	.006
Sports Pitches	.00	.03	4802.29	-0.04	.966

Table 7. The influence of concerns around eco-friendliness on reported mowing importance

As can be seen in Table 7, the importance of ecological impact was least important for council grounds (and sports pitches). Otherwise, it was, for all practical purposes, relatively consistent across most spaces.

Land Type	β	SE	df	t	p
Open Spaces	.40	.04	4802.29	11.26	< .001
Council Grounds	.37	.04	4802.85	10.35	< .001
Verges	.35	.04	4817.38	9.77	< .001
Footpath Borders	.32	.04	4802.29	8.98	< .001
Road Borders	.31	.04	4802.29	8.54	< .001
Parks	.30	.04	4802.29	8.24	< .001
Roundabouts	.30	.04	4802.29	8.48	< .001
Graveyards	.27	.04	4817.38	7.40	< .001
Unused Spaces	.21	.04	4802.29	5.97	< .001
Sports Pitches	.06	.04	4802.29	1.80	.071

Table 8. The influence of concerns around neatness on reported mowing importance

As can be seen in Table 8, the importance of neatness was least important for sports pitches. Otherwise, it was, for all practical purposes, relatively consistent across most spaces.

Land Type	β	SE	df	t	p
Open Spaces	.08	.03	4802.29	2.38	.017
Footpath Borders	.07	.03	4802.29	2.20	.028
Parks	.07	.03	4802.29	2.13	.034
Sports Pitches	.07	.03	4802.29	2.05	.041
Unused	.02	.03	4802.29	0.71	.479
Council Grounds	.01	.03	4811.08	0.34	.732
Graves	.00	.03	4803.30	-0.09	.930
Verges	03	.03	4803.30	-0.85	.393
Roundabouts	04	.03	4802.29	-1.27	.205
Road Borders	11	.03	4802.29	-3.30	.001

Table 9. The influence of concerns around aesthetics on reported mowing importance

As can be seen in Table 9, aesthetics was only important for road borders. Importantly, the more concerned about aesthetics people were, the less important they felt it was to mow road borders, perhaps suggesting that mown road borders are seen as less attractive.

~		~			
50	CHO	n	ım	ma	r\/
JC	LIU		um	iiia	1 V
					- /

With only a small handful of exceptions, reported mowing importance for all types of lands was only predicted by concerns around neatness and eco-friendliness. Many other concerns did not actually impact how important people felt mowing was for most spaces.

While the strength of associations for both concerns varied significantly depending on type of greenspace, the substantive association was largely the same for most spaces.

Overall, this suggests that considering these two levers (neatness and eco-friendliness) as ways of framing any mowing reductions might prove to be useful for multiple land types.

PERCEPTIONS OF FELLOW RESIDENTS' SUPPORT

Do People's Perceptions of Norms Match the Actual Norm?

A correlation analysis between the two ratings of attitudes towards wilding and perception of others attitudes towards wilding found only a small correlation, r(705) = .29, p < .001, which corresponds to only sharing about 9% overlap in variance suggesting that participants had very inaccurate perceptions of norms. When comparing the distributions of the two types of ratings (See Figure 9) we can see that the two distributions are not visually similar and that it appears the distribution for *others* is shifted lower than the distribution for oneself.





Finally, the paired t-test indicated that participants average ratings of the importance of wilding for themselves (M = 1.17, SD = 0.82) was much higher than their perceptions of the same for other people, (M = 0.21, SD = 0.94), t(1387.71) = -2.31, p < .001, d = -.91. Overall, this indicates that participants systematically think everyone else is less supportive of wilding than they really are.

Section Summary

People generally assume that they are more supportive of wild spaces than are other people. Or in other words, people underestimate how much other people support wilding.

DESCRIPTIVE CONSIDERATIONS

How are Mown Spaces Perceived?

