Group #
Group Member names: Aiden Martinez

Project title:

## Annotated Bibliography

Answer the following questions below for each of the 10 sources of evidence you gather.

**Research Question:** How do urban design and pollution affect biodiversity and the health of both humans and wildlife in city environments?

**Review Paper 1**

- Team member evaluation: Aiden Martinez
- Citation for the article: Di Giulio, M., Holderegger, R., & Tobias, S. (2009). Effects of habitat and landscape fragmentation on humans and biodiversity in densely populated landscapes. *Journal of Environmental Management, 90*(10), 2959–2968. https://doi.org/10.1016/j.jenvman.2009.05.002

- 1-paragraph summary:

  The article discusses the effects of habitat fragmentation within urban areas, such as cities, townships, and suburban communities. This article looks at the social understanding of habitat fragmentation; how the issue is not limited to animal populations but also our understanding of habitats and the ramifications of fragmentation.

- What information does this source contribute to your research question?

  This article provides a multifunctional perspective on the topic that we are researching, as outlined in our prior drafts. Through this article, we can address the issues related to our research and address the potential difficulties that may arise from our research.

- How does the source relate to other sources in your bibliography?

  All of the sources we will utilize for our research are connected to the general topic of human-animal relationships and how these relationships effect health outcomes and human well-being. By understanding the difficulties that come with habitat integration within urban landscapes, we can point out these environmental issues in our research, producing higher quality data.

- What are the strengths and weaknesses of the source?

  The strengths of the source include the strong academic reputation of the authors, as they are all experts in the field of urban ecology. The number of authors is also a strength, as this article alone has three authors with different expertise on their

shared field. One of the weaknesses of the article is that of its age, as the article was written in 2009. Due to the number of social changes and practices that have been in use since then, the article may be lacking in current perspectives.

- How does the source fit into your research topic? Why is it useful?

  This source fits into our research as it directly ties to the topic of urban ecology and human-animal mutualism. It is useful for our research as we can learn from their methods to create our own methods unique to our research. By doing this, we have a successful roadmap that will produce quality data.

**Review Paper 2**

- Team member evaluation: Eriel Johnson
- Citation for the article: arselle, Melissa R., et al. "Biodiversity and health in the urban environment." Current environmental health reports 8.2 (2021): 146-156
- 1-paragraph summary: This article explores how urban environments influence the relationships between humans, animals, and ecosystems. It argues that city planning usually focuses only on human needs and overlooks the ecological interactions that include wildlife and pets. The author calls for a more integrated and participatory approach to planning — one that accounts for animal populations, environmental health, and human well-being together. By using ecological planning tools and forecasting methods, the paper promotes viewing cities as shared ecosystems rather than just human spaces.
- What information does this source contribute to your research question? It provides an early framework for understanding how animal populations and environmental health are interconnected in urban areas, which supports the idea that cities function as living ecosystems rather than artificial environments.
- How does the source relate to other sources in your bibliography? This article connects with the newer studies that show more specific biological or health-based effects of urbanization. While newer research looks at microbiomes or biodiversity directly, this one sets up the conceptual base for why these relationships matter in the first place.
- What are the strengths and weaknesses of the source? A key strength is that it was ahead of its time in pushing for animal-inclusive urban planning. It offers strong conceptual arguments and practical suggestions. Its main weakness is that it lacks modern data or molecular evidence — it's more theoretical than experimental.
- How does the source fit into your research topic? Why is it useful? It helps frame my topic by showing that urban wildlife and environmental health should be studied together, not separately. It's useful because it gives historical context and supports my argument that cities must plan with ecological reciprocity in mind.

**Review Paper 3**

- Team member evaluation: Eriel Johnson
- Citation for the article: Strickland, Mary K., et al. "How has the concept of resilience been applied in research across forest regions?." *Frontiers in Ecology and the Environment* 22.3 (2024).

