

Research

The good, the bad, and the unseen: wild mammal encounters influence wildlife preferences of residents across socio-demographic gradients

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ABSTRACT. As natural habitats decline and wildlife adapts to increasing anthropogenic disturbance, it is crucial to understand human-wildlife relationships in residential areas. However, relevant studies are limited and mostly focused on single cities. To address this knowledge gap, we investigated people's preferences for seeing wild mammals in residential areas by conducting and analyzing an online survey distributed across Germany (n = 2997 participants). Our results revealed that preferred species (squirrels, hedgehogs, hares, roe deer) were frequently encountered, whereas unpreferred species were those encountered frequently (rats, martens), as well as those encountered rarely (wild boar, coypus, raccoons). We also found a moderately positive correlation between the number of encounters with mammals and them being preferred by humans. Finally, some socio-demographic variables, particularly gender, garden access, and urbanity, are significantly related to human preferences. Based on our results, we propose tailoring wildlife management in residential areas to promote the positive attributes of preferred wildlife as biodiversity ambassadors, while also addressing ways to mitigate encounters and negative perceptions associated with unpreferred species.

Key Words: *human-wildlife interactions; mammals in the city; socio-demographic factors; survey; urban areas; urban wildlife*

INTRODUCTION

As human populations living in settlements increase (UN 2018), natural land used by wildlife is being destroyed (Adams 2005). Wild animals increasingly find refuge in urban spaces, and some have even become urban exploiters and dwellers as they thrive in residential areas (Fischer et al. 2015) and sometimes reach higher densities there than in their natural environment (Ives et al. 2016). Arguments have been made that synanthropic species, like foxes (*Vulpes Vulpes*) and rats (*Rattus* spp.), have a right to exist in residential areas because of human encroachment upon their natural habitats (Michelfelder 2003).

The presence of wildlife in human settlements has both negative and positive impacts on residents (Soulsbury and White 2015, Perry et al. 2020). On the one hand, mammals can cause damage, for example, damaging gardens or attics, and fear of injuries (Hadidian 2015). On the other hand, their presence has the potential to improve human-nature relationships (Turner et al. 2004) and benefit human well-being and mental health (Methorst et al. 2020). In densely populated residential areas, humans typically have fewer day-to-day experiences with nature compared to rural areas (Soga and Gaston 2016), leading to a reduced emotional connection with nature and possibly a decline in pro-environmental actions (Miller 2005). Greater engagement with wildlife might therefore encourage people to protect biodiversity (Soga and Gaston 2016). On the other hand, people might exhibit an overly sentimental view of wildlife, often disconnected from the realities of nature and their potential negative impacts, a phenomenon termed the “Bambi syndrome” (Lutts 1992).

An understanding of human perceptions can help manage conflicts (IUCN 2023). “Perception” is an umbrella term including people's preferences (Rupprecht 2017), emotions (Jacobs and Vaske 2019), attitudes (Bjerke et al. 2003), and acceptability of wildlife (Straka et al. 2022). Perception shapes people's understanding of conflicts and their acceptability of management strategies (van Eeden et al. 2020, Basak et al. 2023). For instance, in Scotland, the general public tends

to accept culling of red deer (*Cervus elaphus*) because of the association of red deer with negative ecological impacts (Hare et al. 2021). In contrast, in Portugal, the general public perceives red deer more positively, leading to disapproval of culling (Valente et al. 2020). Animal traits influencing their perception are related to size, predatory tendencies, aesthetics (including texture, e.g., fluffy, sleek), or assumed intelligence (Woods 2000). Perceptions are measured to gain evidence of how people want nature to be managed (e.g., Manfredo et al. 2003). “Preferences” describe a divide between liked and disliked animals (e.g., Rupprecht 2017), and understanding human preferences about wildlife is key to reduce conflicts and enhance human-nature relationships. Preferences can be influenced by people's experiences and socio-demographic backgrounds, and previous studies investigated specific factors like age, gender, experiences, and education. For example, Kellert (1996) showed that younger generations were more in favor of wildlife than older generations, Bjerke and Østdahl (2004) found that women preferred pet-like animals, whereas men favored predators, and Rupprecht (2017) demonstrated that participants with a lower educational degree showed lower willingness to coexist with wildlife. Additionally, living in an urban versus rural setting (e.g., Kimmig et al. 2020) as well as being parents of young children (Murray et al. 2023) were shown to affect wildlife perceptions.

However, previous perception surveys on wildlife in residential areas focused on either a particular taxonomic group, e.g., birds (Clergeau et al. 2001), single species like foxes (Kimmig et al. 2020), species pairs (e.g., Straka et al. 2022), or wildlife management (Lloyd and Miller 2010). Perception studies on multiple wildlife species in residential areas are limited. They mostly depict a small spatial scale and focus on single cities such as Athens (Liordos et al. 2020), Krakow (Basak et al. 2022), or Chicago (Murray et al. 2023). Further, previous studies have a limited socio-demographic scope, for example, studies focused on students (Sweet et al. 2023) or housing developers (Jakoby et al. 2019).

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Besides socio-demographic factors as the driving force behind human perceptions, real-life encounters with wildlife are discussed as an additionally important factor (Soulsbury and White 2019). Jacobs (2009) emphasized the relevance of psychological factors and Jürgens et al. (2022) that perception can be influenced by assumptions about animal ecologies instead of actual biological facts. The impact of encounters or the absence thereof on perceptions toward wild species is multifaceted: although some negative perceptions of certain species can be attributed to adverse experiences (e.g., Arbieu et al. 2019, Ostermann-Miyashita et al. 2023, Soga et al. 2023), others may stem from a lack of familiarity and, possibly, fear of the unknown (e.g., Zhang et al. 2014, Soga et al. 2020). Animals are frequently evaluated favorably or unfavorably based on the characteristics and attributes attributed to them by individuals (Callahan et al. 2021, Andrade et al. 2022). Here, the media plays a pivotal role in shaping perceptions and fears toward wildlife (e.g., Arbieu et al. 2021, Oelke et al. 2022). Other sources explain that exposure to wildlife during childhood tends to increase tolerance toward encountering wildlife later in life (Hosaka et al. 2017). Although the effects of human-wildlife encounters are investigated within wildlife tourism (e.g., Curtin 2009, Dell'Eva et al. 2020) or management preferences (e.g., Loyd and Miller 2010, Díaz et al. 2020), relevant studies within residential settings are rare. Bell et al. (2018) looked at the well-being of people encountering wildlife and Basak et al. (2022) at differences between 2010 and 2020 in the number of encountered species, but these and other studies that we are aware of did not investigate the important question of how previous wildlife encounters with a species in residential areas affect its human perception.

To address these knowledge gaps, we conducted a broad survey of human wildlife perception in residential areas across Germany. We not only investigated how socio-demographic background is related to human wildlife perception, but also if previous encounters and experiences with wildlife shaped people's preferences to see them in a residential setting. Specifically, we asked: (1) Which wild mammals are preferred versus not preferred in residential areas? (2) Which wild mammals are frequently encountered in residential areas? (3) Do previous encounters shape human preferences? Finally, (4) which socio-demographic variables shape human preferences of wild mammals? Our results can support wildlife management by helping to identify drivers of wildlife preferences in residential areas and the relevance of actual encounters. With the latter, we can categorize negatively perceived mammals into encountered and unencountered groups.

We therefore hypothesize that wildlife encounters or lack thereof shape wildlife preferences (H1), predicting that positive perceptions and previous encounters are linked. Further, we hypothesize that socio-demographics also influence preferences of urban wild mammals (H2). Aligned with previous research, we predict here that gender (women) and urbanity positively influence human preferences towards wild mammals.

MATERIALS AND METHODS

Mammal species in residential areas

We focused on 12 species of mammals (Fig. 1) that are common in residential areas (Sukopp 1990) and are among the most familiar in Germany (Sweet et al. 2023): European beaver (*Castor fiber*), red squirrel (*Sciurus vulgaris*), European hare (*Lepus*

europaeus), red fox (*Vulpes vulpes*), European hedgehog (*Erinaceus europaeus*), stone marten (*Martes foina*), coypu (*Myocastor coypus*), brown or common rat (*Rattus norvegicus*), roe deer (*Capreolus capreolus*), raccoon (*Procyon lotor*), European rabbit (*Oryctolagus cuniculus*), and wild boar (*Sus scrofa*).

Martens, hedgehogs, and foxes are carnivores, beavers, roe deer, hares, and rabbits herbivores, and the other five species omnivores (Ineichen et al. 2012). Squirrels and hedgehogs are the smallest mammals in our survey (15–20 cm height, 200–400 g weight), and wild boars and roe deer are the biggest with 120–140 cm height and 140–200 kg weight (Ineichen et al. 2012). Roe deer, squirrels, rabbits, and hares are protagonists in Walt Disney's "Bambi" (1942), and the "Bambi syndrome" (Lutts 1992) is suggested to shape a positive image. The marten is the villain in Walt Disney's "Perri" (1957) and in Europe is often connected to damage to cars (Herr et al. 2009). A newer film, DreamWorks Animation's "Over the Hedge" (2006) portrayed squirrels, hedgehogs, and raccoons as protagonists. Although raccoons and coypus are, in contrast to the other 10 species, invasive in Germany and originate from the Americas (Jeschke et al. 2022), Eurasian beavers have been reintroduced across Germany after having almost become extinct in the 19th century; they can now be found in high numbers in Germany again, also increasingly in cities (Zahner et al. 2021).

Survey structure

We built a web-based survey to target participants all over Germany. The online tool SoSci Survey (<https://www.sosicisurvey.de/>) was used to create a survey that was online for 100 consecutive days from 24 August until 7 December 2020 and was only available in German. The link for the survey was spread through mailing lists (university, NGOs, and allotment garden communities, etc.), social media such as Instagram, Twitter, Facebook (here especially regional groups, e.g., *Netzwerk Hamburg* or *Schwarzes Brett München*), and printed flyers with QR codes. The questionnaire (Appendix I) included 36 questions in four parts: (A) Preferences for wild mammals in residential areas (3 questions, e.g., the question, "Which wild mammals would you like to see in your surroundings?"), (B) Occurrence and encounters with wild mammals in residential areas (9 questions, 2 filter questions), (C) Habitat for wildlife (12 questions), and (D) Socio-demographic background (12 questions). Questions were a mixture of open-ended questions, multiple choice, and single answers.

We calculated a preference score from the answers of the open-ended questions "Which wild mammals would you like to see in your surroundings?" and "Which wild mammals would you not like to see in your surroundings?" These questions were inspired by Rupprecht (2017), and survey participants were asked to list up to five wild mammals that they would like, or not like, to see in their surroundings. These questions were asked before the survey participants saw the list of 12 focal mammals (Fig. 1), hence they were not prompted to list these species. Answers to these open-ended questions were cleaned (e.g., separating species and reasons, correcting spelling mistakes) in order to use the R-search function (search terms in Table A2.1). Only free roaming wild (excluding domestic) mammal species in Germany were counted as valid answers, e.g., omitting elephants, butterflies, and dogs. We followed Rupprecht's (2017) preference scoring: preferred/liked animals were coded as 1, and unpreferred/disliked animals were coded as -1. We assigned a value of 0 as neutral if

Fig. 1. The 12 selected mammals in German cities used in the survey questionnaire. These photos shown here were included in the survey and selected to be as neutral as possible. Source: All pictures from Wikimedia Commons: beaver (Klaudiusz Muchowski), red squirrel (Peter Trimming), European hare (Holger001), red fox (Donald Hampton), Hedgehog (Michael Gäbler), stone marten (Jerzysztzelecki), coypu (Gzen92), rat (Zeynel Cebeci), European roe deer (Dornenwolf), raccoon (Korall), European rabbit (JJ Harrison), and wild boar (Esme Ilgin Ucar).



a participant did not list mammals included for the preference-models in the like or dislike question. We only ran preference-models for mammals listed by more than 20% of participants.

Afterward, participants were presented with Fig. 1 and asked if they had encountered these mammals before (“Have you seen some of these mammals in your surroundings?”), which was subsequently used as the “encounter” variable. We provided the participants with the choice of up to 10 options to select where they saw a species in their neighborhood (“in the house,” “in the garden,” “in the courtyard,” “on the street,” “in a park,” “in or at a water body,” “in an urban forest,” “on a playground,” and “in a cemetery”), with the alternative answer “not seen before.” We sorted each participant’s answer for each of our 12 mammals into either encountered before (“yes”) or not encountered before (“no”). In the last section of the survey, we asked for the socio-demographic background: (1) gender, (2) age, (3) education, (4) urbanity, and if participants had (5) children, (6) a garden, (7) a car, and (8) pets (Table 1).

