

Conceptual Framework

Therapeutic Landscapes

What are the theories/elements associated with therapeutic landscapes?

Personal Gardens

Only accessible by owners of property

Therapeutic Landscape Theories/Elements

- Prospect Refuge
- Ulrich's Stress Reduction
- Attention Restoration
- Water

Healthcare Facilities

Have to be sick to be admitted to utilize space

Private

Select individuals can only use space

How do we engage with a therapeutic landscape?

Public

Space is open to everyone

What are the drawbacks to public landscapes?

Have to share space with others possibly hindering benefits or healing and improving overall well-being

Not all public landscape has therapeutic elements

Research Question:

Does a personal landscape within a public therapeutic landscape improve the overall well-being of the user?

Hypothesis:

There will be an improvement in a person's well-being when they are able to have a personal setting within a public therapeutic landscape.

Therapeutic landscapes are believed to possess healing elements for people that experienced the space. These places have attained a reputation for achieving physical, mental, and spiritual healing. (Gesler, 1993)

Through research, I found that there is a vast opportunity to study the benefits of public therapeutic landscapes.

PUBLIC THERAPEUTIC LANDSCAPES: CAN A PERSONAL LANDSCAPE IMPROVE OVERALL WELLBEING OF THE USER?

By Jordan Livingston

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INITIAL QUESTIONS

- What is a public landscape?
- What is a therapeutic landscape and what benefits can they possess? Why is this important?
- What are the characteristics or design considerations to creating a therapeutic landscape?

WELL-BEING

- (1561) With reference to a person or community: the state of being healthy, happy, or prosperous; physical, psychological, or moral welfare. (Oxford English Dictionary)
 - Physically healthy
 - Emotionally happy
 - Healthy balance of stress

PERSONAL

- (1387) Of, relating to, concerning, or affecting a person as a private individual (rather than as a member of a group or the public, or in a public or professional capacity); individual, private; one's own. (Oxford English Dictionary)
- (1626) Affecting one's body; relating to one's physical safety or well-being. (Oxford English Dictionary)

WHAT IS A THERAPEUTIC LANDSCAPE?

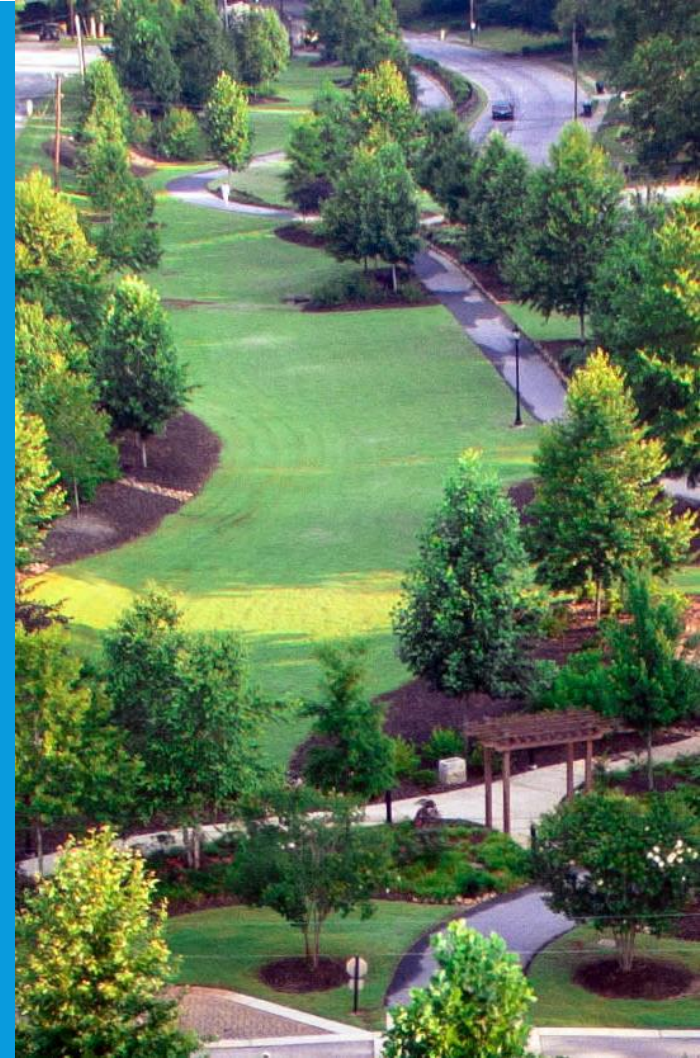
- Places which have attained an enduring reputation for achieving physical, mental, and spiritual healing. (Gesler, 1993)
- “Healing is multidimensional: meaning it includes physical, mental, spiritual, emotional, and social elements. Getting well is not limited to a physical cure.” (Gesler, 2003)

Why is this important?

- People need solutions other than conventional medicine for healing from sickness, stress, etc.
- All 50 states require landscape architects to earn a license to practice, ensuring that the designs **protect the health, safety, and welfare of all users**. (ASLA)

WHAT IS A PUBLIC LANDSCAPE

- A public landscape is a space that is open to the general public and designed to be used by everyone. (Bratcher, 2023)



ISSUES WITH PUBLIC LANDSCAPES

- Not all public landscapes, such as parks, have therapeutic elements
- If they do, the user still shares the space with others not allowing him/her to become fully vulnerable to allow for healing
 - This hinders the ability to relieve stress, decompress, relax, etc.
 - Can also create more stress if the shared experience is overall negative
- The more vulnerable you are in a therapeutic landscape, the more improved your overall well-being can be

STRESS

- **Everyone** has stress. Many people have an over abundance of it.
- Stress has many short-term consequences that left unchecked can evolve into long-term illness and disease



HISTORY OF THERAPEUTIC LANDSCAPES

- 400 BC – Greece with the use of natural springs.
- Early 1980s – Roger Ulrich found that patients that had views of nature from their room had shorter hospital stays along with an overall better mood when compared to patients with no view of nature.
- 1980s – Planetree model was developed focusing on creating a healing environment for patients.
- 1990s – Eden Alternative was created focused on emphasizing a home like environment for healing.



TODAY'S USE OF THERAPEUTIC LANDSCAPES

- Term only used in the healthcare facility landscape
- Meaning you must be “sick” to utilize these environments

Image sourced:
<https://www.cleanlink.com/news/article/Key-Factors-Driving-the-Healthcare-Facilities-Management-Market---29145>



THEORIES SURROUNDING THERAPEUTIC LANDSCAPES

- Prospect-Refuge Theory
- Stress Reduction Theory
- Attention Restoration Theory

PROSPECT-REFUGE THEORY

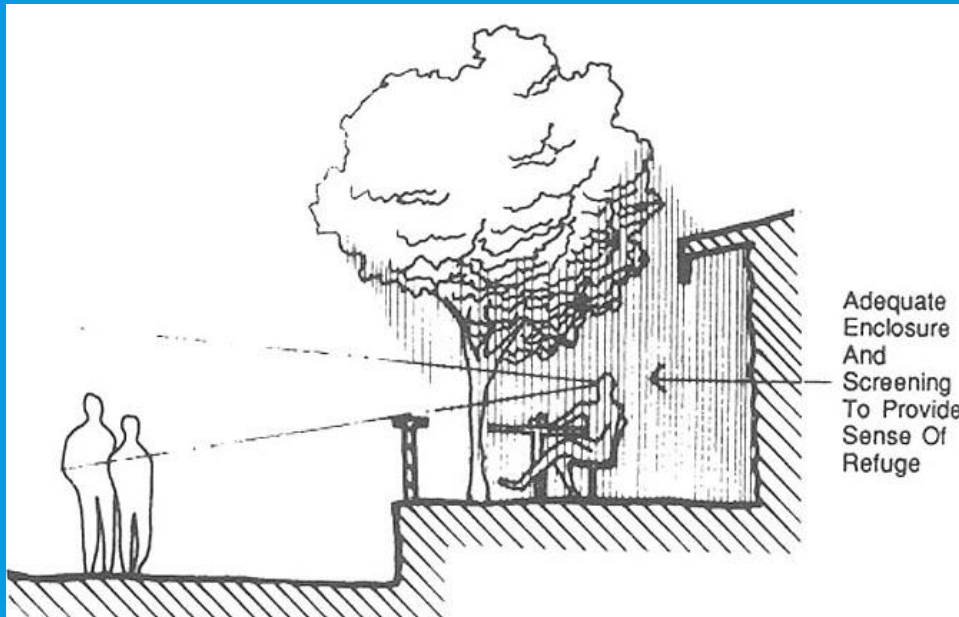


Image sourced:
<https://www.webpages.uidaho.edu/larc301/lectures/archAndSpace.htm>

- Even though people today are not constantly fighting for survival, they still inherently avoid environments, things, and situations that pose a threat to their survival.
- The ability to see the environment with a **clear view** (prospect) from a **safe position without being seen** (refuge) and without any potential danger is the most preferred choice.