In General

Given that perceptions of prettiness, eco-friendliness, and social desirability were revealed as highly influential for mowing preferences, it would be valuable to know which (if any) of these three perceptions are currently problematic (i.e., work to perpetuate support for mowing) and, therefore, are in need of addressing. A series of one-sample t-tests (comparing perceptions to 0 as a reflection of ambivalence) revealed that the sample tended to view mown spaces as clearly harmful to the environment (M = -1.02, SD = 1.02), t(708) = -26.58, p < .001, and as more desirable (M = 0.39, SD = 0.99), t(708) = 1.44, p < .001. In contrast, the sample appeared to have ambivalent perceptions of the prettiness of mown spaces (M = 0.06, SD = 1.00), t(708) = 1.56, p = .119.

Differences between Demographic Groups

It seemed likewise valuable to know whether these perceptions differed by the available demographic information. Accordingly, we conducted a series of regressions predicting each perception from demographics.

Differences between areas

The regressions predicting perceptions from postcode revealed that postcode did not predict any of the perceptions (ps > .212).

Differences between genders

The regressions predicting perceptions from gender revealed that men and women had statistically equivalent perceptions of mown spaces (ps < .060).

Differences between ages

The regressions predicting perceptions from age revealed that age did not predict perceptions of mown spaces (*ps* < .098).

Differences between levels of education

The regressions predicting perceptions from level of education revealed that level of education negatively predicted perceptions of prettiness, β = -0.24, t(687) = -6.53, SE = .02, p < .001, eco friendliness, β = -0.25, t(687) = -6.66, SE = .02, p < .001, and desirability of mown spaces, β = -0.11, t(687) = -2.95, SE = .02, p =

.003. That is, individuals with lower levels of education tended to see mown spaces as more attractive, less environmentally harmful, and more desirable.⁴

Practical Relevance

Overall, this set of analyses suggests that, in general (i.e., ignoring specific audiences), people already seem to recognize that mowing is bad for the environment. While this should not be used to suggest there is *no* need to emphasize to the public the negative impact of mowing (i.e., by the nature of averages, there are still many people falling below the average who could reasonably be brought closer to the point of public consensus; this would seem to hold truest for lower levels of education), it does suggest that the environmental impact might not be the number one priority for targeting. Instead, the fact that people clearly see mown spaces as more desirable suggests that this is an area in need of further investigation. *Why,* for example, do people value mown spaces? Is there any way to retain that value while letting the space remain wild? Is there any way to re-orient people toward other, more important things? Finally, the analysis highlighted that perceptions of prettiness are quite ambivalent. This, ironically, might suggest this is the best area to direct attention. That is, with many people hovering near the midpoint (i.e., on the fence), it might prove easier to tip the scales toward seeing mown spaces as less attractive than it would be to make people see mown spaces as less desirable (which is much further from the midpoint).

Section Summary

People saw mown spaces as harmful to the environment, generally desirable, and neither attractive nor unattractive.

The perceptions that mown spaces were less harmful to the environment, more desirable, and attractive grew stronger as level of education decreased.

⁴ While we also have occupational status, logic suggests it would likely covary with level of education. While occupational status did predict perceptions, once level of education was accounted for, occupation no longer had any influence. Therefore, we have not reported the effects as they are better captured by level of education.

Levels of Concern

In General

Like perceptions, knowing how important the sample rated the most influential mowing concerns (i.e., neatness and environmental impact) seemed useful for guiding the council's future efforts. A series of one-sample t-tests (comparing concerns to 0 as a reflection of ambivalence) revealed that the sample was very concerned about mowing's impact on the environment (M = 1.53, SD = 0.59), t(708) = 68.36, p < .001, and only slightly concerned about neatness (M = 0.25, SD = 1.11), t(708) = 5.95, p < .001.

Differences between Demographic Groups

Paralleling perceptions, we conducted a series of regressions predicting both concerns from demographics.

Differences between areas

The regressions predicting concerns from postcode revealed that while postcode did not predict the importance of ecological impact (p = .096), it did predict the importance of neatness, F(5, 687) = 2.83, p = .015, $R^2 = .01$. A follow-up Tukey post hoc analysis adjusting for multiple comparisons indicated that the only significant difference was between postcodes "SR" and "DH" (difference = .60, p = .011). Otherwise, all other comparisons were not significantly different from each other.

