



# Main Motivations and Barriers to Wildlife-Friendly Gardening in Sweden

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# Main Motivations and Barriers to Wildlife-Friendly Gardening in Sweden

A study of socio-psychological factors predicting the  
conservation behaviour of private garden owners

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# Abstract

Biodiversity is declining all over the world due to human activities. This is alarming since human survival is dependent on biodiversity and the ecosystem services nature provides. In urban areas, private gardens have been pointed out as important agents for nature conservation, at the same time as they function as expressions of the owner's identity and personal values. This study investigates what wildlife-friendly gardening (WFG) practices are carried out in Sweden today and the main motivations behind these behaviours. Additionally, barriers to WFG and implications for interventions to increase WFG-behaviour are identified. An online survey was created and structured around seven specific WFG-practices to assess these aspects.

The results show that respondents carrying out the practices were mainly motivated by environmental reasons, while the motivations for not carrying out the practices were mainly aesthetics, health and safety reasons, and practicality. Self-perceived knowledge had a small effect on predicting WFG-behaviour, while additional information of the environmental benefits of the practices may have an impact on increasing WFG-behaviour. Additional factors of age, gender, the number of gardens, and the time spent in the garden did not have a substantial impact on gardening behaviour. This suggests that WFG-behaviour in Sweden is better explained by other factors.

A higher sense of nature-connectedness might explain the environmental motivations of current practitioners, while a cultural norm of tidiness may explain the main barriers to WFG. Moreover, interventions for increasing WFG in Sweden should focus on providing inspiration and increasing engagement in nature conservation, e.g., through two-way communication and the managing of public green spaces. Further studies investigating the impact of socio-psychological factors on gardening behaviour in Sweden are needed to better understand how to design interventions for increasing biodiversity in urban areas.



# Populärvetenskaplig sammanfattning

Den biologiska mångfalden minskar över hela världen till följd av människans påverkan på naturen. Klimatförändringar, användning av bekämpningsmedel och mark för växande städer fragmenterar landskap och förstör livsmiljöer för tusentals arter. Detta är allvarligt, inte minst eftersom människans välmående och överlevnad är helt beroende av naturen och de tjänster den ger oss, till exempel rent vatten och pollinering för odling. Grönområden i bebyggda miljöer, så som privata trädgårdar, har potential att gynna biologisk mångfald och ekosystemtjänster i städer. Men trädgården är inte bara en plats för naturen i staden, den fungerar också som uttryck för identitet och personliga värderingar. Få studier har hittills fokuserat på relationen mellan ekologiska och sociala aspekter av trädgårdsskötsel i Sverige. Detta tvärvetenskapliga perspektiv är centralt inom miljövetenskap och viktigt för att förstå hur insatser kan utformas för att inspirera till främjande av biologisk mångfald i trädgården.

Denna studie undersöker vilka motiv och hinder som ligger bakom trädgårdsskötsel för biologisk mångfald i Sverige idag, med specifikt fokus på sociala och psykologiska aspekter och betydelsen av ökad kunskap för beteendeförändring. För att undersöka detta utformades en enkät kring sju specifika trädgårdsåtgärder som är positiva för biologisk mångfald.

Resultaten av studien visar att personer som utför dessa åtgärder främst är motiverade av miljöhänsyn, medan motiven för att inte genomföra åtgärderna främst handlade om estetik, hälsa- och säkerhet och praktiska skäl. Självskattad kunskap hade en liten inverkan på huruvida personer genomför trädgårdsåtgärder som är bra för biologisk mångfald, medan mer information om de specifika åtgärdernas miljönytta kan ha en inverkan på att öka genomförandet av dessa åtgärder. Ytterligare faktorer som ålder, kön, antal trädgårdar och hur mycket tid som personer lägger på trädgårdsarbete hade inte heller någon betydande inverkan på utförandet av dessa sju trädgårdsåtgärder. Sammantaget tyder detta på att trädgårdsbeteende i Sverige bättre kan förklaras av andra faktorer.

Sambandet mellan att personer som genomför trädgårdsåtgärder som är bra för biologisk mångfald också är motiverade av miljöaspekter, kan ha att göra med att dessa personer känner en större närhet och samhörighet med naturen. Motiven för att inte genomföra dessa åtgärder skulle kunna kopplas till en kulturell norm i Sverige kring välskötta och prydliga trädgårdar. Insatser för att öka trädgårdsskötsel för biologisk mångfald i Sverige bör fokusera på att inspirera och öka engagemanget för naturvård,

snarare än att tillhandahålla information. Det behövs fler tvärvetenskapliga studier kring trädgårdsskötsel i Sverige som undersöker sambanden mellan ekologi och sociala- och psykologiska aspekter, för att få en bättre förståelse för hur insatser kan utformas för att främja biologisk mångfald i städer.



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# Introduction

Humans are dependent on nature and the irreplaceable services it provides. Through ecological and evolutionary processes, nature sustains the quality of soil, water, and air as well as provides food, medicine, and materials (Díaz et al., 2019; Parmesan et al., 2022). These so-called ecosystem services are delivered by biodiversity – the diversity of ecosystems, species, and genes within species (Parmesan et al., 2022). However, biodiversity is rapidly declining due to human activities such as the usage of pesticides, and climate- and land-use change (Díaz et al., 2019; Gordon et al., 2019). The loss of biodiversity causes direct negative consequences for human well-being and health (Parmesan et al., 2022). This is alarming and calls for action – We need to bend the curve of biodiversity decline.

Urban areas have more than doubled since 1992 (Díaz et al., 2019). Urban expansion causes land-use change that destroys natural habitats and fragments landscapes, causing biodiversity decline (Díaz et al., 2019; Gordon et al., 2019). However, green spaces within the urban matrix, such as private gardens, have the potential to maintain and restore biodiversity and ecosystem services within cities (Díaz et al., 2019). Thereof, as urbanisation increases, so does the importance of these privately owned gardens as nature conservation agents (Goddard et al., 2010; Loram et al., 2007).

## Current research on wildlife-friendly gardening

Research has primarily focused on the ecological aspects of nature conservation, and there is extensive knowledge about wildlife-friendly gardening (WFG) practices. These practices range from providing nectar sources for pollinators by keeping flowering weeds in the lawn (Larson et al., 2014; Lerman et al., 2018; Persson et al., 2022a; Smith et al., 2006), contributing to increased tree cover in urban green spaces (Fernández-Juricic & Jokimäki, 2001; Smith et al., 2006), to letting leaves decompose on the ground to contribute to soil health and biota (Gessner et al., 2010; Kibblewhite et al., 2008). Other examples are providing bee hotels to increase the abundance of pollinators (Persson et al., 2023; von Königslöw et al., 2019), not using pesticides due to their toxicity to a range of non-target invertebrates and negative impact on biodiversity (van

der Sluijs et al., 2015), as well as not using fertilisers which have been found to have negative effects on plant diversity in lawns (Yang et al., 2019).

However, various socio-psychological factors have been found to affect motivations and barriers to WFG-practices in urban areas. As nature conservation is an anthropogenic activity, human factors of social and cultural aspects must be attended to in order to address biodiversity loss (Hall & Martins, 2020). There are different social norms affecting the behaviour of individuals, also in the context of gardening behaviour (Jones & Niemiec, 2020; Uren et al., 2015). Social norms can be divided into descriptive and injunctive norms. Descriptive norms inform us of what is typically done in a situation, while injunctive norms inform us of what is approved or disapproved of in a certain situation (Cialdini & Goldstein, 2004; Gavrillets, 2020). Moreover, certain gardening behaviours and practices can be considered part of a cultural norm (Uren et al., 2015), e.g., certain practices related to tidiness and conformity (Hanson et al., 2021; Ignatieva et al., 2017). Going even deeper, these cultural processes are linked to people's worldviews, including to what extent people feel connected to nature (nature-connectedness) which also is a predictor for nature conservation- and WFG-behaviour (Knapp et al., 2020; Larson et al., 2022; Parmesan et al., 2022; Uren et al., 2015). Another human factor relevant to the subject is knowledge, where the lack of knowledge is an often-cited barrier to WFG (Goddard et al., 2013). Knowledge of nature conservation actions, wildlife, and gardening practices have been found to predict WFG-behaviour to different extents (Jones & Niemiec, 2020; Knapp et al., 2021; Persson et al., 2022b).

