

Post-Zoo Design: Alternative Futures in the Anthropocene

by

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A Dissertation Presented in Partial Fulfillment
of the Requirements for the Degree
Doctor of Philosophy

Approved April 2019 by the
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ARIZONA STATE UNIVERSITY

May 2019

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ABSTRACT

Public awareness of nature and environmental issues has grown in the last decades and zoos have successfully followed suit by re-branding themselves as key representatives for conservation. However, considering the fast rate of environmental degradation, in the near future, zoos may become the only place left for wildlife. Some scholars argue that we have entered a new epoch titled the “Anthropocene” that postulates the idea that untouched pristine nature is almost nowhere to be found.¹ Many scientists and scholars argue that it is time that we embraced this environmental situation and anticipated the change.² Clearly, the impact of urbanization is reaching into the wild, so how can we design for animals in our artificializing world? Using the Manoa School method that argues that every future includes these four, generic, alternatives: growth, discipline, collapse, and transformation³, this dissertation explores possible future animal archetypes by considering multiple possibilities of post zoo design.

Keywords: Nature, Environment, Anthropocene, Zoo, Animal Design, Future, Scenario

¹ Paul J. Crutzen, “Geology of Mankind,” *Nature* 415, no. 6867 (January 3, 2002): 23.

² Jamie Lorimer, *Wildlife in the Anthropocene* (Minneapolis, Minnesota: University of Minnesota Press, 2015); Frank Oldfield et al., “The Anthropocene Review: Its Significance, Implications and the Rationale for a New Transdisciplinary Journal,” *The Anthropocene Review* 1, no. 1 (December 3, 2013): 3–7.

³ Jim Dator, “Alternative Futures at the Manoa School,” *Journal of Futures Studies* 14, no. 2 (2009):1-18.

DEDICATION

For my beautiful mother, Majda, who taught us the importance of education early on. She has a strong reverence for knowledge and learning, and excels at all that she does.

For my loving father, Isa, who is always immensely proud of us. For his endless support, and for his understanding of whatever eccentric project I choose to pursue.

ACKNOWLEDGMENTS

My dear husband deserves the first acknowledgment. He has been a strong, reassuring presence over the years, and did not hesitate to uproot our small family so I can pursue my PhD. Similarly; my beloved little one has provided joyful distraction and unconditional love.

A big thank you to my committee, for their willingness to join me in this interdisciplinary, futures-based journey. My chair, Dr. Renata has been an attentive, patient, and enthusiastic guide throughout this endeavor. I am grateful for Dr. Ed for teaching me how to think about futures studies, and how to engage its vernacular without apology. I am forever thankful for his belief in my storytelling skills. Dr. Brad gave me hope from the outset that my inquiry was important and relevant, and helped me develop the major currents of this dissertation. Professor Darren's openness to visual approaches and expert guidance has made my research joyful. Dr. James Dator, the reviewer of the first draft, contributed his excitement and valuable recommendations.

Librarian Erika Lankton has been a skilled wrangler of new publications. And my appreciation extends to Corie and Jessica for their support and guidance through the administrative maze.

Friends have propped me up on days when that was needed. For that, I am forever grateful to Shaikha, Esra'a, Lysandra, and Nadia. I am also appreciative of, my siblings for their unceasing support they send from overseas.

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CHAPTER 1

INTRODUCTION



Figure 1. Futurist vision of the animal ark⁴

We are experiencing unprecedented rates of environmental degradation, habitat loss, and animal extinction. As much as we like to believe that the romanticized image of nature still exists, it is important that we prepare for the crisis ahead and consider adequate alternative environments. This dissertation raises questions regarding fake real vs. real fake environments, private vs. public habitats, generic vs. specific design solutions, global vs. local scales, and environmental sustainability among others.

⁴ Shigeru Komatsuzaki, *The Ark of Space*, 1968.

The overarching questions that this research undertakes are:

- What is the ideal future archetype for animals in the Anthropocene?
- How do we use scenarios to help work through possible green design futures?