Differences between genders

The regressions predicting concerns from gender revealed that men were slightly more concerned about neatness, $\beta = 0.08$, t(706) = 2.23, SE = .09, p = .026, and moderately less concerned about environmental impact, $\beta = -0.20$, t(706) = -5.29, SE = .05, p < .001, than were women.

Differences between ages

The regressions predicting concerns from age revealed that age did not predict either concern (ps < .057).

Differences between levels of education

The regressions predicting concerns from level of education revealed that level of education negatively predicted concerns about neatness, $\beta = -0.19$, t(687) = -5.12, SE = .03, p < .001, but positively predicted environmental concerns, $\beta = 0.15$, t(687) = 4.01, SE = .01, p < .001. That is, individuals with

higher levels of education tended to be more worried about environmental impact and less worried about neatness.⁵

Practical Relevance

This set of analyses is most useful for potentially guiding any tailoring of efforts to win over specific audiences in support of mowing reductions. In particular, it highlights that, for example, if one were to try and target men, it might make the most sense to focus on neatness as they are both (a) significantly less supportive of mowing reductions and (b) more worried about neatness than women. Similarly, it suggests that in areas with comparatively lower levels of education, the potentially more effective framing might be one that emphasizes neatness; in contrast, in areas with comparatively higher levels of education, environmental impact might prove more effective.

Section Summary

People were very worried about environmental impact and somewhat worried about neatness.

Compared to women and those with higher levels of education, respectively, men and those with lower levels of education were more worried about neatness and less about environmental impact.

⁵ As with perceptions, the effect of occupational status was accounted for entirely by level of education.

FREE TEXT RESPONSES

WE SHARE

What do People Say About the Councils Mowing Practices?

325 free text responses were recorded and placed into four categories: pro-mowing reduction, antimowing reduction, in the middle, and unrelated. This coding method identified 57 comments in favour of reduced mowing, 58 against reducing mowing and 79 comments advocating less mowing in some contexts but not in others (in the middle). The remaining 131 comments were unrelated to mowing. A full list of the free text responses can be found in Appendix B. Below are presented some exemplars from each category.

Example comments in the "pro-mowing reduction" category:

"Durham council seems to be trying hard to manage green spaces. however, it needs a great mindset change from the majority of the general public who cling to the victorian idea of manicured grass. I hope the council continues to chip away at this attitude to increase and maintain biodiversity."

"Help to bring back more natural meadows with native plants, and provide wildlife corridors for wildlife. Having more roundabouts/unused green spaces be turned into areas with wildflowers."

"I absolutely love the roundabouts and grass verges when they are wild and covered in flowers for the wildlife."

Example comments in the "anti-mowing reduction" category:

"Green spaces near homes in residential areas should be mowed regularly to be kept tidy."

"I feel it's great thr council maintain the green spaces the kids use them , it keeps the place tidy. It all together just makes a massive difference in Ithe area if places are cut and mown nice , council do a great job."

"I think 5he general public should have move access to the council owned green spaces or. Ie a village of 600 hours but 4 football pitches and zero place to exercise

animals. The drainage of fields because of lack of bushes and trees. The danger at road junctions when the grass is high and visibility becomes a problem."

Example comments in the "in the middle" category:

"For the questions where I've 'neither agree or disagree ' it's because I believe that there needs to be some mowing (e.g. for visibility) but otherwise left as wild."

"I believe areas do need to be maintained like paths, motorways, parks etc. however some areas could be let to go wild to increase wildlife populations like bee's etc."

"I believe there should be a balance between mown and unmown. On road verges, safety can be an issue but leaving some parts unmown encourages wild flowers and so insects and then birds."

Example comments in the "unrelated" category:

"Community orchards and vegetable gardens would be a good addition."

"Build less houses."

"I think that more effort needs to be directed at dealing with littering and fly tipping rather than grass cutting in County Durham."