STRESS REDUCTION THEORY



Image sourced: <https://www.pinterest.com/pin/landscaping-hospitals-six-things-to--740560732491412574/>

- Developed by Roger Ulrich
- Believed stress was the process of the body responding to environmental features that were challenging, demanding, or threatening to the well-being of a person.
- 4 components to stress reduction:
 - **Sense of control**
 - regaining control of one's actions
 - **Social support**
 - emotional or physical support
 - **Physical movement & exercise**
 - walking
 - **Positive natural distraction**
 - sense of escape

ATTENTION RESTORATION THEORY

- Prolonged directed attention leads to physical and mental fatigue → irritability, impatience, unhappiness, and even hostility.
- Indirect attention does not require effort leading to restoration
- Four characteristics of restorative environments:
 1. **Being away** – distance from source of stress
 2. **Extent** – The belief that someone is in a totally different place
 3. **Fascination** – captivates and holds one's attention within a space
 4. **Compatibility** – one's preferences match with the environmental circumstances present



ATTENTION RESTORATION THEORY

- Four factors for design considerations of a restorative outdoor space:
 1. **Coherence** – orderly and structured into clear areas where people can easily interpret the site
 2. **Complexity** – many opportunities for sensory engagement
 3. **Legibility** – one or more memorable features that help someone remember the place
 4. **Mystery** – someone feels compelled to explore and discover different parts or elements of the space

Image sourced: <https://workjournal.org/news-blog/dr-amy-wagenfeld-nurture-through-nature-attention-restoration-theory-natural-antidote>



WATER

- Within literature, water is considered to hold the strongest healing properties because not only does it cleanse the body, but it also is believed to cleanse the soul (Gesler, 2003).
- Most important element for human survival.



WHERE THE RESEARCH ENDS

- All previous research has looked at therapeutic landscapes/healing gardens in healthcare settings.
- These spaces are being shared by others not giving someone the ability to completely be vulnerable/be themselves because they are always being watched.



RESEARCH QUESTION

- Does a personal landscape within a public therapeutic landscape improve the overall well-being of the user?
- Hypothesis: There will be an improvement in a person's well-being when they are able to have a personal setting within a public therapeutic landscape.

METHODOLOGY

- Identify a public landscape that possesses therapeutic design elements
 - Needs to **show evidence** of areas compliant with the **prospect-refuge theory, attention restoration theory**, and must contain the element of **water**

ADAPTABLE STRATEGIES

- Once a site is identified, conduct a **quasi-experimental design** to test the hypothesis
- Identify a test group that indicates signs of stress by having them take a stress survey (Perceived Stress Scale)
- Have two groups of test subjects: 1) individuals get to experience the therapeutic landscape by themselves 2) individuals get to experience the therapeutic landscape with others
- Experiment duration: 20 minutes
- Have individuals of both groups fill out a survey (Perceived Restorativeness Scale) that focuses on how the landscape affected their overall well-being

SIGNIFICANCE

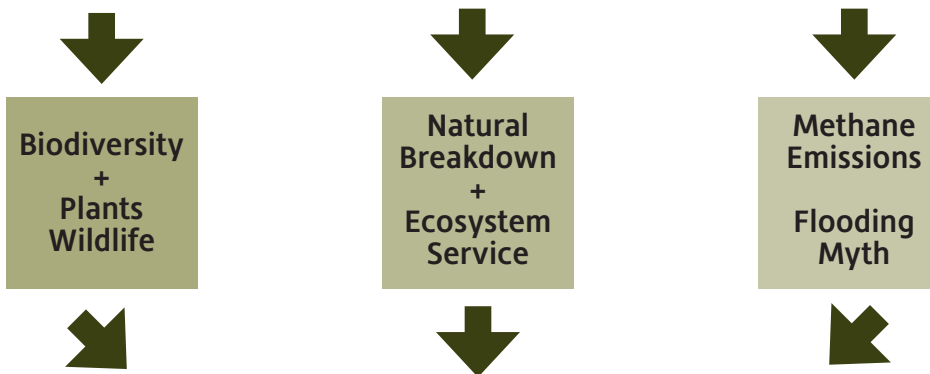
- Analyze the Data
 - Observe if there is a correlation between the test subjects in group 1 with a higher overall score on the PRS. Inversely, observe if the test subjects in group 2 have a lower overall score on the PRS.
 - Compare the PRS scores with the PSS scores of each group respectively to see if there is a trend

LITERATURE CITED

- Bratcher. (2023, March 7). What is Public Landscape?. Verde Landscape. <https://verdelandscape.org/what-is-a-public-landscape/>
- Landscape architecture - your environment. designed. (n.d.). <https://www.asla.org/design/index.html#mainnav>
- Gesler, W M. (1993). Therapeutic landscapes: Theory and a case study of Epidauros, Greece. *Environment and Planning D: Society and Space*, 11(2), 171–189. <https://doi.org/10.1068/d110171>
- “personal, adj., sense 1.1.a”. *Oxford English Dictionary*, Oxford University Press, September 2023,
- Well-being, N. meanings, etymology and more | oxford english dictionary. (n.d.). https://www.oed.com/dictionary/well-being_n
- Gesler, W. M. (2003). *Healing places*. Rowman & Littlefield Publ.
- Jiang, S. (n.d.). Encouraging engagement with therapeutic landscapes: Using transparent spaces to optimize stress reduction in Urban Health Facilities. TigerPrints. https://tigerprints.clemson.edu/all_dissertations/1495/
- Marcus, C. C., & Sachs, N. A. (2014). *Therapeutic landscapes: An evidence-based approach to designing healing gardens and restorative outdoor spaces*. Wiley.
- Grove, B., & Prapavessis, H. (1992). Preliminary evidence for the reliability and validity of an abbreviated Profile of Mood States. *International Journal of Sport Psychology*, 23, 93-109.
- Cohen, S. and Williamson, G. Perceived Stress in a Probability Sample of the United States. Spacapan, S. and Oskamp, S. (Eds.) *The Social Psychology of Health*. Newbury Park, CA: Sage, 1988.

CONCEPTUAL FRAMEWORK

FRESHWATER WETLANDS



- Hammer, D.A. (2020)
- Klein, et. al, (2014)

- Scholz, M. (2006)
- Stanely, et. al, (2022)

Freshwater Wetlands are an incredibly biodiverse and meaningful ecosystem for plants and animals in SC.

Incredibly, these wetlands can act as a filtration system for water, using microbial organisms underwater to break down and allow for absorption of pollutant materials.

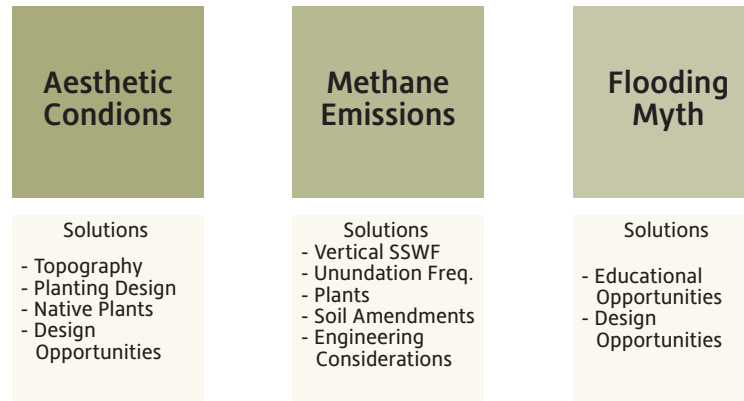
It is my belief that these ecosystems could be a natural alternative to traditional stormwater treatment.

In my research, I uncovered evidence of the wetlands ability to filter water and the negative side affects to these processes.

Methane emissions is a serious problem of wetlands, and there have been several methodologies to mitigating these effects in constructed wetlands.

Is it possible to take these methodolgies and design these constructed wetlands with aesthetic considerations to make them more palatable for their implementation in urban environments?

PROBLEMS:



- Zhang, et. al, (2017)
- Wu, et. al, (2017)
- Mander, et. al, (2014)

- Li, et. al, (2023)
- Lee, et. al, (2006)
- Brix, et. al, (1998)

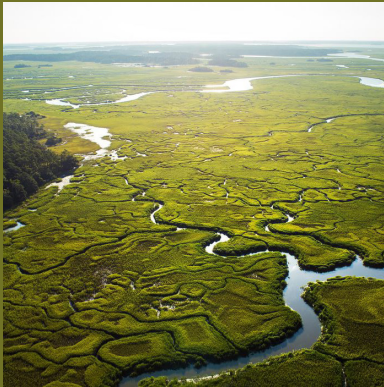
RESEARCH:

- **Hypothesis:** Constructed Wetlands can treat stormwater runoff in urban environments while providing both an ecological and aesthetic function.
- **Question:** Can we design constructed wetlands to have both an aesthetic and ecological function?