Research Scope

This dissertation presents a unique contribution to the fields of architecture, environmental research, and futures studies. People from various professions are labeled as “futurists,” but architects especially “are truly effective in creating the futures—what they design and build often persists for a very long time, shaping, thwarting, and facilitating behavior for generations to come.”⁵ There is very little design research done on the topic of animal futures in the Anthropocene, and this dissertation takes the opportunity to tackle this gap in literature.

“The era of climate change involves the mutation of systems beyond 20th century anthropomorphic models and has stood, until recently, outside representation or address. Understood in a broad and critical sense, climate change concerns material agencies that impact on biomass and energy, erased borders and microbial invention, geological and nanographic time, and extinction events. The possibility of extinction has always been a latent figure in textual production and archives; but the current sense of depletion, decay, mutation and exhaustion calls for new modes of address, new styles of publishing and authoring, and new formats and speeds of distribution. As the pressures and realignments of this re-arrangement occur, so must the critical languages and conceptual templates, political premises and definitions of ‘life’.”⁶

After considering inclusion and exclusion criteria, my research explores a future zoo typology rather than focusing on a specific animal species. Due to this new subject matter,

⁵ Jim Dator, “Alternative Futures in Architecture,” in *The Routledge Companion for Architecture Design and Practice: Established and Emerging Trends*, by Mitra Kanaani and Dak Kopec (London: Routledge, 2015): 35.

⁶ Claire Colebrook, *Death of the PostHuman: Essays on Extinction, Vol. 1* (London, UK: Open Humanities Press, 2014): 4.

tackling the topic more generally will set a base for possible future research to elaborate on specific animal bodies. The dissertation is also targeting a specific time horizon, the year 2050, using a twenty to thirty year projected time frame. It is near enough in the future so that we have some sense of realistic prediction, as well as an understanding of ongoing trends.⁷ Also, this qualitative research is “not limited to any one specific socio-geographic location, but rather is theoretically charged. Theory travels far better across boundaries, both geographic and cultural, than empirical research.”⁸ Although the discussion of case studies are site specific, the intention of the research is to explore models that can be replicated for different climates and biomes. The goal is to use scenarios to produce “interesting research” that is engaging and facilitates new research prospects.⁹

⁷ Christopher T Boyko et al., “Benchmarking Sustainability in Cities: The Role of Indicators and Future Scenarios,” *Global Environmental Change* 22, no. 1 (2012): 245–254.

⁸ Murphy, Mark. *Theory as Method in Research: On Bourdieu, Social Theory and Education* (Florence: Taylor and Francis, 2015): 129.

⁹ Rafael Ramirez et al., “Scenarios as a Scholarly Methodology to Produce ‘Interesting Research,’” *Futures* 71 (2015): 70–87.

Anthropocene	The most recent geological epoch following the Holocene, characterized by the role of humans in transforming the planet ¹⁰
Scenarios	“A set of hypothetical events set in the future constructed to clarify a possible chain of causal events as well as their decision points” ¹¹
Archetype	“An original model or type after which other similar things are patterned; a prototype” ¹²

Table 1. Operational Definitions

The term ‘Anthropocene’ stirred discussions from both scientists and renowned environmental crusaders.¹³ Supporters of this terminology appreciate that it stimulates a wide social and cultural awareness about environmental changes brought about by human activities. Also, formal acknowledgment of a new geologic period enables the scientific community at large to solidify that mankind is now Earth’s major transformer. The term is being widely used in the media as well as in established scientific literature.¹⁴

There has been some disagreement however on when the new epoch began. Nobel Prize-winning, atmospheric and environmental chemist, Paul Crutzen was behind popularizing the term. He suggests that technological advancements started the alteration of

¹⁰ R.T. Corlett, “The Anthropocene concept in ecology and conservation.” *Trends in ecology & evolution* 30, no. 1 (2015): 36-41.

¹¹ Herman Kahn and Anthony J. Wiener, *Year 2000; a Framework for Speculation on the next Thirty-Three Years* (New York: Macmillan, 1967).

¹² Brandon Allen, “Culturalistic Design: Design Approach to Create Products for Specific Cultural and Subcultural Groups” (Auburn University, 2009).

