

# NESTS FOR THE CITY

An exploratory research of how values contribute to avian-inclusive planning

MASTER THESIS

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Tiffany Khuu

Amsterdam, June 11, 2018

## Abstract

Rapid human developments are altering landscapes and habitats, affecting ecosystems, and accelerating global biodiversity loss. Birds are favourable indicators of relationships between urban processes and ecological systems, as changes in urban designs can be reflected through changes in avian communities. Human social and cultural values can influence urban designs that shape the environment but these relationships are not well studied.

This research explores how different forms of social and cultural values contribute to planning with avian-inclusive urban designs. It uses GWL Terrain, an eco-district in Amsterdam, The Netherlands, as a case study to interpret how various value traits (importance, feelings, preference, norms, and behaviours) contributed to the successful inclusion of birds in this development. A site analysis of the land cover features was done to contextualize the spatial features that may influence ecological processes. Primary documents and interviews were collected and qualitative content analyses using Atlasti.8 illustrated which dominant value traits towards birds and towards environmental aspects were present during its planning process, and why they may have dominated. Local urban avian data was collected and analyzed in conjunction with the value traits to explore what impacts these have for avian biodiversity at GWL Terrain.

It concludes that the value traits of feelings, importance, and behaviours led to the inclusion and acceptance of birds at this site. These values held by stakeholders were oriented towards the

biocentric sphere, or towards the other rather than oneself, and connected to underlying themes of health, family, safety, quality, and livability. This may be influenced by the circumstance that GWL Terrain was designed to cultivate responsibility in its residents towards the neighbourhood, which it succeeded in as all residents interviewed had participated in activities within the neighbourhood. Though it was inconclusive on whether the avian-inclusive features had effects on local avian biodiversity, most residents at GWL Terrain gained an increased awareness for birds and hold positive values towards them. Thus, these avian-inclusive designs were successful in eliciting an urban development that contributes to the stewardship, education, and encouragement of policies that benefit birds and global biodiversity.

This stewardship is a fundamental principle of the *ecology for the city* framework. When stewardship is embedded into societies' values, people may pursue goals that create livable places for humans and wildlife. This study's transdisciplinary approach sets up further research to explore how values can supplement objective-based decisions in nature-inclusive planning. As 2018 is the Year of the Bird, planning with space for birds in mind provides a foundation to nurture sustainable cities while reflecting our moral and ethical values towards nature and one another.

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# 1. Introduction



Common pigeon (“stadsduif” in Dutch, *Columba livia*) in a tree at  
GWL Terrain (Author, June 3, 2018)

An urbanization milestone was reached in 2007 when for the first time the majority of the world’s population lived in urban areas rather than in rural areas. Furthermore, 66% of the world’s population is projected to reside in urban areas by 2050 (United Nations, 2014). Historically, urban spaces were constructed as entities segregated from nature (Wachsmuth, 2012) and are loci of intense consumption levels, deviating from equilibrium states of natural cycle flows (McKinney, 2006), transforming habitats and thus abundance, distribution, and communities of other living organisms (Evans, Ryder, Reitsma, Hurlbert, & Marra, 2015).

Understanding the impacts of habitat changes created by human development is crucial as landscapes are rapidly transformed via urbanization (Evans et al., 2015), contributing to the accelerated extinction of local species and biodiversity loss (Lerman & Warren, 2011; McKinney, 2002). Global biodiversity is homogenizing as habitat for urban adaptable and invasive species spreads, displacing native species. This is concerning as species richness often increases in suburban and urban areas, but overall biodiversity and local ecosystems’ uniqueness are declining, threatening linkages between ecological, biological, and social systems (Chace & Walsh, 2006; McKinney, 2002; McKinney, 2006). This negative relation may undermine conservation efforts and overshadow the state of global biodiversity levels (McKinney, 2006).

Birds are helpful indicators of relationships between urban processes and their embedded ecological systems as they are readily observable by professionals, and they respond to different urban designs (Chace & Walsh, 2006; Clergeau, Mennechez, Sauvage, & Lemoine, 2001; Melles, 2005). Urban avian ecology studies typically compare bird populations and communities

throughout temporal and spatial urbanization processes (Bowman & Marzluff, 2001). However, the intrinsic, preferential, and moral choices of various human social and cultural values can influence urban designs that consequentially shape the environment and this relationship has not been well researched (Bowman & Marzluff, 2001).

By investigating how these principle-driven values guide urban design decisions, this study provides insights on what influences the incorporation of avian biodiversity in urban developments and how this can affect urban ecosystems. As societies are progressively concerned about the environmental impacts and health of urban systems (Pickett, Cadenasso, Childers, McDonnell, & Zhou, 2016), these understandings can influence designs that benefit wildlife and contribute to planning and policy making (Bowman & Marzluff, 2001; Scholte, van Teeffelen, & Verburg, 2015). The GWL Terrain neighbourhood in Amsterdam was chosen as a case study for this purpose.

## 1.1. Research Question and Objectives

The main research question is:

### **How do different kinds of social and cultural values contribute to planning with avian-inclusive urban design?**

This is answered through the following subquestions:

- Which social and cultural value traits towards birds and environmental aspects were dominant during the development process of GWL Terrain?
- Why did those traits dominate?

- What does the dominance of those traits mean for avian biodiversity at GWL Terrain?

I aim to achieve an understanding of how moral, intrinsic, and normative held values can lead to choosing urban designs that incorporate avian biodiversity (Pickett et al., 2016). This will be operationalized through indicators of different value traits of stakeholders involved in the development. Additionally, bird count data is sought to investigate if there are effects on avian biodiversity from these designs.

## 1.2. Outline

This thesis is structured in the following manner. Section 1 introduces avian-inclusive planning and presents the research question and aims of this study. Section 2 delves into urban avian ecology and the *ecology for the city* paradigm which are pillars for this research, alongside the framework of values used to examine how avian-inclusive designs can be incorporated in planning. Section 3 describes GWL Terrain which provides background for the case study. Section 4 describes the methodology undertaken and how these techniques can best explore the research question. Limitations to the data are presented along with this study's ethical considerations. Section 5 provides a site analysis of GWL Terrain to contextualize the site's spatial features that may affect ecological processes. Section 6 analyzes documents and interviews to answer the first subquestion of what value traits were prominent in the case study, followed by Section 7 that answers the second subquestion by interpreting why these may be the foremost value traits. Section 8 explores avian data to deduce potential impacts of these avian-inclusive designs, and answers the third subquestion as

to what the significances of the dominant value traits are for avian biodiversity. Section 9 concludes this thesis by reflecting upon the findings of the subquestions and how they connect to existing literature to answer my research question. The contributions of my research to the emerging transdisciplinary field within urban avian ecology are elaborated, and connected to steps moving forward for researching and planning with avian-inclusive designs.



## 2. Theoretical framework



Eurasian Coot (“meerkoet” in Dutch, *Fulica atra*) in the canal at GWL Terrain (Author, June 3, 2018)

### 2.1. Avian biodiversity’s significance

Birds connect people to the natural world and concern for their populations connects our ethics and morals to the wellbeing and needs of other organisms (Franzen, 2018). They are accessible study subjects which render them favourable indicators of urban ecological relationships (Chace & Walsh, 2006; Clergeau et al., 2001; Melles, 2005). Trends observed in avifauna may also apply to other wildlife, thus avian studies have wide implications for ecosystems monitoring (Melles, 2005).

Public support for wildlife conservation is low when people do not have knowledge or a connection to species in their community (Clergeau et al., 2001; McKinney, 2006), and people are becoming increasingly disengaged with their natural environment as biodiversity decreases (Lerman & Warren, 2011). This continuous disassociation threatens the appreciation of nature and diversity, leading to a path of further ecological degradation as peoples’ perception and realities of “nature” continue to erode (Melles, 2005). Nevertheless, synanthropic birds, or birds that exploit urban environments can be significant for biodiversity education even if they are introduced species (Marzluff & Rodewald, 2008), as substantial numbers of people live in urban and suburban settings and people’s perception of birds are influenced by diversity more than by density (Clergeau et al., 2001). Some endangered and rare species are located within urban areas, creating an impetus for species conservation within cities (McKinney, 2002; Evans et al., 2009). Public education, awareness, social attitudes, and relationships with the natural environment may play a crucial role in influencing economic and political measures to conserve and restore local species to slow the decline of global biodiversity

(Clergeau et al., 2001; Lerman & Warren, 2011; McKinney, 2002; McKinney, 2006).

## 2.2. Urban ecology's role in biodiversity conservation

Urban inhabitants often appreciate species conservation more than rural dwellers (Clergeau et al., 2001; Lerman & Warren, 2011). Many city dwellers' main interactions and relationships with the natural environment occur just outside their home (Lerman & Warren, 2011) and a society's quality of life may improve with avian interactions, thereby adding justification for protecting urban avifauna. A study of urban parks demonstrated that experiencing nature within urban areas brings positive feelings to inhabitants, thus contributing to a higher quality of life, which is an intrinsic characteristic of sustainable cities (Chiesura, 2004). Increasing urban biodiversity is further supported when environmental and human benefits align with planning goals that address social, economic, and environmental needs (Clergeau et al., 2001).

There is insufficient knowledge of avifauna responses to urban developments (Clergeau et al., 2001; Miller, Fraterrigo, Hobbs, Theobald, & Wiens, 2001). Species richness typically declines from rural to suburban to urban regions, leaving urban cores as loci of the greatest biodiversity poverty. However, local expertise could advise policies that mitigate negative repercussions of urban development and contribute to local enrichment (Chase & Walsh, 2006; Evans et al., 2015; Miller et al., 2001). The increasing number of people residing in urban areas means that more consideration is needed on species that occur close to humans' homes. There is a great potential and challenge for planners to tackle biodiversity

conservation within cities as urban development continues to alter landscapes (McKinney, 2002; Lerman & Warren, 2011).

Urban design can improve bird habitats within built environments (Miller et al., 2001), especially for species that struggle with urbanization (Lerman & Warren, 2011). Buildings have significant aggregate effects that result in certain species avoiding areas whilst attracting others, or creating more heterogeneous habitats that potentially increase bird diversity from what existed before development (Miller et al., 2001). This is important when buildings are renovated or newly constructed with smooth, neat façades that may remove previous space for urban birds to nest, such as for House Sparrows, Swifts, and Starlings<sup>1</sup> (Vogelbescherming Nederland, n.d.b.; Vogelbescherming Nederland, n.d.a.; Vogelbescherming Nederland, n.d.c.).

## 2.3. Ecology for the city

This thesis uses the *ecology for the city* framework (Pickett et al., 2016) which is a product of two preceding paradigms. The initial paradigm of urban avian ecology is *ecology in the city* that seeks temporal and spatial patterns between avian communities or populations by comparing ecological mechanisms in habitats throughout the urban-rural gradient (Bowman & Marzluff, 2001). *Ecology of the city* developed afterwards and expresses complex,

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<sup>1</sup> These 3 birds are frequently mentioned in this thesis. For readability, the Common Swift ("gierzwaluw" in Dutch, *Apus apus*) will be referred to as "Swift", the House Sparrow ("huismus" in Dutch, *Passer domesticus*) as "House Sparrow", and the Common Starling ("spreeuw" in Dutch, *Sturnus vulgaris*) as "Starling". A chart from De Nationale Tuinvogeltelling (2018) of common Dutch garden birds is in Appendix E with Dutch and English names.

holistic views of urban ecosystems as assemblages of social-ecological systems, including biological, social, and built elements. It recognizes that physical biogeographic structures and processes intertwine with social ones, creating feedbacks and forging urban patterns from these interactions (Bowman & Marzluff, 2001; Pickett et al., 2016).

The emerging *ecology for the city* paradigm extends both *ecology in* and *ecology of* the city to incorporate academic and local insight and learning, power relations, globalization, economics, and institutional roles to approach the growing cultural values and goals of urban sustainability. This expanded framework adopts the ethics of stewardship to stimulate academic knowledge into action that influences decision making and whose values rests in the management and restoration of urban ecosystems (Pickett et al., 2016).

*Ecology for the city* emerged from the increasing insight of how humans and their actions influence all ecosystems and from the motivation to create a better world for future generations (Pickett et al., 2016). This recognition of responsibility is important to manage human activity and urban environments in approaches that improve living environments for humans and birds, while reducing negative impacts on biodiversity (Bowman & Marzluff, 2001). In investigating urban spaces through transdisciplinary lenses of social-ecological systems, relationships between urban structures and system functions can connect urban needs to ecological ones (Cadenasso, Pickett, Mcgrath, & Marshall, 2013).

As human populations continue moving into urbanized areas, “there is a pressing need for more research on virtually all aspects of the

relationship between urbanization and bird communities” (Miller et al., 2001). Past studies of urban avian ecology were generally conducted by natural scientists in environmental fields, including those that stress the need for more studies combining ecosystems management and urban areas (e.g. Miller, Pickett, Marzluff, Bowman, and McKinney). This lack of research through an urban planning lens renders this thesis timely and serves as a fulcrum to combine an interdisciplinary lens that addresses global biodiversity issues in an urbanizing era.

#### **2.4. Intrinsic social and cultural values**

Humans are elements within our environment; therefore the preferences and values we hold will favour certain structural patterns (Bowman & Marzluff, 2001). Understanding urban patterns that affect ecological processes in temporal and spatial manners can guide policies that contribute to social costs or benefits. This study recognizes that the concept of “value” has an extensive range of meanings, but for the purpose of this research employs the concept as non-monetary, immaterial, intrinsic, principle-driven, “held values” (Lockwood, 1999; Chan, Satterfield, & Goldstein, 2012; Scholte et al., 2015). This definition encompasses what is regarded as morally important or ideal by specific social or cultural standards, along with their practices, preferences, and what they would act upon (Vaske, Donnelly, Williams, & Jonker, 2001), which differ from values attributed to ecosystem services and economics (Scholte et al., 2015). Such values are contingent on the assemblages of the time period and place of study (Scholte et al., 2015).

The valuation of particular spatial patterns can influence planning that benefit peoples’ living standards while improving global biodiversity and wildlife habitat, but these connections are not well

studied (Scholte et al., 2015; Bowman & Marzluff, 2001). However, these non-consumptive intrinsic needs are important for human welfare and can be achieved through urban nature (Chiesura, 2004). These ethical and principle-driven values should not be disregarded as that would exclude facets of social behaviour (Chan et al., 2012).

Since many forms of values can affect decision-making (Chan et al., 2012), this thesis explores five traits that illustrate normative, moral, and held values towards birds and environmental aspects (Saris & Gallhofer, 2004; Stern & Dietz, 1994; Vaske et al., 2001; Chiesura, 2004): importance, feelings, preference, norms, and behaviour. These traits were chosen to operationalize intuitive concepts (Saris & Gallhofer, 2004) that give insight to different facets of values. By no means does this fully encompass the range of values towards birds and environmental aspects, but this method distinguishes dynamics of how values may have influenced avian-inclusive designs at GWL Terrain.

## 3. Case Study



Swifts (“gierzwaluw” in Dutch, *Apus apus*) flying over  
GWL Terrain (Author, June 3, 2018)

### 3.1. Setting the scene

This thesis uses GWL Terrain, an urban development in Amsterdam, The Netherlands, as a case study to demonstrate a successful implementation of avian-inclusive design and to explore values that were present which enabled these designs to be adopted. It examines the relationship between stakeholders’ values towards the eco-development and towards birds, and whether these values can stimulate action towards local biodiversities. It sets up further studies to use avian biodiversity as inherent indicators of urban ecosystems’ performances, rather than relying solely on techno-managerial indicators of sustainability.