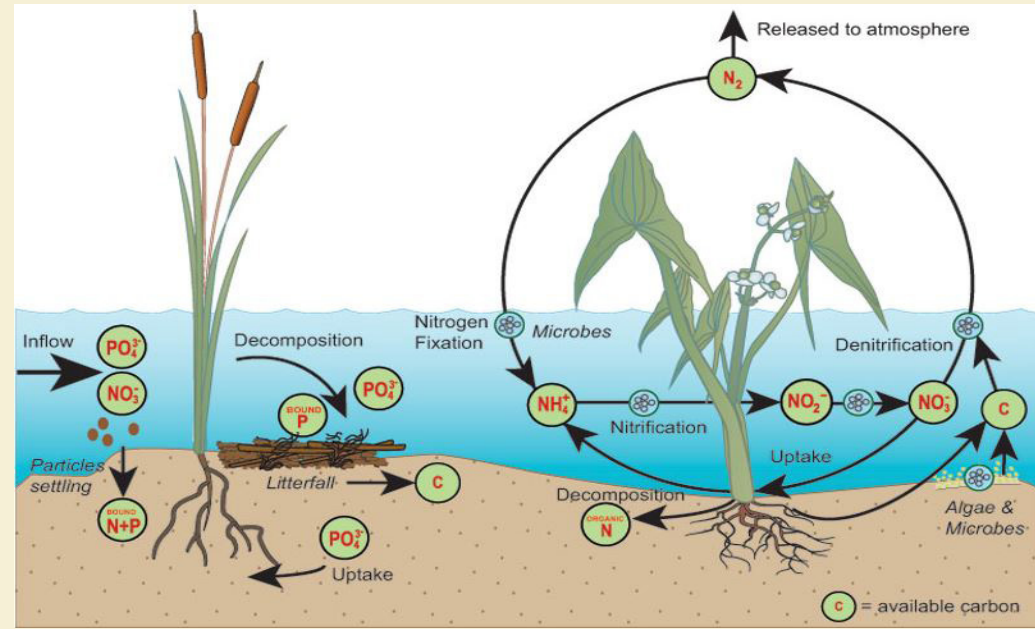
Michael Tyler
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Dr. Hyejung Chang

URBAN WETLANDS FOR POLLUTED RUNOFF TREATMENT





CAN WE USE WETLANDS IN URBAN ENVIRONMENTS TO TREAT STORMWATER RUNOFF?



- Freshwater Wetlands are the most productive natural resource in South Carolina (SCDNR).
- Freshwater Wetlands are the most biodiverse ecosystem in South Carolina. (SCDNR)
- Wetlands are capable of breaking down heavy metals and common pollutants found in stormwater. (Scholz, M. 2006)
- Oxygen released in the rhizosphere of plants in wetlands allow microbes to live in the astronomical surface area within the wetland. (Scholz, M. 2006)
- These microbes are capable of breaking down heavy metals and pollutants into plant available forms that are removed from the water. (Stanley, et. al, 2022)

SOURCES

- Hammer, D.A. (2020)
- Klein, et. al, (2014)

ARE ARTIFICIAL OR MAN-MADE WETLANDS AS EFFECTIVE AT TREATING RUNOFF?

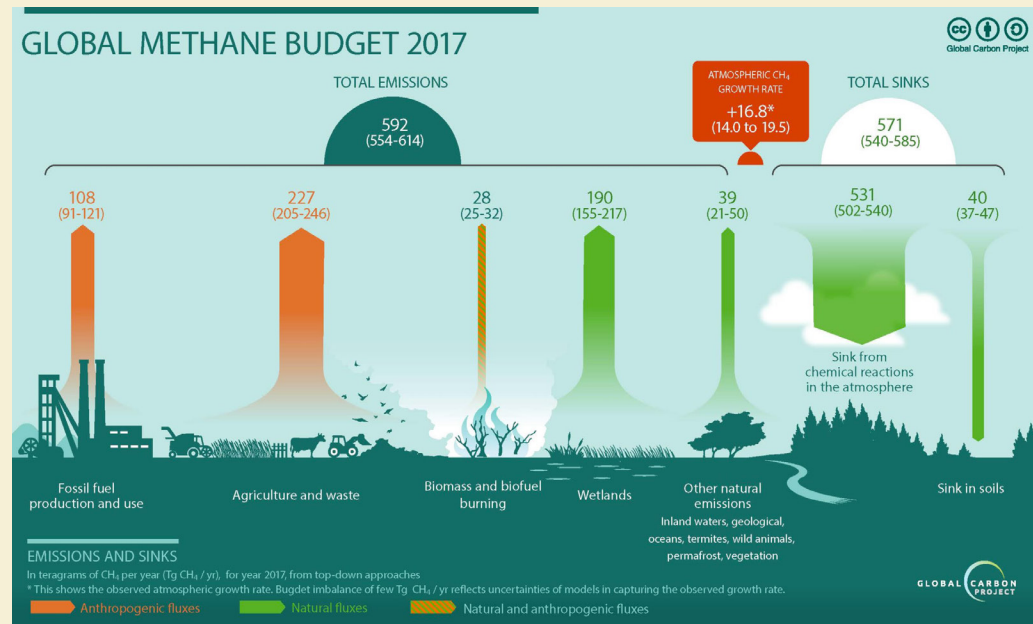


- Constructed Wetlands (CWs) as a means to treat stormwater and wastewater were developed by engineers in the mid-twentieth century.
- Constructed Wetlands are still capable of treating polluted water even though they are artificially created. (Hammer, D.A. 2020)
- The design and implementation of constructed wetlands has a significant impact on the effectiveness of the wetland to remove heavy metals and pollutants from the water. (Klein, et. al, 2014)
- What design considerations are necessary to make these wetlands aesthetically pleasing to be used in high traffic areas?

SOURCES

- Zhang, et. al, (2017)
- Wu, et. al, (2017)
- Mander, et. al, (2014)

WHAT ARE THE POTENTIAL DRAWBACKS OF USING WETLANDS FOR URBAN RUNOFF?

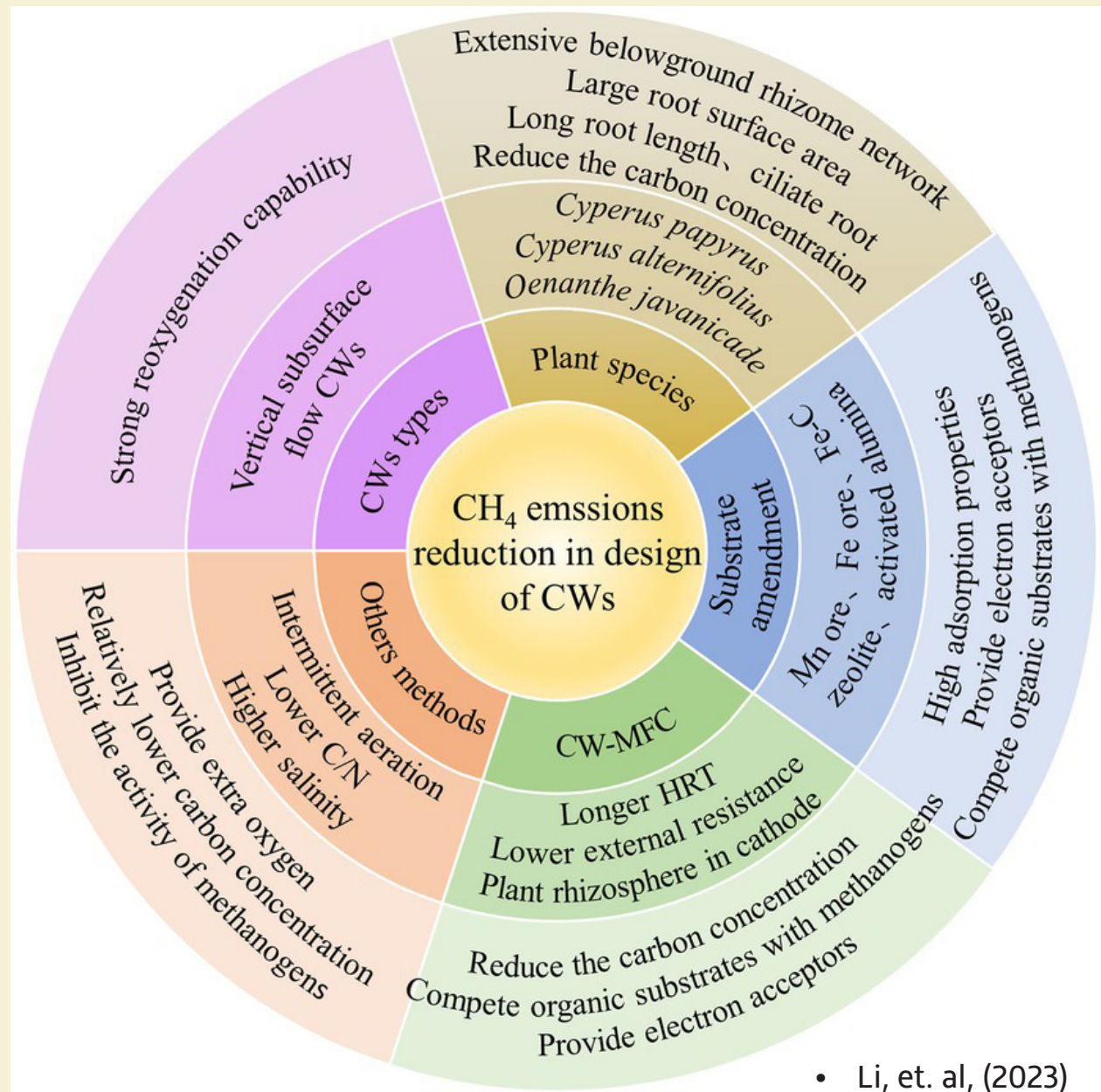


- The anaerobic processes that the microbes use to break down these pollutants produce both methane and nitrous oxide.
- Methane is a significant source of carbon emissions feedback that contributes to global warming.
- According to recent studies, boreal wetland methane emissions will continue to grow to become the largest natural source of methane emissions (Zhang, et. al, 2017).
- There have been several strategies developed to diminish the methane production in constructed wetlands (Li, et. al, 2023).