¹³ Whitney J Autin and John M Holbrook, “Is the Anthropocene an Issue of Stratigraphy or Pop Culture,” *GSA Today* 22, no. 7 (2012): 60–61.

¹⁴ Will Steffen et al., “The Anthropocene: Conceptual and Historical Perspectives,” *Philosophical Transactions of the Royal Society A: Mathematical, Physical and Engineering Sciences* 369, no. 1938 (2011): 842–867.

the environment with the Industrial Revolution.¹⁵ Others claim that The Great Acceleration following World War II reports a significant deviation in monitored Earth systems from Holocene patterns.¹⁶ Furthermore, palaeoclimatologist William Ruddiman, concludes that the anthropocene commenced with the Agricultural Revolution.¹⁷

Geologists however are not convinced with this buzzword. To them, terminology has to be backed up with scientific stratigraphic data, study of the rock formations, and earth layers. Especially since present day scientists are subjected to a lot pressure to create and maintain a reputation that governs their research.¹⁸ Coming up with iconic terms in society does not provide enough ground to allow for the amendment of formal practices. Particularly since Anthropocene directly compares human insurgence on the Earth with natural agitators such as earthquakes. Therefore, they feel an extensive scientific research was not considered in the formalization banter.¹⁹

¹⁵ Paul J. Crutzen and Stoermer, E.F., “The Anthropocene,” *Global Change Newsletter* 41 (2000): 17–18.

¹⁶ Will Steffen et al., “The Anthropocene: Conceptual and Historical Perspectives,” *Philosophical Transactions of the Royal Society A: Mathematical, Physical and Engineering Sciences* 369, no. 1938 (2011): 842–867.

¹⁷ William Ruddiman, *Plows, Plagues, and Petroleum* (Princeton, New Jersey: Princeton University Press, 2005).

¹⁸ Hessels, L.K., van Lente, H., and Smits, R., 2009, In search of relevance: the changing contract between science and society: *Science and Public Policy*, v. 36, p. 387–401.

¹⁹ “The Human Epoch,” *Nature* 473 (2011): 254.

Arguments For/Against Zoos

Zoos animals are utilized for research, education, and the recreation of millions of visitors from all ages and backgrounds.²⁰ However, the concept of zoos and keeping animals captive for public display is a decades-long debate.²¹ The main controversy is whether it is just to continue keeping wild animals captive in artificial environments, especially exploiting them for human entertainment, and whether zoos provide benefits that justify the need for captivity. Mathematician Michael Wiseman and scientist Bogner Franz proposed a Model of Ecological Values (MEV) that describes human attitudes towards animals and nature as influenced by preservation and utilization notions.²² Their model describes, “one’s position on two orthogonal dimensions, a bio-centric dimension that reflects conservation and protection of the environment; and an anthropocentric dimension that reflects the utilization of natural resources.”²³ Expanding their model further and looking at a broader spectrum of utilization and preservation, it is easy to find examples of exploitation²⁴ and conservation²⁵ attitudes in our interactions with the animal world.

²⁰ David Chiszar, "For Zoos." *Psychological Record* 40 (1990): 3-13.

²¹ Mary P. Benbow, "Death and Dying at the Zoo." *The Journal of Popular Culture* 37 (2004): 379-398; Irus Braverman, "Zootopia: Utopia and Dystopia in the Zoological Garden." *Earth Perfect* (2012):2012-038; David Chiszar, "For Zoos." *Psychological Record* 40, no. 1 (1990): 3-13.

²² Michael Wiseman and Bogner, Franz, "A Higher-Order Model of Ecological Values and Its Relationship to Personality," *Personality and Individual Differences* 34 (2003): 783–94.

²³ Ibid

²⁴ Lauri L. Hyers, "Myths Used to Legitimize the Exploitation of Animals: An Application of Social Dominance Theory," *Anthrozoös* 19, no. 3 (September 1, 2006): 194–210.

²⁵ Brian Miller, "New Conservation' or Surrender to Development?," *Animal Conservation* 17, no. 6 (n.d.): 509–15.