Statistical analyses

All statistical analyses were performed using R v4.2.2 (“Innocent and Trusting”; R Core Team 2022). We calculated Pearson’s moment correlation (Pearson 1992, Freedman et al. 2007) of the Preference-Score and the percentage of encounters with the 12 focused mammals to investigate the connection of actual encounters and imagined preferences. Additionally, we ran models on the preference-score testing the influence of our eight predictor variables (Table 1) as well as encounter. Because values for the preference-score were categorical (like/neutral/dislike), we used cumulative link models (clm) within the “ordinal” package (Christensen 2015, 2023). We tested all predictor variables (Table 1) for multicollinearity with the variance inflation factor (vif; Thompson et al. 2017), using the R-package “car” (Fox and Weisberg 2019). Following O’Brien (2007), variables with a vif-factor < 3 can be included in the same models. Our variables all showed a vif factor < 2, suggesting that there is no

multicollinearity (Table A2.2). For statistical significance tests, a threshold p-value of 0.05 was used. Model fit was assessed according to conditional Hessian values, where models with values above 10e6 were deemed ill-defined models (Christensen 2015). For our analysis, we ran a total of 10 models: one model per mammal species listed by more than 20% of participants in questions 2 and 3. We depicted the results of the models with Dot-and-Whisker-Plots with the R-package “dotwhisker” (Solt and Hu 2015). For visualization, we used mammal silhouettes from the R-package “phylopic” (Geartly et al. 2023).

RESULTS

Sample population

Of the 4294 survey participants, we included the 2997 participants that completed the survey including the last question. More women than men participated in the survey (women 76%, men 24%; Fig. 2). The average age was 46 years (men 47, women 46), and the level of education was divided into 54% without and 46% with an academic degree. Almost all survey participants (99%) were born in Germany. Most participants lived in urban areas (61%) opposed to 21% in periurban and 19% in rural areas. Additionally, most participants had no children (78%), but a pet (70%), a garden (73%), and a car (77%). For pets, 39% answered that they had dogs, 33% cats, 12% rabbits or guinea pigs, 10% chickens, and 9% horses. Social media, and especially Facebook, were the main means through which to spread the survey (79%), followed by friends (7%), conservation associations (3%), university (3%), allotment gardens (2%), flyer (2%), and other (2%; Fig. A2.1). Most participants (20%) have resided in their current residence for 5 years or less (Fig. A2.2).

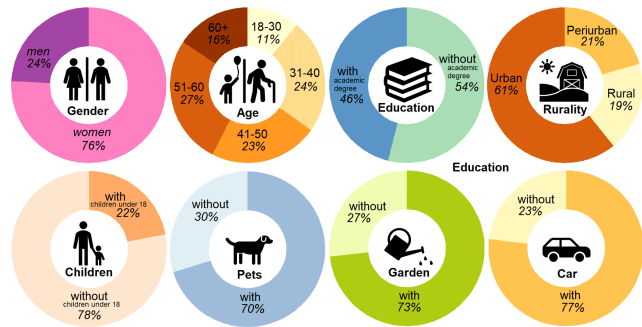
Preferences

Answers to the open-ended question addressing mammal preference showed that squirrels are the most liked and wild boars the most disliked species (Fig. 3). Alongside our 12 focal mammals (Fig. 1), some participants also listed other mammals (e.g., wolves,

Table 1. Socio-demographic predictor variables (symbols from Microsoft Word Pictograms) as used in the statistical models. Response variables were Preference-Scores.

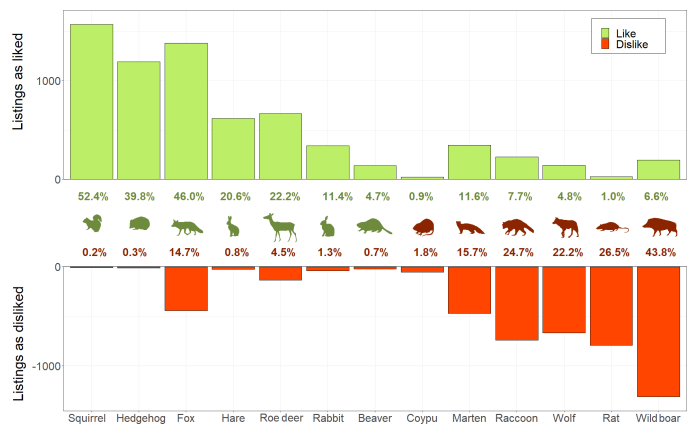
Variable	Description	Base level in models
Gender	Relied on a single selection question (men, women, diverse). According to the number of participants only men and women were included in the models.	Women
Age	Relied on a drop-down selection of the participants' birth year between 1921 and 2002.	Younger age
Education	Relied on a single selection question of 10 categories adapted from Schneider (2016) and sorted into two levels: without academic background (still in school, not graduated from school, elementary school diploma, Hauptschule diploma, Realschule diploma, Fachhochschule diploma, high school diploma/Abitur, completed apprenticeship) and with academic background (Bachelor's degree, Master's degree, Doctoral degree).	Without academic background
Urbanity	Relied on the participant's postal codes. Urbanity was attributed to a rurality index by the German Thünen Institute Landatlas (https://karten.landatlas.de/) using population, land use, accessibility among others for their index calculations). Per postal code the urbanity was calculated via a GIS-intersection. The index lies between -6 and 2, where 0 is the average urbanity of the calculated regions resulting in values greater than zero more urban and values smaller than zero are less urban (= rural).	Rural
Children (under 18 years)	Relied on a multiple-choice question, where participants were asked if they had children below 4, children between 4 and 10, children between 11 and 18, children above 18, or no children. For the models, two groups, those with children below the age 18 and those with no children below the age of 18, were created.	No children under 18
Garden	Relied on a single selection question, where participants were asked if they had access to a garden at their home, to an allotment garden in another area, or no garden access. For the models, two groups, those with garden access and those without, were created.	No garden
Pet	Relied on a multiple-choice question, where participants indicated if they had dogs, cats, horses, guinea pigs, rabbits, chickens, or other pets. For the models, two groups, people with vs without pets, were created.	No pet
Car	Relied on a single-selection question, asking participants if they own a car (yes/no).	No car

Fig. 2. Overview of socio-demographic backgrounds of survey participants (gender, age, education, urbanity; children under 18, garden, car, pets)



bears, bats) where we also included wolves because of their high number of listings ($n = 810$). A majority of respondents expressed liking squirrels ($n = 1569$, 52.4%), hedgehogs ($n = 1192$, 39.8%), deer ($n = 666$, 22.2%), and hares ($n = 618$, 20.6%) while only a minority mentioned disliking these species, with 6 (0.2%), 10 (0.3%), 134 (4.5%), and 25 (0.8%) respondents, respectively. In contrast, a significant majority of respondents expressed dislike toward wild boar ($n = 1313$, 43.8%), rats ($n = 794$, 26.5%), raccoons ($n = 741$, 24.7%), wolves ($n = 665$, 22.2%), and martens ($n = 471$, 15.7%), while only a minority indicated liking these species, with 198 (6.6%), 29 (1.0%), 230 (7.7%), 145 (4.8%), and 349 (11.6%) respondents, respectively. Despite high popularity ($n = 1380$, 46.0%), foxes were also disliked by many respondents ($n = 442$, 14.7%). For each mammal, we calculated a preference-score of the difference of listings as liked and disliked (Table A2.2). Squirrels obtained the highest score (score = 1563), followed by hedgehogs (1182) and foxes (938). Wild boars (-1115), rats (-765), wolves (-520), and raccoons (-511) exhibited the lowest scores, all of which were negative.

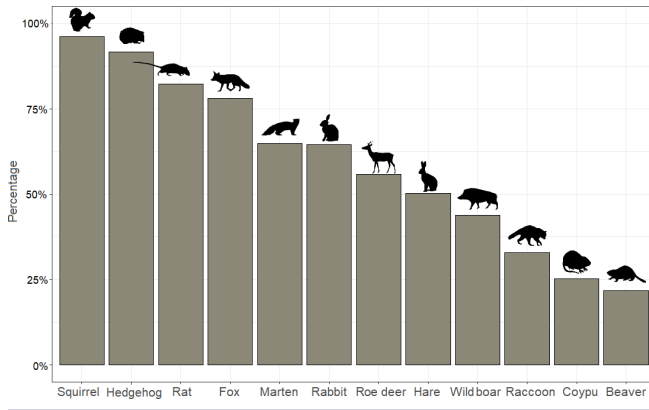
Fig. 3. Human preferences for wild mammals in residential areas in Germany. Green bars show total amount of mammal listed as liked, red bars show total number of mammals listed as disliked. Mammal silhouettes in dark green showed a greater number of like than dislike mentions, dark red silhouettes showed a greater number of mentions as disliked than liked. Order according to overall preference score (difference between the number of listings as liked and disliked for each species). See Figure 1 for species scientific names.



Encountered mammals

Squirrels ($n = 2883$; 96%) were the most encountered mammal (Fig. 4), followed by hedgehogs ($n = 2776$; 93%), rats ($n = 2546$, 85%), foxes ($n = 2.412$; 80%), martens ($n = 2126$; 71%), rabbits ($n = 1.980$, 66%), roe deer ($n = 1708$, 57%), and hare ($n = 1.596$, 53%). Wild boar ($n = 1470$, 49%) and raccoon ($n = 1146$, 38%) were encountered by less than half of the participants, and coypu ($n = 813$, 27%) and beavers ($n = 711$, 23%) by less than a third (Fig. 4). Most mammals

Fig. 4. Percentage of survey participants having encountered the mammal previously in their residential surroundings. See Figure 1 for species scientific names.



were encountered on streets (average: 25%), followed by gardens (19%), parks (19%), and urban forests (19%). Wildlife in houses were spotted least (3%), with rats and martens most present (Fig. A2.3).

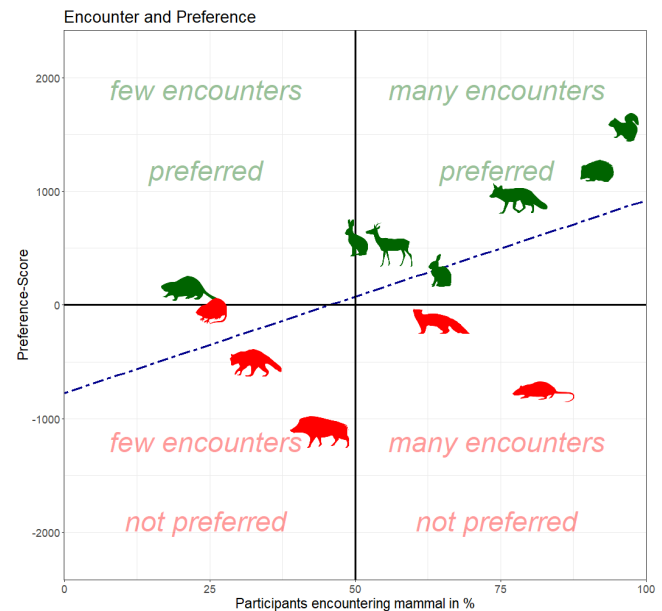
PREFERENCES AND ENCOUNTERS

The percentage of encounters and preference for a mammal species were moderately positively correlated (Pearson correlation coefficient = 0.54, $p = 0.07$). Thus, frequently encountered mammals tended to be preferred by participants. While squirrels, hedgehogs, foxes, hare, and rabbits are encountered and preferred by many people, wild boars, raccoons, and coypus are rarely encountered and disliked by people (Fig. 5). Thus, 6 of the 12 mammals are encountered often and preferred. On the other hand, rats and martens are frequently encountered by people but still disliked, while beavers are rarely encountered and preferred by people.