As this study concentrates on intrinsic values that stakeholders hold and not on the development process, a detailed timeline and explanation of this development is not provided. Rather, a historical description of motivations behind the site’s fruition, along with the landscape and architectural features that benefit wildlife, and birds specifically, are provided instead. Section 5 provides further information about the site through an analysis of land cover features using the HERCULES (High Ecological Resolution Classification for Urban Landscapes and Environmental Systems) classification (Zhou, Cadenasso, Schwarz, & Pickett, 2014) to quantifying spatial features in an approach useful for ecological interpretation (Zhou et al., 2014).



### 3.2. GWL Terrain

GWL Terrain is a 6 hectare eco-district in Amsterdam West (Images 1 & 2), constructed in stages between 1995 and 1998. There are 600 housing units (half social housing, half market housing with two thirds grant-aided) along with a café-restaurant, a small hotel, and small businesses. The property was an obsolete site of the Municipal Water Company (Gemeente Waterleidingen (GWL)) and in 1989 local citizen lobbying steered the municipality to zone the site for housing rather than for industry (GWL Terrein, n.d.a). GWL Terrain was created through a highly participatory planning process that was novel at the time (Architect 3, personal communication, April 9, 2018), involving many residents of the adjacent Staatsleidenbuurt neighbourhood. Those residents were characteristic of the 1980's left-wing anarchist movement in Amsterdam, where citizens didn't trust the state and wanted self-governance and action. Staatsleidenbuurt was also the loci of a large squatter's movement at the time (Resident 16, personal communication, April 5, 2018). This development was a pilot project to create an attractive, environmentally friendly, car-free, dense residential neighbourhood, aimed primarily to house residents and growing families from the local neighbourhood (Gemeente Amsterdam Stadsdeel Westerpark, 1993).

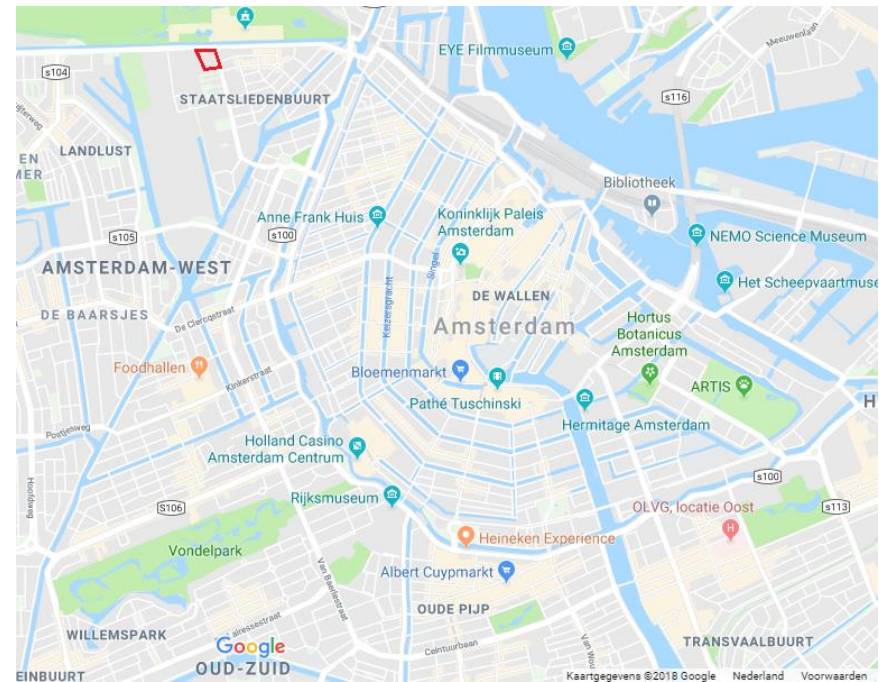


Image 1: Location of GWL Terrain in Amsterdam, outlined in the superimposed red polygon (Google Maps, 2018a).



Image 2: Graphic site map of GWL Terrain (n.d.e.).

### 3.3. Environmental and avian-friendly features

GWL Terrain was intentionally built as a car-free, urban eco-area with low carbon impact initiatives and Green Building principles. Construction materials followed the City of Amsterdam’s 1993 Environmentally Preferred List (Eisen en aanbevelingen nieuwbouw 1993), energy and water efficient mechanisms were installed, organic waste was separated, and vegetation cover was bolstered through green roofs, hedge fencing, and community gardens. Although some initiatives, such as flushing toilets with rain water and organic waste separation have ceased due to operational

complications, it is still successful as a car-free eco-district with strong social cohesion. Inhabitants were actively involved from the beginning of the planning process and citizen participation has been the backbone of this development’s low environmental footprint ethic (GWL Terrein, n.d.a; GWL Terrein, n.d.c.; Foletta & Field, 2011).

This urban plan’s foundation was to create a car-free neighbourhood, which gave space for high quantities of ground level entrances, individual gardens, and vegetation (GWL Terrein, n.d.a.). This physical environment and space for gardens, trees, and vegetation will henceforth be collectively referred to as “green space” for consistency, following the terminology in primary documents on GWL Terrain such as,

“Urban green areas include the public green spaces, the restricted access to sports and allotment parks and cemeteries and the remainder, not public green.” (Dienst Ruimtelijke Ordening Amsterdam, Hoofdafdeling Stedelijke Ontwikkeling, & Gemeentesecretarie Amsterdam, 1992, p.117)

and by interviewees,

“I would like to have some more trees... with trees I think you could filter out the noise. But I think it would also be good for birds. It would make it greener. And a lot of this green parts is just grass.” (Resident 7, personal communication, March 26, 2018)

Its open plan structure design differs from the traditional closed-block style (“bouwblok” in Dutch) of older Amsterdam

neighbourhoods such as the adjacent Staatsliedenbuurt (Gemeente Amsterdam Stadsdeel Westerpark, 1993). This allowed gardens and non-built spaces to be visible and a part of public space (whereas in closed-block designs, gardens were enclosed and private), relieving the visual pressure of a highly dense neighbourhood by emphasizing open space and ground level interactions (Gemeente Amsterdam Stadsdeel Westerpark, 1993; Pos, 2009).

The only dedicated features for birds are the brick nest boxes on the north and east sides of building façades, but other features targeted to achieve an eco-area also created space for birds (and other wildlife). The car-free design created gardens spaces with fruit and decorative trees which provide food and shelter, hedge fencing provides nesting areas and covered passage, and the canal for rain water capture provides habitat and food for waterfowl (GWL Terrain, n.d.b.).



Image 3: Two nest boxes of different sizes on a building façade at GWL Terrain (Author, June 3, 2018).

This study is not limited to specific designs for birds, but considers avian-inclusive designs as any intentional or unintentional space for birds that is constructed (e.g. nest boxes) or non-constructed (e.g. hedges, climbing ivy).



Image 4: Rose-ringed parakeet (“halsbandparkiet” in Dutch, *Psittacula krameri*) eating a cherry while perched on a tree at GWL Terrain (Author, June 3, 2018).



## 4. Methodology



View of next boxes on a building façade at GWL Terrain.  
Three birds perch on the roof above the next boxes  
(Author, June 3, 2018).

### 4.1. Research Strategy

This exploratory research assumes an epistemically interpretive lens to provide insight on a successful case of avian-inclusive design, rather than provide generalizing or comparative data. As my research aims to investigate social and cultural values that influenced decisions to make space for birds within urban design, I needed to explore the non-monetary, intrinsic, principle-driven, held values (Lockwood, 1999; Chan et al., 2012; Scholte et al., 2015) prevalent to understand why certain decisions were made and how social values affected those decisions. This comprehension of values is based upon the understanding of meanings and motives of human behaviours that shape how they perceive the world (Bryman, 2012) and thus influence the decisions they make, rendering this interpretive lens the most suitable. It also takes on a constructionist perspective in that values and “social properties are outcomes of the interactions between individuals, rather than phenomena “out there” and separate from those involved in its construction” (Bryman, 2012, p.380).

This study possesses inductive elements that seeks to add to theory (Bryman, 2012) through qualitative insights, but contains deductive components by examining bird count data of GWL Terrain’s neighbourhood to analyze if these spaces for birds do impact their population levels. Avian ecology is traditionally studied through a quantitative deductive lens, but as this study focuses on intrinsic concepts in an urban setting, a qualitative perspective can provide greater depth and context for examining relationships between different value traits and designs as human perceptions and opinions may be inconsistent. The

intrinsic nature is well suited for exploratory research as it does not limit the scope of results. Numerical evaluations through quantitative means may overlook the complexity of intangible and non-monetary factors that can influence peoples' values and beliefs that are better sought through an interpretivist epistemological research strategy (Bryman, 2012). A "thick description" analysis can provide interpretation within context (Bryman, 2012, p.401), particularly "to interpret people's behavior in terms of the norms, values, and culture of the group or community in question" (Bryman, 2012, p.620).

Triangulation uses different methods to collect and cross-examine data through perspectives of different stakeholders and to account for biases. The avian-inclusive designs were implemented during participatory processes of GWL Terrain's development phase. This makes triangulation especially important to discern what values dominated that purposely incorporated birds, and from whom. This was achieved by seeking out values through more than data source (Bryman, 2012) using primary documents and interviews.

## **4.2. Research design**

A case study is best suited to examine my research question as it enables "detailed and intensive analysis" (Bryman, 2012, p.66). Values are distinct products of the time and place of histories and cultures (Scholte et al., 2015), thus making it imperative to place this study within context to understand decision makers' behaviours and decisions. This is also pertinent since previous studies of socio-cultural ecosystem values were expressed as lacking sufficient detail of their site area (Scholte et al., 2015;

Marzluff, Bowman, & Donnelly, 2001).

To provide a "thick" description (Bryman, 2012) to comprehend values that enabled avian-inclusive design, the following data was collected and analyzed: site typology, primary documents on GWL Terrain, interviews with residents and stakeholders of GWL Terrain and urban bird professionals, and bird population data around GWL Terrain and national avian trends.

## **4.3. Data collection, analysis methods, and operationalization**

This section outlines my approach to data collection, operationalization, and analysis for four types of data in this research: site topology, primary documents, interviews, and bird population data.

### **4.3.1. Land cover features**

My preliminary literature review identified that many avian studies provided insufficient descriptions of land cover features to understand the ecology of the area (Scholte et al., 2015; Marzluff et al., 2001). An analysis of the site's land cover features was conducted to place my case study within the geographical and urban setting. The HERCULES (High Ecological Resolution Classification for Urban Landscapes and Environmental Systems) classification (Zhou et al., 2014) was chosen as it provides quantitative information of the spatial heterogeneity of urban areas with high accuracy that provides better comprehension of ecological interactions between built and non-built environments (Zhou et al., 2014; Pickett et al., 2016). The biophysical structures of this classification (Table 1) are useful for translating characteristics from aerial maps for comparative studies.



Land cover feature		Description
Vegetation: coarse-textured		Trees, shrubs
Vegetation: fine-textured		Herbs, grasses
Bare soil		Non-vegetated, no buildings, often correlated to new construction
Pavement		Non-vegetated, no buildings, not bare soil
Building		Human-made structure
Building typology	Single	Individual structure, clustered or in rows
	Connected	Structure with shared walls or roofline, connected with walkways
	Mixed	Structure with many wings adjoined via courtyards or other covered ways, or cluster of buildings with varied structures
	High-rise	Structure of 4 to 10 stories
	Tower	Structure exceeding 10 stories
Water		Deemed present when the above features are absent

Table 1: Classification and definitions of land cover features of urban environments (Zhou et al., 2014).

My research uses this HERCULES classification, but not the authors' method to analyze the site. Zhou et al. (2014) utilized LIDAR (Light Detecting and Ranging) and high-resolution colour-infrared data uploaded into ArcGIS 3D Analyst™ to analyze the land cover proportions of their site. This requires a minimum orthogonal patch (biophysical structure) dimension of 20m (Zhou et al., 2014), but some features at GWL Terrain are smaller and fail this prerequisite. This site analysis was done manually instead. This is feasible as its size of 6 hectares is significantly smaller than the 17,150 hectares watershed in Zhou et al.'s (2014) analysis. Additionally, there is little

difference between the tested accuracy of the program and a person's visual interpretations of landscape feature coverage, though both interpretations are subjective due to delineation limitations<sup>2</sup> (Zhou et al., 2014).

A Google Maps (2018b.) aerial satellite image of GWL Terrain from June 2017 (Image 5) was used to measure the land cover proportions as this map is easily accessible and provides an accurate representation of the features. A graphic site map is available on GWL Terrain's website (Image 2) but this was not used as it oversimplified the land cover features such as vegetation, which is of high importance in this study.

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<sup>2</sup> HERCULES categorizes land cover proportions using ranges of "(0) absent, (1) present – 10% cover, (2) 11%-35% cover, (3) 36% - 75% cover, and (4) >75% cover" (Zhou et al., 2014, p.3377-3378). Human visual interpretation depends on where one determines a patch ends and another begins and can differ according to the person's skill level (Zhou et al., 2014). Both can be accurate but are not precise in regards to the actual percent coverage of features.

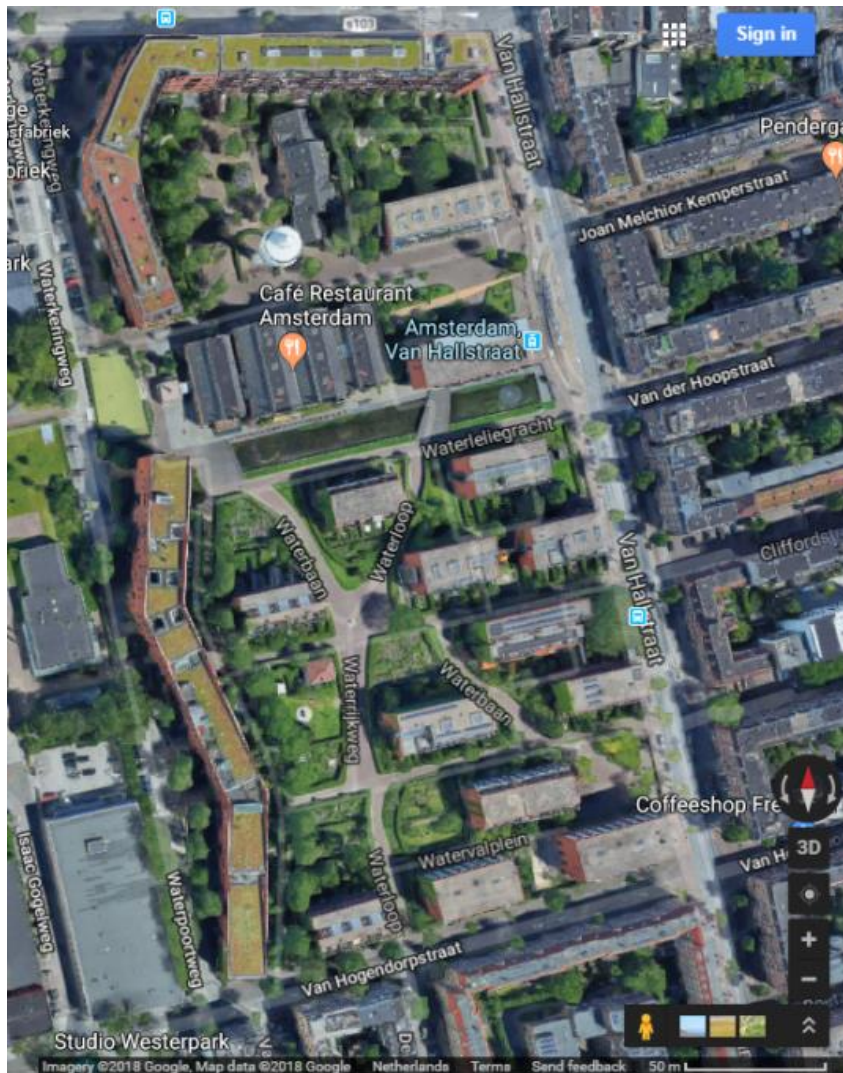


Image 5: A satellite map of GWL Terrain used for analysis (Google Maps, 2018b.).