Figure 2. Extended Model of Ecological Values

Modern professionally run zoos have made great strides in animal care.²⁶ They have also evolved as centers of science and conservation.²⁷ Empirical studies show that many species of zoo animals live longer than their equivalents in the wild²⁸. Additionally, psychological strains can generally be avoided, by advanced enclosure design, exercise regimes, birth control, and social interaction²⁹. Also, zoos are routinely inspected to evaluate the appropriateness of their services, techniques, and management. In the United States,

²⁶ J. Stuart Bunderson and Jeffery A. Thompson, “The Call of the Wild: Zookeepers, Callings, and the Double-Edged Sword of Deeply Meaningful Work,” *Administrative Science Quarterly* 54, no. 1 (March 1, 2009): 32–57.

²⁷ Ben A. Minter, “Can zoos save the world?” (October 30, 2016). <https://theconversation.com/can-zoos-save-the-world-32356> (accessed April 18, 2017).

²⁸ Richard Weigl, *Longevity of mammals in captivity; from the living collections of the world*. E. Schweizerbart'sche (2005).

²⁹ Kathy Carlstead and David Shepherdson, “Alleviating Stress in Zoo Animals with Environmental Enrichment,” in *The Biology of Animal Stress: Basic Principles and Implications for Animal Welfare.*, ed. G. P. Moberg and J. A. Mench (Wallingford, UK: CABI, 2000), 337–54.

AAZPA and the United States Department of Agriculture grant accreditation to zoos after approving the site facilities and staff expertise³⁰. Miranda Stevenson³¹, biologist and former Executive Director of the British and Irish Association of Zoos and Aquariums (BIAZA), writes in support of zoos that are challenging mass extinctions and have started strong conservation initiatives. She explains that human exploitation of the environment has made many habitats unsafe, however zoos' conservation efforts have aided the survival of many species and the protection of their habitats. She adds that the focus of zoos toward conservation plans has resulted in successfully saving numerous species such as the Arabian Oryx, which was extinct in the wild, and a large part of other managed zoo populations has returned again to their original habitats under protected systems. However, the truth of the matter is that in the 21st century, many species' survival depends upon being managed through a process that involves captivity and/or secure areas in one way or another.

The anti-zoo movement that is seemingly making a come back chooses to concentrate on ill-designed and ill-maintained zoos, ignoring any good that has been accrued from the concept of zoological parks. It is on this premise that they base their arguments for proposing doing away with all zoos. While the moral argument brought forth by this movement is sound, the implications are far from justifiable. Daniel Turner³², founder member of ENDCAP a pan-European Coalition of animal welfare organizations and wildlife professionals believes that the wild is where animals belong and can naturally evolve to achieve survival, and wildlife problems should be resolved in situ. "It is a sad indictment that

³⁰ David Chiszar, "For Zoos." *Psychological Record* 40 (1990): 3-13.

³¹ Miranda Stevenson and Daniel Turner, "Zoos The Debate." *Ecologist* 34, no. 1(2004): 20.

³² Ibid

the list of zoo 'success stories' remains distressingly short. Can the reintroduction into the wild of a handful of captive-bred species justify the lifelong incarceration of millions of wild animals in thousands of zoos?"³³ He argues that we need to change our behavior to minimize our impact on the environment, and if needed gently interfere to manage habitats without moving the animals to artificial environments. Animals have allegedly starved to death in Naples Zoo, and the National Zoo in Washington DC has been blamed for a series of scandalous animal fatalities³⁴. Even in more advanced zoos where they try to offer nourishing food, social interaction, naturalistic enclosures, and environmental enrichment animals still lack the richness of their original habitats³⁵. More often than not, animals at zoos suffer physically and psychologically³⁶.

In her book, Vicki Croke³⁷, expert animal writer and journalist, examines the zoo dilemma. On one hand, zoos celebrate life, and provide the visitors with a natural and spiritual experience. Alternatively, "If we continue to lock beasts up in barren enclosures, the heart of darkness will belong to mankind. Just as bear-baiting seems barbaric to us now, so will confining wild animals in cement bunkers seem to our grandchildren"³⁸. However the physical appearance of modern zoos has replaced "cement bunkers" with more naturalistic

³³ Miranda Stevenson and Daniel Turner, "Zoos The Debate." *Ecologist* 34, no. 1(2004): 21.