ENCOUNTERS, PREFERENCES, AND SOCIO-DEMOGRAPHICS

The preference models (Fig. 4, Table A2.4) showed that for all of the 10 mammals, at least one socio-demographic predictor variable showed significant results. In terms of gender, we found that women significantly preferred squirrels, hedgehogs, and foxes (which are already highly liked) in contrast to men. Similarly, wolves and raccoons (which are already highly disliked) were disliked significantly more by men than women. Age had significant effects, too, as younger participants did not want to see martens. Our models also show that participants from rural areas liked roe deer significantly more than participants from urban areas, while those from urban areas significantly liked squirrels and foxes more. Rats were significantly disliked more by urban participants compared to rural participants. Regarding education, participants with an academic background significantly disliked wolves and raccoons more than those without academic degrees but liked hedgehogs significantly more. The variable of participants who were currently taking care of young children did show significant influences for a preference to see deer. The variable of having young children did show significant influences for a preference to see deer. Participants without pets significantly liked squirrels more than pet owners,

Fig. 5. Relationship between the percentage of participants encountering one of the 12 focal mammal species and the preference score for this species. X-Axis shows the Preference-Score from below 0 as not preferred and above 0 as preferred. Y-Axis shows the percentage of encounters (from below 50% as few encounters and above 50% as many encounters). Dashed line shows regression line.



but listed rats, foxes, and martens significantly more often as disliked. Participants with a garden liked hedgehogs significantly more than non-garden owners, but they significantly disliked martens, rats, and raccoons. Non-garden owners significantly disliked wolves compared to participants with gardens. Car owners significantly disliked martens and wild boar. Finally, in relation to the eight socioeconomic variables examined, encounters with wildlife significantly influenced preferences for all preference models (wolf being the exception as the variable was not accessed in the survey): Participants who had encounters with squirrels, hedgehogs, foxes, hares, and deer expressed significantly higher preferences for these animals compared to those who did not encounter them. Conversely, participants who encountered rats and raccoons exhibited significantly lower preferences for them compared to those who did not encounter them. Similarly, the lack of encounters with martens and wild boars resulted in significantly lower preferences among participants compared to those who did encounter them.

DISCUSSION

Through our survey conducted in German residential areas, our primary objective was to examine the intricate interplay among socio-demographic factors, wildlife encounters, and preferences. Our findings mostly supported our two hypotheses (H1-H2), with minor elaborations. First, our results showed that preferred species (squirrels, hedgehogs, hares, roe deer) were encountered often, whereas unpreferred species were either often (rats, martens) or rarely (wild boars, coypus, raccoons) encountered.

Second, women generally preferred wildlife, and while in rural settings, roe deer were the preferred species, in urban settings it was squirrels and foxes. Additionally, wildlife was also preferred by people with garden access.

The “good” wildlife in residential areas

Our results of preferred mammals, namely squirrels, hedgehogs, hares, rabbits, and roe deer align with studies from other countries (Liordos et al. 2020, Basak et al. 2022). One indicator for the popularity of squirrels might be that there are about 200 wildlife rescue centers across Germany for just squirrels (www.eichhörnchen-in-not.de), around 80 for hedgehogs (www.pro-igel.de), but no specific centers for our other 10 focal mammal species. The high preference for squirrels, hedgehogs, hares, rabbits, and roe deer underlines the Bambi syndrome hypothesis (Lutts 1992). This notion is further reinforced by the frequent portrayal of these mammals, characterizing them as “cute,” on children’s clothing (Hooykaas et al. 2022), and their prominent roles as heroes in children’s books (Hara and Koda 2020) and movies, such as “Bambi” (1942) and “Zootopia” (2016). Further, squirrels are used as symbols for conservation efforts (Rotherham and Boardman 2006), hedgehogs are connected to well-being through gardening (Hobbs and White 2016), and rabbits and hares are symbols of spring and Easter (Lauritsen et al. 2018). Although foxes play a secondary role in Basak et al.’s (2022) survey, in our results foxes showed the second highest number of listings as preferred animal, but also a number of listings as unpreferred animal. Controversial beliefs around foxes prevail in Germany: Although Germany is considered free of terrestrial rabies (Müller et al. 2012), they are still connected to this disease (Kimmig et al. 2020). Similarly, although foxes are liked because of their aesthetic appearance (König 2008) and their intelligence as featured in folk tales (Uther 2006), they are also connected to pet predation (Peerenboom et al. 2020) and fear (König 2008). Generally, however, foxes are considered as “good” mammals by human residents, and therefore can be symbolic ambassadors for greening and restoration in residential areas. Our results indicate that the same applies for beavers for urban waters. Such ambassadors are essential for effective public outreach (Wilkinson 2023).

The “bad” wildlife in residential areas

Our results of unpreferred mammals mirror studies from other countries (e.g. Basak et al. 2022, Murray et al. 2023), with wild boar, rats, raccoons, martens, and coypus as the least liked ones. Wild boars were the most disliked mammals and pose danger because of their size, weight, strength, and tusks (Conejero et al. 2019). Rats are associated with dirt and garbage (Byers et al. 2019), bad neighborhoods (German and Latkin 2016), as well as disease, also still including the Black Death plague (Jedwab et al. 2019). Raccoons are disliked despite their charisma (Jarić et al. 2020) and being movie heroes (e.g., Marvel’s Guardians of the Galaxy, 2014), probably because of the damage they cause for native fauna and private properties (Nehring 2018). Martens are known as pet predators (Lanszki 2003) and connected to damage of cars (Lachat 1991), even though evidence shows that not every car visited by martens is impacted (Herr et al. 2009). Coypus, also known as water rats (Manno 2017), reflect the pest image of rats and are connected to dike damage (Gethöffe and Siebert 2020) and negative impacts on native ecosystems (Prigioni et al. 2005).

We trace back the listings of wolves, even though they are known to avoid residential areas (Bateman and Fleming 2012), to the generally negative portrayal of this species in the media (Arbieu et al. 2019) and the stereotype of the “big bad wolf” (Jürgens and Hackett 2017). Thus, mammals perceived as “bad” (wild boar, rats, raccoon, marten, coypu) partly have actual negative impacts, but their image also suffers from stereotypes. Although for some species a better public image highlighting the scarcity of possible negative encounters is needed, e.g., for wolves (Arbieu et al. 2019, 2021) and wild boar (Goulding and Roper 2002, Oelke et al. 2022), for others, targeted measures could prevent undesirable encounters, which could lead to negative perceptions, e.g., those that deter raccoons and martens from properties (Lopez 2002, Kistler et al. 2013). Accordingly, we encourage the use of public outreach as a component of management action in order to reduce human-wildlife conflicts in urban areas going forward.

The “unseen” wildlife in residential areas

The “unseen” mammals are beavers, coypus, wild boar, and raccoons. The beaver is the only animal in our survey that is rarely encountered but preferred, as all other preferred mammals are encountered frequently. This suggests that real-life encounters are important for people to prefer particular species. Our results are in line with Soulsbury and White’s (2019) theory of human-wildlife encounters being an influential factor of an animal’s perception.

The low number of beaver encounters might be due to their primarily nocturnal activity and their still relatively low abundance in densely settled areas in Germany (Zahner et al. 2021). Hence, a beaver sighting is a rare event even leveraged for tourism purposes (Auster et al. 2020). Although beavers are mostly seen as nuisance by German land managers (Hohm et al. 2022), people like to see them in residential areas. Negative effects of beaver-related flooding might be smaller for residents in densely populated settlements than for farmers, so beaver acceptance is higher where their presence and damage are less visible (Siemer et al. 2013). Hence, the positive image of beavers in urban areas might help to prevent a general perception as nuisance.

Wild boars, raccoons, and coypus are disliked but rarely encountered. This result does not correspond with Conejero et al.’s study (2019) where encounters with wild boars related to negative human perception. Wild boars have been highlighted as dangerous in literature and films (Mathews and Kendall 2023). And for Germany, particularly within urban settings, wild boars have garnered substantial media coverage in recent decades, even outside of the country (e.g., Gray 2020, Oltermann 2023) and were connected with the spread of African swine fever (Frant et al. 2021). Consequently, although remaining largely invisible in the physical landscape, wild boars are prominent in the media notably in a negative context.

Similarly, there has been a notable surge in German newspaper articles about non-native raccoons over the past decade, predominantly depicting them in a negative context because of the damage they cause to native species and private properties (Moesch et al. 2024). Listing unseen mammals as disliked species might also suggest a lack of preparedness in the event of actual encounters (e.g., fear of wild boars and uncertainty about how to

behave when encountering them). Increased knowledge about these species and appropriate behavior in the case of encounters could potentially reduce negative perceptions. We conclude that more studies are needed to understand the negative perceptions of those unseen and unpreferred mammals (wild boar, raccoon, coypu) and where possible, to create adequate management plans to reduce negative impacts.

Socio-demographic factors

An important part of wildlife management is managing people (Davies et al. 2004). With the insights from our models, we concluded that encounters play a crucial role for wildlife perception. Given the significant results observed with socioeconomic variables outside of wildlife encounters, we can single out socioeconomic demographics where public outreach is needed. We found gender, garden access, and urbanity to be the most significant factors determining wildlife preference; we therefore need to specifically address those groups.

In terms of gender, women's preferences for a greater number of mammals mirror other studies (e.g., Bjerke et al. 1998, Bjerke and Østdahl 2004) and underline that women give more rights to and are more interested in wildlife (Herzog 2007). Deruiter (2002) speaks of a feminine quality of nurturing connected to a greater compassion between women and other creatures, as evidenced by higher rates of vegetarianism among women (Dowsett et al. 2018). This leaves us with the conclusion that we need to move away from wildlife being a "feminine" topic (Donovan 2008) and to also target men when it comes to public outreach.

In terms of garden access, although raccoons, martens, and rats are seen as nuisances because of garden damage (Peerenboom et al. 2020), preferred hedgehogs are connected to well-being through gardening (Hobbs and White 2016). Their reliance on biodiverse green spaces (Hof and Bright 2009) and the connectivity of gardens (Gazzard et al. 2021), means that by using hedgehogs as ambassadors for wildlife-inclusive gardening, we can help other species as well (Dowding et al. 2010). Access to gardens is inherently linked to encountering wildlife, given that gardens serve as both a location where humans frequently encounter wildlife (Fig A2.3) and a habitat utilized by wildlife itself (Gaston et al. 2007, Van Helden et al. 2020). The interplay between encounters and gardens becomes crucial because this is where conflicts might arise (Peterson et al. 2010) as human interests, such as growing vegetables, might clash with wildlife choosing gardens as habitats or foraging on vegetables (Curtin and Fox 2014).

For a rural-urban comparison, the preference of urban participants for foxes mirrors the results of Kimmig et al. (2020), and those for squirrels the results of Sweet et al. (2023). The preference for roe deer by rural participants might be connected to a sense of guilt over high deer mortality by cars (e.g., Seidel et al. 2018) and fawn mortality by mowing machines in agricultural areas (Wimmer et al. 2013). Rats could be significantly disliked in urban areas because of their image as pests and disease vectors especially in cities (Byers et al. 2019). Our findings support the idea that urban foxes hold potential as effective ambassadors for urban wildlife (Clark 2011) and can serve as umbrella species, fostering the creation of more "wild" green spaces that also benefit other species.

Pathways for applying our findings to enhance urban wildlife management

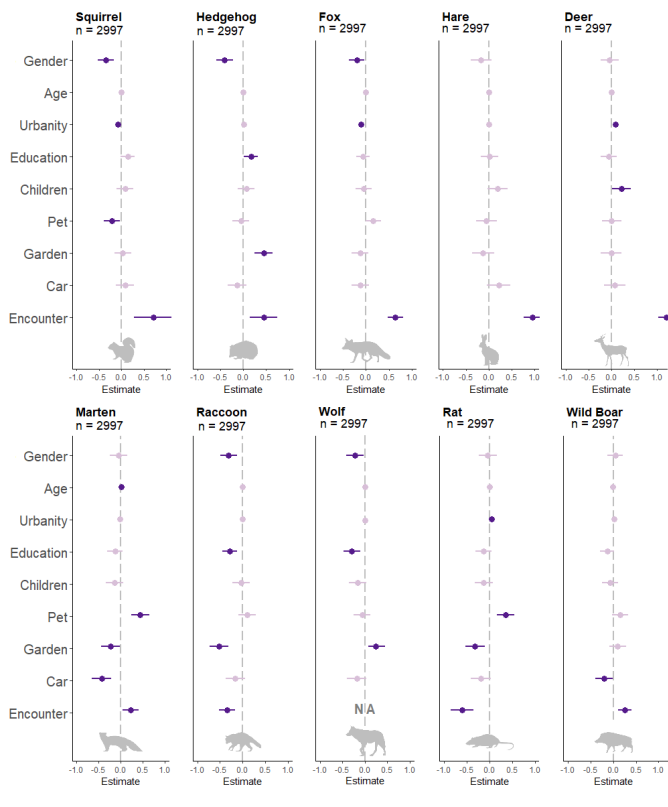
Using the insights garnered from our research, wildlife management can be customized to tackle animals that are perceived positively or negatively. In consideration of the "pigeon paradox" (Dunn et al. 2006), which underscores the significance of people engaging with nature in urban settings for motivating future conservation, we see that our findings could be used to increase positive encounters with wildlife.