CONCLUSIONS

What are the Overall Findings and Conclusions?

The council is actively pursuing ways to manage for biodiversity on the substantial amount of land managed across the county. The recent declaration of an ecological emergency has led to the reassessment of current practices and therefore an understanding of how supportive the county residents will be of these potential changes is essential. The analyses detailed in this report demonstrate that there is no evidence of opposition (i.e., there is evidence of a slight preference to the contrary) to reducing the council's mowing, and there is significant support for increasing the amount of wild space that is present within the county.

This report suggests two important conclusions, County Durham residents were:

(a) significantly in favour of the Council reducing the amount it mows green spaces

(b) they slightly underestimate the present frequency of mowing in the county.

In other words, residents think mowing is less frequent than it really is, yet, they *still* generally support mowing less frequently. On the whole, this optimistically suggests that the council might find less resistance to reduced mowing than originally anticipated.

Separate from resident's desire to reduce mowing there is an even stronger desire for the county to have more wild spaces. Whilst it is unclear exactly why the desire for wild spaces is much higher than the desire to reduce mowing (and also predicted by slightly different things), this finding clearly indicates that wild spaces are something that the people of County Durham want much more of. This is important for two reasons. First, it suggests that residents are potentially unaware of the connection between reduced mowing and increased wildness (or at least are failing to make the connection in the moment). In turn, given the clear desire for more wild spaces, this suggests that emphasising wilding as the goal of any mowing reduction (e.g., signs that say 'we are mowing this space less frequently to increase the number of beautiful wild spaces for nature') might help people see the mowing reduction as aligning with their desires.

• The two most important factors when considering opinions to increase or decrease mowing were beauty and environmental impact. The more people cared about beauty the more regularly they wanted greenspace mown, whereas the more they cared about the environment the more they wanted greenspace left wild.

- The only places where it was deemed notably important to mow were cemeteries, parks, and sports pitches. All other greenspaces had relatively ambivalent perceptions around the importance to mow them or it was actively deemed important to mow them less, again though this was not strong.
- County Durham residents generally assumed that they cared more about reducing mowing than
 other members of their community. This could imply that there is a misconception that most
 people are in favour of heavy mowing. Additionally, this could mean that the 1404 complaints
 received were lodged by individuals who believe that most people have even greater support for
 regular mowing than they do.

Section Summary

On average, County Durham residents were slightly supportive of reduced mowing.

County Durham residents underestimate how much the council currently mows.

County Durham residents strongly want more wild spaces.

Beauty, environmental impact, and social desirability were the important factors for people when thinking about mowing.

Mowing was only deemed expressly important for graveyards, parks, sports pitches, and footpath borders. Otherwise, mowing was seen as neither important or unimportant or flatly unimportant.

County Durham residents assume *other* people want more mowing than the data suggests.

RECOMMENDATIONS

What do the Results of this Report Mean for Durham County Council?

Based on the findings of this report, there are several recommendations that are based on data driven insights and empirical evidence. The first recommendation is that based on this sample the residents of County Durham appear to be supportive—albeit slightly—of a reduction in mowing county wide.

Based on the analyses here, the most fruitful areas worth considering for reduced mowing (i.e., in the sense that these areas received, at most, neutral ratings of reported mowing importance) are unused spaces, roundabouts, grass verges, road borders, council grounds, footpath borders, and open spaces. The areas that would potentially receive the most opposition are sports pitches, park grounds, and graveyards.