³⁴ Ibid: 20.

³⁵ PETA, "Zoos: Pitiful Prisons." (March 1,2015). <http://www.peta.org/issues/animals-in-entertainment/animals-used-entertainment-factsheets/zoos-pitiful-prisons/> (Accessed April 20, 2017).

³⁶ Michael Lawrence, *The Zoo and Screen Media: Images of Exhibition and Encounter* (Berlin, Germany: Springer, 2016).

³⁷ Vicki Croke, *The Modern Ark: The Story of Zoos, Past Present and Future* (New York: Scribblers,1997).

³⁸ Ibid: 14.

enclosures including vegetation, rocks and water. In the 1990s, the Bronx Zoo went as far as renaming itself the Wildlife Conservation Park and began to call its enclosures *living classrooms*³⁹.



Our drive as a species towards conservation is an attempt to rectify the wrong we have already done. The entire concept of conservation, including the keeping of animals in zoos, is a rather defeatist one. Conservation in essence tries to go against the laws of natural selection. The species that are able to quickly adapt to the changes are the species that eventually survive. Should these adaptive capabilities fail to match up to the changing world then mankind, along with all other species that will have been wiped out will simply go down history as a failed experiment. For the necessary changes to occur in zoos as we know them

³⁹ Alan Beardsworth & Alan Bryman, "The wild animal in late modernity: The case of the Disneyization of zoos." *Tourist Studies* 1, no. 1 (2001): 83-104.

today, we need to change the public's opinion of them. People can no longer look at zoos as a one-stop shop for all their wildlife needs. Awareness of animal welfare has (in the past) been an impetus for the conditions of zoos improve. Some zoos have caved into public pressure to do away with bars in the animal enclosures. It is from such a state of enlightenment amongst the public that the distinction between a good zoo and a bad zoo can be drawn and a guideline for proper zoo management can be established. With the evolution of various conservation-related concepts and strategies, there needs to be an evolution in how zoos operate.

Zoos provide a platform within which people can draw meaning and an understanding of both nature and culture. The understanding of nature is based on how well the zoo does and how well people engage with it on an aesthetic as well as educational level. It is hard to deny that zoos are great catalysts for environmental change. The Association of Zoos & Aquariums (AZA) has been pushing for green design solutions that demonstrate environmental awareness and advocacy, by combining education and conservation⁴⁰. Zoos (like other cultural institutions such as museums), aspire to valuable goals. These objectives include education, recreation, scientific research, and saving certain species from extinction.⁴¹ A lot of zoos have enthusiastic research divisions that support valuable field research, but are not necessarily focused on publishing⁴². Furthermore, the majority of the knowledge we have about wild population management and veterinary expertise came from

⁴⁰ Patricia G. Patrick, et al, "Conservation and education: prominent themes in zoo mission statements." *The Journal of Environmental Education* 38.3 (2007): 53-60.

⁴¹ Jackie Ogden and Joe E. Heimlich, "Why focus on zoo and aquarium education?" *Zoo biology* 28.5 (2009): 357-360.

⁴² Andrew Moss, Maggie Esson & Sarah Bazley, "Applied research and zoo education: The evolution and evaluation of a public talks program using unobtrusive video recording of visitor behavior." *Visitor Studies* 13, no. 1 (2010): 23-40.

experimentation at zoos⁴³.

Zoo goals are undeniably important to society, yet critics question whether these goals benefit both the public and the animals. In his essay, philosopher Dale Jamieson⁴⁴ advanced a well-known ethical critique of zoos, concluding that zoo animals are imprisoned for negligible public or scientific benefits. Similarly, Terry Maple⁴⁵ the former president of Zoo Atlanta, is critical of bad zoos, stating that: “zoo animals are deprived of freedom for little social or scientific good, and that zoos cause suffering without producing compensatory benefits for animals or people”⁴⁶. Other critics also challenge the educational claims of zoos, e.g.,⁴⁷ stating that people do not visit zoos to learn⁴⁸. As a result, an extensively promoted study was sponsored by the National Science Foundation and led by members of the Association of Zoos and Aquariums (AZA) to determine if zoo visits yield lasting effects on the public’s attitude towards animals⁴⁹. The Visitor Impact Study states that zoos are indeed improving the visitors’ awareness of wildlife and habitat conservation, and it endorses the

⁴³ Miranda Stevenson and Daniel Turner, "Zoos The Debate." *Ecologist* 34, no. 1(2004): 20.