Species perceived as "good" could serve as ambassadors for conservation efforts. Similar to flagship species utilized for conservation in natural habitats (Smith and Sutton 2008), which depend on high visibility and charismatic appeal (Jarić et al. 2024), urban areas can utilize frequently encountered and publicly favored species to educate the public about animals and their conservation needs (Sexton et al. 2015, Soanes et al. 2023). Examples include beaver tours in Scotland (Auster et al. 2020) and a bat festival in Austin, Texas (Dearborn and Kark 2010). Ultimately, these species could facilitate the promotion of wildlife-inclusive designs (e.g., Apfelbeck et al. 2020, Hauck et al. 2021) and wildlife-friendly gardening (e.g., Gazzard et al. 2021, Fardell et al. 2022).

The findings concerning animals encountered and perceived as "bad" underscore the necessity for implementing measures to mitigate conflicts. Alongside efforts to reduce negative stigma, such as the portrayal of martens as "car marten" (Herr et al. 2009), there is a pressing need for implementing measures to reduce negative encounters (Treves et al. 2009). Examples are the deterrence of martens from properties (Kistler et al. 2013) or the implementation of vehicular fortifications (Langwieder et al. 2000). Moreover, if deemed necessary, akin to the case of red deer in Scotland (Hare et al. 2021), lethal management might find greater public acceptance, particularly in instances of high encounter rates and negative perceptions, as already witnessed in the management of rats perceived as pests (Murray and Sánchez 2021). Nonetheless, it is crucial to address the root causes of problems and seek sustainable approaches rather than relying solely on lethal control (Lee et al. 2022). For instance, learning about rats might lead to a neutral acceptance of their presence (Aivelo and Huovelin 2020).

Regarding the "unseen" species, which are rarely encountered but largely disliked, socio-demographic factors such as education also influence perceptions alongside the scarcity of encounters (Fig. 6). Because newspaper consumers often tend to have higher levels of education (Elvestad and Blekesaune 2008, Artero et al. 2020), media portrayal plays crucial roles in shaping perceptions, particularly for non-native species like raccoons (Moesch et al. 2024) and returned or reintroduced species like wolves (Arbieu et al. 2019, 2021). Media often sensationalize wildlife narratives to enhance sales, with conflict-driven stories gaining attraction (Goulding and Roper 2002, Houston et al. 2010). Consequently, we advocate for a more balanced and fact-based portrayal of reintroduced, native, and non-native wild species in the media, focusing on their impacts without resorting to emotional language or perpetuating stereotypes. Nevertheless, the negative perception is not necessarily unfounded, as these unseen species may indeed pose negative impacts (Jernelöv 2017, Colomer et al. 2021). As with frequently encountered, unpreferred wildlife, it is equally

Fig. 6. Results of preference models: Influences of socio-demographic variables on the preference score to see wildlife in residential areas. Plotted are the model outcomes with the socio-demographic variables (gender, age, urbanity, education, children, pet, garden, and car) and encounter at base level (women, younger age, without academic background, rural, no children under 18, no garden, no pet, no car, no encounter) on the y-axis and the estimate of a mammal's preference (negative: unpreferred, positive: preferred) by the socio-demographic factors on the x-axis. Significant results ($p < 0.05$) shown in dark purple. See Figure 1 for species scientific names.



crucial to minimize negative interactions with those that are encountered rarely. Examples are to give guidance on how to prevent negative consequences, e.g., creating raccoon-proof trash cans (Rosatte 2000), building fences as wild boar barriers (Laguna et al. 2022), and the incorporation of wildlife within urban design and planning (Treves et al. 2009; Kay et al. 2022), e.g., reducing the attractiveness of urban corridors for wild boar movement into residential areas (Castillo-Contreras et al. 2018).

Limitations and future research

Because online surveys might attract only specific demographics (Bethlehem 2010, Andrade 2020), it is imperative to consider the potential influence of our dissemination strategy. However, the verification that our dissemination strategy did not influence outcomes in our analysis is supported by our sample, which only shows a marginal impact from distribution channels such as universities, NGOs, and allotment garden communities (2–3%, Fig. A2.1), with the largest number of respondents (79%) accessing our

survey via diverse social media platforms. Further, our study operated under the presumption that humans can identify species, despite potential similarities, e.g., hares and rabbits (Langley 2014), or beavers and coypus (Viviano et al. 2023). The absence of a specific time frame or frequency of encounters with wildlife in our survey data limits our ability to assess the effect of multiple versus single encounters. Regarding our analysis, assuming a neutral perception for species not listed as preferred or unpreferred may oversimplify perceptions. Additionally, the noticeable imbalance in male and female participants might obscure the true sentiments of men toward wildlife. This is not an isolated occurrence, as other studies examining perception of animals also indicate a higher level of women participation (Herzog 2007). Furthermore, it is important to note that our survey focused on wild mammals and excluded domesticated pets. This leaves out species that do not neatly fit into either category, such as stray cats and dogs which act wild, but have different origins within human society (Rodríguez-Rodríguez et al. 2022, Göttert and Perry 2023). Although not a major concern in Germany, stray and feral animals cause conflicts in other cities (e.g., Parsons et al. 2018, Coronel-Arellano et al. 2021). These limitations should be considered when interpreting the results and suggested avenues for future research.

CONCLUSIONS

Although there appears to be an initial contradiction, our viewpoint aligns with the perspectives of Soulsbury and White (2019) as well as Jürgens et al. (2022): The formation of favorable perceptions for our preferred mammals is primarily influenced by real, physical encounters, while less favored species tend to be associated with negative perceptions stemming from a combination of real negative impacts and adverse public portrayals. Particularly in the case of disliked wild boars and raccoons, we need to provide people with precise instructions on how to act during real encounters, and to reduce the damage they cause with proactive management plans.

Encountering wildlife in residential areas will most likely increase in the future, with urban sprawl from growing cities encroaching upon natural habitats. Therefore, we need to shape our lives together with wildlife: Enhance greenspaces in residential areas to promote positive encounters with those we prefer (squirrels, hedgehogs, fox, hare) and prevent negative human-wildlife impacts in residential areas with public outreach and conflict-prevention measures for those we do not prefer (wild boar, raccoons, martens, rats). We propose that the knowledge derived from this research has the potential to shape urban planning strategies and broader environmental and conservation policies going forward, facilitating the coexistence of urban biodiversity alongside effective management of human-animal conflicts.

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Data Availability:

The data and code that support the findings of this study are available on request from the corresponding author, SSM. None of the data and code are publicly available because they contain information that could compromise the privacy of research participants. There were no institutional requirements for ethical clearance. However, the survey was undertaken in accordance with the General Data Protection Regulation (GDPR) of the European Union. A consent form was provided to participants ensuring their anonymity, information about the general aim of the study, data that will be collected, contact, and that there would be no disadvantages for participants if they resign from the study at any stage of their participation. Participants had to agree to this consent form before they could start the survey.

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Liebe Teilnehmerin, lieber Teilnehmer,

vielen Dank, dass Sie sich die Zeit nehmen, die Umfrage zu Mensch-Wildtier-Interaktionen im Siedlungsraum zu beantworten. Die Umfrage wird ca. 15-20 Minuten in Anspruch nehmen und kann von Stadtbewohnern aber auch Bewohnern auf dem Land ausgefüllt werden.

Die Umfrage besteht aus vier Abschnitten. Mit "Weiter" schreiten Sie voran und mit "Zurück" kehren Sie zur vorherigen Seite zurück.

Ihre Angaben werden vertraulich behandelt und anonymisiert. Die Ergebnisse werden in Rahmen einer Studie im Zuge einer Doktorarbeit verwendet. Diese sollen dazu dienen, bestehende Probleme, aber auch positive Erfahrungen mit Wildtieren in Städten zu erfassen. So können diese gezielt an Stadt- und Grünflächenplaner sowie Naturschutzbehörden weitergegeben werden, um hier gegebenenfalls Lösungskonzepte zu entwickeln.

Für mehr Informationen und Ansprechpartner besuchen Sie bitte meine Mitarbeiterseite der [Humboldt-Universität zu Berlin](#), der [Freien Universität Berlin](#), der [Deutschen Bundesstiftung Umwelt](#), meine persönliche [Homepage](#) oder schreiben Sie mir [eine Email](#).

Gerne dürfen Sie den Link für die Umfrage auch an Interessierte weitergeben.

Ich danke Ihnen vielmals für Ihre Unterstützung.

Mit freundlichen Grüßen

Simon Mösch

In Kooperation mit



Hier starten Sie die Umfrage!



1) Wildtiere im Siedlungsgebiet

UE01

1. Wie lautet die Postleitzahl Ihres Wohnortes?

WT04

Bitte geben Sie Ihre PLZ ein und wählen Sie die entsprechende Stadt mitsamt PLZ aus der Liste.

2. Welche wilden Säugetiere sehen Sie gerne in Ihrem Siedlungsraum bzw. würden Sie gerne in Ihrem Stadtgebiet sehen?

WT02

Nennen Sie bitte 1-5 Säugetiere nach Möglichkeit zusammen mit ein oder zwei Schlagworten in Klammern als Begründung, warum Sie diese Arten gerne sehen.

Sie können hier auch „Keine“ in das erste Feld schreiben, sollte dies Ihre Antwort sein.

1	<input type="text"/>
2	<input type="text"/>
3	<input type="text"/>
4	<input type="text"/>
5	<input type="text"/>

3. Über die Anwesenheit welcher wilden Säugetiere würden Sie sich in Ihrem Siedlungsraum bzw. Ihrem Stadtgebiet NICHT freuen?

WT03

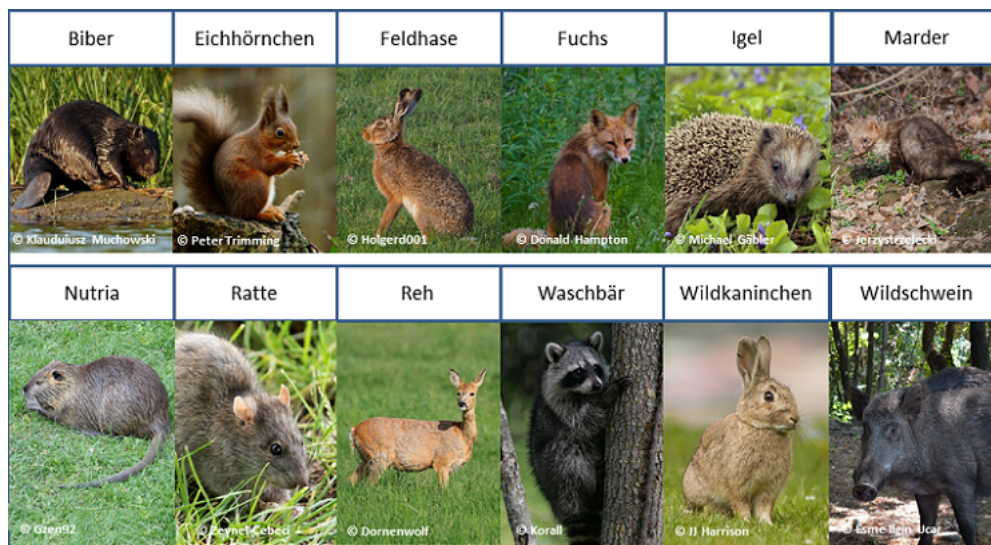
Nennen Sie bitte 1-5 Säugetiere und nach Möglichkeit je ein oder zwei Schlagworte in Klammern als kurze Begründung.

Sie können hier auch „Keine“ in das erste Feld schreiben, sollte dies Ihre Antwort sein.

1	<input type="text"/>
2	<input type="text"/>
3	<input type="text"/>
4	<input type="text"/>
5	<input type="text"/>

2) Vorkommen wilder Säugetiere im Siedlungsraum/ in der Stadt

UE02

**4. Welche der oben aufgeführten Säugetiere kommen laut Ihren Kenntnissen in Ihrer Stadt vor?**

VW02

Bitte setzen Sie ein Häkchen, wenn Sie der Annahme sind, dass diese Art in Ihrer Stadt vorkommt.

- Biber
- Eichhörnchen
- Feldhase
- Fuchs
- Igel
- Marder
- Nutria
- Ratte
- Reh
- Waschbär
- Wildkaninchen
- Wildschwein

VW16

5. Sehen Sie bei einigen dieser Säugetiere besondere Risiken bezüglich Ihrer Gesundheit?

Bitte wählen Sie aus. Mehrfachnennungen möglich.