While the report suggests that people might be open to changes in mowing, it also highlights that there are key dimensions that might prove to be useful levers in efforts to frame any changes in the public eye. Specifically, preferences for mowing reductions and reduced importance placed on mowing of specific places were most impacted by the perceived prettiness and desirability of mown green space, followed by the perceived environmental impact of mowing-neatness and environmental impact also happen to be the most influential concerns in the data. Whilst this report does not test any behavioural interventions or provide enough empirical evidence by itself to definitively suggest that these perceptions will be an effective lever for increasing support for any mowing reductions, it does suggest that perceptions of prettiness, desirability, and ecological impact may be a fruitful area into which further resources could be devoted. That is, it would likely be worth considering whether focusing messaging or signage in areas with reduced mowing on the enhanced beauty from, increased desirability of, and reduced environmental impact of allowing native plants to grow. An important caveat to this recommendation is that the changes to green space management must have a tangible impact. This is most readily illustrated by considering the lever of beauty as an example. If signage says, for example, 'By not mowing, we are letting this space remain naturally beautiful', people will likely respond negatively if the space does not look beautiful. Thus, any reductions in mowing/increases in wildness of the area must be accompanied by a tangible change in beauty so as to avoid backlash to the messaging and the perception that it is disingenuous, dishonest, or divorced from reality. Fortunately, research in Cambridge has shown that wildflower meadows are considered more aesthetically pleasing than traditional lawns (Marshall et al., 2023). Therefore, if the council decides to implement alterations to mowing practices, these could potentially be made more acceptable in the eyes of the public if they also include such attractive changes.

Here, it seems important to acknowledge the discrepancy between people's most important concerns and the ones that were most statistically influential. In terms of overall scores, people indicated that they were most concerned about environmental impact and only slightly concerned about neatness. This alone would have seemed to imply that environmental concerns would most influence their preferences and, therefore, be worth targeting. Yet, from the analyses earlier in the report, we clearly see that the importance of neatness is more influential than environmental concerns. In fact, when environmental concerns are used to predict preferences for mowing reductions alongside neatness concerns, environmental concerns only account for 4.6% of the variance in preferences, whereas neatness concerns predict 28.8% of the variance. This clearly indicates that neatness is the more powerful force driving mowing preferences (and it also highlights an especially important social-psychological principle: people aren't always the best judges of what drives their own behaviour). It is important to emphasize, however, that this does not necessarily mean one should blindly focus on the lever of neatness at the cost of environmental impact. If it is equally easy to frame wilding as 'neat' as it is to frame it as 'environmentally friendly', then the analyses here would clearly indicate effort is best placed on the neatness lever. At least as likely, though, is that convincing people that wild spaces are neater might prove more difficult than it is to convince them it is good for the environment. In such a case, the better lever to address might be the environmental lever—after all, even if a lever will cause greater movement, if it is stuck, it won't matter. Accordingly, the malleability of both perceptions and concerns should be taken into account when deciding the way forward.

The report also suggests that people's preference for wilding might be a stronger priority than their preference for reduced mowing. Thus, in a similar vein to the previous paragraphs, this might suggest framing mowing reductions as 'wilding increases' might help to direct the public's attention to their stronger preference, thereby reducing the chance of any lingering opposition.

In contrast, this report also highlights some things that might be likely to be ineffective—and, therefore, our recommendation would be to avoid them. For one, cost does not seem to be a driving factor in people's preferences about ECLM practices. That is, our analyses clearly suggest that people who want to save money have statistically equivalent preferences for mowing as those who do not care about saving money. Thus, there is little reason to tailor public-facing messaging or justification to this concern. Likewise, our analyses indicate that people who voice strong concerns about safety or accessibility also have similar preferences as those who have no such concerns—similarly suggesting that these dimensions are not useful levers.

The final recommendation from this report is based upon the findings that whilst people are generally supportive of reduced mowing, they routinely believe that most people are less in favour of this change than they are. Information and messaging could potentially be disseminated to the County's residents to outline that there is general support for less mowing county wide.

