

**PhD Thesis Acceptance Report**  
**Research Discipline Council of Biological Sciences**  
**Jagiellonian University in Kraków**

**Candidate's name and surname: Sayantani Basak**

**PhD Thesis Title: Spatio-Temporal and Social Dimensions of Human-Wildlife Interactions**

**Thesis Supervisor: Dr. hab Izabela A. Wierzbowska**

**Assistant Supervisor / Second Supervisor/ Co-supervisor (if applicable): NA**

**Reviewer: dr hab. Nuria Selva Fernández, prof. IOP PAN**

**THESIS EVALUATION**

1. **Scientific merit of the thesis**
  - a. Originality of the research (25-200 words):

The thesis presents original work on human-wildlife interactions in urban environments. It includes a systematic review of published studies on this topic and two original studies conducted in the city/region of Kraków and based on comparative analyses of human-wildlife interactions in time: one dealing with the patterns and changes in the perceptions and attitudes of Krakow citizens in a decade (between 2010 and 2020) and another focused on a type of human-wildlife conflict (animal-vehicle collisions) covering the 6-month period (January-June) during the covid-19 lockdown in 2020 and the same period the year before. This thesis represents an important contribution to urban ecology and deals with the important topic of human-wildlife interactions in an increasingly urbanised world. It also contributes to 'anthropause' research, not missing the unique opportunity of the reduced human mobility during the covid-19 pandemics to gain insight into how human activity affect wildlife in urban environments. This thesis highlights the importance of integrating wildlife conservation and management into urban planning- a relevant conclusion for biodiversity conservation.

- b. Scientific merit of the chapters / articles (25-200 words):

The first chapter systematically reviews the studies published on human-wildlife interactions in urban environments (n= 124). It identifies gaps in knowledge and taxonomic and geographical bias in the studies, mostly focused on mammals and conducted in North America, as well as a lack of long-term research. It proposes a conceptual framework for urban human-wildlife conflicts and discuss how to mitigate these conflicts. The second chapter is a longitudinal study on people's attitudes towards urban wildlife. Through a questionnaire to over 700 Kraków residents, both in 2010 and 2020, conducted in the same districts, this study investigates changes in the encountered wildlife species, citizens' perceptions, the type of conflicts and preferred management. It identifies changes in the main conflict species, an increase in encounters and conflicts, new wildlife responses (less afraid of humans) and a general improvement in human attitudes in spite of the lack of information from the responsible administration. The chapter also addresses the limitations of the study and discuss policy implications. The third chapter collects information on traffic volume in the city of Kraków and on animal-vehicle collisions (n=1063) in Kraków and two suburban neighbouring areas (Niepołomice and Wieliczka communes). The study showed no effect of the lockdown-induced reduced traffic on the

collision rate in the urban area, but a significant decrease in collisions in the suburban areas. The study discusses how changes in traffic volume could affect human behaviour and wildlife space use.

2. **Substantial merit of the thesis**

*(ability to introduce the research topic and clarity of research hypotheses, the choice of research methods and statistical tools for data analysis, presentation and critical analysis of the research data, the ability to discuss research data and the theoretical background, clarity and quality of the conclusions) (25-200 words):*

In general, the research questions and goals are well introduced and stated in each of the thesis chapters. The data collected, methods and statistical analysis are adequate and described accurately and in detail. The presentation and description of results are good, as well as their interpretation. Chapters 2 and 3 are already published in high-ranked journals (both Q1 and with an IF >5). Chapter 1 is presented as a submitted manuscript, and, as such, it has room for improvement. This manuscript has been just published in *Ecological Indicators* (also Q1 and with IF > 5). My main critical remark is that the thesis introduction, goals and conclusions could integrate more the research conducted in the three chapters. In the Introduction, I missed more background information and on the state-of-the-art of the topic of "human-wildlife conflicts", how their definition has evolved and the way to the current "human-wildlife coexistence" approach. I have also missed some reference and comparison to human-wildlife conflicts in rural or more natural areas in both the thesis introduction and discussion. In fact, they are not fully separate compartments (urban vs natural ecosystems), but ecosystems in a gradient of urbanization. The dissertation goals could be more developed and not presented compartmentalized as chapters- this would have helped to link the chapters and provide a more integrative view of the doctoral research. The candidate is the first author in the three publications derived from the thesis -but not corresponding author- and has had a relevant and main contribution in all of them.

3. **Layout and register**

*(layout, register and the clarity of the language, the quality of the visual material etc.) (25-200 words):*

The thesis has a traditional layout, and has followed the recommendations by the Council of the Faculty of Biology of the Jagiellonian University. It includes a summary (in English and Polish), a general introduction followed by three articles/chapters (together with the supplementary information and co-authors' statements on contributions) and conclusions. Each chapter, as well as the rest of the text (Intro and Conclusions), has its own reference list. The doctoral thesis is complemented in the end with a list of publications, projects and congress contributions of the candidate. Graphical aspects and language are of good quality, with only minor syntax errors. The title is good, although it would have been even better if the focus on urban environments was specified. I should mention that I particularly like the thesis dedication: simple and meaningful.

4. **Critical notes**

Two of the chapters are already published and, thus, have undergone a review process and editorial screening. Therefore, my comments refer mostly to the Introduction and Conclusions and chapter 1.