Biber

Tollwut	Bandwürmer	Maul- u. Klauen-seuche	Morbus-pocken	Schweine-pest	Parasiten und Flöhe	Tierangriffe /-bisse	Autounfälle	<i>Ich sehe keine besonderen Risiken</i>
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Eichhörnchen

Tollwut	Bandwürmer	Maul- u. Klauen-seuche	Morbus-pocken	Schweine-pest	Parasiten und Flöhe	Tierangriffe /-bisse	Autounfälle	<i>Ich sehe keine besonderen Risiken</i>
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Feldhase

Tollwut	Bandwürmer	Maul- u. Klauen-seuche	Morbus-pocken	Schweine-pest	Parasiten und Flöhe	Tierangriffe /-bisse	Autounfälle	<i>Ich sehe keine besonderen Risiken</i>
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Fuchs

Tollwut	Bandwürmer	Maul- u. Klauen-seuche	Morbus-pocken	Schweine-pest	Parasiten und Flöhe	Tierangriffe /-bisse	Autounfälle	<i>Ich sehe keine besonderen Risiken</i>
---------	------------	------------------------	---------------	---------------	---------------------	----------------------	-------------	--

Igel

Tollwut	Bandwürmer	Maul- u. Klauen-seuche	Morbus-pocken	Schweine-pest	Parasiten und Flöhe	Tierangriffe /-bisse	Autounfälle	<i>Ich sehe keine besonderen Risiken</i>
---------	------------	------------------------	---------------	---------------	---------------------	----------------------	-------------	--

Marder

Tollwut	Bandwürmer	Maul- u. Klauen-seuche	Morbus-pocken	Schweine-pest	Parasiten und Flöhe	Tierangriffe /-bisse	Autounfälle	<i>Ich sehe keine besonderen Risiken</i>
---------	------------	------------------------	---------------	---------------	---------------------	----------------------	-------------	--

Nutria

Tollwut	Bandwürmer	Maul- u. Klauen-seuche	Morbus-pocken	Schweine-pest	Parasiten und Flöhe	Tierangriffe /-bisse	Autounfälle	<i>Ich sehe keine besonderen Risiken</i>
---------	------------	------------------------	---------------	---------------	---------------------	----------------------	-------------	--

Ratte

Tollwut	Bandwürmer	Maul- u. Klauen-seuche	Morbus-pocken	Schweine-pest	Parasiten und Flöhe	Tierangriffe /-bisse	Autounfälle	<i>Ich sehe keine besonderen Risiken</i>
---------	------------	------------------------	---------------	---------------	---------------------	----------------------	-------------	--

Reh

Tollwut	Bandwürmer	Maul- u. Klauen-seuche	Morbus-pocken	Schweine-pest	Parasiten und Flöhe	Tierangriffe /-bisse	Autounfälle	<i>Ich sehe keine besonderen Risiken</i>
---------	------------	------------------------	---------------	---------------	---------------------	----------------------	-------------	--

Waschbär

Tollwut	Bandwürmer	Maul- u. Klauen-seuche	Morbus-pocken	Schweine-pest	Parasiten und Flöhe	Tierangriffe /-bisse	Autounfälle	<i>Ich sehe keine besonderen Risiken</i>
---------	------------	------------------------	---------------	---------------	---------------------	----------------------	-------------	--

Wildkaninchen

Tollwut	Bandwürmer	Maul- u. Klauen-seuche	Morbus-pocken	Schweine-pest	Parasiten und Flöhe	Tierangriffe /-bisse	Autounfälle	<i>Ich sehe keine besonderen Risiken</i>
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Wildschwein

Tollwut	Bandwürmer	Maul- u. Klauen-seuche	Morbus-pocken	Schweine-pest	Parasiten und Flöhe	Tierangriffe /-bisse	Autounfälle	<i>Ich sehe keine besonderen Risiken</i>
---------	------------	------------------------	---------------	---------------	---------------------	----------------------	-------------	--

VW06

6. Was sind die wichtigsten Informationsquellen für Ihr Wissen zum Thema Wildtiere?

Bitte wählen Sie aus. Mehrfachnennungen möglich.

- Die eigene Kindheit
- Schulbildung (Weiterführende Schulen)
- Studium (Hochschule)
- Erzählungen von Familie, Freunden und Bekannten
- Museen
- Zoologische Gärten
- Fernsehen/Dokumentationen
- Bücher/Zeitschriften
- Stadtverwaltungen und Behörden
- Naturschutzvereine (NABU, BUND, etc.)
- Internet
- Andere, und zwar

2) Vorkommen wilder Säugetiere im Siedlungsraum/ in der Stadt

UE02

7. Haben Sie einige dieser Säugetiere schon in Ihrem Siedlungsraum bzw Ihrer Stadt gesehen?

VW08

Bitte kreuzen Sie an, wo Sie die angegebenen Säugetiere gesehen haben.

Biber

Im Wohnhaus	Im (Klein-) Garten	Im Innenhof	Im Park	In/an Gewässern	Im (Stadt) Wald	Auf dem Spielplatz	Auf dem Friedhof	Auf der Straße	Bisher nicht gesehen
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Eichhörnchen

Im Wohnhaus	Im (Klein-) Garten	Im Innenhof	Im Park	In/an Gewässern	Im (Stadt) Wald	Auf dem Spielplatz	Auf dem Friedhof	Auf der Straße	Bisher nicht gesehen
-------------	--------------------	-------------	---------	-----------------	-----------------	--------------------	------------------	----------------	----------------------

Feldhase

Im Wohnhaus	Im (Klein-) Garten	Im Innenhof	Im Park	In/an Gewässern	Im (Stadt) Wald	Auf dem Spielplatz	Auf dem Friedhof	Auf der Straße	Bisher nicht gesehen
-------------	--------------------	-------------	---------	-----------------	-----------------	--------------------	------------------	----------------	----------------------

Fuchs

Im Wohnhaus	Im (Klein-) Garten	Im Innenhof	Im Park	In/an Gewässern	Im (Stadt) Wald	Auf dem Spielplatz	Auf dem Friedhof	Auf der Straße	Bisher nicht gesehen
-------------	--------------------	-------------	---------	-----------------	-----------------	--------------------	------------------	----------------	----------------------

Igel

Im Wohnhaus	Im (Klein-) Garten	Im Innenhof	Im Park	In/an Gewässern	Im (Stadt) Wald	Auf dem Spielplatz	Auf dem Friedhof	Auf der Straße	Bisher nicht gesehen
-------------	--------------------	-------------	---------	-----------------	-----------------	--------------------	------------------	----------------	----------------------

Marder

Im Wohnhaus	Im (Klein-) Garten	Im Innenhof	Im Park	In/an Gewässern	Im (Stadt) Wald	Auf dem Spielplatz	Auf dem Friedhof	Auf der Straße	Bisher nicht gesehen
-------------	--------------------	-------------	---------	-----------------	-----------------	--------------------	------------------	----------------	----------------------

Nutria

Im Wohnhaus	Im (Klein-) Garten	Im Innenhof	Im Park	In/an Gewässern	Im (Stadt) Wald	Auf dem Spielplatz	Auf dem Friedhof	Auf der Straße	Bisher nicht gesehen
-------------	--------------------	-------------	---------	-----------------	-----------------	--------------------	------------------	----------------	----------------------

Ratte

Im Wohnhaus	Im (Klein-) Garten	Im Innenhof	Im Park	In/an Gewässern	Im (Stadt) Wald	Auf dem Spielplatz	Auf dem Friedhof	Auf der Straße	Bisher nicht gesehen
-------------	--------------------	-------------	---------	-----------------	-----------------	--------------------	------------------	----------------	----------------------

Reh

Im Wohnhaus	Im (Klein-) Garten	Im Innenhof	Im Park	In/an Gewässern	Im (Stadt) Wald	Auf dem Spielplatz	Auf dem Friedhof	Auf der Straße	Bisher nicht gesehen
-------------	--------------------	-------------	---------	-----------------	-----------------	--------------------	------------------	----------------	----------------------

Waschbär

Im Wohnhaus	Im (Klein-) Garten	Im Innenhof	Im Park	In/an Gewässern	Im (Stadt) Wald	Auf dem Spielplatz	Auf dem Friedhof	Auf der Straße	Bisher nicht gesehen
-------------	--------------------	-------------	---------	-----------------	-----------------	--------------------	------------------	----------------	----------------------

Wildkaninchen

Im Wohnhaus	Im (Klein-) Garten	Im Innenhof	Im Park	In/an Gewässern	Im (Stadt) Wald	Auf dem Spielplatz	Auf dem Friedhof	Auf der Straße	Bisher nicht gesehen
-------------	--------------------	-------------	---------	-----------------	-----------------	--------------------	------------------	----------------	----------------------

Wildschwein

Im Wohnhaus	Im (Klein-) Garten	Im Innenhof	Im Park	In/an Gewässern	Im (Stadt) Wald	Auf dem Spielplatz	Auf dem Friedhof	Auf der Straße	Bisher nicht gesehen
-------------	--------------------	-------------	---------	-----------------	-----------------	--------------------	------------------	----------------	----------------------

VW03

8. Was haben Sie beim Anblick der Säugetiere gefühlt?

Bitte wählen Sie aus.

	Freude	Interesse	Gleichgültigkeit	Ekel	Angst	k.A.
Biber	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Eichhörnchen	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Feldhase	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Fuchs	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Igel	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Marder	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Nutria	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Ratte	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Reh	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Waschbär	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Wildkaninchen	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Wildschwein	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

9. Welche Erfahrungen haben Sie mit den oben genannten Säugetieren bereits in der Stadt gemacht?

VW05

Geben Sie einen kurzen Einblick mit ca. einem Satz zu den angegebenen Tierarten.

Biber	<input type="text"/>
Eichhörnchen	<input type="text"/>
Feldhase	<input type="text"/>
Fuchs	<input type="text"/>
Igel	<input type="text"/>
Marder	<input type="text"/>
Nutria	<input type="text"/>
Ratte	<input type="text"/>
Reh	<input type="text"/>
Waschbär	<input type="text"/>
Wildkaninchen	<input type="text"/>
Wildschwein	<input type="text"/>

10. Wohnen Sie in oder in der Nähe einer der gelisteten Großstädte?

VW10

Bitte wählen Sie aus.

- Berlin
 Hamburg
 München
 Köln
 Kassel
 Ich wohne weder in, noch in der Nähe einer dieser Städte

5 aktive(r) Filter**Filter VW10/F1**

Wenn eine der folgenden Antwortoption(en) ausgewählt wurde: **1**
 Dann Seite(n) **KB** des Fragebogens anzeigen (sonst ausblenden)

Filter VW10/F2

Wenn eine der folgenden Antwortoption(en) ausgewählt wurde: **2**
 Dann Seite(n) **KH** des Fragebogens anzeigen (sonst ausblenden)

Filter VW10/F3

Wenn eine der folgenden Antwortoption(en) ausgewählt wurde: **3**
 Dann Seite(n) **KM** des Fragebogens anzeigen (sonst ausblenden)

Filter VW10/F4

Wenn eine der folgenden Antwortoption(en) ausgewählt wurde: **4**
 Dann Seite(n) **KK** des Fragebogens anzeigen (sonst ausblenden)

Filter VW10/F5

Wenn eine der folgenden Antwortoption(en) ausgewählt wurde: **5**
 Dann Seite(n) **KC** des Fragebogens anzeigen (sonst ausblenden)

2) Vorkommen wilder Säugetiere im Siedlungsraum/ in der Stadt

UE02

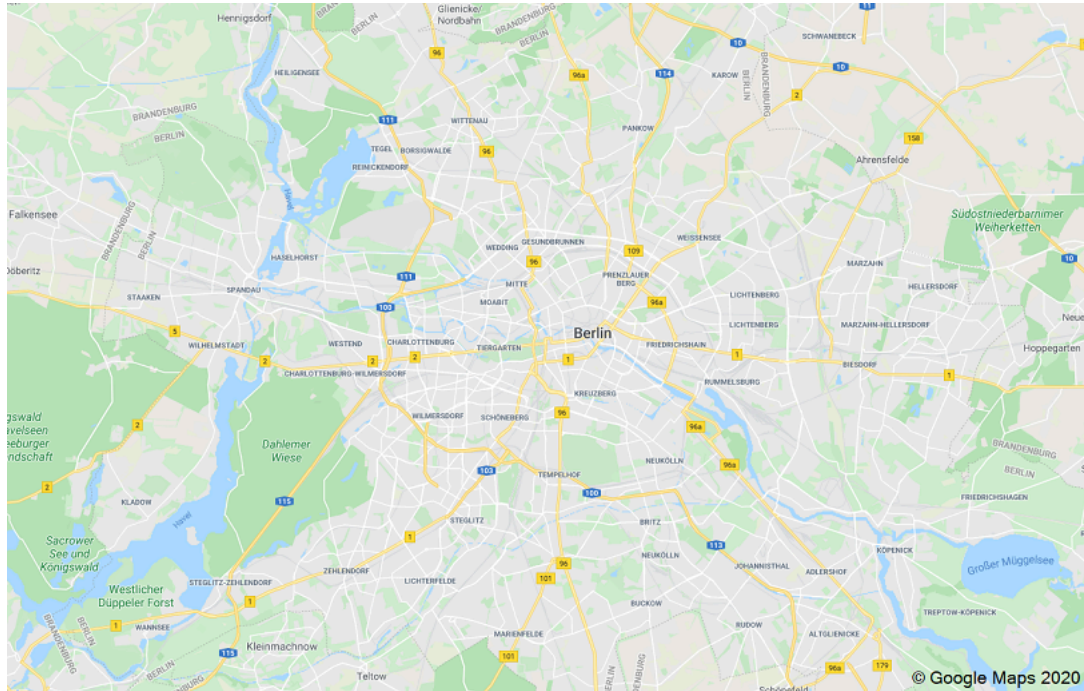
11. Biber, Waschbär und Wildschwein stehen besonders im Fokus von Mensch-Wildtier-Konflikten. Wo haben Sie schon Erfahrungen mit diesen drei Wildtieren in der Stadt gemacht?