References

- Aarssen, L. W. (1997). High Productivity in Grassland Ecosystems: Effected by Species Diversity or Productive Species? *Oikos*, *80*(1), 183. https://doi.org/10.2307/3546531
- Baumeister, R. F., Bratslavsky, E., Finkenauer, C., & Vohs, K. D. (2001). Bad is Stronger than Good. *Review* of General Psychology, 5(4), 323–370. https://doi.org/10.1037/1089-2680.5.4.323
- Chase, J. M., Blowes, S. A., Knight, T. M., Gerstner, K., & May, F. (2020). Ecosystem decay exacerbates biodiversity loss with habitat loss. *Nature*, *584*(7820), Article 7820.

https://doi.org/10.1038/s41586-020-2531-2

- Daba, M. H., & Dejene, S. W. (2018). The Role of Biodiversity and Ecosystem Services in Carbon
 Sequestration and its Implication for Climate Change Mitigation. *International Journal of Environmental Sciences & Natural Resources*, *11*(2), 1–10.
 https://doi.org/10.19080/IJESNR.2018.11.555810
- Díaz, S., Fargione, J., Iii, F. S. C., & Tilman, D. (2006). Biodiversity Loss Threatens Human Well-Being. *PLOS Biology*, *4*(8), e277. https://doi.org/10.1371/journal.pbio.0040277
- Díaz, S., Hector, A., & Wardle, D. A. (2009). Biodiversity in forest carbon sequestration initiatives: Not just a side benefit. *Current Opinion in Environmental Sustainability*, 1(1), 55–60. https://doi.org/10.1016/j.cosust.2009.08.001
- Duckles, J. (2021, February 17). 'Ecological Emergency' declared by South Oxfordshire District Council. South Oxfordshire District Council. https://www.southoxon.gov.uk/climateemergency/ecological-emergency-declared-by-south-oxfordshire-district-council/

- Durham County Council. (2022, April 6). Agenda for Cabinet on Wednesday 6 April 2022, 9.30 am. https://democracy.durham.gov.uk/ieListDocuments.aspx?Cld=154&Mld=12642
- Garbuzov, M., Fensome, K. A., & Ratnieks, F. L. W. (2015). Public approval plus more wildlife: Twin benefits of reduced mowing of amenity grass in a suburban public park in Saltdean, UK. *Insect Conservation and Diversity*, 8(2), 107–119. https://doi.org/10.1111/icad.12085

Green Space Index. (n.d.). Fields in Trust. Retrieved 26 July 2024, from

https://fieldsintrust.org/insights/green-space-index

- Half of World's GDP Moderately or Highly Dependent on Nature, Says New Report. (2020). World Economic Forum. https://www.weforum.org/press/2020/01/half-of-world-s-gdp-moderately-orhighly-dependent-on-nature-says-new-report/
- Hooper, D. (1998). The Role of Complementarity and Competition in Ecosystem Responses to Variation in Plant Diversity. *Ecology*, *79*(2), 704–719. https://doi.org/10.2307/176964
- Hooper, D., Chapin III, F. S., Ewel, J. J., Hector, A., Inchausti, P., Lavorel, S., Lawton, J. H., Lodge, D.,
 Loreau, M., Naeem, S., Schmid, B., Setälä, H., Symstad, A., J.J., V., & Wardle, D. (2005). Effects Of
 Biodiversity On Ecosystem Functioning: A Consensus Of Current Knowledge. *Ecological Monographs*, *75*, 3–35. https://doi.org/10.1890/04-0922
- Houlden, V., Jani, A., & Hong, A. (2021). Is biodiversity of greenspace important for human health and wellbeing? A bibliometric analysis and systematic literature review. Urban Forestry & Urban Greening, 66, 127385. https://doi.org/10.1016/j.ufug.2021.127385
- How much carbon dioxide would we have to remove from the air to counteract climate change? | MIT Climate Portal. (n.d.). Retrieved 26 July 2024, from https://climate.mit.edu/ask-mit/how-muchcarbon-dioxide-would-we-have-remove-air-counteract-climate-change
- Hydock, C., Chen, Z., & Carlson, K. (2020). Why Unhappy Customers Are Unlikely to Share Their Opinions with Brands. *Journal of Marketing*, *84*(6), 95–112. https://doi.org/10.1177/0022242920920295