Studies have identified the need for further research investigating the role of socio-psychological factors in nature conservation and gardening behaviours (e.g., Goddard et al., 2010; Goddard et al., 2013; Hall & Martins, 2020; Knapp et al. 2020; Larson et al., 2022). Few studies have been conducted in Sweden (e.g., Hanson et al., 2021; Ignatieva et al., 2017; Persson et al., 2022b; Persson et al., 2023), and therefore, taken together, there is a need for further research on socio-psychological factors of WFG, and in particular to gain a broader understanding of garden owners in Sweden. This interdisciplinary approach is central to environmental studies and crucial to understanding how to inspire WFG-behaviour.

## Purpose and aim

The purpose of this study was to contribute to an increased understanding of gardening behaviour in Sweden and how interventions to increase WFG-behaviour can be designed. The aim was to investigate the main motivations and barriers to WFG, focusing on socio-psychological factors and the impact of knowledge on current nature conservation behaviour, specifically answering the questions:

1. What WFG-practices are currently being carried out?

2. What are the main motivations for gardening behaviour?
3. What factors influence motivations and barriers to WFG?
4. How can interventions be designed to increase WFG?

Against the background of previous studies on the subject, social and cultural norms were expected to constitute the main motivations related to WFG in Sweden. In addition, social and cultural norms were expected to function as barriers to WFG-behaviour. Moreover, a high level of self-perceived knowledge was expected to predict WFG in Sweden, while additional information on the ecological benefits of WFG-practices was expected to have a low impact on whether people would reconsider adopting the practices. Other factors expected to impact WFG-behaviour in Sweden were the amount of time spent in the garden as well as owning multiple garden types.



# Method

## Survey

An online survey was created to assess the main motivations and barriers to WFG among Swedish garden owners. The survey was structured around seven specific WFG-practices which were used to investigate the main motivations, as well as the impact of increased knowledge on the willingness to carry out these practices:

- keeping *dandelions* (1), *nettles* (2), and *leaves* (3),
- having *flowering bushes and trees* (4),
- providing *bee hotels* (5),
- not *mowing the lawn* (6) in some parts of the garden, and
- not using *pesticides and fertilisers* (7).

The survey was designed with inspiration from previous studies on motivations and barriers to WFG (Jones & Niemiec, 2020; Knapp et al., 2020; Uren et al., 2015; Smith et al., 2006). The survey consisted of 22 questions across four sections: (1) Background information, (2) Self-perceived knowledge about biodiversity and conservation actions, (3) Motivations to carrying out or not carrying out each of the seven WFG-practices, and (4) The impact of increased knowledge on reconsidering adopting the WFG-practices.

Section 1 consisted of four multiple-choice items collecting information about the respondent's age, gender, and garden type(s), as well as an open-box item to assess the respondent's self-evaluated time spent gardening. Section 2 consisted of four 5-point Likert-scale items, a form of rating scale, which were used to rank respondents from high to low self-perceived knowledge. Section 3 consisted of one yes/no item for each gardening practice and a following multiple-choice item to identify the main motivation from one of the following groups:

- descriptive norm
- injunctive norm
- the environment
- aesthetics
- health and safety
- practicality

Section 4 presented more detailed information on why each of the seven gardening practices is beneficial for biodiversity. It consisted of seven multiple-choice items for the practices to identify the impact of increased knowledge on reconsidering adopting the practices. It also had one open-box item to allow the respondents to elaborate on their answers.

The survey was designed to fulfil the research ethical principles as stated by the Swedish Research Council and The All European Academies (Swedish Research Council, 2023) as well as the four research ethical principles: the requirement of information, consent, confidentiality, and information utilisation (Ejlertsson, 2005). The survey was pre-tested on 3 individuals, and minor adjustments were thereafter made to the questions.

The final survey was launched on April 14, 2023, and answers were collected over 10 days until April 24, 2023. The survey was distributed via the author's Facebook, LinkedIn, and Twitter, and targeted specifically to garden owners via multiple Facebook groups about home gardening in Sweden. The survey was also spread through the social networks of Lund University and employees at CEC, Lund University, as well as marketed during Lund Sustainability Week 2023. In addition, posters were put up around the city of Lund, Sweden. The distribution method might have created a bias towards people with a high pre-existing interest in gardening, towards people living in the south of Sweden, as well as people with high digital fluency and access to the internet. Thereof, the respondents might not be representative of garden owners in Sweden. This is further discussed under "Limitations and future research".

## Data curation

In section 1 of the survey, the answers from respondents with different garden types than specified as a multiple-choice option, as well as answers from respondents with gardens outside of Sweden, were excluded from the analysis. For the stated time spent in the garden, one answer of 700 days/year was removed before analysis, resulting in a range between 0 – 365 days/year in the garden. Where respondents had answered a span of days spent in the garden per year, a mean number was calculated.

In section 2 of the survey, self-perceived knowledge (5-point Likert scale) was coded with numeric values 1, 2, 3, 4, and 5, increasing with higher perceived knowledge. A mean value of self-perceived knowledge was calculated using these numeric values.

In section 3 of the survey, the answers for the seven WFG-practices were transformed into binominal values. For the questions where "yes" would result in a wildlife-friendly outcome (keeping *nettles*, having *flowering bushes and trees*, providing *bee hotels*, and not *mowing the lawn*), "yes" = 1 and "no" = 0. For the questions where "no"



would result in a wildlife-friendly outcome (removing *dandelions*, raking up *leaves*, and using *pesticides and fertilisers*), “yes” = 0 and “no” = 1. The total number of WFG-practices carried out, ranging from 0 – 7, was summarised. In the same section, where free-text options clearly fit in one of the multiple-choice categories, the answer was assigned to the relevant multiple-choice category manually (e.g., “I don’t want my children to get stung by nettles” was assigned to the category: “health and safety”). Free-text responses that could not be assigned to any of the multiple-choice categories were excluded from further statistical analysis. Data representing < 15 respondents were removed from further analysis.

In section 4 of the survey, responses that crossed in all seven WFG-practices as well as the option “none of the above”, were removed from further analysis. The answers were transformed into binominal values, where each of the seven WFG-practices was coded with 1 = crossed in, or 0 = not crossed in. The alternative “none of the above” was coded 0 regardless of if it was crossed in or not. The total number of continued/reconsidered practices, ranging from 0 – 7, was summarised. Data representing < 15 respondents were removed from further analysis.

## Statistical analysis

The statistical analyses were carried out in SPSS. Since the data collected were non-normally distributed, a selection of non-parametric tests was carried out (Table 1).