VW09


Es geht um eine grobe räumliche Einordnung. Bitte markieren Sie:


- 1) Tierart unterhalb der Karte auswählen.
- 2) Markierung setzen mit Linksklick in die Karte.
- 3) Falsche Markierungen entfernen mit Rechtsklick in die Karte.

Sie können aber auch gerne auf „Weiter“ klicken, falls Sie keine Markierungen setzen wollen.



 Biber

 Wildschwein

 Waschbär

12. Hier können Sie bei Bedarf die in der Karte markierten Erfahrungen genauer beschreiben.

VW15

Benutzen Sie hierfür bitte die Freifläche.

2) Vorkommen wilder Säugetiere im Siedlungsraum/ in der Stadt

UE02

13. Biber, Waschbär und Wildschwein stehen besonders im Fokus von Mensch-Wildtier-Konflikten. Wo haben Sie schon Erfahrungen mit diesen drei Wildtieren in der Stadt gemacht?

VW12

Es geht um eine grobe räumliche Einordnung. Bitte markieren Sie:

- 1) Tierart unterhalb der Karte auswählen.
- 2) Markierung setzen mit Linksklick in die Karte.
- 3) Falsche Markierungen entfernen mit Rechtsklick in die Karte.

Sie können aber auch gerne auf „Weiter“ klicken, falls Sie keine Markierungen setzen wollen.



- Biber
- Wildschwein
- Waschbär

14. Hier können Sie bei Bedarf die in der Karte markierten Erfahrungen genauer beschreiben.

VW15

Benutzen Sie hierfür bitte die Freifläche.

2) Vorkommen wilder Säugetiere im Siedlungsraum/ in der Stadt

UE02

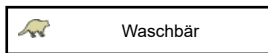
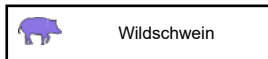
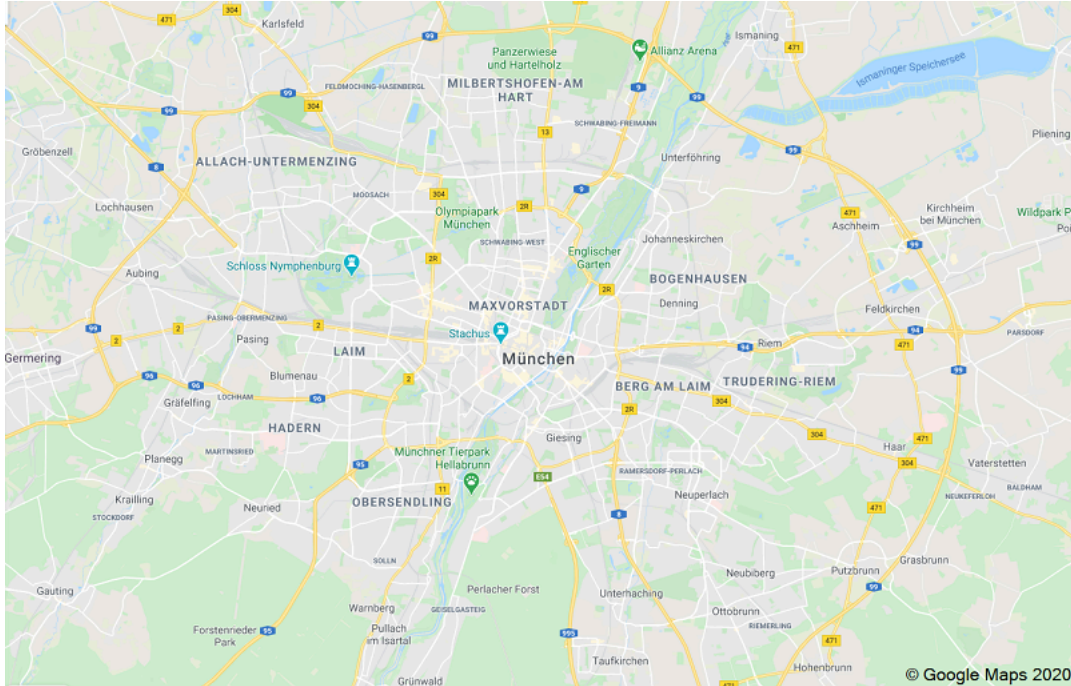
15. Biber, Waschbär und Wildschwein stehen besonders im Fokus von Mensch-Wildtier-Konflikten. Wo haben Sie schon Erfahrungen mit diesen drei Wildtieren in der Stadt gemacht?

VW13

Es geht um eine grobe räumliche Einordnung. Bitte markieren Sie:

- 1) Tierart unterhalb der Karte auswählen.
- 2) Markierung setzen mit Linksklick in die Karte.
- 3) Falsche Markierungen entfernen mit Rechtsklick in die Karte.

Sie können aber auch gerne auf „Weiter“ klicken, falls Sie keine Markierungen setzen wollen.



16. Hier können Sie bei Bedarf die in der Karte markierten Erfahrungen genauer beschreiben.

VW15

Benutzen Sie hierfür bitte die Freifläche.

2) Vorkommen wilder Säugetiere im Siedlungsraum/ in der Stadt

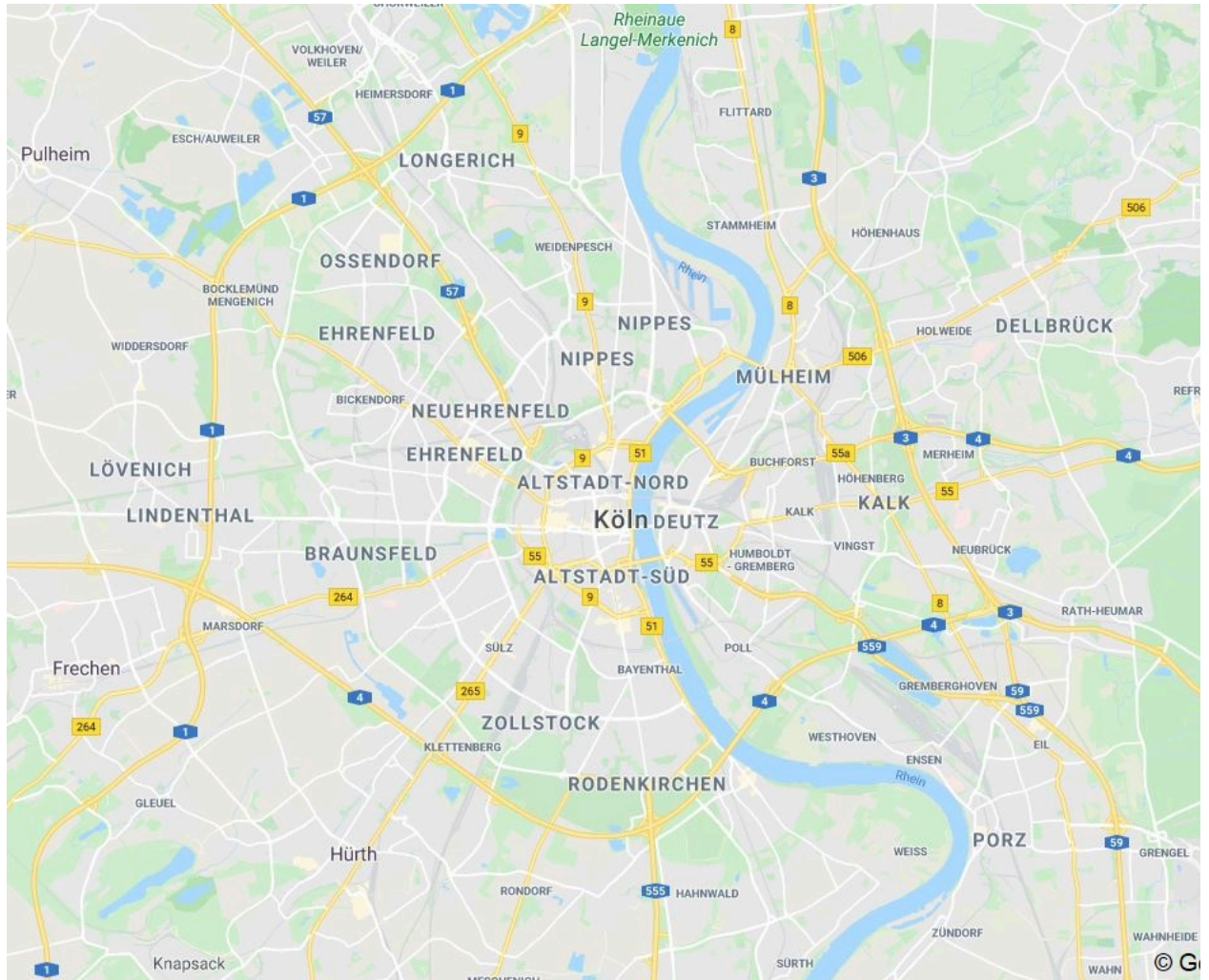
UE02

17. Biber, Waschbär und Wildschwein stehen besonders im Fokus von Mensch-Wildtier-Konflikten. Wo haben Sie schon Erfahrungen mit diesen drei Wildtieren in der Stadt gemacht?

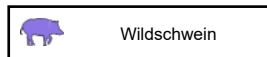
VW11

Es geht um eine grobe räumliche Einordnung. Bitte markieren Sie:

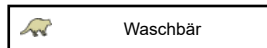
- 1) Tierart unterhalb der Karte auswählen.
- 2) Markierung setzen mit Linksklick in die Karte.
- 3) Falsche Markierungen entfernen mit Rechtsklick in die Karte.



Biber



Wildschwein



Waschbär

18. Hier können Sie bei Bedarf die in der Karte markierten Erfahrungen genauer beschreiben.

VW15

Benutzen Sie hierfür bitte die Freifläche.

3) Lebensraum für Wildtiere

UE04

21. Wie ist Ihre Haltung zu folgenden Situationen von Mensch und Wildtier?

LR09

Bitte stellen Sie den Schieberegeler zwischen „Akzeptabel“ und „Inakzeptabel“ je nach Ihrer Haltung.

Akzeptabel

Inakzeptabel

Biber am Erholungs- oder Badesee

Fuchs auf dem Sport- oder Spielplatz

Fuchs auf dem Friedhof

Fuchs während meines Picknicks

Waschbär auf dem Sport- oder Spielplatz

Wachbär während meines Picknicks

Wildschwein am Erholungs- oder Badesee

Wildschwein auf dem Sport- oder Spielplatz

Wildschwein auf dem Friedhof

Wildschwein während meines Picknicks

22. Welche Meinungen stimmen mit Ihren überein?

LR10

Bitte wählen Sie aus.

	Stimme vollkommen zu	Stimme zu	Stimme teilweise zu	Stimme nicht zu	Stimme gar nicht zu	k.A.
Wildtiere sollten nicht in der Stadt leben, sondern nur im Wald und auf Feldern.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Wildtiere in der Stadt dürfen von Menschen gefüttert werden.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Menschen haben eine moralische Verpflichtung, Wildtieren auch in der Stadt ein Zuhause zu geben.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Menschen sollten selbst in dicht besiedelten Gebieten Räume für Tiere schaffen, die der Mensch nicht betritt, um ein besseres Miteinander zu fördern.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Problematische Wildtiere im Siedlungsraum sollten von Jägern erlegt werden dürfen.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

23. Kennen Sie Wildtierberatungen und deren Verantwortliche in Ihrer Stadt?

LR02

Wenn ja, welche davon haben Sie bereits genutzt?

Wenn nein, an wen würden Sie sich für Fragen/Problemen bzgl. Wildtieren im Siedlungsraum wenden?

24. Wie häufig besuchen Sie Grünflächen wie Parks oder Stadtwälder?

LR06

Bitte wählen Sie eine Option aus.