⁴⁴ Dale Jamieson, "Against Zoos." In *In Defense of Animals*, ed. P. Singer (Oxford: Basil Blackwell, 1985),108-117.

⁴⁵Dita Wickins-Dražilová, "Zoo animal welfare." *Journal of agricultural and environmental ethics* 19.1 (2006): 23.

⁴⁶ Terry Maple, "Toward a responsible zoo agenda." In *Ethics on the Ark*, edn. M. Hutchins, E. Stevens, T. Maple and B. Norton (Washington: Smithsonian Institution Press, 1995), 20-30.

⁴⁷ Stephen R. Kellert, *The Value of Life: Biodiversity and Human Society*. (Washington D.C: Island Press, 1996).

⁴⁸ Michael D. Kreger and J. A. Mench, "Visitor–animal interactions at the zoo." *Anthrozoös* 8, no. 3 (1995): 143–158.

⁴⁹ John Howard Falk, et al., *Why zoos & aquariums matter: Assessing the impact of a visit to a zoo or aquarium*. Silver Spring, MD: Association of Zoos & Aquariums, 2007.

idea that zoos have a strong positive influence on visitors⁵⁰. However, in a study of the Reptile House in the National Zoo, Washington, D.C., it showed that the average visitor spends only 26 seconds in front of each exhibit. Therefore, it is hard to comprehend how any significant learning can happen in such a short time⁵¹. Adding to the discussion, another research study shows that zoo visits boost biodiversity literacy, but that increased awareness does not necessitate a change in behavior.^{52 53} Overall, zoo animals are utilized to accomplish positive outcomes, but if they are not handled well, they can leave visitors saddened about the settings under which the animals are held, and frame a negative idea about all zoos⁵⁴. One shouldn't suppose that zoo animals inevitably live under harsh circumstances, in fact in recent years zoos have been scrutinizing their own practices and investigating new techniques to further improve welfare rather than simply avoid animal cruelty⁵⁵.

⁵⁰ John Howard Falk, et al., *Why zoos & aquariums matter: Assessing the impact of a visit to a zoo or aquarium*. Silver Spring, MD: Association of Zoos & Aquariums, 2007.

⁵¹ Bob Mullan, *Zoo Culture* (Champaign, IL: University of Illinois Press, 1999).

⁵² Andrew Moss, Eric Jensen & Markus Gusset, "Conservation: Zoo visits boost biodiversity literacy." *Nature* 508, no. 7495 (2014): 186.

⁵³ Andrew Moss, Eric Jensen & Markus Gusset, "Evaluating the contribution of zoos and aquariums to Aichi Biodiversity Target 1." *Conservation Biology* 29, no. 2 (2015): 537-544.

⁵⁴ Barbara Woods, "Good zoo/bad zoo: Visitor experiences in captive settings." *Anthrozoös* 15, no. 4 (2002): 343-360.

⁵⁵ Jessica C. Whitham and Nadja Wielebnowski, "New Directions for Zoo Animal Welfare Science," *Applied Animal Behaviour Science* 147, no. 3 (2013): 247-60.

CHAPTER 2

DESIGN THEORY



Zootopia

British sociologist Krishan Kumar describes three different types of utopian societies.⁵⁶ The first is Paradise, a society peacefully co-existing with all living things. The second is the Ideal City, a society created in accordance with logic. Finally, the zoo as a theme park embodies Cockaigne, a land of amusement and indulgence. The concept of utopia is more than just a fusion of these three concepts; nevertheless, they each provide a glimpse of the utopian ideal. Paradise highlights the elements of balance with nature; the Ideal City emphasizes structure and order; while Cockaigne highlights pleasure.⁵⁷ All these attributes are present at zoos. Worth noting, though, is that each utopian society also contains the elements for its own downfall and, giving rise to a *dystopian state*. Historian Annette Giesecke and English Professor Naomi Jacobs in their book "*Earth Perfect? Nature,*

⁵⁶ Krishan Kumar, *Utopianism* (Minneapolis: University of Minnesota Press, 1991).