**Table 1: Statistical tests carried out on the data collected from the survey.**

Focus	Factors/covariates	Test	Additional test 1	Additional test 2
<b>The distribution of motivations (nominal)</b>	- carrying out each of the WGF-practices (nominal) - not carrying out each of the WFG-practices (nominal)	Chi-square ( $X^2$ )	Fisher-Freeman-Halton Exact Test (when cells had an expected count < 5)	Post Hoc Z-test (to determine what groups were driving differences in the distribution)
<b>The number of WFG-practices carried out (ordinal)</b>	- age (ordinal) - gender (nominal) - the number of gardens (ordinal) - time spent in the garden (scale) - mean self-perceived knowledge (scale)	Ordinal regression model fitting	McFadden Pseudo R-square	
<b>Distribution of the number of WFG-practices</b>	- age (ordinal) - gender (nominal) - the number of gardens (ordinal)	Kruskal-Wallis ( $H$ )		

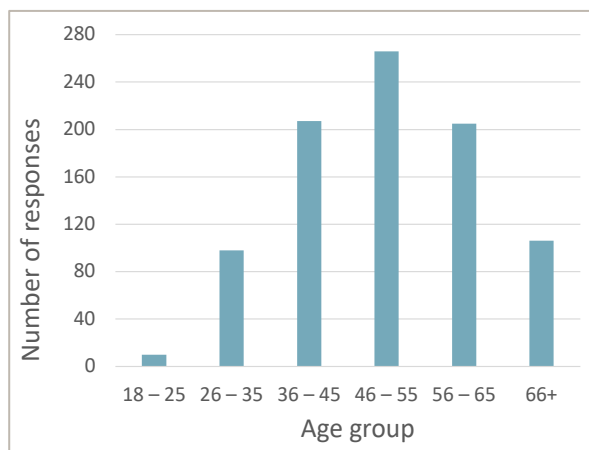
Focus	Factors/covariates	Test	Additional test 1	Additional test 2
<b>carried out (ordinal)</b>				
<b>The distribution of motivations (nominal)</b>	<ul style="list-style-type: none"> <li>- would reconsider carrying out each of the WGF-practices (nominal)</li> <li>- would not carrying out each of the WFG-practices (nominal)</li> </ul>	Chi-square ( $X^2$ )	Fisher-Freeman-Halton Exact Test (when cells had an expected count < 5)	Post Hoc Z-test (to determine what groups were driving differences in the distribution)
<b>The number of reconsidered practices (ordinal)</b>	<ul style="list-style-type: none"> <li>- age (ordinal)</li> <li>- gender (ordinal)</li> <li>- the number of gardens (ordinal)</li> <li>- time spent in the garden (scale)</li> <li>- mean self-perceived knowledge (scale)</li> <li>- number of WFG-practices carried out (ordinal)</li> </ul>	Ordinal regression model fitting	McFadden Pseudo R-square	
<b>Distribution of the number of reconsidered practices (ordinal)</b>	<ul style="list-style-type: none"> <li>- age (ordinal)</li> <li>- gender (nominal)</li> <li>- the number of gardens (ordinal)</li> <li>- the number of WFG-practices carried out (ordinal)</li> </ul>	Kruskal-Wallis ( $H$ )		

# Results

930 responses to the survey were conducted, whereof 892 responses were used for further analysis after the data curation. Fewer responses were analysed when it comes to motivations, due to free-text answers being removed. Full results of the statistical tests are presented in Appendix A (Table A1 – A6). The full data set used for analysis after data curation has been summarised in Appendix B (Table B1).

## Background information

Responses from all age groups were conducted with at least 98 respondents in each age group, except in the group 18 – 25 with only 10 respondents (Figure 1). The majority of the respondents identified as female (92.7%), the rest primarily identified as male (6.6%), and a small portion as other/don't know/prefer not to say (0.7%). Looking at garden type, 82% of the respondents had a *private residential garden*, followed by 11% owning a *summer house*, 4% owning an *allotment*, and 3% having a *yard connected to an apartment building*. The majority of the respondents (94%) had one type of garden, 5.6% had two types of gardens, and 0.3% had three types of gardens.

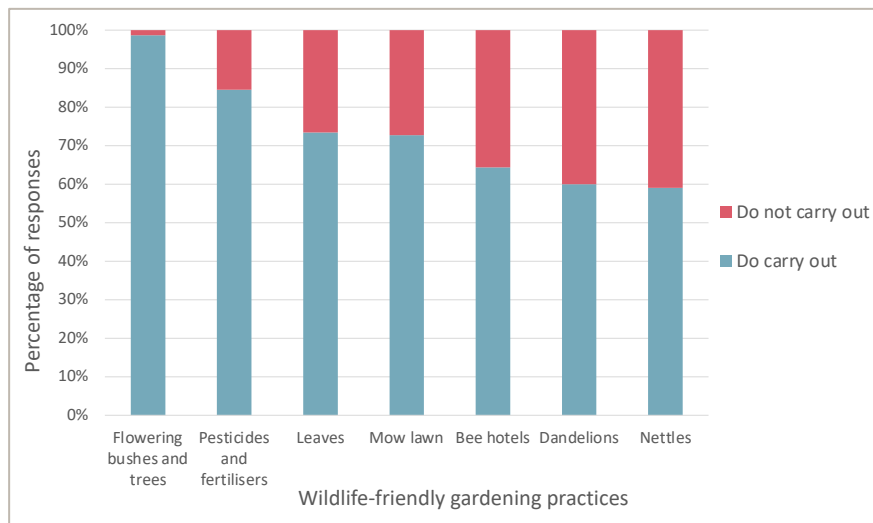


**Figure 1: Distribution of age**

The number of respondents within different age groups.

## Current practices and motivations

All seven WFG-practices were carried out by a majority of the respondents (Figure 2). Having *flowering bushes and trees* in the garden was the practice carried out by the biggest share of respondents (99%). Keeping *nettles* in the garden was the practice with the smallest share of respondents carrying out the practice (59%). The remaining practices were carried out by 85 – 60% of the respondents.



**Figure 2: The share of respondents carrying out and not carrying out each of the WFG-practices.**

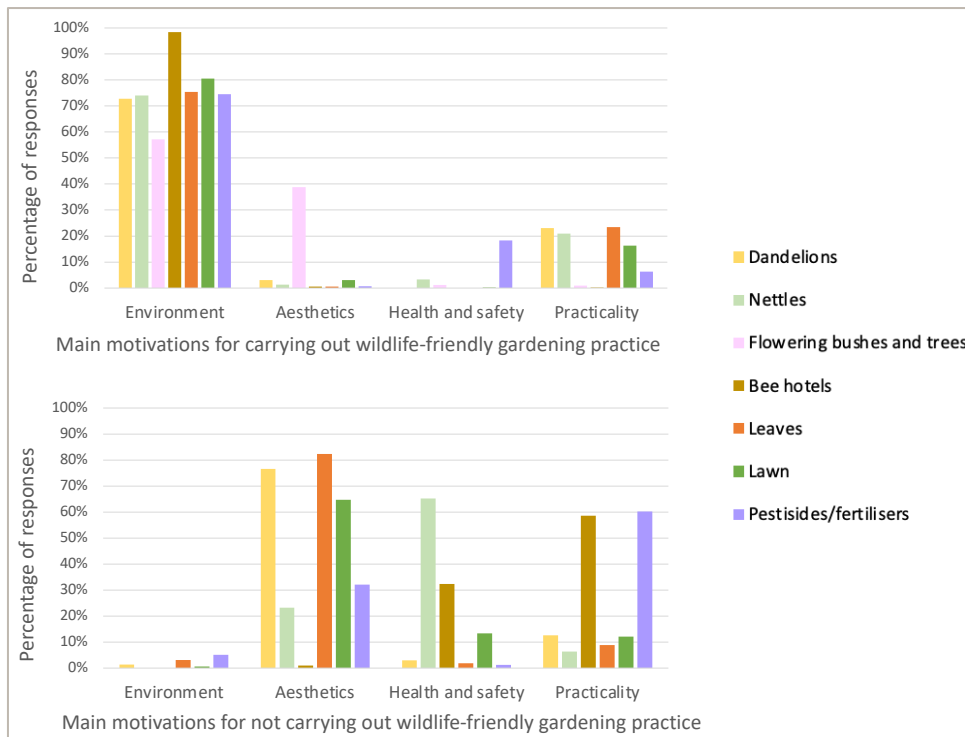
The percentages of respondents carrying out and not carrying out the WFG-practices are based on 892 responses for each practice separately.