As per my own site observations, residents planted climbing vegetation along building façades and many homes have bird houses, both of which provide additional avian nesting spaces to the original landscape features and brick nest boxes. The HERCULES classification utilizes biophysical structures from aerial imagery and thus should not include this vertical vegetation cover on building exteriors. However, since it provides significant space for birds and all interviewees remarked on the amount of greenery at this site, it is included in addition to the two-dimensional proportions, resulting in a total coverage exceeding 100%. I visually estimated this vegetation coverage using Google Maps Street Views (2018c.)<sup>3</sup> from June 2017, as at the time of this study’s observations (in March) the foliage had not bloomed and thus could not show the extent of foliage cover. The coverage was estimated by calculating the façade areas, and then derived by visually assessing the percentage covered by greenery. These were classified as coarse-textured vegetation as their texture resembles hedges and shrubs more than grasses. The bird houses were not counted as their small sizes would add an insignificant difference in the land cover proportions.

I used ImageJ, an image processing program (ImageJ, 2016), to measure and calculate the land cover feature areas. This program was chosen because it is an easy to use open platform that processes data from image files. As the site’s vegetation contains many irregular shapes, I used a freehand tool to trace the outlines

<sup>3</sup> Only one reference is provided for the street views, but a huge number of angles and street views were used. They are not individually cited as it would create an incredibly long reference list that does not provide meaningful data to the study. However it should be recognized that this analysis was not conducted using only one street view.

of the features, which then automatically calculated the areas within those shapes. Although this method is not precise and is subjective to the delineated lines, it provides sufficient indication of the site composition for discussion during interviews.

#### 4.3.2. Primary documents

Primary documents provide perspectives of the social attitudes in place during GWL Terrain's planning period and reveal what was important to the community and the city at that time which would have influenced decisions. GWL Terrain was created through a highly participatory planning process, therefore diverse stakeholders were sought to understand their values. GWL Terrain's resident-run umbrella organization manages a website containing information for its residents and visitors. The website posts reports, past studies, and videos with information on the neighbourhood's special features and development processes. Documents applicable to GWL Terrain's development plans and discussions were identified by searching through this website.

Documents related to the planning processes were retrieved and scanned from the City of Amsterdam's Archives. The discussions for development began in 1989 and construction was completed in 1998, thus material from this 9 year period was considered. Documents retrieved include reports such as the 1991 Amsterdam Structure Plan (Structuurplan Amsterdam 1991), 1993 Urban Schedule of Requirements [SPvE] (Concept stedenbouwkundig programma van eisen 1993), and the Environmental preference materials list (Eisen en aanbevelingen nieuwbouw: produktontwikkeling). Magazines include Plan Amsterdam (first issued in 1995 by the City of Amsterdam), and Look at Westerpark: one from Westerpark District (Kijk op Westerpark: een van

Stadsdeel Westerpark, published by the District government). Manuals distributed to initial residents were retrieved from GWL Terrain's website. Appendix B lists the 22 relevant documents acquired.

The documents are in Dutch and therefore applicable sections were first translated into English using Google Translate for my comprehension. Although I do not have sufficient language skills to code the documents in Dutch, I have sufficient vocabulary to search the documents and select pertinent sections for translation.

Qualitative content analyses of the documents were done using Atlasti.8 for reoccurring types of values and themes, which were given codes. Coding allows researchers to "label, separate, compile, and organize data" (Bryman, 2012, p.568), allowing indicators of concepts to be compared and examined for relationships. Concepts that were frequently associated to values were also of interest as part of the thick description and context of the development process.

Designs for birds at GWL Terrain include brick nest boxes on the exterior building façades along with vegetation planted, especially trees and hedges used for fencing. Because of this high interconnectivity between making space for birds and incorporating vegetation within the environmentally conscious design, values towards birds and values towards environmental aspects were frequently co-analyzed. Reference to environmental aspects often referred to the car-free and resource-efficient goals of the site alongside vegetation as an overarching environmental concept, therefore for consistency, my analysis of values also does not

distinguish between different types of environmental features, as demonstrated,

“It’s an ecowijk, it’s also the way it was built as environmental friendly, and I like that there are about 70 food trees in the communal areas and that there’s nutstuin, where people grow their own vegetables outside the park, and the most important thing is that it’s car-free.” (Resident 8, personal communication, March 26, 2018)

This research operationalizes intuitive concept of values through different traits which serve as indicators. Five traits were chosen, inspired from Chiesura (2004) and Saris & Gallhofer’s (2004) articles. Chiesura’s (2004) study examines how urban nature contributes to the well-being of citizens and a city’s sustainability by exploring park users’ motives for nature, their emotional aspects, perceived benefits of urban parks, and how satisfied they are with the amount of green spaces in their city. The results of this study express that urban nature provides important immaterial benefits and these benefits can be valued through investigating the “needs, wants, and beliefs” (Chiesura, 2004, p.137) of that population. Through this literature’s aims and results, I deduced that some main aspects that hold value are actions or behaviours (what sort of activities were undertaken in the park), feelings (“which feeling does nature evoke” (Chiesura, 2004, p.134)), importance (“how important are these feelings” (Chiesura, 2004, p.134) thus investigating beliefs), and preference (majority of respondents were dissatisfied by the amount of green areas, thus implying that they prefer more, hence investigating “wants”). Saris & Gallhofer’s (2004) article provides examples and classifications of how those traits can be operationalized, amongst other concepts by intuition (concepts with

obvious meanings (Saris & Gallhofer, 2004)) including norms. I included norms as a trait as it is a social and cultural factor that can also influence decisions.

These 5 traits were chosen to cover a range of reasons for possessing those values that are relevant to making decisions, and were expected to be clearly distinguishable from other concepts that may arise in the data. Although this would not encompass all facets of values that may have played a role, the traits are representative of concepts used to explore influences of avian-inclusive designs in this case study. The values are operationalized using 4 subjective indicators comprised of importance, feelings, preference, and norms, and 1 objective indicator comprising of behaviours (Figure 1). The subjective responses are developed only within the minds of the participants and cannot be verified, whereas the objective indicator can be verified (Saris & Gallhofer, 2004).

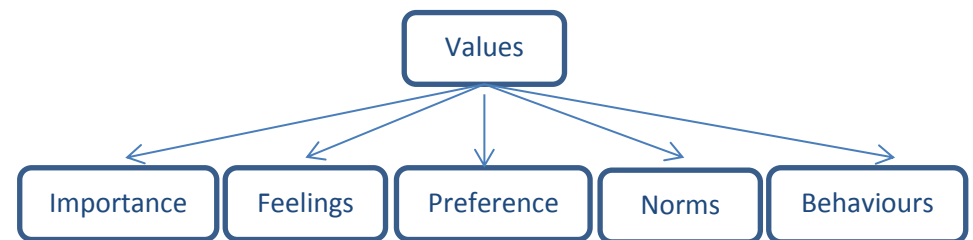


Figure 1: Flow chart showing the 5 traits chosen as indicators of values (Source: Author).

These indicators are distinguished through wording and concepts exemplified in Saris & Gallhofer’s (2004) literature. The concept of importance is signalled by forms of evaluation or cognitive judgements of the topic, indicated by concepts and words such as



“important”, “significant”, and “need”. Feelings are also forms of evaluation but they contain affective and emotional components such as “like” and “hate”. Preference has a comparative implication and is often used in policy studies. This trait includes “in favour of”, “want”, and “would like”. Norms refer to what is deemed correct or proper, such as the concepts and words “should”, “must”, and “trend”. For this study, policies and rules have been grouped with norms as they dictate acceptable actions that should be followed. The behaviours trait is represented through actions in the past or present, such as demonstrations of “action” or “participation”. These indicators and signals decipher aspects of values which can then be used to examine their relationship towards birds and co-occurring themes and their inclusion in planning, as per my research question. Examples of these indicators signalled by words or situations are presented in Table 2.

Value trait	Key words or situations
Importance	Important, significant, need
Feelings	like, love, happy, pride, concern
Norms	Should, must, trend, a normal practice, policy, regulation
Preference	Want, prefer, would like
Behaviours	Participation, action

Table 2: Key words, phrases, or situations that demonstrate the presence of the value traits.

The dominance of the different value traits were determined by how frequently they appeared in the documents, then ranked from most frequent (#1) to least frequent (#5) compared to the other traits. This presence of the traits was determined when key words, phrases, or concepts were explicitly demonstrated or when an

action was done. Basic statistics are provided for descriptive purposes, but the primary focus is on the qualitative analysis that explores and interprets which value traits contributed to the success of avian-inclusive designs at this site.

#### 4.3.3. Interviews

The initial interviewees were determined through the same documents and media sources from the GWL Terrain website as for the primary documents. Individuals and stakeholders who were involved in the development process were sought which provided the basis for purposive sampling. This strategic search for non-random participants ensures my data remains relevant to the research question (Bryman, 2012). Further interviewees, primarily professionals, were acquired via snowball sampling where I asked interviewees to refer me to someone else who may have input on my research. The City of Amsterdam’s webpages and websites of various bird conservation organizations were explored for stakeholders on urban birds.

Residents were first reached via an email to GWL Terrain’s umbrella organization. Initially I sought residents who partook in the planning process for purposeful and snowball sampling, but due to the low number of these participants available, convenience sampling of the wider resident population was also conducted. Further details of this decision are provided in the limitations in Section 4.4. I reached out to residents through a message posted on the residents’ social media app and in their neighbourhood email newsletter. Moreover, I attended two neighbourhood events to approach residents and schedule interviews. Although convenience sampling does not allow the generalization of findings (Bryman, 2012), results from this



study can still be applicable to examine social and cultural values present at GWL Terrain.

Thirty-four interviews were conducted in English to gain qualitative insight for this research. This involved 26 residents from GWL Terrain, of which 2 are active local bird watchers, and 8 professionals, of which 2 have urban avian expertise. Two interviews were with people who are not direct residents of the site, but they live in the neighbourhood nearby and participate in activities within GWL Terrain as a resident would and were thus categorized as so. In the list of interviewees below, the professionals' roles are provided according to their relation during GWL Terrain's development or to urban birds.

<b>Interviews</b>	<b>Date</b>
Resident 1	March 15, 2018
Environmental Advisor (at BOOM Environmental Research and Design firm)	March 15, 2018
Resident 2	March 19, 2018
Resident 3	March 19, 2018
Landscape Architect (at West 8 Urban Design & Landscape Architecture)	March 21, 2018
Resident 4	March 23, 2018
(current) City of Amsterdam Neighbourhood Coordinator	March 23, 2018
Resident 5	March 24, 2018
Resident 6	March 24, 2018
Architect 1 (Project Architect at KCAP Architects and Planners)	March 26, 2018
Resident 7	March 26, 2018

<b>Interviews</b>	<b>Date</b>
Resident 8	March 26, 2018
Resident 9	March 27, 2018
Resident 10	March 28, 2018
Resident 11	March 29, 2018
Resident 12	March 30, 2018
Resident 13	March 31, 2018
Resident 14	April 2, 2018
Resident 15	April 2, 2018
Architect 2 (Urban Development Plan Architect at KCAP Architects and Planners)	April 3, 2018
Resident 16	April 5, 2018
Resident 17	April 6, 2018
Resident 18	April 6, 2018
Resident 19	April 8, 2018
Architect 3 (Architect at Atelier Zeinstra van der Pol)	April 9, 2018
Resident 20	April 9, 2018
Resident 21	April 9, 2018
Resident 22	April 10, 2018
Resident 23	April 11, 2018
Resident 24	April 11, 2018
Resident 25	April 11, 2018
Resident 26	April 13, 2018
City of Amsterdam Urban Ecologist	April 16, 2018
Assistant Professor (in Animal Ecology at Vrije Universiteit Amsterdam)	April 16, 2018

Table 3: 34 interviews were completed with GWL Terrain residents and professionals who have a role with GWL Terrain or with birds.

Most interviews were conducted in person, but 4 were conducted via Skype or phone call. Semi-structured interviews averaging 45 minutes were conducted so that interviewees could express a range of thoughts. Questions were tailored for professionals in order to address their specific role with GWL Terrain in greater depth. Questions ultimately sought to explore what role the person had within the site, how their value orientations lie (towards the self or towards the other), and whether those values influenced the inclusion of birds in designs. Previous studies of ecosystem values determined that people whose values are other-oriented, as in towards other people or non-human biospheric entities as opposed to oneself, had a greater tendency of choosing actions with environmental, conservation, and protection benefits and policies (Scholte et al., 2015; Stern & Dietz, 1994; Vaske et al., 2001). This was investigated by asking questions about whether they participated within the community, what motivated them to participate (or not), and why they valued something. When possible, the questions were phrased as to not suggest or assume that a type of value was present. Sample interview questions for residents are in Appendix D and interview documents are in Appendix E.

Interviews were recorded for transcription and coding purposes when possible. Recording was not possible for 3 interviews that were conducted during (site) walks, thus detailed notes were taken during or promptly afterwards. Transcripts and notes were coded using Atlati.8 using the same qualitative content analysis as with primary documents from Section 4.3.2.

#### 4.3.4. Bird count data

As my research questions not only examine what values influence avian-inclusive design but also whether it affects biodiversity, bird count data was sought to assess whether these designs impacted local avian populations. Data was retrieved and used during interviews to measure interviewees' awareness of birds (when possible) and to make the current avian biodiversity more tangible during discussions.

Four types of avian information were retrieved serving different purposes. Although examining this quantitative data is not a major goal of my research, it provided discussion points during my interviews and assists in answering my third subquestion of whether values that influence avian-inclusive design also influence biodiversity. The first two sources were used during interviews and include a visual informational chart of common garden birds in The Netherlands, and data from the 2018 National Garden Bird Count<sup>4</sup> event for GWL Terrain's postal code area 1051 in Amsterdam. The

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<sup>4</sup> The National Garden Bird Count (De Nationale Tuinvogeltelling) is an annual Dutch garden bird count event that takes place in late January, since 2003. It is spearheaded by Vogelbescherming Nederland (a national organization of professionals and volunteers who organize conservation projects, provide educational and legal information about birds, and act to preserve wild birds and their habitats (Vogelbescherming Nederland, n.d.d.)). Volunteers count the number and species of birds they see within 30 minutes in their garden or from their balcony and upload the results into the online database. This information advises national trends and conservation action. Educational information and instructions for the count are provided on their website (Vogelbescherming Nederland, 2018a.). The data sets are subjective to the volunteers' experience and knowledge levels and thus may not be accurate, but they provide useful indications of abundance and diversity.

third and fourth data sets were for analysis purposes, comprising of bird count data also from The National Garden Bird Count for the same area but for years 2010 to 2017 inclusive, and avian population trends for The Netherlands for years 2007 to 2017 inclusive from Sovon<sup>5</sup>.

The first source does not contain quantitative data but is an informational chart with images and names of common garden birds in The Netherlands that I used during interviews, obtained from The National Garden Bird Count's website (Vogelbescherming Nederland, 2018b.) (Appendix E). I asked interviewees to indicate how many birds from the page they recognized, which helped me assess their relative avian biodiversity awareness levels. Unfortunately this was not feasible during phone calls or Skype audio interviews as interviewees could not see the list. Awareness and education may influence decisions and policies that address the decline of global biodiversity (Clergeau et al., 2001; Lerman & Warren, 2011; McKinney, 2002; McKinney, 2006). This was used to examine whether interviewees with different awareness levels held different values towards avian-inclusive design.