⁵⁷ Donald Capps, "Melancholia, Utopia, and the Psychoanalysis of Dreams," *The Blackwell Companion to Sociology of Religion*, 2001, 96.

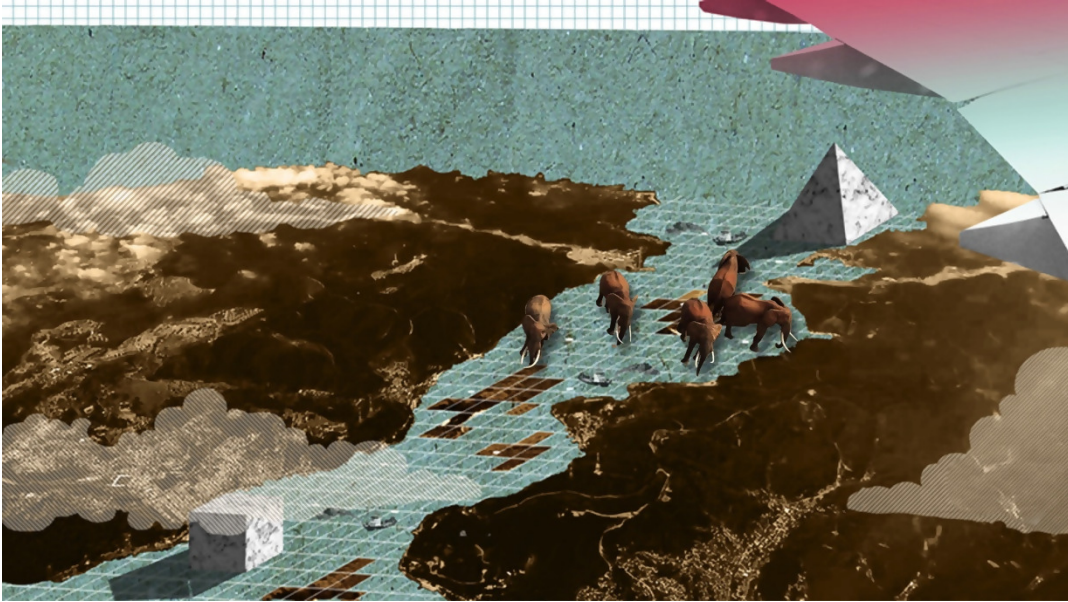
*Utopia, and the Garden,*⁵⁸ adopt the term “zootopia” to emphasize the inextricable link between the utopian and dystopian presence at zoological gardens.

The idea of “heterotopias” as described by Michel Foucault, describes a world within which all other alternate realities and cultures are represented and contrasted at the same time.⁵⁹ Zoos in urban spaces fall into this description. They are reenactments of utopian conditions as depicted in biblical occurrences such as Noah’s ark or the Garden of Eden where human and animals interacted freely and shared the same space. They can, therefore, be compared to other ‘nature’ sites such as farms and forests but simultaneously contrasted with others such as animal sanctuaries. In light of emergent animal geography studies, the creation of divisions between rural, urban, and wild spaces that are ideally meant to be a shared resource between humans and animals are criticized. It is important that the human presence be a continuous one within the environment in order for us to discover rules of engagement with other species without the relationship being an exploitative one.⁶⁰

⁵⁸ Annette Giesecke and Naomi Jacobs, *Earth Perfect? Nature, Utopia, and the Garden* (London: Black Dog Publishing, 2012).

⁵⁹ Michel Foucault and Jay Miskowicz, “Of Other Spaces,” *Diacritics* 16, no. 1 (1986): 22–27 (24).

⁶⁰ Ralph Acampora, “Oikos and Domus: On Constructive Co-Habitation with Other Creatures,” *Philosophy & Geography* 7, no. 2 (2004): 219–235 (222).