The main motivations of injunctive and descriptive norms represented a very small portion of the main motivations, both for respondents carrying out and not carrying out the WFG-practices (< 3%) and are thereof not shown in further charts. There was a significant difference in the distribution of motivations between respondents who do carry out WFG-practices, and respondents who do not carry out WFG-practices ( $\chi^2 = 24.7 - 627.4$ ,  $p < 0.001$ , Table A1, Figure 3).

Looking at the main motivations for carrying out the WFG-practices, “the environment” was the most common main motivation for all the practices similarly with a mean percentage of 76% (Figure 4). It was also the driving motivation behind the significant difference in the distribution of main motivations for five out of seven WFG-practices (Post Hoc Z-test, Table A1). However, the second biggest main motivation for carrying out the WFG-practices varied depending on the practice itself (Figure 3). “Aesthetics” was the second biggest main motivation for having *flowering*

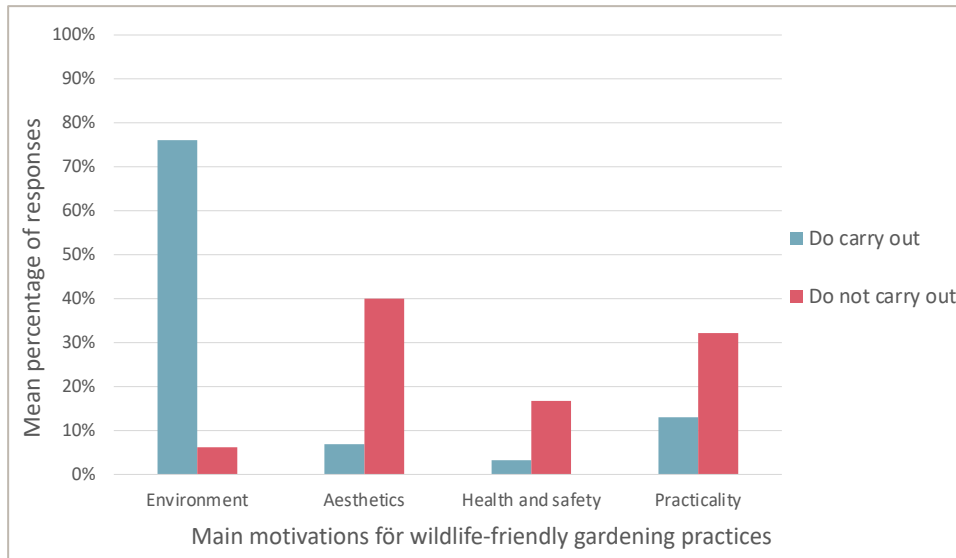
*bushes and trees*, and “health and safety” was the second biggest main motivation for not using *pesticides and fertilisers*. For keeping *dandelions, nettles, and leaves*, and not *mowing the lawn*, the second biggest main motivation was “practicality”.

Looking at the main motivations for not carrying out the practices, the data for *flowering bushes and trees* was represented by 3 individuals and was removed from further analysis (< 15 respondents). The main motivation for not carrying out the practices varied depending on the practice itself (Figure 3). “Aesthetics” was the primary main motivation for removing *dandelions*, and *leaves*, and *mowing the lawn*. For removing *nettles*, the primary main motivation was “health and safety”, while “practicality” was the main motivation for not having *bee hotels*, and for using *pesticides and fertilisers*. Taking all the practices together, the most common main motivations for not carrying out the practices were “aesthetics”, “practicality”, and “health and safety” (Figure 4).



**Figure 3: Main motivations for carrying out and not carrying out WFG-practices.**

Main motivations shown for each WFG-practice individually. The top chart shows the main motivations for respondents carrying out the practices. The bottom chart shows the main motivations for respondents not carrying out the practices, where *flowering bushes and trees* has been removed due to limited data. The percentages for the main motivations are relative to the number of responses for carrying out, respectively not carrying out the individual practice. The difference in the distribution of motivations of respondents carrying out, respectively not carrying out the practices are significantly different for each practice individually ( $X^2 = 24.7 - 627.4$ ,  $p < 0.001$ , Table A1).



**Figure 4: Distribution of main motivations for carrying out and not carrying out WFG-practices.**

Mean percentages of the main motivations for all the WFG-practices taken together, as presented in Figure 3. The mean percentages for carrying out the WFG-practices are based on 3963 responses, and the mean percentages for not carrying out the WFG-practices are based on 933 responses. The same respondent might be represented multiple times due to the practices being added together.

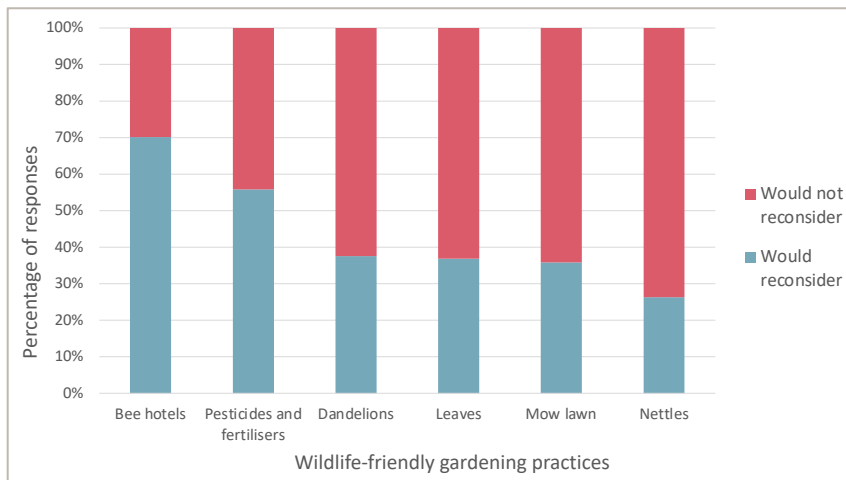
There was a significant correlation between the number of WFG-practices carried out and mean self-perceived knowledge, but only explaining 2.7% of the variation in the number of WFG-practices carried out ( $p < 0.001$ ,  $R^2 = 0.027$ , Table A2).

Looking at other factors determining WFG-behaviour, the ordinal regression model showed that there was no significant correlation between the number of WFG-practices carried out, and age, gender, or number of gardens ( $p > 0.05$ , Table A2). The Kruskal-Wallis tests also showed that there was no difference in the distribution of the number of WFG-practices carried out, over categories of age, gender, or number of gardens ( $H = 0.80 - 1.98$ ,  $p > 0.05$ , Table A3). The ordinal regression model showed that there was a significant correlation between the number of WFG-practices carried out and time spent in the garden ( $p < 0.001$ , Table A2). However, the variation in the number of WFG-practices carried out could not be explained by the time spent in the garden ( $R^2 = 0.005$ , Table A2).

## Reconsidering adopting practices

The results shown here are only representing respondents who did not already carry out the WFG-practices. The practice of *flowering bushes and trees* was excluded from further analysis due to the data only representing 12 respondents (< 15 respondents).

The outcome of providing more information on reconsidering adopting the WFG-practices differed depending on the practice itself (Figure 5). A majority of the respondents were open to reconsidering providing *bee hotels* (70%) and stopping using *pesticides and fertilisers* (56%). However, a minority of these respondents were open to reconsidering keeping *dandelions*, *nettles*, and *leaves*, and not *mowing the lawn*.