- 1-paragraph summary: Strickland et al. (2024) review how the notion of “resilience” is operationalized, measured, and applied in forest ecosystems across diverse regions under ecological change. They compile and synthesize empirical studies that explicitly frame forest dynamics through resilience lenses — including recovery after disturbances, resistance to shocks, regime shifts, and thresholds. They examine methodological approaches (e.g. remote sensing, field surveys, modelling), the spatial and temporal scales at which resilience is studied, and how conceptual clarity (or lack thereof) about resilience affects interpretations. They also identify gaps, such as limited cross-scale integration, inconsistent definitions, and underutilization of mechanistic or predictive resilience frameworks, urging more rigorous standardization and bridging between theory and empirical work.
- What information does this source contribute to your research question? This source helps in clarifying how resilience is conceptualized in ecological (forest) settings, which is relevant if your research question involves ecosystem resilience, adaptation, or the stability of natural systems under stress (e.g. climate change, land use change). It offers a meta-perspective, showing how resilience is measured (e.g., via return times, resistance, variability) and where methodological weaknesses or disagreements lie. Thus, it can help you adopt or critique resilience metrics in your own empirical work or interpret others’ resilience-related results.
- How does the source relate to other sources in your bibliography? Compared to empirical case studies, this review offers a higher-level, synthetic perspective. If your bibliography includes other forest or ecosystem resilience studies, this work serves as a “bridge” that contextualizes the specific methods or definitions those cases use. It may contrast with more narrowly focused research (e.g. a study on forest recovery in a particular region), by highlighting general trends and methodological issues. It complements biodiverse / health-oriented sources by offering insight into how ecological systems endure or shift, which underpins the stability of ecosystem services (which may connect to human health or well-being).
- What are the strengths and weaknesses of the source? A major strength of this source is that it combines information from many regions, giving a wide perspective on how resilience is studied. It is also valuable because it clearly identifies the confusion around definitions and encourages consistency in future research. However, one weakness is that it does not go into detail about individual species or mechanisms, since it focuses on many studies at once. Another limitation is that it centers mainly on forests, so the findings might not fully apply to urban or aquatic systems.
- How does the source fit into your research topic? Why is it useful? If your topic involves interactions between ecosystems and human well-being (e.g. how resilient ecosystems support health, or how land use change affects both ecological resilience and human outcomes), this source is useful at the conceptual and methodological level. It helps you (i) choose or critique resilience metrics, (ii) avoid conceptual confusion (what “resilience” means in different contexts), and (iii) situate empirical findings about ecosystem change within broader resilience discourse. Even if your focal system is not a forest, the insights about resilience theory and measurement are transferable or can be adapted.

**Review Paper 4**

- Team member evaluation: Aiden Martinez
- Citation for the article

  Aronson, M. F. J., Lepczyk, C. A., Evans, K. L., Goddard, M. A., Lerman, S. B., MacIvor, J. S., Nilon, C. H., Spotswood, E. N., & Warren, P. S. (2023). Urban biodiversity and ecological networks: Perspectives and tools for understanding cities as ecological systems. *People and Nature, 5*(4), 1010–1025. https://doi.org/10.1002/pan3.10604

- 1-paragraph summary:

  This article looks at human tolerance for animals within urbanized environments. Their research was conducted within Atlanta, Georgia where researchers conducted a survey to gather data related to the interactions between people within the city and their relationship with animal species. The article places an emphasis on the human aspect of human-wildlife interactions. There findings were that most people were tolerant towards more common animal species, such as raccoons, opossums, squirls, etc. However, they were apprehensive when presented with snake species, bobcats, and coyotes.
- What information does this source contribute to your research question?

  The information seen within this article is critical to forming a  understanding of the levels of acceptance urban settings have when referring to animals; with some animal species being favored over others. With this research, we can better understand how to address our research topic and avoid potential issues that may arise from introduced native species.
- How does the source relate to other sources in your bibliography?

  This source is focused on human acceptance of animal species, focusing on a sociological perspective over a biological and ecology focused strategy, With that, this article is uniquely beneficial as it provides a unique perspective on this topic.
- What are the strengths and weaknesses of the source?