The second source is The National Garden Bird Count's 2018 results for GWL Terrain's postal code area (Vogelbescherming Nederland, 2018a.) (Appendix E). This data was used during interviews to exhibit the different species of birds and their quantities counted by volunteers within GWL Terrain and in its surrounding neighbourhoods. It compares and demonstrates the variety of birds

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<sup>5</sup> Sovon is a Dutch non-profit organization that oversees wild bird population data and research. Data is collected by volunteers and partnered organizations. Sovon staff analyze and interpret the census data for publication (Sovon, n.d.).

(and an indication of biodiversity) there exists in the neighbourhood. This data is useful because anyone may participate in the bird count event. Of the residents I interviewed, 89% knew of the event and 31% have participated in it. This renders the number of bird species and population counts more tangible to residents.

I acquired data from The National Garden Bird Count for years 2010 to 2017 inclusive for the same area through emails with Sovon Vogelonderzoek Nederland (Personal communication, March 24, 2018). The data contained raw counts of bird species observed. I added the 2018 results to this data set and graphed them using Microsoft Excel to provide a visual representation of population changes. The entire data was not needed for analysis but is provided for reference in Appendix E. In my analysis I examined 3 bird species: Swifts, House Sparrows, and Starlings. These 3 are of interest because they are urban breeders, and particularly House Sparrows and Swifts are urban exploiters that seldom occur outside of urban areas (Gemeente Amsterdam, n.d.c.; Vogelbescherming Nederland, n.d.a.; Assistant Professor, personal communication, April 16, 2018). Ideally I would have obtained data of this area from prior to GWL Terrain's development to the present to examine if there were avian community changes after its construction. I could not find available data of this scope, but The National Garden Bird Count data was the closest fit.

The fourth source of information was urban bird population trends in The Netherlands from Netwerk Ecologische Monitoring, Sovon & CBS (2018) for years 2007 to 2017 inclusive. The trends for Swifts, House Sparrows, and Starlings were graphed to provide a visual analysis of population changes.

## 4.4. Limitations

### 4.4.1. Time limitations

Time posed several limiting dimensions in this study, specifically for interviews. My research explores social and cultural values that contributed to avian-inclusive planning and I aimed to interview residents that were involved in the design process. This was not successful as GWL Terrain was completed 20 years ago. Not all citizens that were involved in the development lived at GWL Terrain and of those that did, I only managed to contact two, as others had moved away by this time and current residents did not have their contact information. However, 58% of residents interviewed lived there since its completion in 1998 and all the residents interviewed were somewhat involved in the neighbourhood or participated in landscaping activities, thus had influence on whether space for wildlife such as the hedges and vegetation remained or were altered.

A similar limitation was encountered with some professionals I identified as stakeholders. They had either retired, no longer worked for the same company, the organization no longer existed, or I was unable to find their contact information through potential acquaintances. Nevertheless, 5 out of the 8 professionals I interviewed were directly involved with GWL Terrain during its development.

### 4.4.2. Data limitations

The strength of my interview data depended on the range of people I reached. All the residents I interviewed were involved in the neighbourhood and therefore pre-selectively possess certain value orientations. I was unable to contact residents who did not

participate in the neighbourhood. Interviews were conducted in English which may have restricted the number of respondents. As this neighbourhood has been popular for many research studies, there is some fatigue amongst residents which may have further limited respondents (Resident 1, personal communication, March 15, 2018). Almost all the residents I interviewed were of a similar life stage (middle-aged adults or older, or with grown-up children), with very few younger adults or parents with young children. This affects my data as people in different life stages could possess different value traits due to unrepresentative sampling bias (Bryman, 2012). There is also the inherent limitation of in-depth interviews that smaller sample sizes are used (often due to time constraints) and consequently results may not be generalized to a wider population (Scholte et al., 2015).

During interviews, I asked open-ended questions to allow answers that were not prompted towards one value trait or another, such as “what do birds mean to you”. When interviewees provided answers containing one (or more) of the targeted value traits in this research, I then inquired why this trait was associated with the topic. However, as they did not know that this study focuses on specific value traits and I wanted an equal opportunity for each trait to be discussed (as I did not have cause to believe that they had an equal chance of spontaneously occurring through the natural flow of conversation), if a trait was not yet mentioned, I used a value signifier in a question, such as “why is this important to you”. Efforts were made to address the value traits equally throughout the interviews to avoid skewed data. Nonetheless I also recognize that in some conversations, I used a trait indicator in the colloquial phrasing of questions, such as “Do you feel like ...” when I meant

something unrelated to affectionate or emotional evaluations of a topic. Most of the time this did not affect answers as interviewees also used that trait in phrasing answers. These occurrences were not counted as value traits when coding.

There is meager information in documents that relate to birds at GWL Terrain. The documents briefly mention birds and nest boxes as one component of a larger discussion of environmental features (Gemeente Amsterdam Stadsdeel Westerpark, 1993; Stichting ECOplan, 1997a; Berents, 1998). Multiple interviewees also said that birds were not highly discussed, such as,

“[Author]: I was wondering when your team was implementing designs and the concept, were birds a part of the discussion?

[Interviewee]: Not so much I’m afraid. Not that I can remember but I think ok, if you make greenery you get more birds and more wildlife, period. We were more busy with the water, keep the water in the area, have plants, but that’s green, no parking, energy efficiency, environmentally friendly materials, what was the fifth...” (Architect 1, personal communication, March 26, 2018)

Furthermore since 20 years have passed since GWL Terrain’s completion, interviewees who were involved in the development process could not recollect details, but only remembered that there was no hesitation to include birds. Though it confirms the general stance for avian-inclusive design, the lack of details on this topic limits my evaluation of value traits during the development to the documents I retrieved.

Another limitation is the lack of bird count data at GWL Terrain from before and during its development to examine whether these avian-inclusive designs influenced biodiversity. Long term bird counts are not conducted everywhere and it could not be expected that such area-specific data exists. The National Garden Bird Count data does provide a snapshot of avian diversity at GWL Terrain. However, its reliability for this scale is questionable for the following reasons: as anyone can participate in the event and upload data, there is uncertainty in its accuracies due to the range of volunteers’ experience levels and familiarity with bird species (some birds are difficult to distinguish); although instructions are provided online including guidelines to avoid double-counting (in one’s own count or with neighbours), this is not assured; and the relatively small sample size, coupled with inconsistency with the numbers and skills of volunteers will likely render a large error margin. Nevertheless it shows the activity of bird counters and an indication of bird populations at GWL Terrain.

#### **4.5. Ethics and Risk Assessment**

My study aims to acquire knowledge of social and cultural values that spurred decisions towards pursuing an eco-urban development and towards incorporating structures for birds, which requires collecting subjective data through questions. This form of subjective information is not verifiable by other means as it derives from the participants’ minds (Saris & Gallhofer, 2004), and the data did not exist prior to my research. Although some value traits can be extracted from official documents as per my document analysis, those represent limited perspectives of stakeholders in the development but lack resident perspectives that I also seek. The data derived from my research may help stimulate avian-inclusive



planning policies and urban biodiversity in future planning processes.

My fieldwork does not target vulnerable groups of people nor children. As my interview questions extracts respondents' values, I am aware it can be a sensitive issue and care was taken to ensure that interviewees understood that their identities are kept anonymous, that they understood the reasons for my research prior to the interviews, and how the information is used in my thesis. Audio-recording was conducted only for note taking purposes and is not distributed. Data is stored in a manner where interviewees' identities are not linked. I engaged in interactions with people through site visits and conducted interviews with adults who volunteered to do so of their own free will. Interviewees were asked to sign a consent form stating the above facts before the interview started. A sample form is provided in Appendix C.

## 5. Site analysis



View of some of the residential blocks from one of the main paths at GWL Terrain (Author, June 3, 2018)

### 5.1. Land cover features

Land cover features were visually estimated using ImageJ, an aerial satellite view of GWL Terrain from Google Maps (2018b.) and multiple Google Maps Street Views (2018c.). Results indicated that the site cover consisted approximately of one third buildings, one third of pavement, one third of vegetation, and 1% water. This is composed of 18% coarse vegetation, 14% fine vegetation, 32% pavement, 6% single buildings, 3% connected buildings, 26% high rises, and 1% water. However if the coarse climbing vegetation (9%) on building facades are included, it increases the vegetation cover to 41%, as per Table 4.



Image 6: Coarse vegetation on a building façade at GWL Terrain (Author, June 3, 2018).

Landscape feature		Approx. percent cover (%)	Grouped features (%)
Vegetation: coarse-textured		18 (+ 9)	41
Vegetation: fine-textured		14	
Bare soil		0	0
Pavement		32	32
Building typology	Single	6	35
	Connected	3	
	Mixed	0	
	High-rise	26	
	Tower	0	
Water		1	1

Table 4: Land cover proportions of GWL Terrain from June 2017 Google Maps imagery. Totals in the rightmost column include vertical summer foliage on building façades.



Image 7: Coarse vegetation on a building façade at GWL Terrain. Next boxes are also visible on the right side of this building (Author, June 3, 2018).

## 5.2. Conclusion

The land cover proportions of 35% buildings, 32% pavement, and 32%-41% vegetation closely reflects the original development plans in the SPvE of 30% hardened surface, 35% landscaping (vegetation), and 35% building area (Gemeente Amsterdam Stadsdeel Westerpark, 1993). It is a purposely designed deviation from the standard land cover proportions to include more non-built, vegetated surface area, as part of the design to create an environmentally friendly development (Architect 2, personal communication, April 3, 2018; Gemeente Amsterdam Stadsdeel Westerpark, 1993).

Green space is visually emphasized through an open plan with gardens oriented towards public space, unlike the closed-block style typical of older Amsterdam neighbourhoods where gardens were privately enclosed within the building block. Additionally, the only fencing allowed was hedges, thereby increasing vegetation. This high visual presence of greenery was confirmed by interviewees as they frequently remarked how green the neighbourhood is.

## 6. Social and cultural value traits during the development process



Birds sharing roof space at GWL Terrain (Author, June 3, 2018)

The value traits in primary documents, interviews with residents and professionals who were involved in the planning process, and interviews with residents who lived at GWL Terrain since its completion were examined and ranked according to the traits' prevalence in the data, with #1 being the most frequent and #5 the least frequent. Thereby, this section answers the first subquestion: "Which social and cultural value traits towards birds and environmental aspects were dominant during the development process of GWL Terrain?"

### 6.1. Value traits in primary documents

Primary documents indicate the values endorsed from official municipal perspectives at that time. The prominent traits were behaviours and importance for both environmental aspects and birds. The value of adhering to norms and trends of environmental developments was also stronger in primary documents than in interviews.

Rank	Birds	Environmental aspect
1	Importance and Behaviours (tied)	Behaviours
2	Importance and Behaviours (tied)	Importance
3	Feelings	Norms
4	Preference and Norms (tied)	Preference
5	Preference and Norms (tied)	Feelings

Table 5: Value traits within primary documents towards birds and environmental aspects. Traits are ranked from the most frequently mentioned (#1) to the least frequent (#5).

## 6.2. Value traits in interviews with stakeholders involved in the development

Analyzing interviews of professionals and residents who were involved in the design process gave insight on which values dominated within stakeholders, as GWL Terrain was created out of a strong participatory planning process. From these interviews, feelings towards birds and environmental aspects dominated the discussions, with the least frequent trait being norms.

Rank	Birds	Environmental aspect
1	Feelings	Feelings
2	Behaviours	Importance
3	Preference	Preference
4	Importance	Behaviours
5	Norms	Norms

Table 6: Values traits towards birds and environmental aspects of stakeholders (residents and professionals) involved during the design process, ranked from the most commonly mentioned (#1) to the least (#5).

## 6.3. Value traits in interviews with initial residents

Residents who first lived at GWL Terrain were invited through a selection process, thus represent the intended target audience for this development. Of these residents, feelings also dominated and norms came in last. The rankings of value traits for this group, as the intended audience of the residential project, are the same as those of stakeholders involved.

Rank	Birds	Environmental aspect
1	Feelings	Feelings
2	Behaviours	Importance
3	Preference	Preference
4	Importance	Behaviours
5	Norms	Norms

Table 7: Values traits towards birds and environmental aspects from residents who lived at GWL Terrain since its completion, ranked from the most common (#1) to the least (#5).

## 6.4. Conclusion

Different value traits dominated according to data source. Primary documents emphasized importance and behaviours, while interviews with stakeholders who were involved during the site's planning process and with residents who lived at GWL Terrain since its completion emphasized feelings, followed by behaviours and importance. Potential reasons for their dominance and differences are addressed in the following sections.



## 7. Why did these traits dominate



Great tits (“koolmees” in Dutch, *Parus major*) in a tree at GWL Terrain (Author, June 3, 2018)

This section examines the results from Section 6 to answer the second subquestion: “Why did those traits dominate?”

### 7.1. Behaviours and importance in primary documents

The dominance of behaviours and importance towards birds and environmental aspects could be related not only to the data source, but to the nature of official municipal documents and magazines. These documents include the 1991 Amsterdam Structure Plan, the 1993 Urban Planning Schedule of Requirements [SPvE], and the 1993 City of Amsterdam Environmental Preference Materials List. Such documents are meant to determine goals and plans, and thus are more oriented towards presenting facts, actions, and results, rather than subjective traits such as feelings. An example of these goals and action plans (behaviours) is from the SPvE,

“The new neighborhood will have a strong environmental friendly character. This is expressed inter alia in a completely car-free ground level, which will make the new neighborhood a unique living environment. The layout of this ground level will receive extra attention during the development.” (Gemeente Amsterdam Stadsdeel Westerpark, 1993, p.9)

Moreover, GWL Terrain was a pilot project to create a sustainable car-free residential development of its scale, and the municipality, architects, and residents were resolute on its success (Pos, 2009). Stating these action points solidified what was feasible in this project. The Plan Amsterdam and Look at Westerpark documents are magazine series distributed from government bodies to inform

readers of projects that were happening around Amsterdam, and by highlighting the important values of environmental aspects and nature, could provide justification for the actions. One example of a successful action point from Look at Westerpark is,

“Environmentally friendly, sustainable construction is successfully applied to the GWL site. In this car-free district with lots of greenery, a great deal of attention was paid to the environmental aspects, which focus on environmental protection in all construction projects, both new construction and renovation.” (Stadsdeel Westerpark, 1995b., p.1)

The value of adhering to norms and trends of environmental developments was also stronger in primary documents than in interviews. This was because regulations and policies were placed under this category as they had become a part of normal practice. This is exemplified in the Structure Plan,

“A policy document on Spatial Planning and the Environment is drawn up, which specifies how spatial planning can contribute to a sustainable environment and a qualitatively good living environment. Attention will also be paid to the further development of the compact city, mobility and infrastructure, the results of the further elaboration of the accessibility profiles and the traffic environment map and the ecological values and potentials present in the city.” (Dienst Ruimtelijke Ordening Amsterdam et. al., 1992a., p.67)

and in the Plan Amsterdam article on Sustainable Building,

“In almost every part of the city there is now a sustainable construction show-project either in actual progress or in the planning phase. To name but a few examples: the Oostelijke Havengebied, IJburg, the GWL site, Nieuw-Sloten, Complex 50 and the new urban district offices of Amsterdam Noord.” (Berents, Roy, 1998, p.19)

## 7.2. Feelings, behaviours and importance in interviews

Feelings towards birds and environmental aspects dominated in both interviews with stakeholders and with residents who lived in GWL Terrain since its completion. There were no differences in dominant traits between those with higher or lower bird diversity awareness levels.