**Figure 5: The share of respondents not already carrying out the WFG-practices willing respectively not willing to reconsider adopting each of the WFG-practices.** The percentages for each practice are based on 318 responses for *bee hotels*, 138 responses for *pesticides and fertilisers*, 357 responses for *dandelions*, 237 responses for *leaves*, 243 responses for *mow lawn*, and 365 responses for *nettles*.

There was no significant difference in the distribution of current motivations between respondents who would, respectively would not, reconsider carrying out WFG-practices after being provided with more information, for six out of seven WFG-practices ( $X^2 = 0.352 - 2.62$ ,  $p > 0.05$ , Table A4). For *bee hotels*, there was a significant difference in the distribution of original motivations between respondents who would reconsider, respectively would not reconsider carrying out the practice ( $X^2 = 16.2$ ,  $p < 0.001$ , Table A4). Respondents who answered “practicality” as their current motivation were more likely to reconsider providing *bee hotels*, while respondents who answered “health and safety” as their current motivation were more likely not to reconsider providing *bee hotels* (Z-test, Table A4).

Investigating other factors determining the number of WFG-practices reconsidered after being provided with more information, the ordinal regression model showed no significant correlation with age, gender, number of gardens, the number of WFG-practices currently carried out, time spent in the garden, or mean

self-perceived knowledge ( $p > 0.05$ , Table A5). The Kruskal-Wallis tests similarly showed no significant difference in the distribution of the number of reconsidered WFG-practices, over categories of age, gender, number of gardens, or number of WFG-practices currently carried out ( $H = 1.88 - 10.9$ ,  $p > 0.05$ , Table A6).



# Discussion

## Current behaviour and main motivations

The result of this study shows that people in Sweden do carry out all the WFG-practices specifically investigated in this study, although to different extents depending on the practice itself (Figure 2). Having flowering bushes and trees does seem to be a standard practice in Swedish gardens, whereof there is little potential to improve this particular WFG-action. When it comes to the other practices, in particular keeping weedy plants and providing bee hotels, there is more potential for improvement and relevant to look further into motivations and barriers.

On reconsidering adopting more WFG-practices, current motivations for not performing these actions do not seem to play a role in reconsidering, except in the case of providing bee hotels. In this case, not having bee hotels due to health and safety reasons seems to be a barrier that is quite permanent, while people motivated by practical reasons are more likely to reconsider. Many of these people stated that they were already planning on putting up bee hotels, which may indicate that this practice is quite well-established in Sweden. Persson et al. (2022b) discuss that providing bee hotels seems to be considered a relatively easy action to take by people with a lower interest in biodiversity conservation in Sweden, thus making bee hotels a possible gateway to further increase engagement in nature conservation. It is possible that this particular practice is making its way into standard gardening behaviour in Sweden, which in that case, might open possibilities for adopting further practices later on.

People who do carry out WFG-practices are more likely to be motivated by environmental reasons, while barriers to WFG mainly seem to be motivations such as aesthetics, health and safety, and practicality (Figure 3 and 4). In contrast to the expectations, social norms (injunctive and descriptive) have almost no impact on gardening behaviours. However, many people in this study expressed motivations of wanting to keep the garden tidy and to avoid potential dangers of ticks and pests, as barriers to WFG, similarly found by Ignatieva et al. (2017). Thereof, the barriers motivated by aesthetics, health and safety, and practicality can be viewed as part of a

cultural norm of tidiness in Sweden, also discussed by Hanson et al. (2021) and Ignatieva et al. (2017). This cultural norm may stem from a mimicking behaviour (Goddard et al., 2013; Hanson et al., 2021), suggesting that it is in fact connected to the social norms.

## The impact of knowledge

In contrast to the expectations and previous studies (e.g., Goddard et al., 2013; Jones & Niemiec, 2020; Persson et al., 2022b), the effect of self-perceived knowledge about biodiversity on WFG-behaviour was very low, only explaining 2.7% of the respondent's current behaviour. However, this goes in line with the findings of Knapp et al. (2020), also showing that the respondents' current gardening behaviour is only explained by pre-existing knowledge to a small extent. It is worth noting that the majority of people carrying out WFG-practices were motivated by environmental aspects, indicating that they are, in fact, aware of the environmental benefits of these particular practices. Thus, the relationship between knowledge and current gardening behaviour remains uncertain.

Providing additional information on the environmental benefits of the WFG-practices did influence a substantial number of individuals on reconsidering adopting these practices, although it did only influence a majority of the respondent in two out of six practices (Figure 5). In contrast to the expectations, and considering the study's sample size, these results indicate that providing information might have a big influence on changing gardening behaviour. However, it is worth noting that respondents may have stated that they would reconsider, although it will not translate into actual action. Especially taking into consideration the weak relationship between self-perceived knowledge and current WFG-behaviour. However, it is important to consider *how* additional information is communicated to facilitate actual behavioural change. In the survey of this study, additional information was given as one-way communicative statements. In contrast, Goddard et al. (2013) found that two-way communication, i.e., dialogues and discussions, is successful in facilitating the adoption of WFG-practices, and practical experience of WFG may have a bigger impact on increasing knowledge than just providing information (Persson et al., 2022b).

## The impact of other factors

The results show that background factors of age and gender do not have an impact on the number of practices currently carried out, nor the number of practices reconsidered. Neither did the number of gardens, which contrast the expectations.

However, the survey mainly targeted people with solely one type of garden. Further contrasting the expectations, the amount of time spent in the garden could not explain the variation in the number of practices currently carried out. This suggests that WFG-behaviour in Sweden is better explained by other factors.

Studies have found that garden size has a big influence on management practices related to biodiversity (e.g., Goddard et al., 2013; Hanson et al., 2021; Persson et al., 2022b). This might also explain the results of this study. For example, many people in this study did mention that the size of the garden is limiting to carrying out practices such as letting the lawn grow and keeping dandelions.

As discussed above, there seems to be a cultural aspect to gardening behaviours in Sweden. More than affecting the motivations behind the behaviour, it may also explain attitudes towards some of the practices. Hanson et al. (2021) concluded that weedy plant species are commonly viewed as problems to gardening in Sweden, which might explain why keeping dandelions and nettles were the two least popular WFG-practices (Figure 2).

Another aspect found to have an impact on conservation behaviour and WFG is the extent to which humans feel part of nature (Parmesan et al., 2022; Knapp et al., 2020; Uren et al., 2015). People who view their gardens as pieces of land to care for rather than an expression of ownership, maintain natural yards to facilitate interactions with nature, and feel a high connection to nature are more likely to participate in conservation behaviours (Knapp et al., 2020; Larson et al., 2022; Uren et al., 2015). This may explain the results of people carrying out WFG-practices primarily being motivated by environmental reasons, as by extension being related to a higher sense of nature-connectedness.

## Wider applications

Coming back to the purpose of this study – contributing to increased knowledge on how to bend the curve of biodiversity loss, one question comes to mind: How do we reach those who are not already participating in WFG-behaviour and will not reconsider after being provided with more information?

As discussed above, the main barriers to WFG-behaviour in Sweden seem to be related to a cultural norm of tidiness. To overcome this barrier, interventions on a community level might have a positive effect of supporting norm-deviant WFG-behaviour. For example, local governments supporting WFG can make for safe settings where individuals can adopt WFG-behaviours despite going against a broader cultural norm (Uren et al., 2015), and the managing of public green spaces might have the potential to influence private garden interventions stemming from a mimicking behaviour (Goddard et al., 2013). The maintenance of public green areas in Sweden is mainly focused on aspects of tidiness and practicality rather than nature conservation

(Bengtsson, 2009; Ignatieva et al., 2017). Here is an opportunity for a multi-beneficial solution, where a top-down approach of increased focus on biodiversity in the managing of public green spaces might contribute to an overall changed cultural norm of tidiness. This may result in an increased uptake of WFG-practices in private gardens, and by extension, increase the total area of urban green space devoted to nature conservation.