  One of the main strengths of the article is that the article is recent, as it was published in 2024. Due to the nature of the article, the recency of it is incredibly important as it is a direct reflection on current opinions on ecology within urban communities. One of the weaknesses of the article is the lack of citations, as the paper has only been cited 3 times. However, as previously mentioned the article is relatively new, so this may explain the lack of citations.
- How does the source fit into your research topic? Why is it useful?

  The source fits into our research as it directly states the opinions urban populations have when referring to animal species. It discusses not only the “what”, but also the “why” when discussing these opinions. Due to this, we can utilize this research to

narrow down the scope of our project, producing a better outcome through our work.

**Research Paper 1**

- Team member evaluation: Lindell Blount
- Citation for the article: Schmit, J. P., & Johnson, L. R. (2025). *The influence of urban and agricultural landscape contexts on forest diversity and structure across ecoregions*. *Ecosphere*.
  This research looked at forest patches near cities like Chicago and New York. The authors studied over 3,000 forest plots to see how the number of nearby buildings or farmland changed the health of the trees. Forests surrounded by other trees had more native species and healthier growth. Forests near cities or farms had more non-native trees and fewer healthy, large trees. This shows how urban areas affect the health of forests. Since forests are homes for many animals, this helps explain how city growth affects both plants and animals. This connects to *Environmental contamination predicts mammal diversity and mesocarnivore activity in the Seattle-Tacoma metro area*. *Urban Ecosystems* by focusing on the plants that animals depend on. Together, they show how both pollution and loss of natural land affect environmental health. One strength of this study is that it used data from many different areas, which makes the results more reliable. Another strength is that it measured many parts of forest health, like tree diversity and size. A weakness is that it focused only on forests in certain U.S. regions, so the results might not apply everywhere. This study is useful because it explains how changes to forests and plants in cities can harm environmental health and native animals.

**Research Paper 2**

- Team member evaluation: Lindell Blount
- Citation for the article: *Landscape connectivity and genetic structure of animal populations in urban ponds*. (2025). *Conservation Genetics*.
  This study looked at animals living in small ponds in Stockholm, Sweden. The scientists studied their DNA to see how connected the populations were. Animals that could not move far had lower genetic diversity, meaning they were less healthy. The more connected the ponds were, the healthier and more diverse the animal populations were. It shows that when urban areas are broken up by roads or buildings, native animals can't travel easily, which makes their population weaker. One strength of this study is that it used detailed genetic information to understand how connected or isolated the animal populations were. Another strength is that it compared several species, which made the results more meaningful. A weakness is that it only looked at pond animals in one city, so the findings might not apply to other kinds of animals or habitats. It helps explain that healthy urban environments need to stay connected so animals can move, breed, and stay strong.

**Research Paper 3**

- Team member evaluation: Eriel Johnson

- Citation for the article: Tarsitano, Elvira. "Interaction between the environment and animals in urban settings: integrated and participatory planning." *Environmental Management* 38.5 (2006): 799-809.
- 1-paragraph summary: This article explores how urban environments influence the relationships between humans, animals, and ecosystems. It argues that city planning usually focuses only on human needs and overlooks the ecological interactions that include wildlife and pets. The author calls for a more integrated and participatory approach to planning — one that accounts for animal populations, environmental health, and human well-being together. By using ecological planning tools and forecasting methods, the paper promotes viewing cities as shared ecosystems rather than just human spaces.
- What information does this source contribute to your research question? It provides an early framework for understanding how animal populations and environmental health are interconnected in urban areas, which supports the idea that cities function as living ecosystems rather than artificial environments
- How does the source relate to other sources in your bibliography? This article connects with the newer studies that show more specific biological or health-based effects of urbanization. While newer research looks at microbiomes or biodiversity directly, this one sets up the conceptual base for why these relationships matter in the first place.
- What are the strengths and weaknesses of the source? A key strength is that it was ahead of its time in pushing for animal-inclusive urban planning. It offers strong conceptual arguments and practical suggestions. Its main weakness is that it lacks modern data or molecular evidence — it's more theoretical than experimental
- How does the source fit into your research topic? Why is it useful? It helps frame my topic by showing that urban wildlife and environmental health should be studied together, not separately. It's useful because it gives historical context and supports my argument that cities must plan with ecological reciprocity in mind.