- Klein, A.-M., Brittain, C., Hendrix, S. D., Thorp, R., Williams, N., & Kremen, C. (2012). Wild pollination services to California almond rely on semi-natural habitat. *Journal of Applied Ecology*, 49(3), 723–732. https://doi.org/10.1111/j.1365-2664.2012.02144.x
- Liu, H., Banfield, C., Gomes, S., Gube, M., Weig, A., & Pausch, J. (2023). Vegetation transition from meadow to forest reduces priming effect on SOM decomposition. SOIL BIOLOGY & BIOCHEMISTRY, 184. https://doi.org/10.1016/j.soilbio.2023.109123
- Loreau, M., & Hector, A. (2001). Partitioning selection and complementarity in biodiversity experiments. *Nature*, *412*(6842), 72–76. https://doi.org/10.1038/35083573
- MacDougall, A. S., McCann, K. S., Gellner, G., & Turkington, R. (2013). Diversity loss with persistent human disturbance increases vulnerability to ecosystem collapse. *Nature*, *494*(7435), 86–89. https://doi.org/10.1038/nature11869
- Marshall, C. A. M., Wilkinson, M. T., Hadfield, P. M., Rogers, S. M., Shanklin, J. D., Eversham, B. C.,
 Healey, R., Kranse, O. P., Preston, C. D., Coghill, S. J., McGonigle, K. L., Moggridge, G. D., Pilbeam,
 P. G., Marza, A. C., Szigecsan, D., Mitchell, J., Hicks, M. A., Wallis, S. M., Xu, Z., ... Eves-van den
 Akker, S. (2023). Urban wildflower meadow planting for biodiversity, climate and society: An
 evaluation at King's College, Cambridge. *Ecological Solutions and Evidence*, 4(2), e12243.
 https://doi.org/10.1002/2688-8319.12243
- Martin. (2019, May 6). UN Report: Nature's Dangerous Decline 'Unprecedented'; Species Extinction Rates 'Accelerating'. *United Nations Sustainable Development*. https://www.un.org/sustainabledevelopment/blog/2019/05/nature-decline-unprecedentedreport/
- Mora, C., Tittensor, D. P., Adl, S., Simpson, A. G. B., & Worm, B. (2011). How Many Species Are There on Earth and in the Ocean? *PLOS Biology*, *9*(8), e1001127. https://doi.org/10.1371/journal.pbio.1001127

National Geographic. (2024). Biodiversity.

https://education.nationalgeographic.org/resource/biodiversity

- Neergheen-Bhujun, V., Awan, A. T., Baran, Y., Bunnefeld, N., Chan, K., dela Cruz, T. E., Egamberdieva, D., Elsässer, S., Johnson, M. V., Komai, S., Konevega, A. L., Malone, J. H., Mason, P., Nguon, R., Piper, R., Shrestha, U. B., Pešić, M., & Kagansky, A. (2017). Biodiversity, drug discovery, and the future of global health: Introducing the biodiversity to biomedicine consortium, a call to action. *Journal of Global Health*, 7(2), 020304. https://doi.org/10.7189/jogh.07.020304
- Parks, K. E., & Mulligan, M. (2010). On the relationship between a resource based measure of geodiversity and broad scale biodiversity patterns. *Biodiversity and Conservation*, 19(9), 2751–2766. https://doi.org/10.1007/s10531-010-9876-z
- Pescott, O. L., Simkin, J. M., August, T. A., Randle, Z., Dore, A. J., & Botham, M. S. (2015). Air pollution and its effects on lichens, bryophytes, and lichen-feeding Lepidoptera: Review and evidence from biological records. *Biological Journal of the Linnean Society*, *115*(3), Article 3. https://doi.org/10.1111/bij.12541
- Robinson, D. (2007). Implications of a large global root biomass for carbon sink estimates and for soil carbon dynamics. *Proceedings. Biological Sciences*, *274*(1626), 2753–2759. https://doi.org/10.1098/rspb.2007.1012
- Schindler, D. E., Hilborn, R., Chasco, B., Boatright, C. P., Quinn, T. P., Rogers, L. A., & Webster, M. S.
 (2010). Population diversity and the portfolio effect in an exploited species. *Nature*, 465(7298), 609–612. https://doi.org/10.1038/nature09060
- Schoenmueller, V., Netzer, O., & Stahl, F. (2019). *The Extreme Distribution of Online Reviews: Prevalence, Drivers and Implications* (SSRN Scholarly Paper 3100217). https://doi.org/10.2139/ssrn.3100217