Additionally, since WFG-behaviour in Sweden seems to be primarily motivated by environmental reasons, targeting interventions around improved nature-connectedness may be a way of reaching non-practitioners and contributing to a broader systemic change towards sustainability. Addressing this deeper leverage point, nourishing an emotional connection to nature, might have a stronger effect on sustainability outcomes than just focusing on shallower leverage points of material and experiential connections (Ives et al., 2018). The importance of nature-connection for conservation behaviour is increasingly being recognised, e.g., highlighted in the latest IPCC report (Parmesan et al., 2022). However, further research is needed to facilitate the mainstreaming of interventions for nature-connectedness, e.g., in educational and policy settings (Wamsler et al., 2021).

## Limitations and future research

There are some limitations to this study, also implicating directions for future studies on the subject. Firstly, the term “ecosystem services” used in the measuring of self-perceived knowledge can be interpreted in several ways and it is possible that people understand these services, although they are not familiar with the phrasing. Thereof respondents might have scored lower in self-perceived knowledge than their actual knowledge level. Moreover, the survey was designed to be quite narrow due to the lack of time to carry out the study. However, many respondents experienced the questions as simplified and limiting, and therefore the results might not be telling the full story. Qualitative open-box answers were not analysed but might have contributed to improving the accuracy of the results. Additionally, more information is needed to better understand the impact of providing information on the environmental benefits of WFG-practices on changing gardening behaviour. Therefore, an implication for future studies is to conduct semi-structured interviews in addition to the multiple-choice options, to get a deeper understanding of motivations and barriers to WFG, and what factors really make people change their gardening behaviour.

Secondly, people motivated by environmental aspects constituted the majority in this study, in contrast to a similar study carried out in Sweden (Ignatieva et al., 2017). This may indicate that the survey mainly targeted people with a pre-existing interest in WFG, thus not being representative of garden owners in Sweden. The uneven distribution of genders targeted, with 92.7% of the respondents identifying as female,

may also indicate that the data collected is not representative of garden owners in Sweden. Moreover, the distribution method of the survey might have created a bias towards people living in the southern part of Sweden, and towards people with high digital fluency and access to the internet. Further studies are needed to increase the general understanding of WFG and socio-psychological factors in a Swedish context.

Thirdly, this study did only target a few aspects of WFG-behaviour, and future studies should investigate additional factors potentially impacting WFG-behaviour. These can include e.g., garden size, the effect of different types and combinations of gardens (this study mainly targeted people with residential gardens), and attitudes towards nature conservation in general. Moreover, future studies should investigate governmental approaches to nature conservation in Sweden, and further examine the potential for top-down approaches to cultural norms related to WFG.

Lastly, the aspect of nature-connectedness is highly relevant to environmental work and biodiversity and may underly WFG-behaviour. However, this aspect was not targeted in this study, and future studies should further examine the role of nature-connectedness in relation to WFG in Sweden.



## Conclusion

Increased engagement in WFG in Sweden has the potential to contribute to bending the curve of biodiversity loss, by enhancing the amount of urban green spaces devoted to nature conservation. Current practitioners are primarily motivated by environmental factors, possibly stemming from a higher sense of nature-connectedness. A cultural norm of tidiness may explain the main barriers to WFG. The impact of pre-existing knowledge on WFG-behaviour remains uncertain, but providing additional information on the environmental benefits of WFG-practices may have an effect on the adoption of these practices. Interventions to increase WFG should therefore focus on providing inspiration and increasing engagement in nature conservation, e.g., through two-way communication and the managing of public green spaces. This might leverage gardening conservation behaviours on the individual level, as well as contribute to an increased focus on biodiversity on a societal level. Future studies should further investigate the governmental approaches to nature conservation in Sweden and the role of socio-psychological aspects of WFG, in particular the role of nature-connectedness.





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## References

- Bengtsson, P. N. (2009). Samspel i parkförvaltning: Om skötselideal och förhållningssätt till biologisk mångfald i tre svenska parkförvaltningar. [Doctoral Thesis, Swedish University of Agricultural Sciences]. SLU publication database. ISBN: 978-91-576-7486-9.
- Cialdini, R. B., & Goldstein, N. J. (2004). Social influence: Compliance and Conformity. *Annual Review of Psychology*, 55, 591-621. Doi: 10.1146/annurev.psych.55.090902.142015
- Díaz, S., Settele, J., Brondízio, E. S., Ngo, H. T., Guèze, M., Agard, J., Arneth, A., Balvanera, P., Brauman, K. A., Butchart, S. H. M., Chan, K. M. A., Garibaldi, L. A., Ichii, K., Liu, J., Subramanian, S. M., Midgley, G. F., Miloslavich, P., Molnár, Z., Obura, D., ... Zayas, C. N. (2019). *Summary for policymakers of the global assessment report on biodiversity and ecosystem services of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services*. IPBES. ISBN: 978-3-947851-13-3
- Ejlertsson, G. (2005). *Enkäten i praktiken* (2nd ed.). Studentlitteratur AB.
- Fernández-Juricic, E., & Jokimäki, J. (2001). A habitat island approach to conserving birds in urban landscapes: case studies from southern and northern Europe. *Biodiversity and Conservation*, 10, 2023-2043. Doi: 10.1023/A:1013133308987
- Goddard, M. A., Dougill, A. J., & Benton, T. G. (2010). Scaling up from gardens: biodiversity conservation in urban environments. *Trends in Ecology and Evolution*, 25(2), 90-98. Doi: 10.1016/j.tree.2009.07.016
- Goddard, M. A., Dougill, A. J., & Benton, T. G. (2013). Why garden for wildlife? Social and ecological drivers, motivations and barriers for biodiversity management in residential landscapes. *Ecological Economics*, 86, 258-273. Doi: 10.1016/j.ecolecon.2012.07.016
- Gordon, I., Calatayud, P.-A., Le Gall, P., & Garnery L. (2019). *UN Environment Foresight brief on insect services, threats and solutions features IPBES Pollination Assessment data*. UN Environment.
- Hall, D. M., & Martins, D. J. (2020). Human dimensions of insect pollinator conservation. *Current Opinion in Insect Science*, 38, 107-114. Doi: 10.1016/j.cois.2020.04.001
- Hanson, H. I., Eckberg, E., Widenberg, M., & Alkan Olsson, J. (2021). Gardens' contribution to people and urban green space. *Urban Forestry & Urban Greening*, 63. Article 127198. Doi: 10.1016/j.ufug.2021.127198
- Ives, C. D., Abson, D. J., von Wehrden, H., Dorninger, C., Klaniecki, K., & Fischer, J. (2018). Reconnecting with nature for sustainability. *Sustainability Science*, 13, 1389-1397. Doi: 10.1007/s11625-018-0542-9
- Ignatieva, M., Eriksson, F., Eriksson, T., Berg, P., & Hedblom, M. (2017). The lawn as a social and cultural phenomenon in Sweden. *Urban Forestry & Urban Greening*, 21, 213-223. Doi: 10.1016/j.ufug.2016.12.006