**Research Paper 4**

- Team member evaluation: Lindell Blount
- Citation for the article: Hentati, Y., Estien, C. O., Hawn, Z., et al. (2025). *Environmental contamination predicts mammal diversity and mesocarnivore activity in the Seattle-Tacoma metro area. Urban Ecosystems*

This study looked at how pollution affects wild mammals living in the Seattle-Tacoma area. The researchers used cameras at 74 spots to see how many kinds of mammals lived there and how often they appeared. They found that in areas with more pollution, there were fewer types of mammals, and the animals acted differently. Coyotes were seen less often, raccoons were seen more, and opossums stayed about the same. The study shows that pollution can hurt wildlife even in cities. This source shows that when the environment is unhealthy, native animals don't do as well. It supports the idea that environmental health and animal populations are connected. One strength of this study is that it used real field data from many locations, which makes the results more trustworthy. Another strength is that it looked at different animal species instead of just one. A weakness is that it only studied one city, so the results might be different in other places. This article is useful because it clearly shows how pollution affects native animals in urban areas.

**Science Communication Paper 1**

- Team member evaluation: Eriel Johnson
- Citation for the article: Dillard, Brian A., et al. "Humanization of wildlife gut microbiota in urban environments." *Elife* 11 (2022): e76381.
- 1-paragraph summary:
- What information does this source contribute to your research question?
- How does the source relate to other sources in your bibliography?
- What are the strengths and weaknesses of the source?
- How does the source fit into your research topic? Why is it useful?

**Science Communication Paper 2**

- Team member evaluation: Aiden Martinez
- Citation for the article:
- Aronson, M. F. J., Lepczyk, C. A., Evans, K. L., Goddard, M. A., Lerman, S. B., MacIvor, J. S., Nilon, C. H., Spotswood, E. N., & Warren, P. S. (2025). Urban biodiversity and ecological networks: Perspectives and tools for understanding cities as ecological systems. *CAB Reviews, 20*, Article 0028. https://doi.org/10.1079/cabireviews.2025.0028

- 1-paragraph summary:

  This article discusses a “One Health” approach to sustainability and conservation, utilizing a hub-and-spoke strategy of environmental health as opposed to the more common top down model. Focusing on the interactions between different stakeholders, this model positions humans, animals, and the environment as equal, promoting mutualism between the groups. This model has been shown to produce effective policy, however the social buy in is higher than the current model. This limiting factor is addressed in the article as a natural response to new perspectives, with the mistrust eroding over time.

- What information does this source contribute to your research question?

  The information contained in this source is beneficial to our research as it displays a challenge to the established model; displaying both the limitations of current strategy and the ways in which we can improve upon the current model. This contributes to our understanding of environmental health and anthropogenic relationships with organic life as well as areas in which to avoid wasting resources on.

- How does the source relate to other sources in your bibliography?

  This source relates to the previous sources as it provides an alternative model in which to view our research on. With respect to the previous articles, this perspective offers an alternative viewpoint on the topics mentioned within them, such as habitat fragmentation and human-animal tolerance rates.
- What are the strengths and weaknesses of the source?

  Some of the strengths of the source include the numerous infographics the authors included within the article. These infographics provide an easily accessible representation of the key points of their research and how the models different aspects relate to each other. One of the weaknesses of the source is that they do not outwardly state the current model and how their model is different, making some parts of the article to be hard to understand.
- How does the source fit into your research topic? Why is it useful?

  This source provides an alternative to our current understanding of the environmental health model and propagates mutualism, a beneficial model with respect to our research topic. This is useful because it provides a model on which to place our collected data into.