### 7.2.1. Dominant values towards birds

The most commonly used words when interviewees were asked about birds were “like” and “love”, followed by an array of positive emotions such as “happy”, “funny”, “amazed”, and “appreciate”. This was expressed by residents and professionals, who said,

“I like them a lot. I always get very happy from birds in the garden. So in the other house we always try to have birds in the garden. With the food.” (Resident 22, personal communication, April 10, 2018)

and

“What do they mean to me? Yeah I do paint them. I think birds, well I like them. This is from last week. And that is what they mean to me. They are the most, they give a lot of nature, they give the noise, this is also one of my birds. I love birds. You should design for birds. One should – this one is also a nice one. I do paint them a lot, because I think they’re very elegant, and then the sound they make and the fact that they help us with the insects, and they help us with the plants, and they help us, they’re the symbol of freedom. And the symbol of elegance.” (Architect 3, personal communication, April 9, 2018)

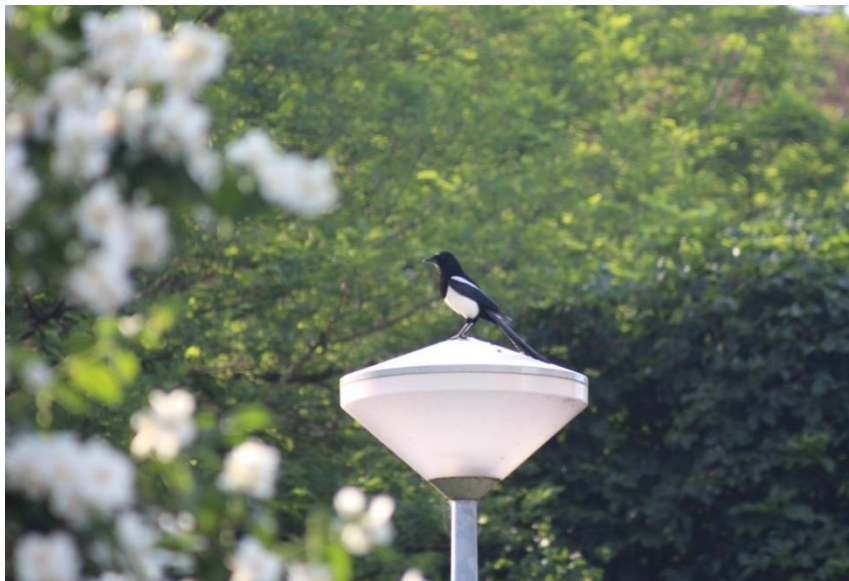


Image 8: Eurasian Magpie (“Ekster” in Dutch, *Pica pica*) standing on top of a lamp at GWL Terrain (Author, June 3, 2018).

Of the residents and professionals interviewed, 100% felt some degree of positivity when they saw or heard birds, and 73% said that birds evoked feelings of relaxation, calmness, and being connected to nature while in the city. Such feelings were considered to be important to the mental health of city inhabitants. One resident said,

“I think it’s good for the environment and it makes people happy. When you’re going to look to birds you see them do everything, it makes that you smile. Because they’re so busy and when I see a koolmees and a pimpeless together, fighting around, and then a roodborst that comes, it’s a lot of fun to see. It’s a lot of colour, and they make sound music, so it makes you happy but it makes you also quiet in one or the other way.” (Resident 10, personal communication, March 28, 2018)

The negative emotions associated with birds include “concerned”, “worry”, and “pity” and were used by 18% of interviewees in context of the welfare of bird populations and diversity. One resident said,

“There were some birds that were coming in the past, you don’t see them in the past few years. Like the groenling you don’t see it much, which is a pity because it sings so beautifully.” (Resident 4, personal communication, March 23, 2018)

The exception of affectionate and concerned feelings towards birds lie with 39% of interviewees that expressed mixed feelings or had negative associations towards 3 types of birds: Common Pigeons or

Rock Doves (“stadsduif” in Dutch, *Columba livia*), Rose-ringed Parakeets (“halsbandparkiet” in Dutch, *Psittacula krameri*), and gulls in general (“meeuw” in Dutch). For these, “don’t like” and nuisance words were used because of the amount of droppings that pigeons leave behind, the gulls’ noise, and because Rose-Ringed Parakeets were observed exhibiting aggressive behaviors that may chase away smaller birds. One interviewee said,

“I don’t like the pigeons, because I associate them with illness, maybe that was before, with the history”. (City of Amsterdam Area Coordinator, personal communication, March 23, 2018)

This parallels a study of residents’ perceptions of birds in Rennes, France, where the majority of people had positive associations from birds with the exception of a few species, including Common Pigeons, where “starlings, gulls, and pigeons were the least appreciated birds” (Clergeau et al., p.80).

### **7.2.2. Dominant values towards environmental aspects**

The same positive feelings for birds were expressed by 76% of interviewees towards environmental aspects and were most frequently used because they felt connected to nature through the amount of vegetation on this site, which is higher than in other Amsterdam neighbourhoods. Although 46% of residents explicitly said that they did not move to GWL Terrain for its environmentally-friendly disposition, it was a characteristic they appreciated greatly. Perspectives include,

“Personally, the colour [green] makes me happy, so the four seasons and the changing of the nature makes you, to see it

makes me happy, maybe not every people. And then you feel that some matters which on your mind are small things. It’s not so important. If you’re healthy then why do you have to complain.” (Resident 11, personal communication, March 29, 2018)

and

“By that time already I was sure and believed that we cannot continue as a society as a whole with this pure consuming oriented approach and not taking care for the earth, and that it was needed to make a switch in this and be more circular economy oriented society as far as the energy is concerned, and also the relation between human and nature and the whole ecosystem and the idea was that something which, could only take place outside of the city, and I believe that no, this is something, actually the city is a very good place to do this, actually I was happy that there was an initiative doing this, knowing that it was a kind of pilot because you discovered that a lot of things didn’t work out finally, but you should start somewhere and learn lessons.” (Resident 16, personal communication, April 5, 2018)

The first inhabitants at GWL Terrain were selected if they met preconditions including whether they would adhere to the car-free and environmental character of the neighbourhood, thus pre-selecting for certain values. Residents from the left-wing Stadsliedenbuurt neighbourhood played a prominent role in developing GWL Terrain based on principles they believed in. This selection process of residents was emphasized in the SPvE,

“There will be an early, active recruitment, and an alignment of the plan with the mobility patterns and lifestyles of potential candidates.” (Gemeente Amsterdam Stadsdeel Westerpark, 1993, p.13)

The environmental principles from selected inhabitants are still reflected amongst present inhabitants, who said,

“I think it’s important that we preserve what we have, I think we already have due to technology and progress, we already have so much convenience, things that are convenient for us but that can be detrimental to the environment, and some of those things we can’t miss already. So whatever we can do to help, to even alleviate a bit of the problem, we should go for it.” (Resident 23, personal communication, April 11, 2018)

Having the space to include higher amounts of vegetation was strongly connected to the site’s car-free nature, which in turn allowed children to play more safely outside their home than they could in other Amsterdam neighbourhoods. GWL Terrain was also built with families in mind, as not many places within the district were large enough to raise a family. One resident said,

“I like the silence. So we picked a block that is a bit farther from the streets. And I don’t have children but for children it’s fantastic that they can run and bike and cycle outside without danger of cars.” (Resident 4, personal communication, March 23, 2018)

The positive feelings of seeing and hearing birds, along with positive feelings connected to health and safety of living at GWL Terrain were strongly connected to the importance of having an environmental area as it was fundamentally beneficial for the existence of the current residents, future residents, the city, and of the planet as a whole. Of the behaviours that dominated towards environmental aspects, 67% involved creating more green space for people, plants, and wildlife, feeding birds, watching birds, and creating a high quality space to live for people and nature. One resident said,

“I think a directly, an awareness of birds and a possibility to see birds on a daily basis, is on a more general possibility to see green in the environment, is just healthy for everybody, to appreciate the jewel that nature is. And indirectly to realize that, means the city has to work, think a lot more of how can we make this space, this area, our city, more environmentally friendly.” (Resident 3, personal communication, March 19, 2018)

The residents at GWL Terrain have a reputation for being highly involved in their neighbourhood. Although many of the actions were directed towards nature, they were also for recreational and leisure purposes that create and enhance social connections. Social connections were in turn linked to traits of feelings (desire to have social connection), behaviours (creating events for the neighbourhood), and importance (holding responsibility for each other, especially if a neighbor needs help). One resident said,



“I like the whole idea of the neighbourhood, of the green projects, that there are no cars, because we have bought our house, you also have your own neighbours that you have. I thought it nice to learn about the people who come to live here. So it’s a good way to get to know people.” (Resident 4, personal communication, March 23, 2018)

The motivations for behaviours towards one another and towards the environment, combined with feelings and importance is reflected in the responsibility to make their neighbourhood a better place. This was explicitly stated in an interview,

“Yeah not everybody, but I think a lot of people feel responsible for the green character.” (Resident 2, personal communication, March 19, 2018)

and reflects the successful implementation of this goal from the SPvE,

“In general, the aim will be for a large degree of appropriation of public space by the residents. This means that the residents will feel responsible for the state and maintenance of the public space. This can be achieved, for example, by a direct view of the greenery, by communal facilities such as vegetable gardens or by creating communal gardens.” (Gemeente Amsterdam Stadsdeel Westerpark, 1993, p.22)

### 7.3. Conclusion

Reasons for the dominance of feelings, importance, and behaviours fall into reoccurring underlying themes of health, safety, family, livability, and quality. To place importance and behaviours towards other people, organisms, nature, and to feel positively about it links these qualities to values orientations towards the other or biocentric sphere, rather than to the self (Scholte et al., 2015; Stern & Dietz, 1994; Vaske et al., 2001). An influencing factor could be that 100% of the residents interviewed participated in neighbourhood activities within GWL Terrain, and 63% have held a leadership role within the neighbourhood. Of the participation in activities with their neighbours or in the neighbourhood, 73% of residents participated for social contact, and 58% of this participation overlapped with actions to improve the environment or grow plants and create more green space. This is a value characteristic strongly visible of this neighbourhood, which likely led to the acceptance and inclusion of birds in the urban design. This was exemplified both by residents and professionals, as stated,

“It’s car-free, and the natural, the green, that was to me very attractive as well. Yeah for the children that they could play in a car-free environment, I was very attracted to that. Because I also knew how it was to live in the old city and have to guard your children to play garden and all kinds of things.” (Resident 9, personal communication, March 27, 2018).

and

“I think it’s really really important for people to see birds coming and going with the seasons...because of the variety

and the richness of nature, and that's why I chose this job already because it's so important to see the seasons and see things grow and animals and birds...it's a quality we have to maintain that they are staying in this world. And it's a quality." (Landscape Architect, March 21, 2018).

Documents of development plans are from municipal and district governments. Those organizations have a purpose to provide livable places for residents in the city, which is embedded in action necessary for the governing body to progress. This is seen in the Structure Plan,

"The desired compact urbanization image provides an adequate response to current and future needs and developments. A number of considerations are important in this respect, such as reducing land use, maintaining a sufficient population base for the city, shortening commuting distances, promoting the use of public transport, preserving nature and landscape and the care for the quality of the living and living environment." (Dienst Ruimtelijke Ordening Amsterdam et al., 1992b., p.14).

To maintain an area with healthy, safe, family-friendly, livable, and quality characteristics mean that these residents with other-oriented values possess a sense of responsibility towards each other and towards the environment. In turn, this fosters environmental stewardship which is crucial for healthy urban ecosystems. The dominance of feelings, importance, and behaviours may also be because they emphasize the benefits of the quality of life, whereas preference and norms may have less influence in that sense.

## 8. Meaning of the dominant value traits for avian biodiversity



Nest box close to a building entrance at GWL Terrain  
(Author, June 3, 2018)

This section answers the third subquestion: “What does the dominance of these traits mean for avian biodiversity at GWL Terrain”? First I examine whether the features to include birds can impact local birds. Then, I examine how the dominant value traits of feelings, importance, and behaviours connect to themes of health, family, safety, livability, and quality and how this connection can be used to include birds as part of a successful residential development.

### 8.1. Impact of avian-inclusive design on birds at GWL Terrain

Population trends for House Sparrows, Starlings, and Swifts in The Netherlands have been moderately declining in recent years (Netwerk Ecologische Monitoring, Sovon & CBS, 2018). Figure 2 was created using trend data calculated using the TRIM method from the Meetnet Urbane Soorten (MUS) project (Netwerk Ecologische Monitoring, Sovon & CBS, 2018). The year 2007 was set at 100 as a baseline to show relative trends for following years.

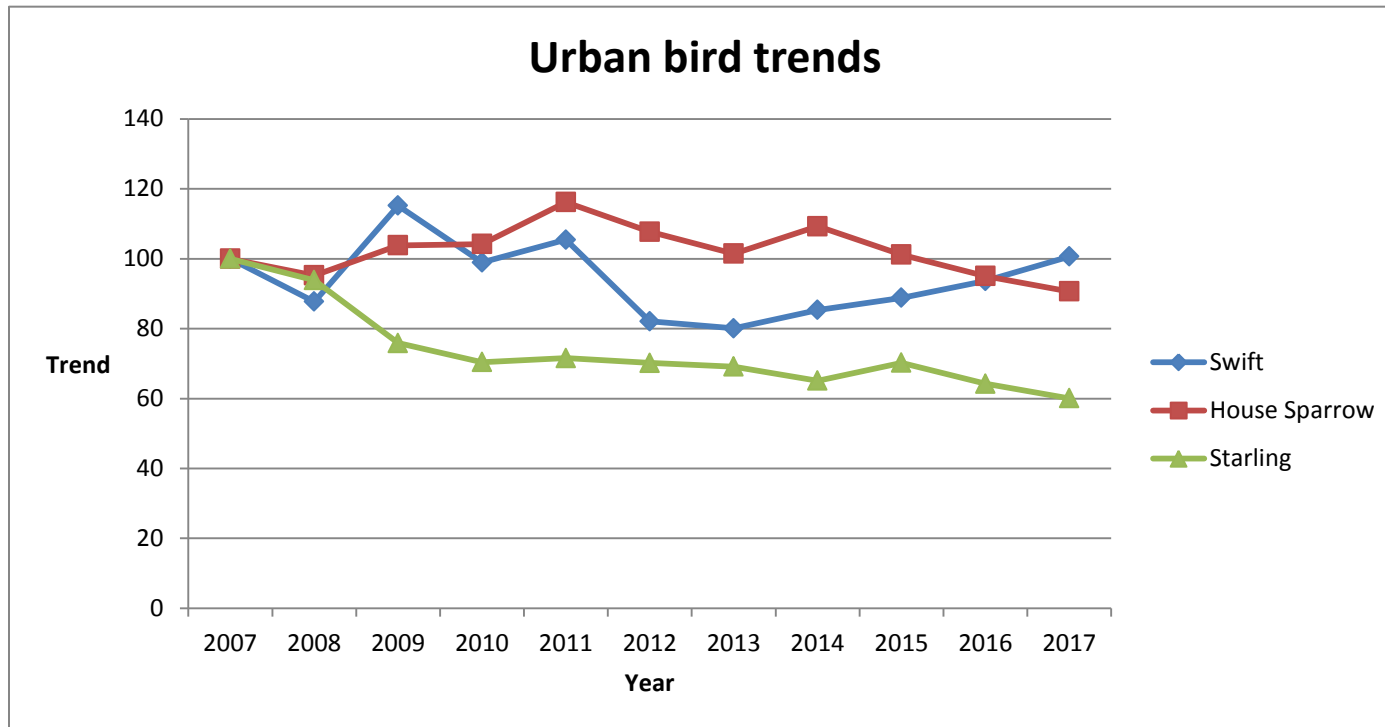


Figure 2: Urban bird trends of Swifts, House Sparrows, and Starlings (Netwerk Ecologische Monitoring, Sovon & CBS, 2018).