SOURCES

- Li, et. al, (2023)
- Lee, et. al, (2006)
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WHAT ARE THE STRATEGIES FOR REDUCING METHANE EMISSIONS IN WETLANDS?

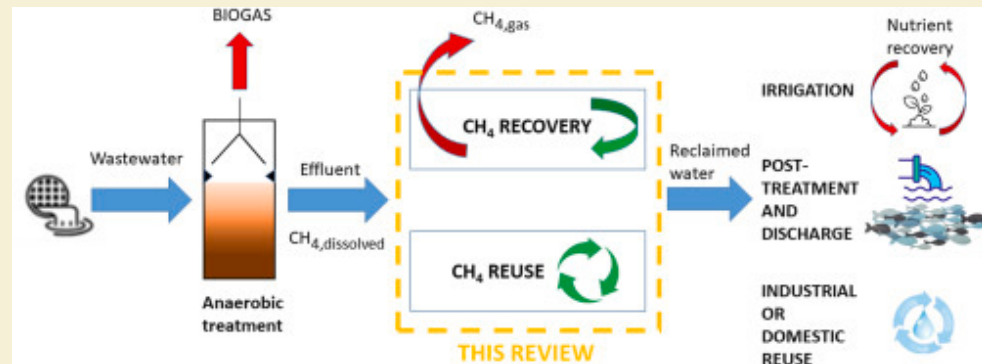


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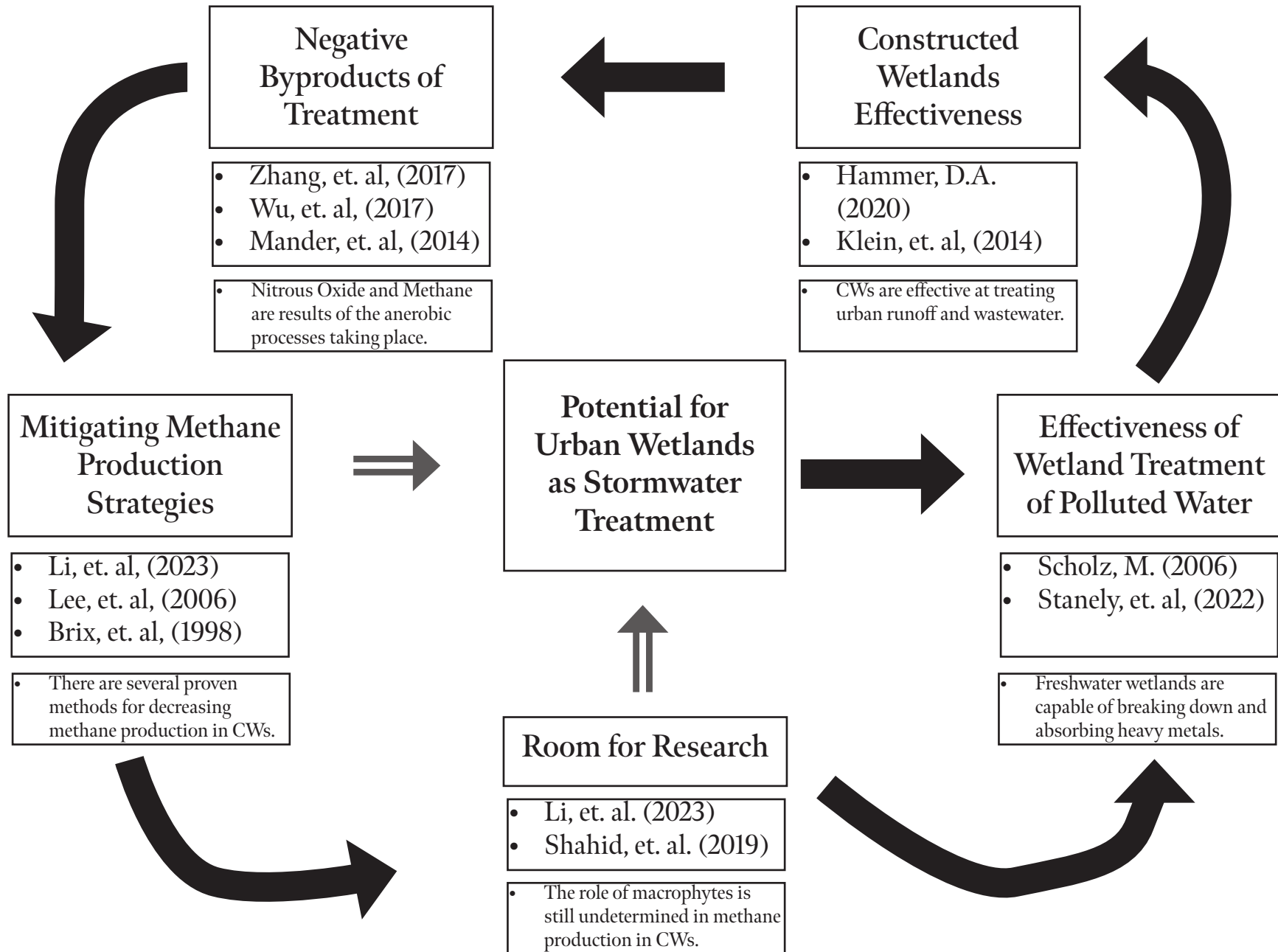
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WHAT ARE THE STRATEGIES FOR REDUCING METHANE EMISSIONS IN WETLANDS?



MITIGATION TECHNIQUES

- Vertical Flow Wetlands vs. Horizontal Flow
- Substrate Ammendments
- Seasonal Flooding and Inundation
- Different Plant Species





ROOM FOR RESEARCH

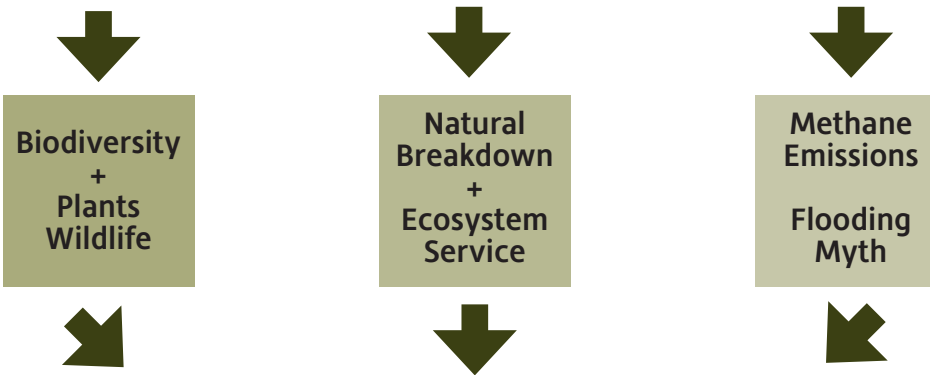
- Role of individual plant species on the reduction of methane emissions in constructed wetlands.
- Impact of stormwater on flora and fauna within the constructed wetlands.
- Design considerations to increase aesthetic function for high traffic areas in urban environments.

QUESTIONS

- What native plant species are most effective at treating common urban runoff pollutants?
- What native plant species reduce methane emissions in constructed wetlands?
- What design considerations could make constructed wetlands feasible in urban conditions?

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PROBLEMS:

Aesthetic Condions

Solutions

- Topography
- Planting Design
- Native Plants
- Design Opportunities

Methane Emissions

Solutions

- Vertical SSWF
- Unundation Freq.
- Plants
- Soil Amendments
- Engineering Considerations

Flooding Myth

Solutions

- Educational Opportunities
- Design Opportunities

- Zhang, et. al, (2017)
- Wu, et. al, (2017)
- Mander, et. al, (2014)

- Li, et. al, (2023)
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RESEARCH:

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RESEARCH STRATEGIES

POSITIVISM: EXPERIMENTAL

- Using Methane Mitigation Strategies in design of prototypical constructed wetland.
- Designing a prototypical constructed wetland with aesthetic design considerations.
- Testing methane emissions and comparing with engineered constructed wetlands and traditional retention ponds.

POST-POSITIVISM: CASE STUDY

- Developing and refining theory surrounding the use of constructed wetlands within urban areas.
- Studying the methane emissions, flooding contributions, and effects of stormwater on flora and fauna in existing constructed wetlands.
- Developing a methodology for the implementation of constructed wetlands in urban areas.