- Jones, M. S., & Niemiec, R. M. (2020). Social-psychological correlates of personal-sphere and diffusion behaviour for wildscape gardening. *Journal of Environmental Management*, 276, Article 111271. Doi: 10.1016/j.jenvman.2020.111271
- Kibblewhite, M. G., Ritz, K., & Swift, M. J. (2008). Soil Health in Agricultural Systems. *Philosophical Transactions: Biological Sciences*, 363, 685-701. Doi: 10.1098/rstb.2007.2178
- Knapp, J. L., Phillips, B. B., Clements, J., Shaw, R. F., & Osborne, J. L. (2020). Socio-psychological factors, beyond knowledge, predict people's engagement in pollinator conservation. *People and Nature*, 3(1), 204-220. Doi: 10.1002/pan3.10168
- Larson, K. L., Lerman, S. B., Nelson, K. C., Narango, D. L., Wheeler, M. M., Groffman, P. M., Hall, S. J., & Grove, M. (2022). Examining the potential to expand wildlife-supporting residential yards and gardens. *Landscape and Urban Planning*, 222, Article 104396. Doi: 10.1016/j.landurbplan.2022.104396
- Larson, J. L., Kesheimer, A. J., & Potter, D. A. (2014). Pollinator assemblages on dandelions and white clover in urban and suburban lawns. *Journal of Insect Conservation*, 18(5), 863-873. Doi: 10.1007/s10841-014-9694-9
- Lerman, S. B., Contosta, A. R., Milam, J., & Bang, C. (2018). To mow or to mow less: Lawn mowing frequency affects bee abundance and diversity in suburban yards. *Biological Conservation*, 221, 160-174. Doi: 10.1016/j.biocon.2018.01.025
- Loram, A., Tratalos, J., Warren, P. H., & Gaston, K. J. (2007). Urban domestic gardens (X): the extent & structure of the resource in five major cities. *Landscape Ecology*, 22, 601-615. Doi: 10.1007/s10980-006-9051-9
- Parmesan, C., Morecroft, M. D., Trisurat, Y., Adrian, R., Anshari, G. Z., Arneith, A., Gao, Q., Gonzalez, P., Harris, R., Price, J., Stevens, N., & Talukdarr, G. H. (2022). *Terrestrial and Freshwater Ecosystems and Their Services. In: Climate Change 2022: Impacts, Adaptation and Vulnerability. Contribution of Working Group II to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change*. Cambridge University Press, 197-377. Doi: 10.1017/9781009325844.004
- Persson, A. S., Westman, A., Smith, T. J., Mayfield, M. M., Olsson, P., Smith, H. G., & Fuller R. (2022a). Backyard buzz: human population density modifies the value of vegetation cover for insect pollinators in a subtropical city. *Urban Ecosystems*, 25, 1875-1890. Doi: 10.1007/s11252-022-01277-w
- Persson, A., Kendall, L., & Hanson, H. (2022b). *Bisysslor: En utvärdering av räddningsinsatser för bin och andra pollinerande insekter*. Naturskyddsföreningen. ISBN: 978-91-558-0238-7.
- Persson, A. S., Hederström, V., Ljungkvist, I., Nilsson, L., & Kendall, L. (2023). Citizen science initiatives increase pollinator activity in private gardens and green spaces. *Frontiers Sustainable Cities*, 4, Article 1099100. Doi: 10.3389/frsc.2022.1099100
- Smith, R. M., Warren, P. H., Thompson, K., & Gaston, K. J. (2006). Urban domestic gardens (VI): environmental correlates of invertebrate species richness. *Biodiversity and Conservation*, 15, 2415-2438. Doi: 10.1007/s10531-004-5014-0
- Swedish Research Council (2023, March 31). *Ethics in research*. Retrieved 5 April 2023, from <https://www.vr.se/english/mandates/ethics/ethics-in-research.html>
- Uren, H. V., Dzidic, P. L., & Bishop, B. J. (2015). Exploring social and cultural norms to promote ecologically sensitive residential garden design. *Landscape and Urban Planning*, 137, 76-84. Doi: 10.1016/j.landurbplan.2014.12.008

- van der Sluijs, J. P., Amaral-Rogers, V., Belzunces, L. P., Bijleveld van Lexmond, M. F. I. J., Bonmatin, J.-M., Chagnon, M., Downs, C. A., Furlan, L., Gibbons, D. W., Giorio, C., Girolami, V., Goulson, D., Kreutzweiser, D. P., Krupke, C., Liess, M., Long, E., McField, M., Mineau, P., Mitchell, E. A. D., ... Wiemers, M. (2015). Conclusions of the Worldwide Integrated Assessment on the risks of neonicotinoids and fipronil to biodiversity and ecosystem functioning. *Environmental Science and Pollution Research*, 22, 148-154. Doi: 10.1007/s11356-014-3229-5
- von Königslöw, V., Klein, A. M., Staab, M., & Pufal, G. (2019). Benchmarking nesting aids for cavity-nesting bees and wasps. *Biodiversity and Conservation*, 28, 3831–3849 (2019). Doi: 10.1007/s10531-019-01853-1
- Wamsler, C., Osberg, G., Osika, W., Herndersson, H., & Mundaca, L. (2021). Linking internal and external transformation for sustainability and climate action: Towards a new research and policy agenda. *Global Environmental Change*, 71, Article 102373. Doi: 10.1016/j.gloenvcha.2021.102373
- Yang, F., Ignatieva, M., Wissman, J., Ahrné, K., Zhang, S., & Zhu, S. (2019). Relationships between multi-scale factors, plant and pollinator diversity, and composition of park lawns and other herbaceous vegetation in a fast growing megacity of China. *Landscape and Urban Planning*, 185, 117-126. Doi: 10.1016/j.landurbplan.2019.02.003



# Appendix

## Appendix A: Statistical analysis

**Table A1: Chi-Square Tests of the distribution of motivations across groups of carrying out/not carrying out each of the WFG-practices.**

The results show a significant difference in the distribution of motivation across groups of carrying out/not carrying out the WFG-practice, similarly for all practices. Post Hoc Z-tests were carried out, showing between what groups a significant difference can be found. Fisher-Freeman-Halton Exact Tests were used for all practices due to cells having an expected count < 5.

WFG-practice	X <sup>2</sup> -value	df	p-value	Cells with expected count < 5	Post Hoc Z-test
<b>Dandelions</b>	578.239	5	< 0.001	4	“the environment”
<b>Nettles</b>	627.414	5	< 0.001	2	“the environment”
<b>Flowering bushes and trees</b>	24.747	5	< 0.001	7	No groups standing out
<b>Bee hotels</b>	516.539	5	< 0.001	5	“the environment”
<b>Leaves</b>	540.565	5	< 0.001	6	“the environment”
<b>Mow lawn</b>	580.415	5	< 0.001	2	“the environment” and “practicality”
<b>Pesticides and fertilisers</b>	286.353	5	< 0.001	3	No groups standing out

**Table A2: Ordinal regression model of the number of WFG-practices carried out in relation to different covariates.**

The results show that there is a significant correlation between the number of WFG-practices carried out and mean self-perceived knowledge, as well as time spent in the garden. The number of WFG-practices carried out can be explained to an extent of 2.7% by mean self-perceived knowledge, and to an extent of 0.5% by the time spent in the garden. There is no significant correlation between the number of WFG-practices carried out and age, gender, or number of gardens.

Covariate	Model Fitting p-value	Pseudo R-square McFadden
Mean self-percieved knowledge	< 0.001	0.027
Age	0.867	0.001
Gender	0.891	0
Number of gardens	0.400	0.001
Time spent in garden	< 0.001	0.005

**Table A3: Kruskal-Wallis Tests of the distribution of the number of WFG-practices carried out, across categories within different groups.**

Similarly for all groups tested, the results show no significant difference in the distribution of the number of WFG-practices carried out across categories within each of the groups tested.