- Jeden Tag
- Mehrmals die Woche
- Mehrmals im Monat
- Nicht regelmäßig
- Weniger als einmal pro Jahr

LR05

25. Was ist Ihr Hauptanliegen, wenn Sie Grünflächen wie Parks oder Stadtwälder besuchen?

Bitte wählen Sie aus. Mehrfachnennungen möglich.

- Liegt auf dem Weg (zur Arbeit, Freunden, Familie, Veranstaltungsort o.ä.)
- Sport, z.B. Joggen, Walking, Radfahren, o.ä.
- Spazieren gehen
- Schwimmen, Baden
- Hund ausführen
- Leute treffen/Picknicken
- Spielplatz besuchen/mit Kindern spielen
- Wildtiere beobachten
- Arbeiten (Touristen führen, Dog Walking, Ausflug mit Schulen oder Kitas)
- Anderes, und zwar

3) Lebensraum für Wildtiere

UE04

26. Besitzen oder mieten Sie einen Garten?

SH10

- Ich habe Zugang zu einem Garten/Kleingarten an meinem Wohnort
- Ich habe Zugang zu einem Garten/Kleingarten in einem anderen Stadtteil
- Ich habe keinen Garten

2 aktive(r) Filter**Filter SH10/F1**

Wenn eine der folgenden Antwortoption(en) ausgewählt wurde: 3
Dann Frage/Text SH11 später im Fragebogen anzeigen (sonst ausblenden)

Filter SH10/F2

Wenn eine der folgenden Antwortoption(en) ausgewählt wurde: 1, 3
Dann Frage/Text SH12 später im Fragebogen anzeigen (sonst ausblenden)

27. Falls Sie einen Gartenzugang haben, sehen Sie hier besondere Probleme mit Wildtieren?

SH12

Könnten Sie bitte einen kurzen Einblick geben?

28. Besitzen Sie ein Auto?

SH13

Bitte wählen Sie aus.

- Ja
- Nein

1 aktive(r) Filter**Filter SH13/F1**

Wenn eine der folgenden Antwortoption(en) ausgewählt wurde: 2
Dann Frage/Text SH14 später im Fragebogen ausblenden

29. Falls Sie ein Auto besitzen, sehen Sie hier besondere Probleme mit Wildtieren?

SH14

Könnten Sie bitte einen kurzen Einblick geben?

30. Besitzen Sie Haustiere oder Nutztiere?

SH15

Bitte wählen Sie aus. Mehrfachnennungen möglich.

- Hund
- Katze
- Kleintier wie Hase, Kaninchen, Meerschweinchen
- Pferd
- Huhn
- Andere, und zwar
- Ich habe keine Haus- oder Nutztiere

1 aktive(r) Filter**Filter SH15/F1**

Wenn eine der folgenden Antwortoption(en) ausgewählt wurde: 1, 2, 3, 4, 5
Dann Frage/Text SH16 später im Fragebogen anzeigen (sonst ausblenden)

SH16

31. Falls Sie Haus- oder Nutztiere besitzen, sehen Sie hier besondere Probleme mit Wildtieren?

Könnten Sie bitte einen kurzen Einblick geben?

32. Gibt es noch etwas, das Sie zum Thema „Wildtiere in der Stadt“ mitteilen möchten?

MU02

Nutzen Sie die Freifläche für Ihre Kommentare.

4) Sozialdemographische Hintergründe

UE03

33. Bitte nennen Sie Ihr Geburtsjahr.

SH02

Bitte wählen Sie aus.

 ▾

34. Bitte nennen Sie Ihr Geschlecht.

SH03

Bitte wählen Sie aus

- Männlich
 Weiblich
 Divers
 keine Angabe

35. Haben Sie Kinder?

SH17

Bei sehr unterschiedlich alten Kindern sind Mehrfachnennungen möglich

- Kinder unter 4 Jahren
 Kinder zwischen 4-10 Jahren
 Kinder zwischen 11-18 Jahren
 Kinder älter als 18 Jahre
 Ich habe keine Kinder

36. Was ist Ihr höchster Bildungsabschluss?

SH04

Bitte wählen Sie aus.

- Noch in der Schule
 Kein Schulabschluss
 Volks-/Hauptschulabschluss
 Realschule (Mittlere Reife)
 Fachhochschulabschluss
 Gymnasium (Abitur)
 Abgeschlossene Ausbildung
 Hochschule (Bachelor)
 Hochschule (Master/Magister/Diplom)
 Hochschule (Promotion)
 Anderes, und zwar

37. Wie ist Ihr derzeitiges Beschäftigungsverhältnis?

SH05

Bitte wählen Sie aus.

- SchülerIn
 StudentIn
 Auszubildende/r
 Teilzeit angestellt
 Vollzeit angestellt
 Selbständig
 Arbeitssuchend
 Karenz/Elternzeit
 Freiwilligendienst
 Haushaltsführend
 Wehrdienstleistend
 RentnerIn
 Anderes, und zwar

38. In welchem Land sind Sie aufgewachsen?

SH06

Bitte geben Sie ein Land an.

SH25

39. Seit welchem Jahr wohnen Sie schon an Ihrem jetzigen Wohnort?

Bitte wählen Sie aus.

 ▼**40. Wie würden Sie Ihr Wohnumfeld während Ihrer Kindheit beschreiben?**

SH07

Bitte wählen Sie aus.

- Dorf
- Kleinstadt
- Mittelgroße Stadt
- Großstadt
- Anderes, und zwar

Seite 13

SH3

4) Sozialdemographische Hintergründe

UE03

41. Was ist Ihre Hauptinformationsquelle für aktuelle Geschehnisse?

SH18

Bitte wählen Sie aus. Mehrfachnennungen möglich.

- Tagesschau oder vergleichbare TV-Nachrichten
- Radionachrichten
- Süddeutsche, Tagesspiegel oder vergleichbare Tageszeitungen (inkl. Onlineangebote dieser Zeitungen)
- BILD, B.Z. oder vergleichbare Boulevardzeitungen (inkl. Onlineangebote dieser Zeitungen)
- Facebook, Twitter, Instagram oder vergleichbare soziale Medien
- Andere, und zwar

42. Sind Sie Mitglied oder spenden Sie für eine Naturschutz-, Tierschutz oder Umweltschutzorganisation (NABU, WWF, BUND etc.) oder auch einer Jagdgemeinschaft?

SH19

Bitte wählen Sie aus und geben Sie an welche Organisation Sie unterstützen.

- Ja, bei
- Nein

43. Haben Sie bereits an einer Umfrage zu Stadtwildtieren teilgenommen (z.B. das Wildtierforscherprojekt WTImpact des IZW Berlin)?

SH22

- Ja
- Nein

44. Wie haben Sie von dieser Umfrage erfahren?

SH20

Bitte wählen Sie aus.

- NABU
- BUND
- LBV
- Universität oder Fachschaft
- Kleingartenverein
- DBU
- Freunde, Familie oder Bekannte
- Facebook
- Twitter
- Instagram
- Youtube
- Zeitung
- Flyer, Briefkasteneinwurf oder Aushang
- IZW oder StadtWildTiere
- Anderer Emailverteiler
- Andere, und zwar



WT05

Vielen Dank für Ihre Teilnahme!

Ich möchte mich ganz herzlich für Ihre Mithilfe bedanken.

Ich würde mich freuen, wenn Sie den Link für den Fragebogen an Interessenten weiterleiten.

Wenn Sie auf "Weiter" klicken, schließen Sie den Fragebogen ab und Ihre Antworten werden gespeichert.

Letzte Seite

Vielen Dank für Ihre Teilnahme!

Ich möchte mich ganz herzlich für Ihre Mithilfe bedanken.

Falls Sie Fragen oder Anregungen haben, melden Sie sich gerne unter Simon.Moesch@geo.hu-berlin.de.

Gerne dürfen Sie den Link für die Umfrage auch an Interessierte weitergeben.

Die Ergebnisse werden Sie nach Auswertung der Umfrage hier finden: [Projekt: Mensch und Wildtiere in der Stadt !](#)

Ich würde mich freuen, wenn Sie sich Zeit nehmen eine Umfrage zu [Bibern in der Stadt](#) auszufüllen!

Ihre Antworten wurden gespeichert, Sie können das Browser-Fenster nun schließen.

Fotos von Wikimedia.

[Simon Moesch](#), Humboldt-Universität zu Berlin – 2020

1 Appendix II

2 *Table A2.1 Included words and spellings for mammal search in open text questions*

3

Mammal	Search words
Fox	Fuchs, Füchse, Fuechse
Squirrel	Eichhörnchen, Eichhoernchen, Eichhorn
Wild boar	Wildschwein, Wildschweine, Schwarzwild
Hedgehog	Igel
Raccoon	Waschbär, Waschbären, Waschbaer, Waschbaeren
Rat	Ratten, Ratte
Wolf	Wolf, Wölfe
Deer	Reh, Rehe, Rehwild,
Marten	Marder, Steinmarder, Baummarder, Automarder
Hare	Hase, Hasen, Feldhase, Feldhasen
Rabbit	Wildkaninchen, Kaninchen,
Beaver	Biber
Coypu	Nutria, Nutrias, Wasserratte, Wasserratten, Biberratte

4

5 *Table A2.2 Numbers of liked and disliked mammals listed by participants with calculated preference scores.*

6 **Mammal not targeted in further questions*

Mammal	Listed as liked	Listed as disliked	Total (Liked + Disliked)	Mammal not listed (Count Neutral = 0)	Preference-Score (Like – Dislike)
Fox	1380	442	1822 (61%)	1175 (39%)	938
Squirrel	1569	6	1575 (53%)	1422 (47%)	1563
Wild boar	198	1313	1511 (50%)	1486 (50%)	-1115
Hedgehog	1192	10	1202 (40%)	1795 (60%)	1182
Raccoon	230	741	971 (32%)	2026 (68%)	-511
Rat	29	794	823 (27%)	2174 (73%)	-765
Wolf*	145	665	810 (27%)	2187 (73%)	-520
Deer	666	134	800 (27%)	2197 (73%)	532
Marten	349	471	820 (27%)	2177 (73%)	-122
Hare	618	25	643 (21%)	2354 (79%)	303
Rabbit	341	38	379 (13%)	2618 (87%)	593
Beaver	140	22	162 (5%)	2835 (95%)	118
Coypu	26	53	79 (3%)	2918 (97%)	-27

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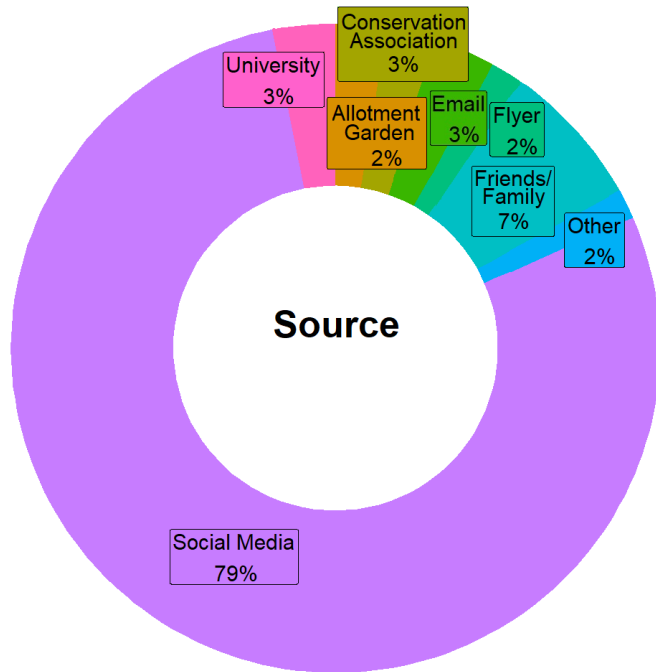
12