CONCLUSION

THE SIGNIFICANCE

THE GOAL

Imagine cities where urban stormwater was not only moved away and treated, but contributing to a bustling and thriving ecosystem in the midst of an urban environment.



Imagine the opportunities for wildlife and education that these unique and powerful ecosystems can create. Imagine the noises, smells, sights, and general feeling this could bring.

[illegible]

What can nature teach us? How to act - to react? How to be still?

Nature Reintegration: How ecological urban design reunites us with nature

A Literature Review
LARC 8210 – Research
Methods, Fall 2023
Elizabeth Pruden



Table of Contents

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- V. Research Strategies
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My area of interest is **urban ecology**: how biodiversity in urban areas can spark and strengthen a sense of citizenship in the natural world.



Goal

EVERYBODY APPRECIATES BUGS AND STOPS USING BROAD-SPECTRUM PESTICIDES

Design biodiverse landscapes that reinforce or generate feelings of awe, love, connection, and relatedness in users and subsequently increase the number of persons experiencing biophilia and exhibiting pro-ecological behaviors.

Hypothesis

Biodiverse landscapes positively affect user's sense of self in nature, connectedness, and likelihood of involvement in conservation or restoration behavior.





Purpose

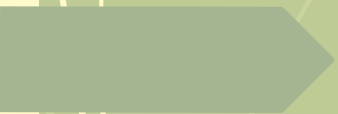
Identify where my hypothesis fits into existing body of knowledge and whether my research direction is valuable.

Rationale

My hypothesis makes several assumptions, fundamental concepts which will make it testable or fail it from the start.

- ❖ Urban environments can be ecologically rich
- ❖ Biodiversity benefits experiences
- ❖ Feeling as part of nature (citizenship) corresponds with pro-ecological behavior

Introduction



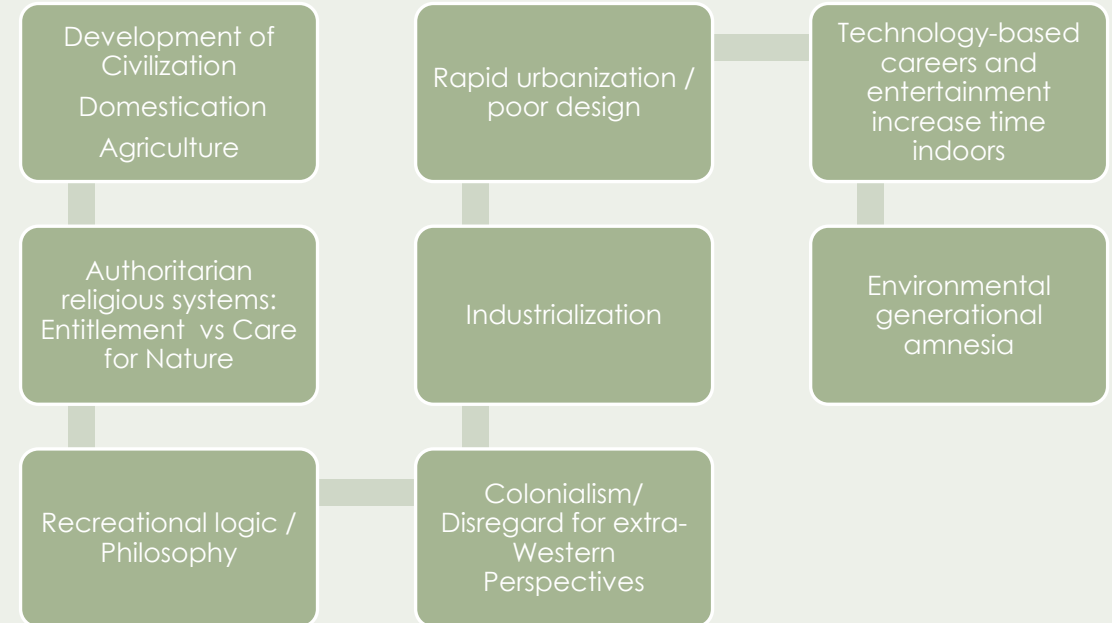


Biophilia Hypothesis

- ❖ Biophilia” of the Greek root, “bio” meaning life and “philia” meaning affection.
- ❖ First used to describe the relationship between humans and non-human nature by E.O. Wilson (1984)
- ❖ Wilson might have done better to say bio + sophy, or knowledge and acquaintance with the living world, which would more clearly include phobias.
- ❖ Biophilic design, meanwhile, alludes to nature in adoption of organic forms and material – the inanimate – the *biomorphic*.

Extinction of Experience

- ❖ Is the phenomenon of the correlational rise in biophobia with decreased exposure to wild areas.
- ❖ Social/Cultural factors which have led us here are well-illustrated by Zylstra et al. (2014)
- ❖ “it is necessary for us to retain a rich matrix of local wildlife habitats nearby” (Pyle, 2016)
- ❖ Wilderness cannot only be places that people must travel to view; they must understand that even their neighborhoods are opportunities to interact with nature (Miller & Hobbs, 2002)



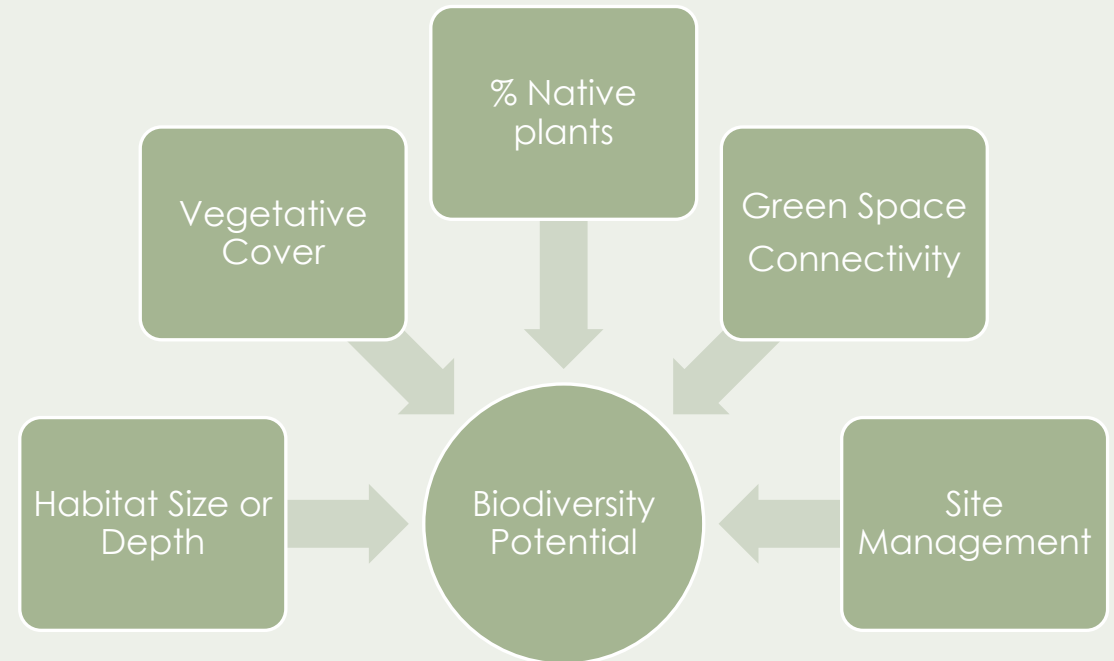
Graphic adopted from selection of table 1 of Zylstra et al. (2014),
“Types and drivers of the human (Eurocentric/Western) disconnect from nature”



Urban Biodiversity Potential: Urban Habitat

Urban Habitat

- ❖ Huge variety in island size, vegetative cover, and taxonomic and genetic diversity (Threlfall, 2018)
- ❖ More vegetation = more potential biodiversity, especially for small, highly mobile organisms (Tzoulas, 2007)
- ❖ At least 70% of vegetation should be native to support insectivorous bird populations (Narango et al., 2018)
- ❖ Case studies show that areas already disturbed by human development still “contain elements of biodiversity that deserve attention from conservationists (Miller & Hobbs, 2002)