Groups	H-value	df	p-value
Age	1.843	5	0.870
Gender	0.803	3	0.849
Number of gardens	1.977	2	0.372

**Table A4: Chi-Square Tests of the distribution of motivations across groups of reconsidering/not reconsidering carrying out each of the WFG-practices.**

The results show a significant difference in the distribution of motivation across groups of reconsidering/not reconsidering carrying out WFG-practices for *bee hotels*. Fisher-Freeman-Halton Exact Tests were used for practices with cells having an expected count < 5. Post Hoc Z-test was carried out, showing between what groups the significant difference can be found. *Flowering bushes and trees* was excluded due to limited data.

WFG-practice	$\chi^2$ -value	df	p-value	Cells with expected count < 5	Post Hoc Z-test
Dandelions	1.268	2	0.503	2	
Nettles	0.986	2	0.609	1	
Flowering bushes and trees	Limited data				
Bee hotels	16.166	2	< 0.001	2	“practicality” and “health and safety”
Leaves	0.352	2	1.000	3	
Mow lawn	2.622	2	0.308	0	



<b>Pesticides and fertilisers</b>	1.814	2	0.390	2	
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**Table A5: Ordinal regression model of the number of reconsidered WFG-practices after being provided with more information.**

Similarly for all covariates tested, the results show no significant correlation with the number of reconsidered WFG-practices.

Covariate	Model Fitting p-value
<b>Age</b>	0.485
<b>Gender</b>	0.185
<b>Number of gardens</b>	0.623
<b>Number of current WFG-practices carried out</b>	0.758
<b>Time spent in garden</b>	0.269
<b>Mean self-percieved knowledge</b>	0.167

**Table A6: Kruskal-Wallis Tests of the distribution of the number of reconsidered WFG-practices after being provided with more information, across categories within different groups.**

Similarly for all groups tested, the results show no significant difference in the distribution of the number of reconsidered WFG-practices, across categories within each of the groups tested.

Groups	H-value	df	p-value
<b>Age</b>	3.846	5	0.572
<b>Gender</b>	2.309	3	0.511
<b>Number of gardens</b>	1.877	2	0.391
<b>Number of current WFG-practices carried out</b>	10.889	6	0.092

## Appendix B: Survey data summary

**Table B1: Data summary of the survey responses after data curation**

Question	Categories	Value
<b>Age</b>	18 – 25	10
	26 – 35	98
	36 – 45	207
	46 – 55	266
	56 – 65	205
	66+	106
<b>Gender</b>	Female	827

Question	Categories	Value	
	Male	59	
	Other	2	
	Don't know/prefer not to say	4	
<b>Garden type</b>	Private residential garden	773	
	Yard in connection to apartment building	25	
	Summer house	108	
	Alottment	42	
<b>Number of gardens</b>	1	839	
	2	50	
	3	3	
<b>Self-percieved knowledge of wildlife (Likert scale)</b>	1	45	
	2	183	
	3	320	
	4	233	
	5	111	
<b>Self-percieved knowledge of ecosystemservices and biodiveristy (Likert scale)</b>	1	39	
	2	161	
	3	302	
	4	249	
	5	141	
<b>Self-percieved knowledge of actions to help wildlife (Likert scale)</b>	1	25	
	2	140	
	3	260	
	4	320	
	5	147	
<b>Self-percieved knowledge of WFG-practices (Likert scale)</b>	1	23	
	2	81	
	3	189	
	4	318	
	5	281	
<b>Current WFG-behaviour</b>		<b>Do carry out</b>	<b>Do not carry out</b>
	Dandelions	535	357
	Nettles	527	365
	Flowering bushes and trees	880	12
	Bee hotels	574	318
	Leaves	655	237
	Mow lawn	649	243
	Pesticides and fertilisers	754	138
<b>Motivations – Dandelions</b>		<b>Do carry out</b>	<b>Do not carry out</b>
	Descriptive norm	4	5

Question	Categories	Value	
	Injunctive norm	1	10
	Environment	334	3
	Aesthetics	14	177
	Health and safety	0	7
	Practicality	106	29
<b>Motivations – Nettles</b>		Do carry out	Do not carry out
	Descriptive norm	1	1
	Injunctive norm	1	12
	Environment	293	0
	Aesthetics	5	58
	Health and safety	13	163
	Practicality	83	16
<b>Motivations – Flowering bushes and trees</b>		Do carry out	Do not carry out
	Descriptive norm	1	0
	Injunctive norm	15	0
	Environment	448	1
	Aesthetics	304	0
	Health and safety	9	0
	Practicality	7	2
<b>Motivations – Bee hotels</b>		Do carry out	Do not carry out
	Descriptive norm	2	4
	Injunctive norm	3	4
	Environment	551	0
	Aesthetics	3	1
	Health and safety	0	32
	Practicality	1	58
<b>Motivations – Leaves</b>		Do carry out	Do not carry out
	Descriptive norm	3	3
	Injunctive norm	0	3
	Environment	380	5
	Aesthetics	3	130
	Health and safety	0	3
	Practicality	118	14
<b>Motivations – Mow lawn</b>		Do carry out	Do not carry out
	Descriptive norm	0	8
	Injunctive norm	0	8
	Environment	503	1
	Aesthetics	19	112

Question	Categories	Value	
	Health and safety	1	23
	Practicality	102	21
<b>Motivations – Pesticides and fertilisers</b>		Do carry out	Do not carry out
	Descriptive norm	1	1
	Injunctive norm	0	0
	Environment	497	4
	Aesthetics	5	25
	Health and safety	122	1
	Practicality	42	47
<b>Do not currently carry out + more information</b>		Would reconsider	Would not reconsider
	Dandelions	134	223
	Nettles	96	269
	Flowering bushes and trees	11	1
	Bee hotels	223	95
	Leaves	88	149
	Mow lawn	87	156
	Pesticides and fertilisers	77	61
<b>Motivations – Do not currently carry out Dandelions</b>		Would reconsider	Would not reconsider
	Descriptive norm	1	4
	Injunctive norm	5	5
	Environment	1	2
	Aesthetics	50	127
	Health and safety	2	5
	Practicality	11	18
<b>Motivations – Do not currently carry out Nettles</b>		Would reconsider	Would not reconsider
	Descriptive norm	1	0
	Injunctive norm	1	11
	Environment	0	0
	Aesthetics	13	45
	Health and safety	35	128
	Practicality	5	11
<b>Motivations – Do not currently carry out Flowering bushes and trees</b>		Would reconsider	Would not reconsider
	Descriptive norm	0	0
	Injunctive norm	0	0
	Environment	1	0
	Aesthetics	0	0
	Health and safety	0	0
	Practicality	1	1

Question	Categories	Value	
		Would reconsider	Would not reconsider
<b>Motivations – Do not currently carry out Bee hotels</b>			
	Descriptive norm	4	0
	Injunctive norm	1	3
	Environment	0	0
	Aesthetics	1	0
	Health and safety	10	22
	Practicality	43	15
<b>Motivations – Do not currently carry out Leaves</b>		Would reconsider	Would not reconsider
	Descriptive norm	1	2
	Injunctive norm	1	2
	Environment	2	3
	Aesthetics	37	93
	Health and safety	1	2
	Practicality	4	10
<b>Motivations – Do not currently carry out Mow lawn</b>		Would reconsider	Would not reconsider
	Descriptive norm	8	0
	Injunctive norm	2	6
	Environment	0	1
	Aesthetics	44	68
	Health and safety	5	18
	Practicality	7	14
<b>Motivations – Do not currently carry out Pesticides and fertilisers</b>		Would reconsider	Would not reconsider
	Descriptive norm	0	1
	Injunctive norm	0	0
	Environment	2	2
	Aesthetics	11	14
	Health and safety	0	1
	Practicality	26	21



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