- Sehrt, M., Bossdorf, O., Freitag, M., & Bucharova, A. (2020). Less is more! Rapid increase in plant species richness after reduced mowing in urban grasslands. *Basic and Applied Ecology*, 42, 47–53. https://doi.org/10.1016/j.baae.2019.10.008
- Southon, G. E., Jorgensen, A., Dunnett, N., Hoyle, H., & Evans, K. L. (2017). Biodiverse perennial meadows have aesthetic value and increase residents' perceptions of site quality in urban green-space. *Landscape and Urban Planning*, *158*, 105–118.

https://doi.org/10.1016/j.landurbplan.2016.08.003

State of Nature 2023—Report on the UK's current biodiversity. (2023). State of Nature.

https://stateofnature.org.uk/

The council and climate crisis. (2024). Uttlesford District Council.

https://www.uttlesford.gov.uk/article/5768/The-council-and-climate-crisis

- Vasiliev, D. (2022). The Role of Biodiversity in Ecosystem Resilience. *IOP Conference Series: Earth and Environmental Science*, *1072*(1), 012012. https://doi.org/10.1088/1755-1315/1072/1/012012
- Walker, K., Stroh, P., Humphrey, T., Roy, D. B., Burkmar, R., & Pescott, O. (2023). Britain's Changing Flora. A Summary of the Results of Plant Atlas 2020.

https://doi.org/10.13140/RG.2.2.25091.99362

Wang, R., Wu, H., Sardans, J., Li, T., Liu, H., Peñuelas, J., Dijkstra, F. A., & Jiang, Y. (2020). Carbon storage and plant-soil linkages among soil aggregates as affected by nitrogen enrichment and mowing management in a meadow grassland. *Plant and Soil, 457*(1–2), 407–420.

https://doi.org/10.1007/s11104-020-04749-0

Watson, C. J., Carignan-Guillemette, L., Turcotte, C., Maire, V., & Proulx, R. (2020). Ecological and
economic benefits of low-intensity urban lawn management. *Journal of Applied Ecology*, *57*(2),
436–446. https://doi.org/10.1111/1365-2664.13542

Weiskopf, S. R., Isbell, F., Arce-Plata, M. I., Di Marco, M., Harfoot, M., Johnson, J., Lerman, S. B., Miller, B.
W., Morelli, T. L., Mori, A. S., Weng, E., & Ferrier, S. (2024). Biodiversity loss reduces global terrestrial carbon storage. *Nature Communications*, *15*(1), 4354.
https://doi.org/10.1038/s41467-024-47872-7

What land is owned by councils? (2020, May 4). *Who Owns England?* https://whoownsengland.org/2020/05/04/what-land-is-owned-by-councils/

- Wood, E., Harsant, A., Dallimer, M., Cronin de Chavez, A., McEachan, R. R. C., & Hassall, C. (2018). Not All Green Space Is Created Equal: Biodiversity Predicts Psychological Restorative Benefits From Urban Green Space. *Frontiers in Psychology*, *9*. https://doi.org/10.3389/fpsyg.2018.02320
- Yang, Y., Tilman, D., Furey, G., & Lehman, C. (2019). Soil carbon sequestration accelerated by restoration of grassland biodiversity. *Nature Communications*, *10*(1), 718. https://doi.org/10.1038/s41467-019-08636-w

Zhang, Y., Mavoa, S., Zhao, J., Raphael, D., & Smith, M. (2020). The Association between Green Space and Adolescents' Mental Well-Being: A Systematic Review. *International Journal of Environmental Research and Public Health*, 17(18), Article 18. https://doi.org/10.3390/ijerph17186640