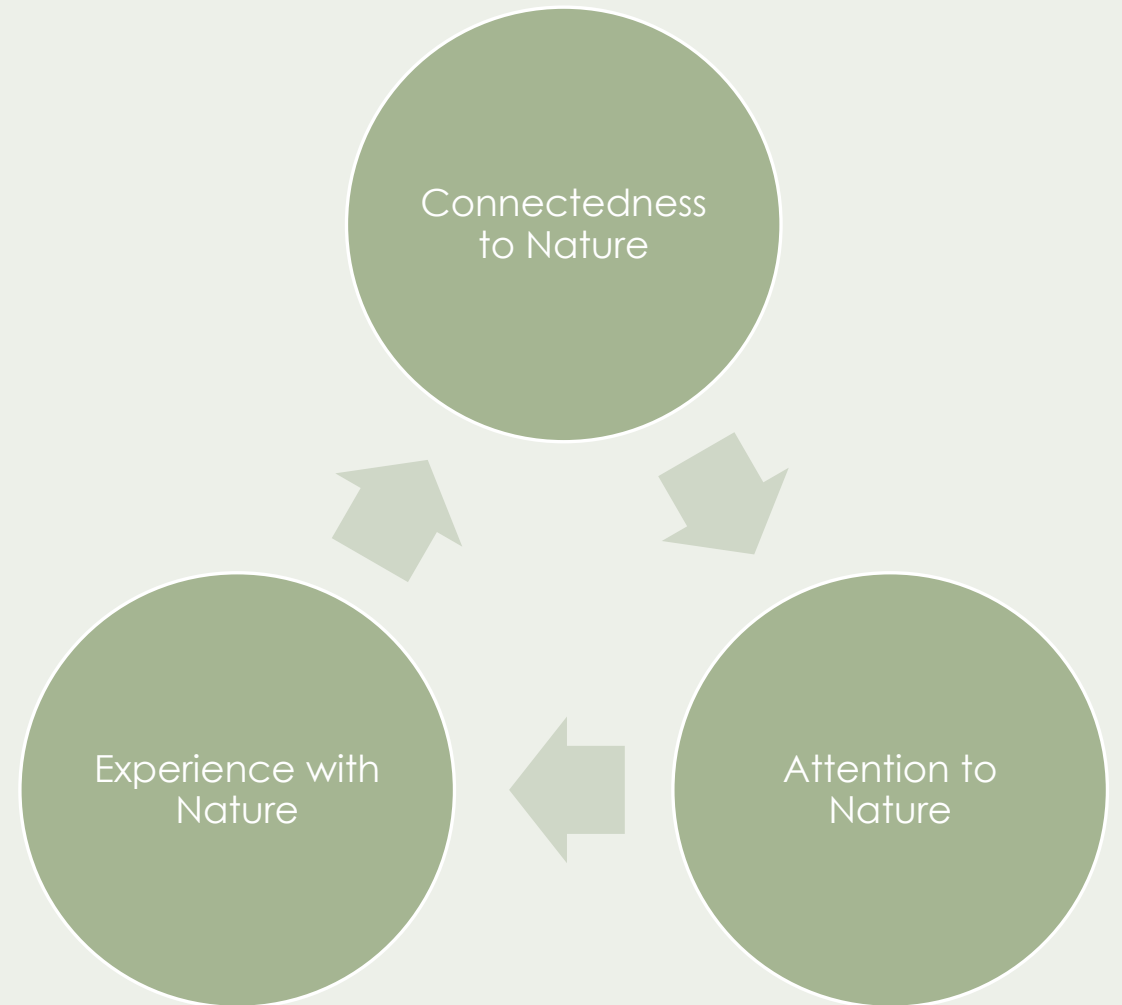


Landscape & User Experience:

Landscape Quality
User Quality

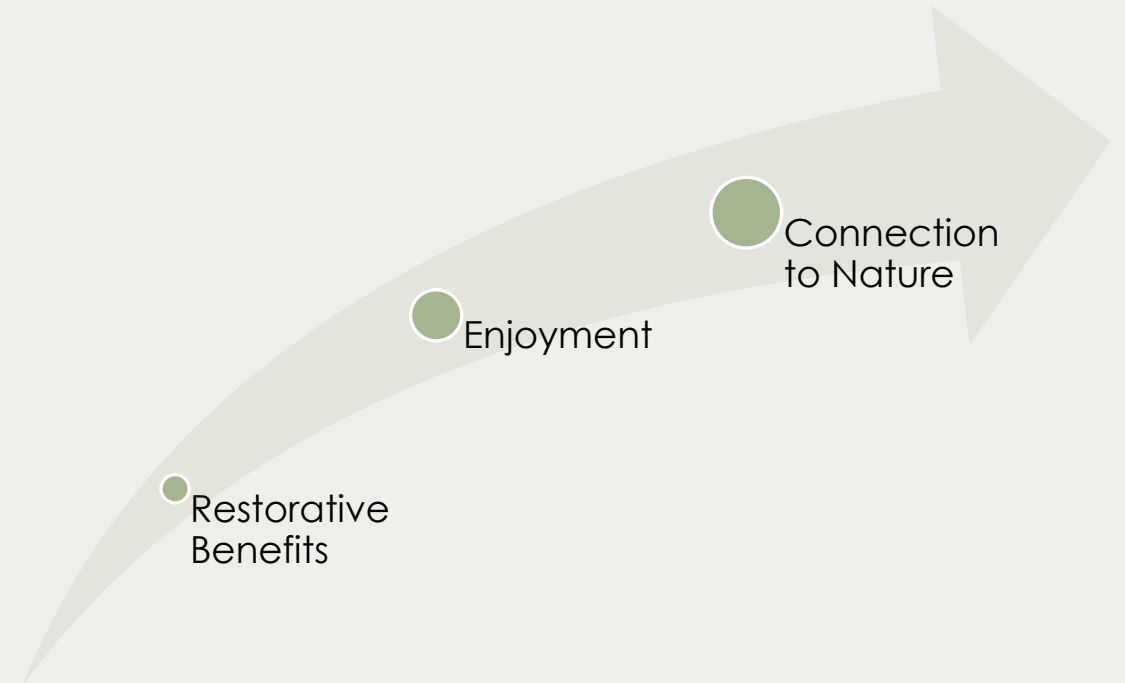
Becoming a Citizen of the Natural World

- ❖ Users with greater sense of belonging in nature reap more benefits, especially in more biodiverse areas (Berto et al., 2018, Totaforti, 2020))
- ❖ Liking nature is a self-supporting feedback with experiencing nature (Berto et al., 2018)
- ❖ Attention-engagement in nature is the best way to form a relationship, but even heavily-mediated experiences can build a sense of relating nature and self (Colleony et al., 2020, Colleony et al., 2017, Lengieza & Swim, 2021, Scott et al., 2014)



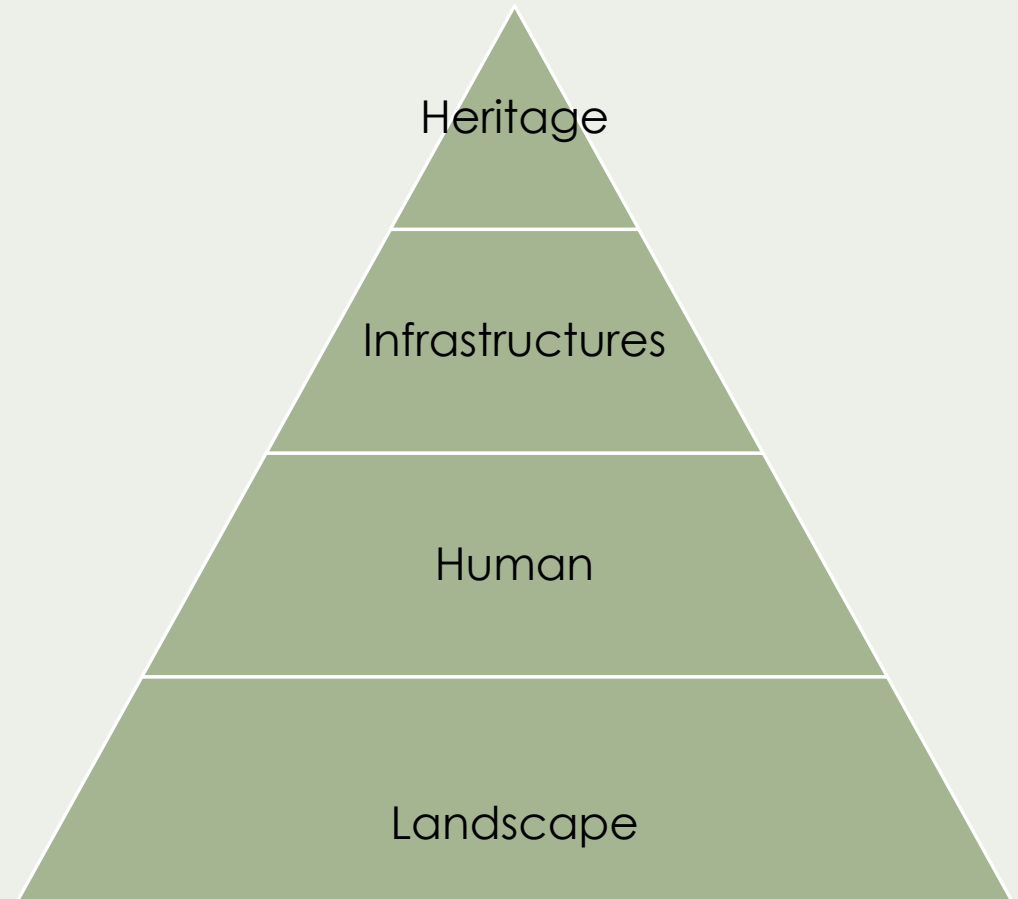
User Contribution to Experience

- ❖ Experience in natural spaces increases with biodiversity for all users (Berto et al., 2018; Cameron et al., 2020; Gunnarsson et al., 2016)
- ❖ Forests are more restorative than parks (Colleony et al, 2017)
- ❖ Users with a stronger connection to nature will get the most out of increased biodiversity, but suffer in low-diversity environments (Berto et al., 2018; Cameron et al., 2020)
- ❖ Users can identify more diverse landscapes on a comparative basis, but rarely independently (Colleony et al., 2017; Gunnarsson et al., 2016)
- ❖ intermediate structural diversity are most preferred. (Johansson et al., 2014)