13

14

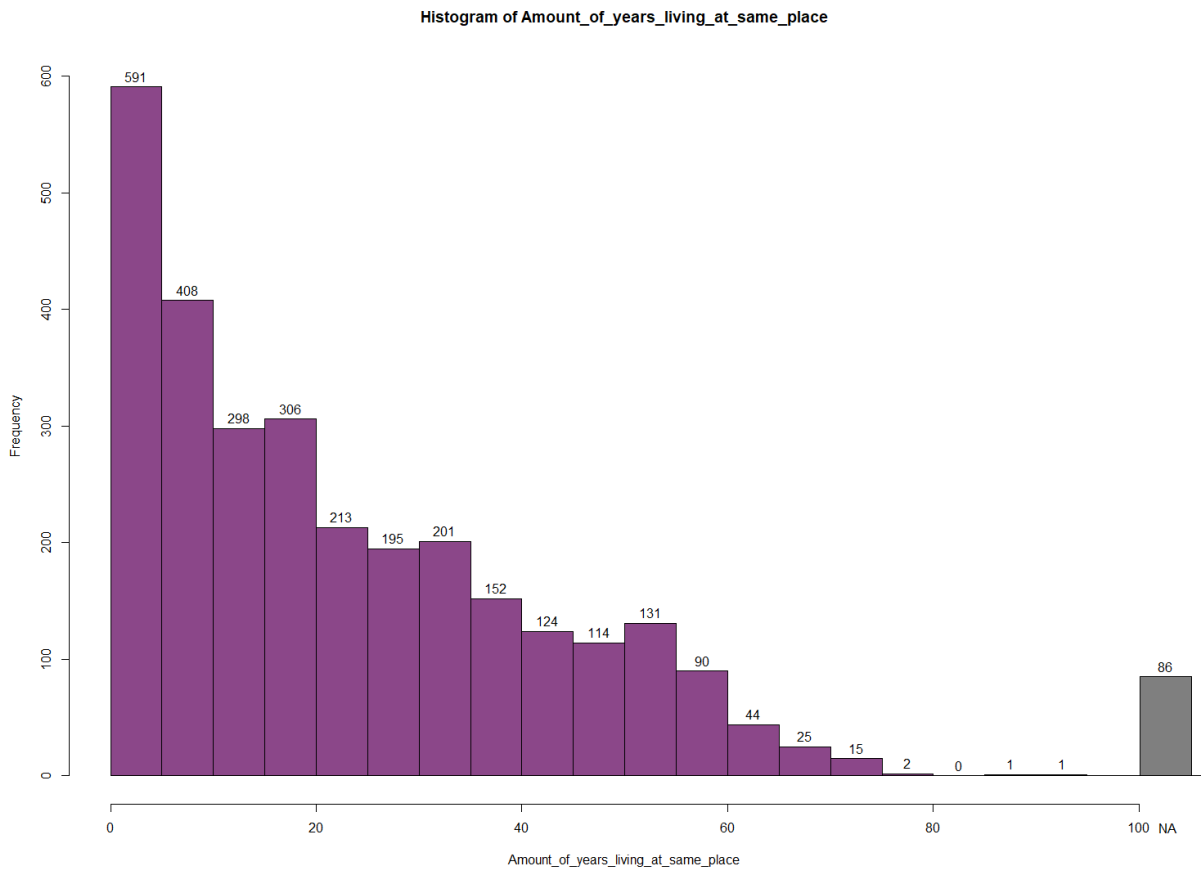
15

16

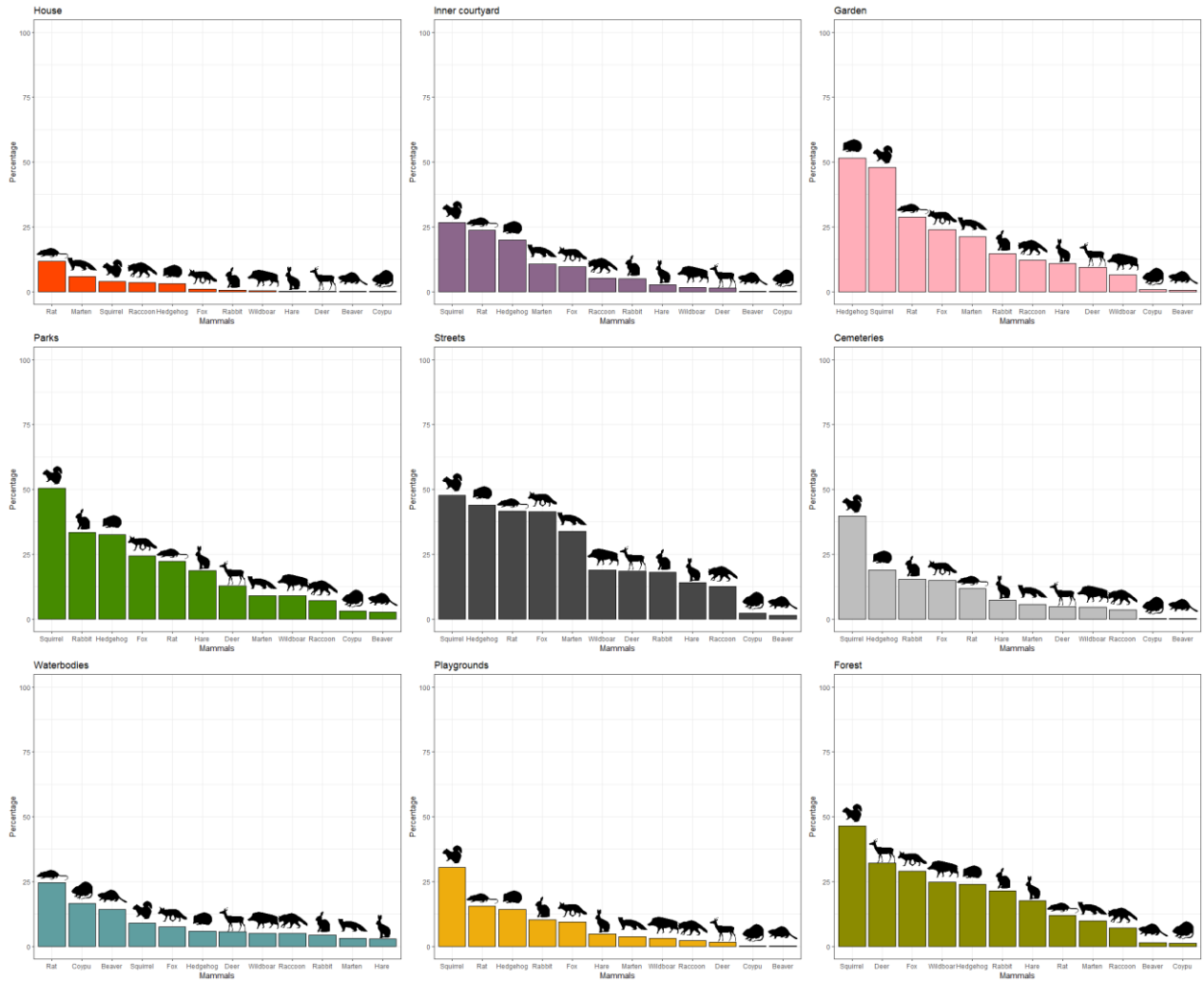


17
18 *Figure A2.1 Sources of survey participants. The chart illustrates how participants were informed about the wildlife*
19 *survey. (n = 2997)*

20



21
22 *Figure A2.2 Histogram depicting the duration of residency of participants at their current location, grouped in*
23 *intervals of 5 years from 0 to 100. Bar segments representing participants with no answer (NA) are indicated."*



24
25 *Figure A2.3 Mammals spotted in urban surroundings (multiple selection)*

26

Table A2.3: Variance Inflation Factors (VIF) for included variables of modelled specie preference, including encounter-specific calculation. Encounter could not be tested for wolves as the variable was not assessed in the survey.

	Squirrel	Hare	Fox	Hedgehog	Marten	Rat	Deer	Raccoon	Wild boar	Wolf
Age	1.055.657	1.060.865	1.055.027	1.058.476	1.055.521	1.057.807	1.055.077	1.055.096	1.057.472	1.055.027
Gender	1.030.996	1.030.891	1.034.478	1.032.562	1.036.676	1.032.822	1.030.947	1.039.048	1.033.190	1.030.864
Urbanity	1.315.791	1.310.161	1.360.161	1.297.826	1.313.946	1.355.880	1.303.934	1.330.977	1.348.494	1.296.826
Education	1.071.311	1.077.237	1.070.931	1.070.158	1.071.250	1.069.942	1.073.750	1.071.429	1.071.669	1.069.832
Children	1.043.959	1.044.435	1.044.098	1.043.941	1.044.243	1.044.022	1.044.868	1.044.030	1.043.872	1.043.800
Garden	1.273.639	1.274.172	1.285.496	1.279.798	1.292.955	1.280.464	1.284.917	1.280.273	1.281.249	1.273.357
Car	1.259.709	1.262.838	1.263.737	1.264.292	1.272.166	1.261.723	1.260.135	1.262.407	1.260.279	1.259.703
Pet	1.207.573	1.209.200	1.219.543	1.213.627	1.227.825	1.213.333	1.213.986	1.219.134	1.213.442	1.207.012
Encounter	1.020.559	1.051.120	1.063.039	1.042.599	1.143.384	1.061.461	1.056.276	1.045.091	1.050.704	NA

Table A2.4 Preference models. Numbers indicate estimate, here the difference compared to the base level (Women, younger age, without academic background, rural, no children under 18, no garden, no pet, no car) with the standard error below in brackets. All continuous predictors are mean-centred and scaled by 1 standard deviation. Standard errors are heteroscedasticity robust, p-values are indicated behind the estimate with asterisks (*** $p < 0.001$; ** $p < 0.01$; * $p < 0.05$). Encounter could not be tested for wolves as the variable was not assessed in the survey.

	Squirrel	Hare	Fox	Hedgehog	Marten	Rat	Deer	Raccoon	Wild boar	Wolf
Age	-0.01 (0.00)	-0.00 (0.00)	-0.00 (0.00)	0.00 (0.00)	0.01 *** (0.00)	-0.01 (0.00)	-0.00 (0.00)	-0.00 (0.00)	-0.01 (0.00)	0.00 (0.00)
Gender	-0.35 *** (0.09)	-0.17 (0.11)	-0.20 * (0.09)	-0.41 *** (0.09)	-0.05 (0.10)	-0.04 (0.10)	-0.04 (0.10)	-0.31 ** (0.10)	0.04 (0.09)	-0.23 * (0.10)
Urbanity	-0.08 *** (0.02)	0.01 (0.02)	-0.11 *** (0.01)	0.01 (0.02)	-0.02 (0.02)	0.04 * (0.02)	0.08 *** (0.02)	-0.00 (0.02)	0.02 (0.01)	-0.00 (0.02)
Education	0.14 (0.08)	0.02 (0.10)	-0.07 (0.08)	0.17 * (0.08)	-0.13 (0.09)	-0.13 (0.09)	-0.06 (0.09)	-0.29 *** (0.08)	-0.14 (0.08)	-0.30 *** (0.09)
Children	0.08 (0.09)	0.20 (0.11)	-0.05 (0.09)	0.07 (0.09)	-0.14 (0.10)	-0.13 (0.10)	0.22 * (0.10)	-0.04 (0.10)	-0.07 (0.09)	-0.16 (0.10)
Garden	0.03 (0.10)	-0.12 (0.12)	-0.13 (0.09)	0.45 *** (0.10)	-0.23 * (0.11)	-0.32 ** (0.11)	-0.00 (0.11)	-0.52 *** (0.11)	0.10 (0.09)	0.24 * (0.11)
Car	0.08 (0.10)	0.22 (0.13)	-0.13 (0.10)	-0.14 (0.10)	-0.43 *** (0.11)	-0.19 (0.12)	0.07 (0.12)	-0.16 (0.11)	-0.21 * (0.10)	-0.18 (0.11)
Pet	-0.22 * (0.09)	-0.05 (0.11)	0.16 (0.09)	-0.05 (0.09)	0.44 *** (0.10)	0.35 *** (0.10)	0.01 (0.11)	0.10 (0.10)	0.15 (0.09)	-0.05 (0.10)
Encounter	0.71 ** (0.22)	0.95 *** (0.10)	0.64 *** (0.09)	0.45 ** (0.15)	0.22 * (0.09)	-0.61 *** (0.13)	1.24 *** (0.10)	-0.34 *** (0.09)	0.26 *** (0.08)	NA NA
nobs	2822.00	2822.00	2822.00	2822.00	2822.00	2822.00	2822.00	2822.00	2822.00	2822.00
edf	11.00	11.00	11.00	11.00	11.00	11.00	11.00	11.00	11.00	10.00
AIC	3881.39	3032.37	5512.94	3865.04	4286.48	3466.24	3699.06	4442.42	4949.55	4015.51
BIC	3946.79	3097.76	5578.34	3930.44	4351.87	3531.64	3764.45	4507.82	5014.94	4074.96
logLik	-1929.70	-1505.18	-2745.47	-1921.52	-2132.24	-1722.12	-1838.53	-2210.21	-2463.77	-1997.75
df.residual	2811.00	2811.00	2811.00	2811.00	2811.00	2811.00	2811.00	2811.00	2811.00	2812.00
nobs.1	2822.00	2822.00	2822.00	2822.00	2822.00	2822.00	2822.00	2822.00	2822.00	2822.00