In Figure 3, only raw counts are used in the graphical representation of data for GWL Terrain’s postal code area for years 2010 to 2018 from The National Garden Bird Count (Sovon Vogelonderzoek Nederland, personal communication, March 24, 2018). This is due to two main reasons: 1) due to my unfamiliarity with the TRIM method, I am unable to employ it to calculate trends from data obtained which would be important for meaningful comparison with Figure 2; 2) there is unreliability in the data due to the nature of its collection by amateur volunteers, wherein data inaccuracies would be

accentuated due to the small focus area of this study. Further details of this limitation are provided in Section 4.4.

Nevertheless Figure 3 demonstrates the presence and counts of House Sparrows and Starlings. No Swifts are present because they overwinter in Africa. Figure 4 in Appendix E shows the raw counts of all birds observed during The National Garden Bird Counts from 2010 to 2018, but is not used during interviews.

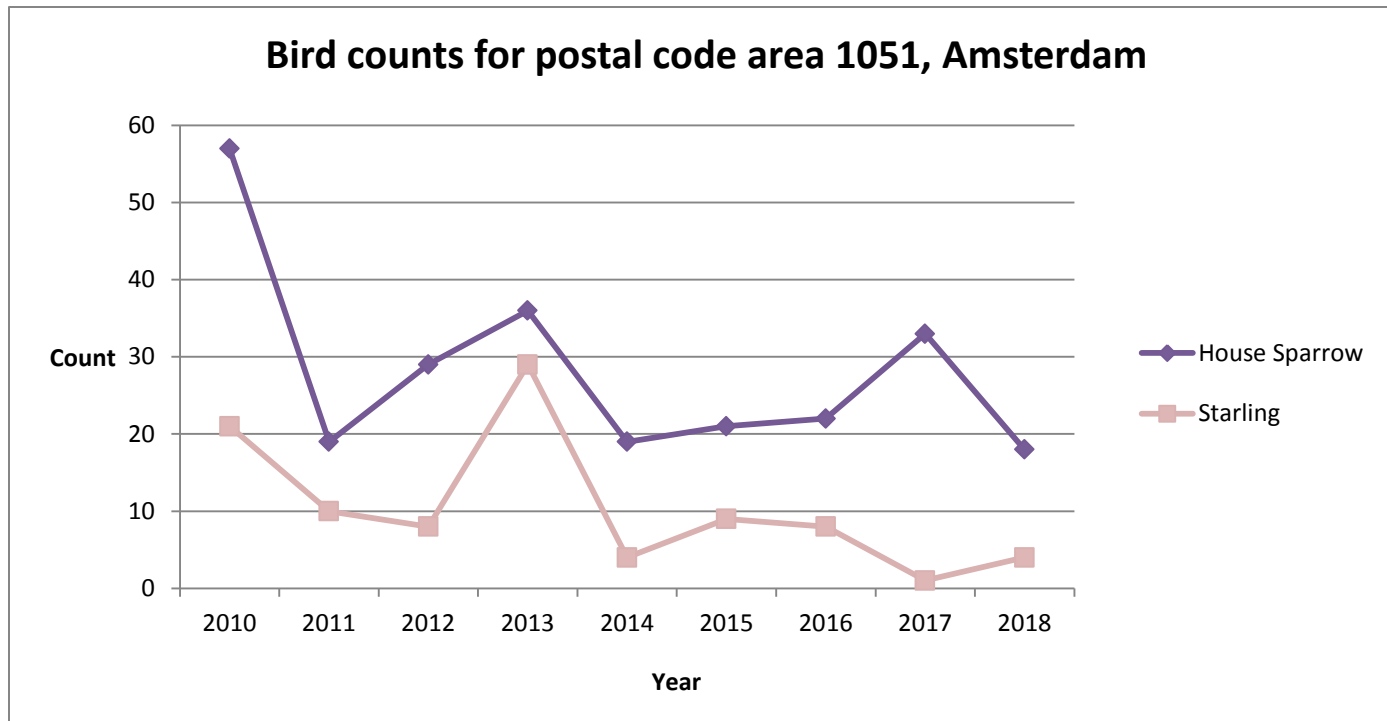


Figure 3: Raw bird counts of urban breeders conducted by volunteers for The National Garden Bird Count over 9 years for GWL Terrain’s postal code area 1051 (Sovon Vogelonderzoek Nederland, personal communication, March 24, 2018).

The City of Amsterdam has an online interactive map that inventories breeding spots of House Sparrows, Starlings, and Swifts observed in the city (Gemeente Amsterdam, n.d.a.), updated annually by avian specialists (Gemeente Amsterdam, n.d.a.; City of Amsterdam Urban Ecologist, personal communication, April 16, 2018). In Image 9, each symbol indicates where avian breeding spots were observed. The red symbols represent House Sparrows, the black symbol Swifts, the purple symbol Starlings, and I demarcated GWL Terrain with the superimposed orange polygon.

Though the map does not show many observed breeding spots outside of GWL Terrain for this area, it could be because the avian specialists could not access some places to observe breeding behaviour, such as in private inner blocks. Additionally this inventory method does not determine the absence of a species where there is no icon (Gemeente Amsterdam, n.d.a.). Nonetheless, it shows that in this vicinity, many nesting spots of 2 urban breeders are publicly observed, whose visibility is beneficial to maintain awareness of these birds.





Image 9: Map from the City of Amsterdam (Gemeente Amsterdam, n.d.a.) of identified breeding spots for Swifts, House Sparrows, and Starlings. The superimposed orange polygon outlines GWL Terrain.

Despite my lack of baseline data to determine whether avian-inclusive designs created an impact on avian biodiversity at GWL Terrain, I can conclude that such designs successfully created visibility and awareness of urban bird species, while providing nesting spots for their survival. Of the residents interviewed, 77% noticed House Sparrows in the nest boxes. Residents were also aware that House Sparrow numbers were declining and felt positively that they nest there. Although including birds was not a main focus during the site’s development, there were efforts to

retain as much of the nature that existed prior to the development (Gemeente Amsterdam Stadsdeel Westerpark, 1993). The nest boxes, hedges, and other vegetation do succeed in creating awareness of birds as 80% of residents interviewed said they noticed birds more since they moved into GWL Terrain than in their previous residence.



Image 10: Swift flying over GWL Terrain (Author, June 3, 2018).

## 8.2. Connecting value traits to health, safety, livability, quality, and family

Through examining dominant value traits towards birds and environmental aspects concurrently with the underlying themes of livability, quality, health, family, and safety, the traits of feelings and importance prevailed (Table 8). Additionally, the theme of connection to nature was examined.

Themes	Birds	Environmental aspect
<b>Livability and quality</b>	Feelings	Importance
<b>Health</b>	Importance	Importance
<b>Family</b>	Feelings	Feelings
<b>Safety</b>	n/a	Feelings
<b>Connection to Nature</b>	Feelings	Feelings + Importance

Table 8: Dominant value traits towards birds and environmental aspects, according to themes of a successful residential area.

GWL Terrain was a pilot project to create a dense, sustainable, residential development of its scale. However, its reputation for success was not from the resource efficient features implemented, but in its livability and the amount of green space possible by virtue of the site’s car-free backbone. As mentioned in Section 7.2, the underlying themes of health, safety, family, livability, and quality were reasons why feelings, importance, and behaviours were so prevalent in the data. The biocentric and value orientations towards the other rather than the self (Scholte et al., 2015; Stern & Dietz, 1994; Vaske et al., 2001) within these themes contributed to the inclusion of birds in the urban design. When residents were asked whether they noticed birds or features that birds use in the neighbourhood, the answered were accompanied by the dominant value trait of feelings. When interviewees heard birds singing, 45% of them associated it with the changing seasons, a connection to nature within the city, and a reminder that they share the space with other wildlife who are also trying to raise their own families. This created moments where residents felt happy, calm, and relaxed, contributing to a better living environment.



Image 11: House Sparrow at a nest box at GWL Terrain. It was spotted feeding chicks inside the nest box right before this photo was taken (Author, June 3, 2018).

Feelings and importance are often found in conjunction with other traits, notably behaviours. For instance, the action of feeding or watching birds is related to feeling pleasure from the act, which might help urban species such as House Sparrows where lack of food may be one of many reasons why their numbers are declining<sup>6</sup> (Gemeente Amsterdam, n.d.c.). In municipal documents, behaviours are emphasized rather than feelings as feelings are not often incorporated into policies and plans, but are still found concurrently with importance. An example is,

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<sup>6</sup> Note: This does not claim that feeding birds is always beneficial. Sometimes feeding causes more harm than good. See article by Groo (2018) for details.



Image 12: House Sparrow emerging from a nest box at GWL Terrain (Author, June 3, 2018).

“The instrument of the Environmental Impact Study (MES) will be used for decisions on policy intentions and activities with potentially important consequences for the environment, which according to the law are not “EIA-compliant”.” (Dienst Ruimtelijke Ordening Amsterdam et al., 1992a., p.62)

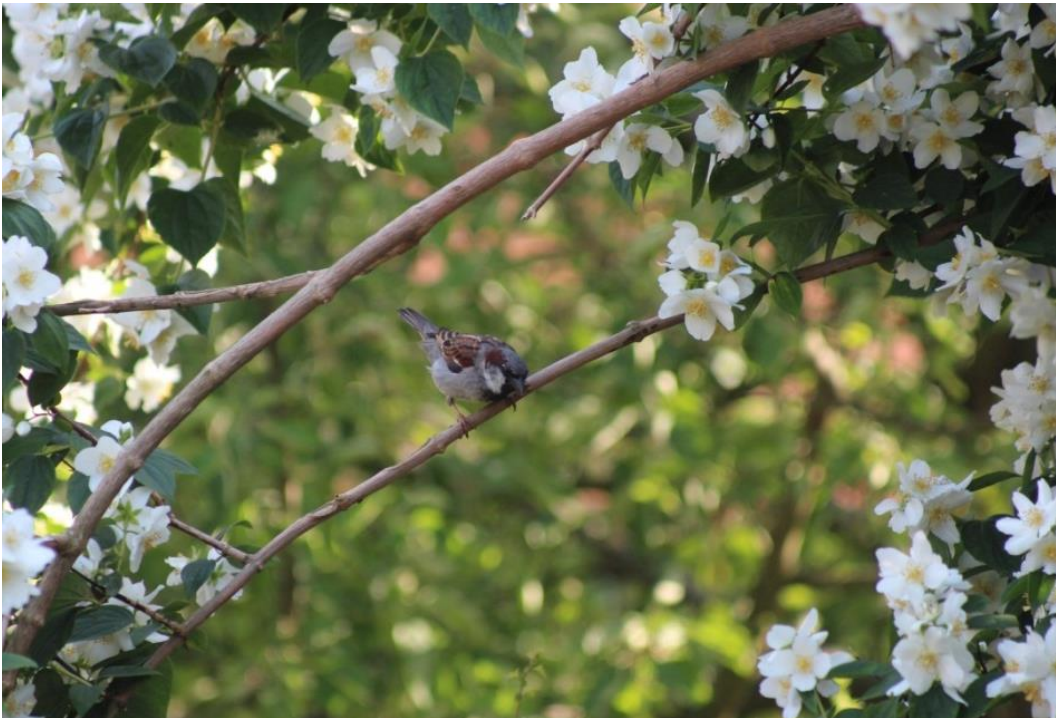
### 8.3. Conclusion

Though the dominance of feelings, importance, and behaviours corresponded to the inclusion of birds in GWL Terrain's urban design, it cannot be attributed to avian population changes due to insufficient data. However, the dominant value traits of feelings and importance towards birds and environmental aspects surfaced concurrently with underlying themes of health, family, safety, livability, and quality throughout interviews and documents.

The designs were successful in that birds including House Sparrows, Swifts, and Starlings do use the features and site. The majority of residents notice the designs and also gained an increased awareness of birds compared to their previous residence. Space can be made for birds in urban designs by using themes of health, family, safety, livability, and quality to emphasize feelings and importance for birds and the environment. Avian-inclusive design can also nurture further (positive) interactions with birds and wildlife, influencing how non-human life is valued (Marzluff & Rodewald, 2008).



## 9. Conclusion and Discussion



House Sparrow in a flowering shrub by a main pathway at GWL Terrain (Author, June 3, 2018)

This section reflects upon the main findings of this study in connection to the research question. It considers the relevance of this research, along with its contribution to the field. This is concluded by a reflection of steps moving forward.

### 9.1. Contextualizing the site

GWL Terrain’s open plan layout deviates from the surrounding closed-block neighbourhoods. This 6-hectare site is comprised of approximately 35% buildings, 32% pavement, and 32% - 41% green space that fluctuates seasonally. This follows the SPvE that stipulates 30% hardened surface, 35% landscaping, and 35% building area (Gemeente Amsterdam Stadsdeel Westerpark, 1993). These features were further categorized into coarse or fine vegetation and specific building types, following the HERCULES classification (Zhou et al., 2014) that enables the biophysical features to be contextualized for comparative studies.

GWL Terrain’s design was meant to emphasize the development’s environmentally-friendly character through increased areas of publicly accessible green spaces, enabled by its car-free nature. This increases social and environmental interactions and experiences at ground level. The only fences allowed are hedges, thus increasing the amount of vegetation and greenery (visually) present.

### 9.2. Answering the research question

The research question “How do different kinds of social and cultural values contribute to planning with avian-inclusive urban design?” is addressed by exploring the interpretations of the main findings of 3 subquestions below.



### **9.2.1. Which social and cultural value traits towards birds and environmental aspects were dominant during the development process of GWL Terrain?**

The dominant value traits were feelings, behaviours, and importance. However, the traits that dominated depended on whether the data was from documents or from interviews. Documents emphasized behaviours and importance, whereas feelings dominated in interviews.

The source and type of data likely guides which value traits dominate, but the overall attitude throughout the data was a support for birds and biodiversity. The implications are that when values are applied as a means to incorporate avian-inclusive designs, a different approach may be needed when using different communications methods for the values to connect and resonate.

### **9.2.2. Why did those traits dominate?**

The dominance of feelings, importance, and behaviours frequently co-occurred in context with health, safety, family, livability, and quality in documents and interviews. Additionally, the attitude towards birds and environmental aspects was positive and desired by the majority of interviewees. This value towards nature and other organisms represents a value orientation away from the self and towards the biocentric sphere (Scholte et al., 2015; Stern & Dietz, 1994; Vaske et al., 2001).

These results may have been pre-selected as all residents interviewed also participated in activities within the neighbourhood for social and/or environmental reasons. However, this high level of participation is a distinguishing feature of GWL Terrain, which can contribute to the social and biocentric nature of the interviewees.

This biocentric value orientation extends to the acceptance and inclusion of nature and birds in the urban design.

The nature of the documents retrieved may strongly influence why behaviours and importance traits are emphasized more due to their purpose and who their authors represent. Official policy documents, plans, and magazines written by local governments are meant to inform their residents of decisions and changes happening in the city. The governing bodies' purposes are to provide work and services to the city, thus it is logical that actions undertaken are highlighted in those documents. By emphasizing importance, the government can justify their decisions and policies towards what they perceive are desirable for a livable city. The residents' manuals reflect value traits similarly as in official documents as manuals' purposes are to provide instruction on actions towards predetermined goals.

Nevertheless, an interpretation to why birds and avian-inclusive design are positively valued throughout the data is that they are a means towards health, safety, family, livability, and quality, themes which are fundamentally perceived as elements of a livable place. GWL Terrain was designed to cultivate responsibility for the neighbourhood within its residents, and the stewardship needed for its success was accomplished. The dominance of feelings, importance, and behaviours could be depicted as traits conducive to creating a better quality of life, whereas preference and norms may have less emphasis in that aspect. Thus, in trying to implement avian-inclusive design, ensuring that dominant value traits are connected to these fundamental themes may guide it onto a path of success.