- (a) Title: as mentioned above, it is too general and it would have benefited from adding "in urban environments".
- (b) As already mentioned, I missed in the Introduction background information on human-wildlife conflicts and how the definitions have evolved. This is a term central to the thesis and the Intro



only says that human-wildlife conflicts are negative interactions, which I find too general. For instance, the IUCN definition, among others, also includes as conflicts those situations where people 'perceive' wildlife to be a direct threat to their property or safety, even if the damage to human properties or harm to human lives have not occurred. This widely used framing of human-wildlife conflict has also been criticized, because it implies that animals are 'conscious human antagonists', which makes no sense, and some authors have highlighted that the conflict is between groups of people or stakeholders with different goals. It has been suggested that human-wildlife conflicts can be split into two components: (1) human-wildlife impacts, which focus on the impacts of wildlife on humans and their activities, and (2) the underlying human-human conflicts, between those defending pro-wildlife positions and those defending other positions. More recently, the use of the term human-wildlife coexistence has been suggested as a more constructive way of framing the issue and moving from the focus on impacts and technical solutions to how to negotiate solutions between these human competing interests.

- (c) The general hypotheses and the goals could have been more developed, and then linked to a rationale for the three studies presented as chapters.
- (d) In general, and particularly in Chapter 1, I miss a clear definition of 'urban wildlife' (also of 'nuisance urban wildlife', e.g. see page 14); the "Species" criteria in Table 1 is too general. I wonder whether typical species inhabiting cities, such as swifts, were included, or why domestic species which have become 'feral' (like dogs in India or cats in many urban and suburban areas) have been excluded. I also miss a reference to invasive species, for which cities are, in general, a suitable habitat, and which often have become "wild" from pets, which has some parallelism to the feral cat & dog situation. The study seems to focus on terrestrial urban wildlife, but this is not explicitly said (see Table 1), thus excluding an important part of (marine) wildlife from urban areas located by the sea (for instance, it is not clear to me whether fauna like sea gulls or sharks were included).
- (e) Chapter 1. Methodological remarks (1) Table 1. The criterion "Non-conflict" is unclear to me; (2) Fig. 2. The growth is exponential (also stated on page 25), but the fit is linear; (3) How the species were assigned to a particular trophic group needs a reference ("based on diet" is not enough); (4) how conflicts were classified needs further explanation (e.g., see page 31, "9% for personal attack or fear for livestock", I find unusual joining personal attacks and fear for livestock under the same conflict type).
- (f) Chapter 1. Discussion. The conceptual framework proposed is not very clear to me; for instance, the role of the perceptions of urban residents as catalyst or how Sustainable Development Goals (SDGs) can act as linkage are not properly explained. I also do not understand why SDG 2 (Zero hunger) is specifically discussed and not other SDGs (e.g. 3, 11, or 15). This comment about SDGs also applies to Chapter 2.
- (g) Chapter 2. Wording and typos. Page 67 "conclusive conclusions". Page 74 "In 2020, approximately 11.10% (n=80) of the respondents...", should be "In 2010...". Tables 4 and 5 have the exact same caption, why are they separated?
- (h) Chapter 2. Questionnaire. Why question 4 did not specify a particular period when the conflict occurred? For instance, a 2020 respondent could indicate an encounter occurring in 2010. Could this somehow influence the 2010 vs 2020 comparison and results?
- (i) Chapter 3. "We found an overall decrease in AVC between 2019 and 2020 in suburban communes, but the AVC rates were similar in Krakow between 2019 and 2020". The comparison of animal-vehicle collisions among Kraków, Niepołomice and Wieliczka is based on the number of collisions.

The number of collisions could have been standardized by km, i.e. taking into account the length of the road network in each of the three communes. Could this influence the results?

- (j) Discussion. As mentioned above, I miss a synthesis of the findings and a connection among the outputs of the three chapters in an integrative way, as well as a comparison of the observed patterns with the findings by similar studies in non-urban environments. Although the three chapters are mostly focused on identifying patterns, it would have been important to discuss and propose some of the main drivers related to those (changes in) patterns. I have also missed some reference to the role of the responsible administrations in mitigating human-wildlife conflicts, which is crucial (e.g. just informing citizens, something the administration did not, as found in Chapter 2).

5. **Final grade** (justification 25-200 words):

Syantani Basak's doctoral dissertation provides new and valuable scientific input and contributes to gain insight into human-wildlife conflicts. The candidate has demonstrated to have developed the skills and competences to conduct scientific research, as well as to have an extensive knowledge on the topic of human-wildlife conflicts.

I, hereby, declare that the reviewed PhD thesis by Syantani Basak meets the criteria pursuant to art. 187 of Act of 20 July 2018 The Law on Higher Education and Science (Journal of Laws of 2018, item 1668, as amended) and request that the Research Discipline Council of Biological Sciences of the Jagiellonian University in Kraków accepts Syantani Basak for further stages of doctoral proceedings in the field of exact and biological sciences, in the discipline of biological sciences.

YES

I, hereby, request that the thesis is accepted with distinctions. Justification (25-200 words)

NO

02.07.2023

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date



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Reviewer's signature