Landscape Contribution to Experience

- ❖ Biophilic design increases perception of benefits to users. (Totaforti, 2020)
- ❖ Both nature-aligned and not nature-aligned users perceive more benefits from environments with higher biophilic quality. (Berto et al., 2018)
- ❖ Although childhood is often perceived as the 'best' window to connect with nature, it is far from the only time people are perceptive (Colleony et al., 2020; Lengieze et al., 2021)
- ❖ Perception and experience are reciprocal (Gunnarsson et al., 2016)



Adaptation of categories of influences on perception from Khalidi et al., 2022



Citizenship & Behaviors:

Measuring Orientation to Nature

How Citizenship Shapes Behavior

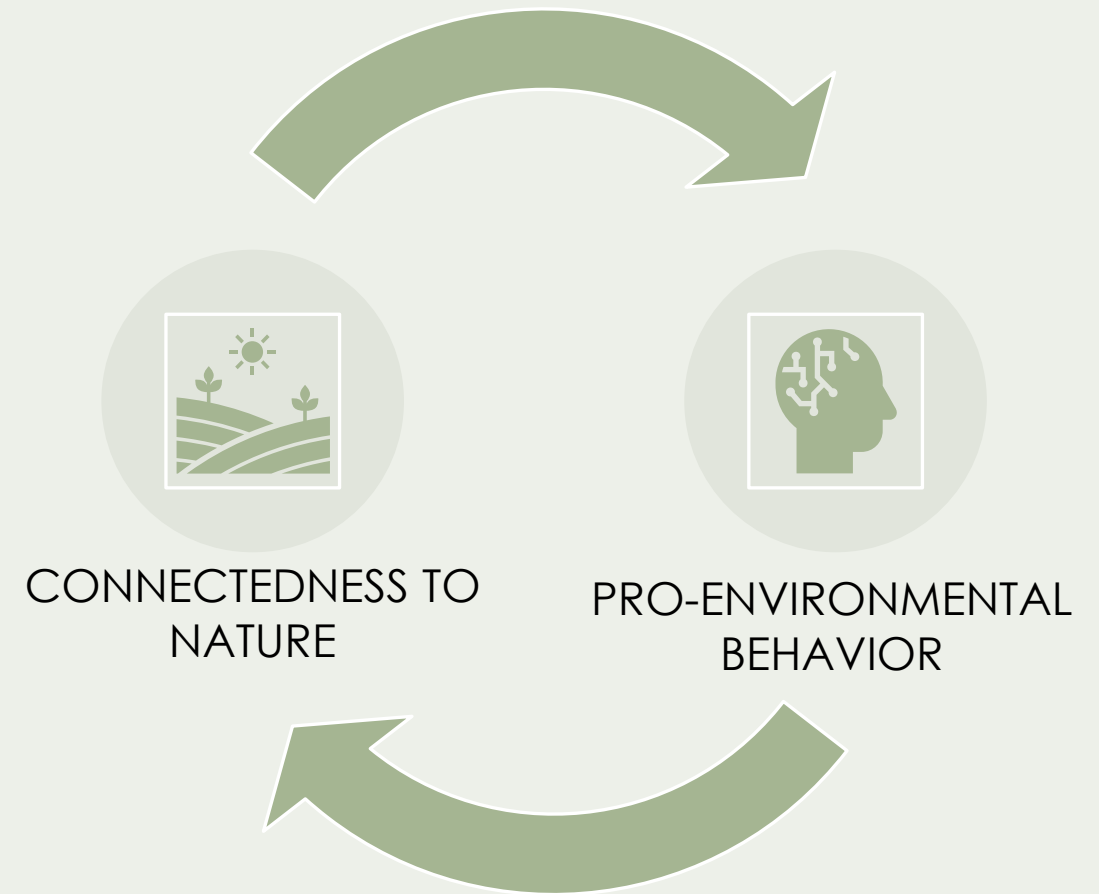


Measuring Orientation to Nature

- ❖ Many ways of interacting with nature, and many ways of relating
 - ❖ Surveys are statistically sound, measuring different facets of human-environment connection
 - ❖ Emotional
 - ❖ Cognitive
 - ❖ Participatory
 - ❖ Behavior
- New Ecological Paradigm (NEP)
 - Inclusion of Nature in Self (INS)
 - Connectedness to Nature Scale (CNS)
 - Nature Relatedness Scales (NR-6)
 - Love and Care for Nature (LCN)
 - GREEN Scale

How Citizenship Shapes Behavior

- ❖ Connectedness to Nature is a better indicator of pro-environmental behaviors than holding biospheric values (Martin & Czeller, 2017; Totaforti, 2020)
- ❖ Access to wilder/more diverse green space correlates to more ecological behaviors than very urban green space (Colleony et al., 2020)
- ❖ Awe-inspiring environments, high-quality nature, increase connectivity and cooperative, pro-environmental behavior (Yang et al., 2018)



Research Strategies:

Questions

Methodology



Our mindsets and hearts must be transformed.

Research Question

Which aspects of a natural(ized) landscape attract the most attention and engagement?

Increasing urban biodiversity is a matter of creating habitats, engagement means the habitat needs to be interesting to people as well so that humans have more opportunity to observe non-human organisms.

Bugs are so cool
- why so feared &
hated?



Essentially, which human-favored environments can be most effectively enriched?



Research Methodology

1

Questionnaires

Self-reported data is great for assessing how people feel, there's always risk of bias in the questionnaires and in reporting but efforts to mitigate make this worthwhile.

2

Interviews

Gains more in-depth responses and nuance, best paired with questionnaires/observation

3

Observation

This method has a high cost to conduct, but provides data which may be subconscious and not accessible through questionnaires or interviews.

4

Case Studies

Lowest cost due to having been performed already by someone else, but poor to nonexistent variable identification limits utility.

society through landscape architecture ? **If we can access a history. Losing connection to nature is losing these lessons, **effect? How to be still?****



Methodology



- ❖ Seek out case studies to form broad categories
- ❖ Identify patterns through questionnaires and interviews
- ❖ Apply isolated traits from prior research methods to an observational study

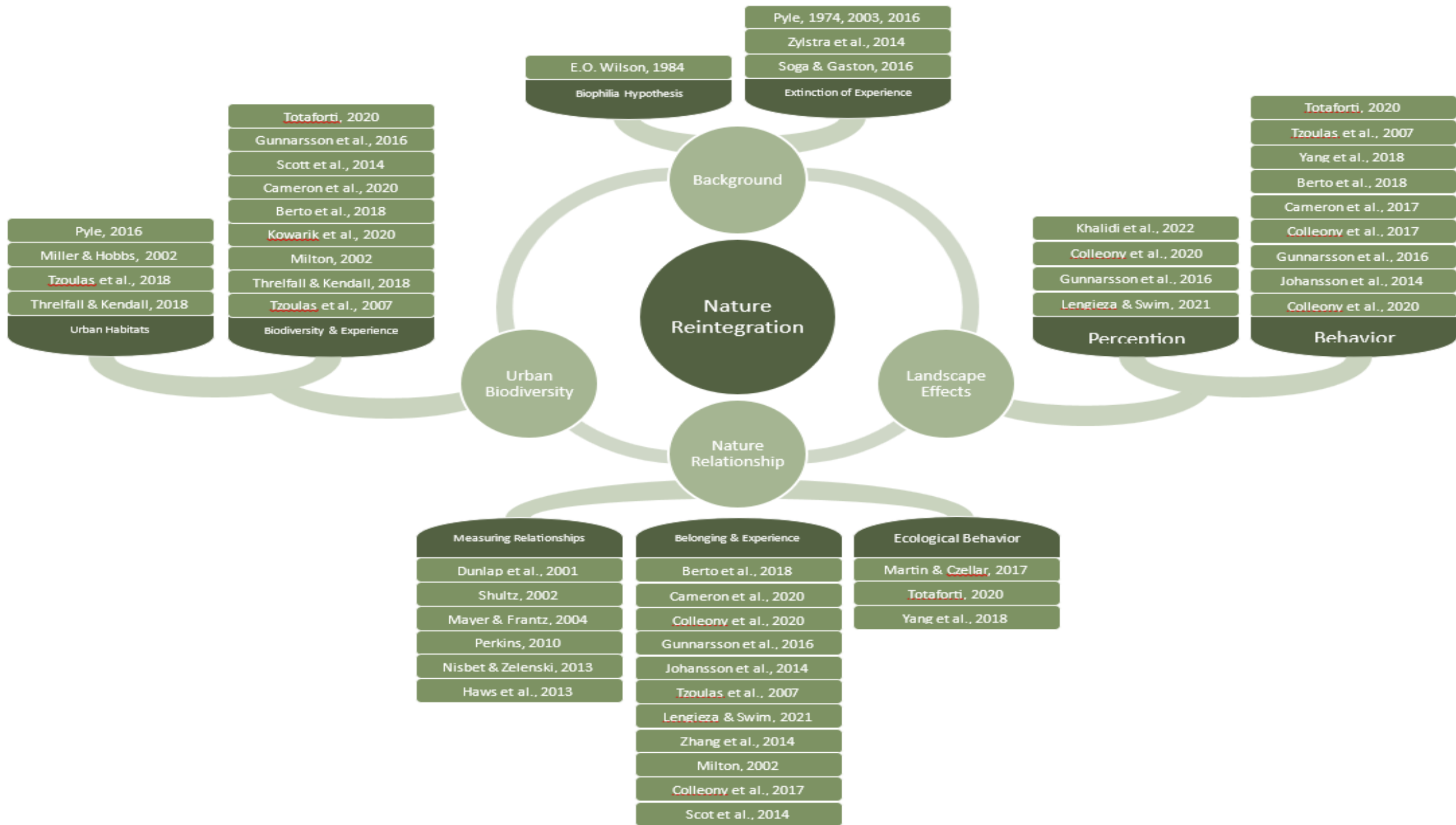
Graphics & References:

Literature Map

Conceptual Diagram

References





WHY DO WE ACCEPT FEAR AS JUSTIFICATION FOR VIOLENCE? When does it start? How do we stop it? Can we intentionally shape society through landscape architecture? **If we can accept fear without retaliation, if we can embrace discomfort - will we have peace?**

Is our social collapse predicated in the way we treat insects, **our first "other"** which frightens us? **What can nature teach us? How to act - to react? How to be still?**

What nature can show us about relationships is the balance which we desperately need. **landscape - the environment - has shaped us through history. Losing connection to nature is losing these lessons,**

we must reunite physically and emotionally with nature for the good of all life - contemporary biodiversity and human societies alike.

Topic

Ethics

Urban Ecology

Ecocentrism: priority of ecosystems over individual species



Goal

Enrich urban biodiversity to increase engagement with & love of nature

Lit review showed these are true

We are a small part of the world; **what a terrible choice to deny ourselves being part of it**

Environment impacts perception + behavior

+

Spending time in landscapes increases biophilia

+

Rich species diversity is possible in cities

Impact of landscape on perception + biophilia correlates to quality of environment, which is often shorthand for more biodiverse or naturalized

Research Question

Which aspects of a natural(ized) landscape attract the most attention and engagement?

Increasing urban biodiversity is a matter of creating habitats, engagement means the habitat needs to be interesting to people as well so that humans have more opportunity to observe non-human organisms.

Bugs are so cool - why so feared & hated?

Essentially, which human-favored environments can be most effectively enriched?



Research Methodology

1

Questionnaires

Self-reported data is great for assessing how people feel, there's always risk of bias in the questionnaires and in reporting but efforts to mitigate make this worthwhile.

2

Interviews

Gains more in-depth responses and nuance, best paired with questionnaires/observation

3

Observation

This method has a high cost to conduct, but provides data which may be subconscious and not accessible through questionnaires or interviews.

4

Case Studies

Lowest cost due to having been performed already by someone else, but poor to nonexistent variable identification limits utility.

Since humans want to distinguish themselves they should do so by acknowledging the responsibility that comes with having transformative power over the world

References

- Cameron, R.W.F., Brindley, P., Mears, M., McEwan, K., Ferguson, F., Sheffield, D., Jorgensen, A., Riley, J., Goodrick, J., Ballard, L., & Richardson, M. (2020). Where the wild things are! Do urban green spaces with greater avian biodiversity promote more positive emotions in humans? *Urban Ecosystems*, (23), 301-317. <https://doi.org/10.1007/s11252-020-00929-z>.
- Colléony, A., Cohen-Seffer, R., & Schwartz, A. (2020). Unpacking the Causes and Consequences of the Extinction of Experience. *Biological Conservation*, 251. <https://doi.org/10.1016/j.biocon.2020.108788>.
- Colléony, A., Prevot, A., & Jalme, M.S. (2017). What Kind of Landscape Management Can Counteract the Extinction of Experience? *Landscape and Urban Planning*, vol. 159, 23-31, <https://doi.org/10.1016/j.landurbplan.2016.11.010>.
- Gunnarsson, B., Knez, I., Hedblom, M., & Sang, A.O. (2016). Effects of Biodiversity and Environment-Related Attitude on Perception of Urban Green Space. *Urban Ecosystems*, 20 (1), 37-49, <https://doi.org/10.1007/s11252-016-0581-x>.
- Johansson, Gyllin, M., Witzell, J., & Küller, M. (2014). Does biological quality matter? Direct and reflected appraisal of biodiversity in temperate deciduous broad-leaf forest. *Urban Forestry & Urban Greening*, 13(1), 28-37. <https://doi.org/10.1016/j.ufug.2013.10.009>
- Khaledi, H.J., Khakzand, M., & Faizi, M. (2022). Landscape and Perception: A systematic review. *Landscape Online*, vol 97, 1098. <https://doi.org/10.3097/LO.2022.1098>.
- Kowarik, I., Fischer, L., & Kendal, D. (2020). Biodiversity Conservation and Sustainable Urban Development. *Sustainability (Basel, Switzerland)*, 12(12), 4964-. <https://doi.org/10.3390/su12124964>.
- Threlfall, C.G., & Kendal, D. (2018). *The Distinct Ecological and Social Roles That Wild Spaces Play in Urban Ecosystems*. *Urban Forestry & Urban Greening*, vol. 29, 348-356, <https://doi.org/10.1016/j.ufug.2017.05.012>.
- Martin, C., & Czellar, S. (2017). Where Do Biospheric Values Come From? A Connectedness to Nature Perspective. *Journal of Environmental Psychology*, 52, 56-68. <https://doi.org/10.1016/j.jenvp.2017.04.009>. Accessed 22 Oct. 2019.
- Miller, & Hobbs, R. J. (2002). Conservation Where People Live and Work. *Conservation Biology*, 16(2), 330-337. <https://doi.org/10.1046/j.1523-1739.2002.00420.x>
- Milton, K. (2002). *Loving Nature: Towards an Ecology of Emotion*
- Narango, D.L., Tallamy, D.W., & Marra, P.P. (2018). Nonnative plants reduce population growth of an insectivorous bird. *The Proceedings of the National Academy of Sciences*, 114, 11549-11554. www.pnas.org/cgi/doi/10.1073/pnas.1809259115
- Pyle, R. (2003). Nature matrix: reconnecting people and nature. *Oryx*, 37(2), 206-214. <https://doi.org/10.1017/S0030605303000383>.
- Ritchie, H., & Roser, M. (2018, June 13). *Urbanization*. Our World in Data. <https://ourworldindata.org/urbanization#citation>
- Scott, B.A., Amel, E.L., & Manning, C.M. (2014). In and of the Wilderness: Ecological Connection through Participation in Nature. *Ecopsychology*, 6(2), 81-91. <https://doi.org/10.1089/eco.2013.0104>.
- Totaforti, S. (2020). Emerging Biophilic Urbanism: The Value of the Human-Nature Relationship in the Urban Space. *Sustainability*, 12(13), 5487. <http://dx.doi.org/10.3390/su12135487>.
- Tzoulas, & James, P. (2010). Making biodiversity measures accessible to non-specialists: an innovative method for rapid assessment of urban biodiversity. *Urban Ecosystems*, 13(1), 113-127. <https://doi.org/10.1007/s11252-009-0107-x>
- Tzoulas, Korpela, K., Venn, S., Yli-Pelkonen, V., Kaźmierczak, A., Niemela, J., & James, P. (2007). Promoting ecosystem and human health in urban areas using Green Infrastructure: A literature review. *Landscape and Urban Planning*, 81(3), 167-178. <https://doi.org/10.1016/j.landurbplan.2007.02.001>
- Yang, Y., Hu, J., Jing, F., & Nguyen, B. (2018). From Awe to Ecological Behavior: The Mediating Role of Connectedness to Nature. *Sustainability*, 10, 2477. <https://doi.org/10.3390/su10072477>
- Zhang, W., Goodale, E., & Chen, J. (2014). How Contact with Nature Affects Children's Biophilia, Biophobia and Conservation Attitude in China. *Biological Conservation*, 177, 109-16. <https://doi.org/10.1016/j.biocon.2014.06.011>.
- Zylstra, M. J., Knight, A.T., Esler, K.J., & LeGrange, L.L.L. (2014). *Connectedness as a Core Conservation Concern: An Interdisciplinary Review of Theory and a Call for Practice*. *Springer Science Reviews*, 2(1-2), 119-143, <https://doi.org/10.1007/s40362-014-0021-3>.

Landscapes & Behavior

- ❖ Biophilic design increased sociability in study groups (Totaforti, 2020)
- ❖ Access to non-urban green space positively correlates to pro-ecological behaviors, while access to urban green space does not (Colleony, 2020)