### 9.2.3. What does the dominance of those traits mean for avian biodiversity at GWL Terrain?

Due to a lack of baseline avian data for the area and some unreliability in the nature of data gathered, it cannot be determined whether these designs for birds and nature at GWL Terrain had an influence on local avian diversity. However, it shows that urban species such as House Sparrows, Starlings, and Swifts use the site and designs. As these bird populations show declining trends in The Netherlands (Netwerk Ecologische Monitoring, Sovon & CBS, 2017), being able to make and provide space for them is beneficial for their population levels.

Over three-quarters of residents interviewed became more aware of birds since they moved to GWL Terrain. This includes attention to House Sparrows using nest boxes and hedges. This increased awareness has created relationships with birds and are associated with factors of health, safety, livability, quality, and family aspects of this neighbourhood. Feelings and importance dominated in these themes, and towards birds and environmental aspects. These value traits led to the inclusion of avian-inclusive designs, and their significance is that it is a means to bring people closer to nature while being in the city, therefore increasing chances for education and awareness for nature. Interviews and documents showed that residents and professionals found it attractive to include birds in urban design. It can be concluded that these designs are beneficial and successful in instilling awareness and maintaining positive values towards birds and urban ecosystems, which are crucial seeds towards ecosystem conservation and preservation outside of the city to tackle the issue of global biodiversity declines (Melles, 2005; Clergeau et al., 2001). As per an interview,

“To me the other importance is that if people are getting to contact with wildlife, then they generally appreciate it. So the more wildlife they see, the more diverse it is, the more they appreciate it, and the more willing they are to protect it outside of their living area.” (Assistant Professor, personal communication, April 16, 2018)

This is also affirmed in studies where people had low support for wildlife conservation when they lacked knowledge or connection to the wildlife of their community (Clergeau et al., 2001; McKinney, 2006), and the disengagement from their surrounding environment can be further exacerbated as biodiversity decreases (Lerman & Warren, 2011). Urban exploiters such as House Sparrows, Swifts, and Starlings are helpful in increasing biodiversity awareness and education as urbanization increases. People’s awareness and connection with their environment is a crucial influencing factor in decelerating declines in global biodiversity (Lerman & Warren, 2011; Clergeau et al., 2001; McKinney, 2002; McKinney, 2006).

### 9.3. Connection to existing literature

This study connects to *ecology for the city* by exploring the contributions of stakeholder values towards a sustainable urban development. GWL Terrain illustrates a successful project that increased avian awareness at residents’ homes, laying down foundations for the principle of stewardship towards urban ecosystems in *ecology for the city*. As social and cultural values shape decisions that can benefit urban ecosystems (Pickett et al., 2016), immersing stewardship for ecosystems into societies’ values and practices can assume the responsibility needed for a livable environment for humans and nature and mitigate the issue of decreasing global biodiversity (Bowman & Marzluff, 2001). Different

kinds of values can be employed to create relationships that connect people to their ecosystems, to get people to be excited and interested in birds, which supplement scientific approaches (National Geographic Livestream, 2018).

This study takes a transdisciplinary approach to urban systems and ecology to address the increasingly resource intensive standards of our urbanizing world. Approaching *ecology for the city* through an urban planning lens is increasingly needed to understand how nature, indicated through birds in this study, can be included into cities to alleviate the extensive resource consumption standards. By approaching planning designs through value traits that resonate and connect to people, community support can be harnessed as stewardship for ecosystems.

#### **9.4. Relevance of this study and its contribution to the field**

This study has approached many elements in the *ecology for the city* framework that contributes to the literature in both the social sciences and conservation ecology fields. Although the results of this study may not be generalizable or fully transferable to other planning processes and designs due to the contextual nature of social and cultural value assemblages, it provides a means of interpreting how different value traits can connect avian-inclusive design with what is perceived to be a safe, healthy, livable, quality, family-inclusive place. It explores the role of different values in a dense urban residential development in the Amsterdam context. Urban avian ecology has traditionally been researched through quantitative methods, whereas with *ecology for the city*, understanding that urban ecosystems are dynamic and highly

influenced by choices and actions by humans, calls for qualitative rationalization such as through the social sciences. This is particularly applicable as the City of Amsterdam is beginning to implement nature-inclusive features as a prerequisite in the development and planning process for new buildings (City of Amsterdam Urban Ecologist, personal communication, May 12, 2018).

There is still much research needed in this field since little information exists in regards to how urban planning can affect avian biodiversity (and by extrapolation global biodiversity) and vice versa, even though past research has shown potential for biodiversity conversation in urban areas (Marzluff & Rodewald, 2008). In an age where many decisions and policies are implemented using objective premises such as hard science and facts, it is easy to forget the role of subjective factors such as values in planning and practice. However, this complementary approach that incorporates transdisciplinary, qualitative perspectives can bring in other institutions and industries that may benefit from such planning and design. For example in Turkey, bird palaces carved into the outer facades of structures during the Ottoman Empire era are now a part of the history and art of the area (Erman, 2014). As urban ecology exists within the urban realm, the subjective nature of humans plays a crucial role in the field.

#### **9.5. Moving forward**

Time constraints limit the scale of this study but further research can link these findings to an enriched understanding of Amsterdam's urban social-ecological processes. As I am examining social and cultural values towards birds, these values will have demographic inclinations. However, examining whether

demographic factors also correlate to social or cultural values towards birds or environmental aspects was beyond the scope of this study. Amsterdam is a multicultural city and therefore possesses many social-cultural values assemblages (Scholte et al., 2015). Research through a sociological lens may provide different comprehensions and interpretations of how ethnographic and demographic differences may engage intrinsic, principle-based values to incorporate avian-inclusive designs.

Spatial patterns are also products of economic, political and governance assemblages (Pickett et al., 2016) which can be mapped with quantitative demographic comparisons, such as in Melles's study (2005) where the socioeconomic gradient in Vancouver was compared to avian diversity. Clergeau et al. (2001) examined people's perceptions and appreciations of birds in France through interviews and also conducted avian censuses to determine whether these perceptions correlated with the actual avian diversity and density in the area. A similar census can examine whether values towards environmental developments or towards birds correlate with real local avian biodiversity in Amsterdam. Longitudinal and larger scale research would provide better insight into the relationships between designs and urban avian ecology as ecological processes occur at large and heterogeneous scales (Bowman & Marzluff, 2001).

Similar studies to this would benefit by exploring neighbourhoods and designs where baseline data is available or collectable from before the development, during, and after to analyze whether avian-inclusive designs do have an impact on local biodiversity. It would require a long-term approach as species can take 50 years to settle in a site (Assistant Professor, personal communication, April

16, 2018). This study did not acquire interviewees that did not like birds or that did not participate in neighbourhood activities. This meant that interviewees possessed pre-selected values. Studies able to acquire a wider range of participants could examine whether the dominant value traits still hold true if the interviewees did not like birds or did not participate within the neighbourhood. Research examining recent or in-progress developments would be advantageous to explore whether values change due to transfer agents in planning processes. There is no shortage of further studies for urban avian ecology in the planning realm. Urban planning itself is a holistic practice of transdisciplinary fields, thus offers many angles to seek how avian biodiversity can be incorporated in an urbanizing world.

National Geographic, Birdlife International, The National Audubon Society, and The Cornell Lab of Ornithology have declared 2018 as the Year of the Bird to celebrate the 100 year anniversary of the American Migratory Bird Treaty Act (Goldberg, 2018) that prohibits the trade or possession of migratory birds (U.S. Fish & Wildlife Service, 2017). It is a year to explore how these entities provide crucial environmental services and have been a part of human art, spirit and religion throughout the ages and serve as symbols of power, peace, and freedom (Erman, 2014). As living descendants of dinosaurs, birds connect us to the natural world that existed before humans, while simultaneously can inform us of changes in the future of our environment. In caring for the well-being of birds and their populations, it reflects upon the state of our moral and ethical values towards our responsibility to nature (Franzen, 2018).

*“If you take care of birds, you take care of most of the environmental problems in the world.”*

*–Dr. Thomas Lovejoy  
(Goldberg, 2018)*



Bird palaces in Turkey (Ahvenas, 2018)



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## Appendix A: Glossary

- *Avian*: of or relating to birds.
- *Avifauna*: birds that inhabit a certain place or time.
- *Biodiversity*: variety of organisms in a particular place.
- *Homogenization*: process of reducing the biodiversity of a place, decreasing species richness.
- *Introduced species*: species not native or originating to the place in consideration, possibly recently brought in by humans. Also known as non-native, exotic, or alien species. (National Geographic Society, 2018)
- *Invasive species*: species not originating to the place in consideration that causes harm to the environment, health, or economy. (National Geographic Society, 2018)
- *Native species*: species occurring naturally to the place in consideration. Also known as indigenous species. (National Geographic Society, 2018)
- *Synanthropic species*: species that thrive in urbanized areas and that may be dependent on urban resources. Their peak abundance levels are found in urban cores. (McKinney, 2006)
- *Urban*: definition varies according to country, but generally refers to an area with denser human settlement. Differences in standard of living and facilities may also be considered. (United Nations Statistics Division, 2017)
- *Urban adaptable*: species that adapt to urbanization but still use natural resources. (McKinney, 2006)
- *Urban avoiders*: species that are very sensitive to urbanization and disappear quickly. (McKinney, 2006)
- *Urban exploiters*: Also known as synanthropes. See Synanthropic species for definition.

## Appendix B: Primary Documents

### Reports:

Title	Author/Organization	Date Published
1991 Amsterdam Structure Plan (Structuurplan Amsterdam 1991), #1-4	Dienst Ruimtelijke Ordening Amsterdam, Hoofdafdeling Stedelijke Ontwikkeling, & Gemeentesecretarie Amsterdam	1992
1993 Urban Planning Schedule of Requirements (Concept Stedebouwkundig Programma van Eisen [SPvE])	Gemeente Amsterdam Stadsdeel Westerpark	1993
Environmental preference materials list (Eisen en aanbevelingen nieuwbouw: produktontwikkeling)	Bouw en Woningdienst Amsterdam	1993

Table 9: Reports retrieved for data analysis.

### Magazines:

Title	Author/Organization	Magazine name	Date published
GWL-terrein autovrij?	Westerpark District (Stadsdeel Westerpark)	Look at Westerpark: one from Westerpark District (Kijk op Westerpark: een van Stadsdeel Westerpark)	June 1992
Straatnamen voor nieuwe wijk	Stadsdeel Westerpark	Kijk op Westerpark: een van Stadsdeel Westerpark	September 1994
Sloop GWL - reinwaterkelders	Stadsdeel Westerpark	Kijk op Westerpark: een van Stadsdeel Westerpark	September 1994
Westerpark bloeit	Stadsdeel Westerpark	Kijk op Westerpark: een van Stadsdeel Westerpark	September 1995
Wat wil het stadsdeel met het milieu?	Stadsdeel Westerpark	Kijk op Westerpark: een van Stadsdeel Westerpark	November 1995
Grand café verrijking van de buurt	Stadsdeel Westerpark	Kijk op Westerpark: een van Stadsdeel Westerpark	December 1995

<b>Title</b>	<b>Author/Organization</b>	<b>Magazine name</b>	<b>Date published</b>
Raadsleden aan het woord	Stadsdeel Westerpark	Kijk op Westerpark: een van Stadsdeel Westerpark	March 1996
Woningmarkt voor huurders	Stadsdeel Westerpark	Kijk op Westerpark: een van Stadsdeel Westerpark	March 1996
Werkgelegenheid	Stadsdeel Westerpark	Kijk op Westerpark: een van Stadsdeel Westerpark	June 1996
Buurtbeheer op GWL-terrein	Stadsdeel Westerpark	Kijk op Westerpark: een van Stadsdeel Westerpark	October 1996
Café restaurant Amsterdam	Stadsdeel Westerpark	Kijk op Westerpark: een van Stadsdeel Westerpark	December 1996
Inschrijving huurwoningen WES en GWL	Stadsdeel Westerpark	Kijk op Westerpark: een van Stadsdeel Westerpark	December 1996
GWL-terrein genomineerd voor stadsvernieuwingsprijs	Stadsdeel Westerpark	Kijk op Westerpark: een van Stadsdeel Westerpark	January 1998
Van tuinstad naar parkstad	Anna Vos	Plan Amsterdam	March 1996
Structuurplan Amsterdam 1996 vastgesteld – Open Stad	Leon de Laat	Plan Amsterdam	May 1997
Duurzaam bouwen in Amsterdam	Roy Berents	Plan Amsterdam	April 1998
Maatwerk met milieu - De integratie van milieuaspecten in de ruimtelijke ordening	Arjen Hof & Martijn Simons	Plan Amsterdam	September 1999

Table 10: Magazines retrieved for data analysis.

#### Manuals:

<b>Document name</b>	<b>Author/Organization</b>	<b>Date published</b>
Overview of GWL-Terrain	Stichting ECO-plan Amsterdam	1997
The Resident's booklet: GWL-Terrain (Het Bewoner's Boekje)	Stichting ECO-plan Amsterdam	1997

Table 11: Manuals retrieved for data analysis.



## Appendix C: Ethics form

 UNIVERSITY OF AMSTERDAM

 UNIVERSITY OF AMSTERDAM

**University of Amsterdam (UvA)**  
**Human Geography, Planning and International Development (GPIO)**  
**Faculty of Social and Behavioural Sciences (AISSR)**

*Research project*

**Title: Using social and cultural values to include avian biodiversity in urban design**


**Student Researcher: Tiffany Khuu**

**Supervisor: Prof. Maria Kaika**

BRIEF DESCRIPTION OF RESEARCH PROJECT

This research explores decisions in incorporating avian biodiversity in the planning process, and whether environmental innovations and designs have a role in improving local biodiversity, using the environmental urban development of GWL Terrain as a case study. A series of interviews will explore the planning process between the residents and the developers/architects/planners, the decisions that led to the eco-design, the decisions that led to the incorporation of the swift nesting boxes on the facades, and the current opinions of the accomplishments of the eco-area and presence of birds in and around the development.

Image13: Page 1/2 of the consent form used for interviews.

 UNIVERSITY OF AMSTERDAM

**CONSENT FORM**

If you are happy to participate in this research project as an interviewee, please read this consent form and sign your agreement to the following:

- 1 I confirm that I have read (or the student has communicated verbally to me) information on the above project and have had the opportunity to ask questions and these were answered satisfactorily.
- 2 I understand that my participation in the study is voluntary .
- 3 I understand that the interview will be audio-recorded (no images) **whilst PRESERVING MY FULL ANONYMITY**. If I object to audio-recording, I shall clearly state this to the researcher who will fully respect my preference.
- 4 I understand that if material (e.g. quotes) is used from my interview for academic publications and non-commercial non-profit publications this will **BE FULLY ANONYMISED and MY IDENTITY WILL BE FULLY PROTECTED**, unless I state otherwise.

I agree to take part in the interview under the conditions stated above.

_____	_____	_____
Name of participant	Date	Signature
_____	_____	_____
Name of person taking consent	Date	Signature
_____	_____	_____

Image 14: Page 2/2 of the consent form used for interviews.

## Appendix D: Semi-Structured Interview Guide

1. How long have you lived at GWL Terrain?
2. Why did you move here?
3. For most of your life, did you live in a city or rural place?
4. How would you describe the character of GWL Terrain?
5. Have you participated in activities within the GWL Terrain neighbourhood?
6. Why did you/ did you not participate in activities?
7. Have you initiated activities with your neighbours or the GWL Terrain community?
  - a. Why did /didn't you want to initiate something?
8. Has there been something (e.g. activity, topic) that someone else has initiated in the community that you liked? That you didn't like?
9. Why did/ didn't you like the initiative?
10. How many birds in this list from De Nationale Tuinvogeltelling do you recognize (within GWL Terrain and elsewhere)? (Image 15).
11. What do birds mean to you?
12. What do you think of the number of different types of birds that are shown on this year's Nationale Tuinvogeltelling results (Image 16 & 17)? Is this what you expected? Did you expect something different, and if so, what?
13. Why did/ didn't you expect something different?
14. Do you want this number of species (biodiversity) to change? If yes, how so?
15. Why do/ do you not want the amount of species to change?
16. Do you notice birds within GWL Terrain, and if so, where?
17. Do you think that space for birds should deliberately be included in urban planning and architecture?
18. Why should/ shouldn't there be this space?
19. This map from the City of Amsterdam shows the nesting places of three bird species that are protected in the city (Image 18). You can see the number of House Sparrow and Swift nests that have been observed at GWL Terrain, compared to the surrounding neighbourhoods. If someone were to ask you to redesign a neighbourhood like GWL Terrain, what features would you want to keep and what would you want to change?

## Appendix E: Urban bird data

**Vogelbescherming NEDERLAND** | **Tuinvogeltelling**

 Boorniveleer Eurasian Nuthatch	 Boorniveleer Short-toed Treedrepper	 Eekster Eurasian Magpie	 Gaai Eurasian Jay	 Groenling European Greenfinch
 Grote bonte specht Woodpecker	 Halsbandparkiet Rose-ringed Parakeet	 Heugenvuis Dunnock	 Houtduif Common Wood Pigeon	 Huisvuis House Sparrow
 Kauw Western Jackdaw	 Koolmees Great Tit	 Koperwiek Redwing	 Kramsvogel Fieldfare	 Merel Common Blackbird
 Pimpelmees Blue tit	 Roodborst European Robin	 Spreeuw Common Starling	 Staartmees Long-tailed Tit	 Stadsduif Common Pigeon/ Rock Dove
 Turkse tortel Eurasian Collared Dove	 Vink Common Chaffinch	 Winterkoning Eurasian Wren	 Zanglijster Song Thrush	 Zwarte kraai Carrion Crow
Vul zelf in	Vul zelf in	Vul zelf in	Vul zelf in	Vul zelf in

Tel gedurende een half uur de vogels in uw tuin of op uw balkon. Kijk voor alle spelregels op [www.tuinvogeltelling.nl](http://www.tuinvogeltelling.nl). Beef daar uw telling door in het weekend van de Nationale Tuinvogeltelling. U kunt ook gebruik maken van de app Tuinvogels. © Vogelbescherming Nederland

Tekeningen © Evert van der Kolk

Image 15: List of common garden birds in The Netherlands. Original chart retrieved from De Nationale Tuinvogeltelling (Vogelbescherming Nederland, 2018b.). The English names of birds superimposed here by Author.

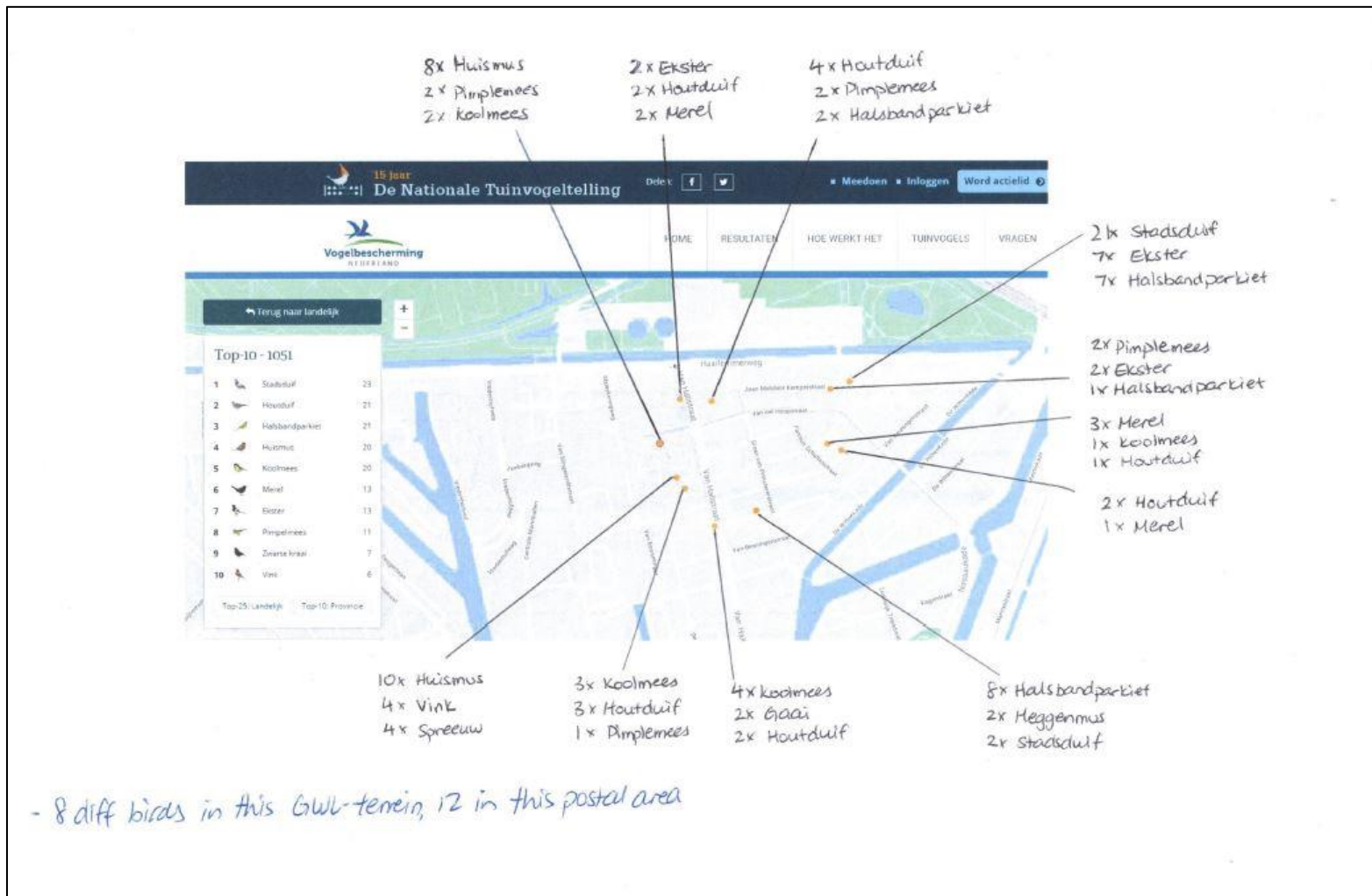


Image 16: Results from the 2018 De Nationale Tuinvogeltelling for postal code area 1051 in Amsterdam, where GWL Terrain is located. Figures and results marked on this sheet are derived from information from De Nationale Tuinvogeltelling website (Vogelbescherming Nederland, 2018a.). Each point was retrieved, with the results compiled in Image 17 below. As details from multiple points could not be retrieved simultaneously on the website, it had to be done individually.

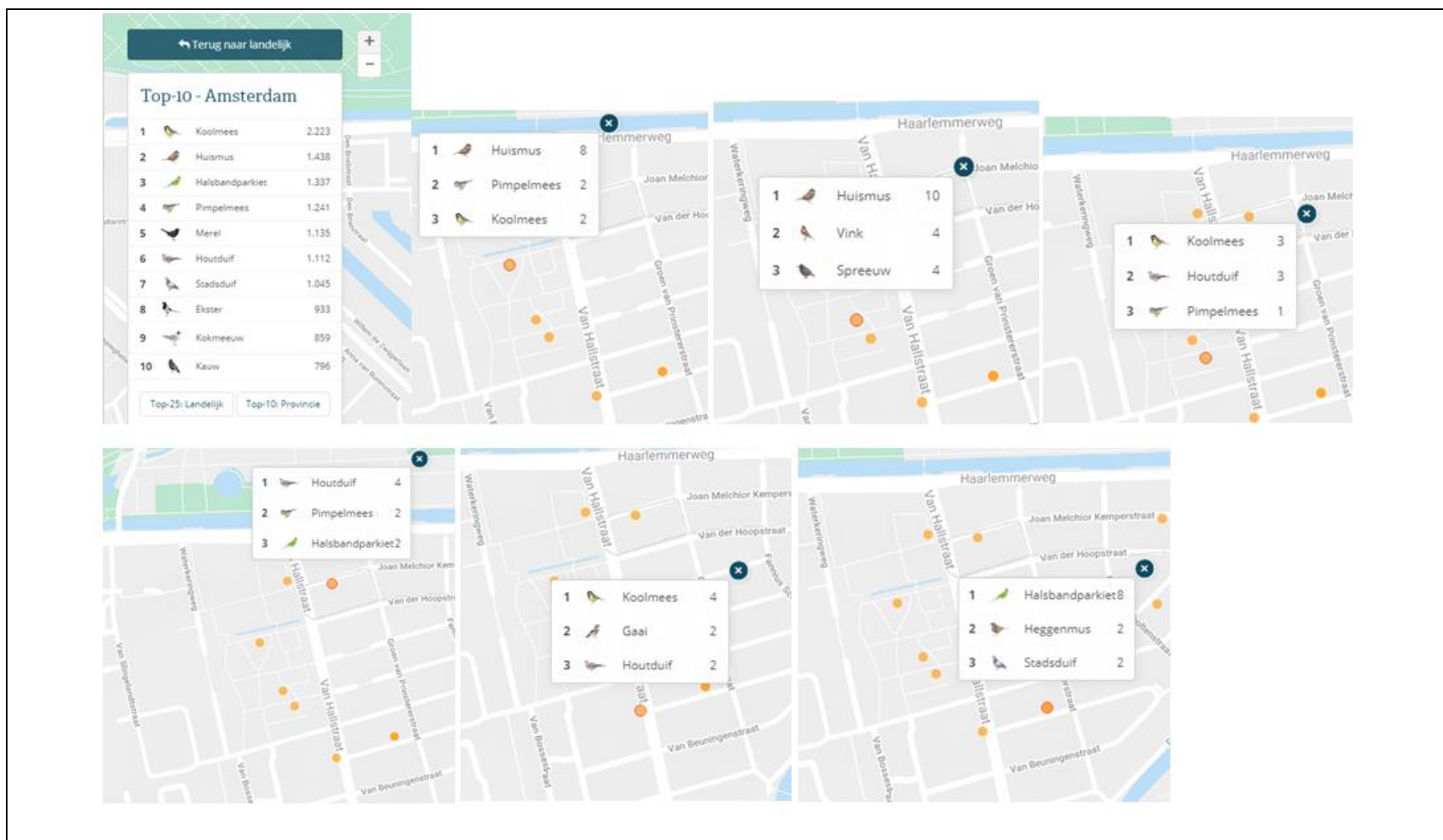


Image 17: Results from the 2018 De Nationale Tuinvogeltelling for postal code area 1051 in Amsterdam, where GWL Terrain is located. Figures and results are retrieved from De Nationale Tuinvogeltelling website (Vogelbescherming Nederland, 2018a.). As details from multiple points could not be retrieved simultaneously on the website, it had to be done individually, then assembled together for comparison on Image 16.





Image 18: Image retrieved from Gemeente Amsterdam (n.d.a.) of observed breeding places for Swifts (“gierzwaluw” in Dutch, *Apus apus*), House Sparrows (“huismus” in Dutch, *Passer domesticus*), and Starlings (“spreeuw” in Dutch, *Sturnus vulgaris*).

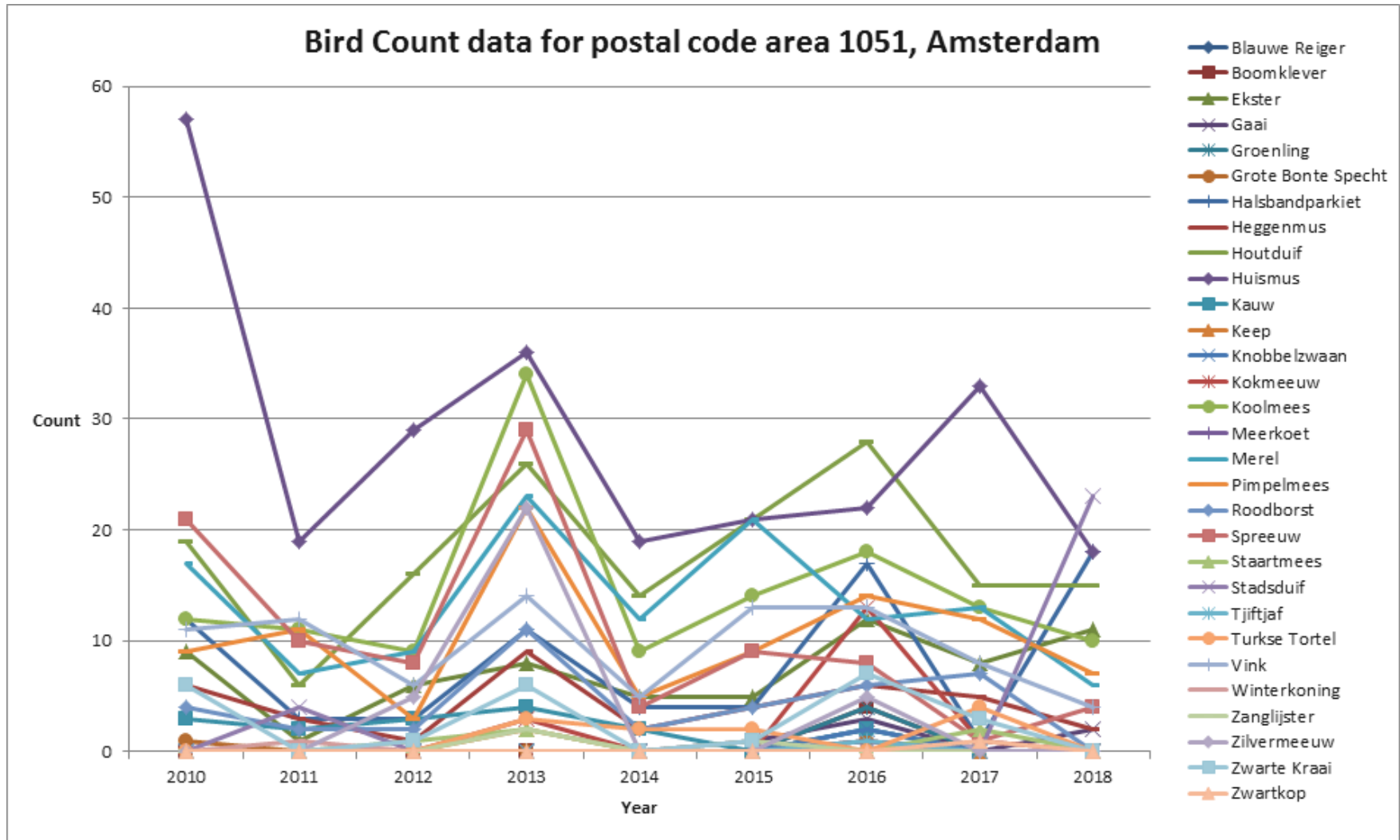


Figure 4: Graphical representation of raw bird count data GWL Terrain’s postal code area 1051, Amsterdam, from years 2010 – 2018 (Sovon Vogelonderzoek Nederland, personal communication, March 24, 2018). This was not used in interviews and is provided only for reference.