It is undeniable that the modern zoo has been established as an urban body. Ever since the late 19th century, the development of cities has paraded man's power, and that included showcasing a collection of exotic wildlife. "This is the crux of the matter: those who envisage creating 'heaven earth' ..., 'will only succeed in making hell'."⁶¹ These zoos were a testament to man's triumphant ability to place the chaos and wilderness of nature into complete subjection and order.⁶² Zoo animals are carefully classified and encoded into large international databases; and high-tech computer programs store and organize data about them. At the core of this is a utopian belief that the humans can bring order to the world.⁶³ In a sense, the zoo shelters not just nature's chaos, but also man's need for control.

Zoo cages are considered by art critic John Berger to be an unreal space that makes

⁶¹ Karl Popper, *The Open Society and Its Enemies* (London: Routledge, 2012).

⁶² Chris Philo, "Animals, Geography, and the City: Notes on Inclusions and Exclusions," *Environment and Planning D: Society and Space* 13, no. 6 (1995): 655–681.

⁶³ Geoffrey C Bowker and Susan Leigh Star, *Sorting Things out: Classification and Its Consequences* (MA: MIT press, 1999).

zoo animals marginal. He states that the visibility through glass barriers, bars, or mesh have been tokenized and the space these animals inhabit is artificial.⁶⁴ According to naturalist James Breheny, zoos provide for its visitors the illusion of being transported into an environment, that is both wild and free, and very much unlike the orderly spaces in which they live in.⁶⁵ And in the same vein, Paul Harpley from Toronto Zoo points out that “without the city, there would also not be a zoo in the way we think about zoos, because we wouldn't need to bring the other to the urban.”⁶⁶ The zoo provides an escape to a world that is presented as natural but is in fact governed by manmade ideals of structure and organization.⁶⁷ This utopian design, however, is not based on an abstract idea but on actual natural environments from around the world. For example, the Buffalo Zoo utilizes three different ways of organizing the enclosures. First, the zoo site is divided into continents and locations on Earth. Second, certain exhibits are classified based on their habitats; thirdly and finally, signage is used to explain the taxonomic background of the animals. “Each of these three mapping schemes—continent-based, habitat-based, and taxonomy-based—highlights a different aspect of the human-nature relationship.” The first method of continent-based organization relies on a person’s knowledge of the map of the world, thereby utilizing skills that have been important for survival since the colonial age. This mapping scheme is dependent on geography, and therefore emphasizes human supremacy over the Earth. The second method of

⁶⁴ John Berger, *Why Look at Animals?* (London, UK: Penguin, 2009).

⁶⁵ Irus Braverman, “Zootopia: Utopia and Dystopia in the Zoological Garden,” SSRN Scholarly Paper (Rochester, NY: Social Science Research Network, November 30, 2011).

⁶⁶ Annette Giesecke and Naomi Jacobs, *Earth Perfect? Nature, Utopia, and the Garden* (London: Black Dog Publishing, 2012).

⁶⁷ Lyman Tower Sargent, “The Three Faces of Utopianism Revisited,” *Utopian Studies* 5, no. 1 (1994): 28.

organization, habitat-based classification, views the world as different biomes where humans and animals are interdependent of each other. Lastly, the taxonomy system is based on the Linnaeus' *Systema Naturae*, 1735, which classifies species according different kingdoms.⁶⁸ Taxonomy divides animal kingdoms into classes, and then into orders, genes, and species. It showcases scientific progress, together with the human ability to choose the specie names. Several categorization schemes can be used in one zoo simultaneously, since they all reflect a need to make sense of the world and a desire to subjugate it.

In designing the zoo, two methods are used to facilitate the illusion of the natural habitat – immersion design, and zoogeography.⁶⁹ For the proponents of the naturalistic design, it would not make sense to spend millions of dollars on an exhibit, advertise to people that they will be immersed in the experience of nature, only for them to see a lion eating out of his food bowl. Special attention is given to detail, such as avoiding areas with high-rises when choosing a zoo site. Sound is also a very important factor in immersion designs, especially at the Saint Louis Zoo. Almost every enclosure and pathway has its own audio system installed with geographically appropriate squeaks, rattles, and chirps. It is very difficult to differentiate the animal audio recordings from the natural sounds . Award-winning designer, Chin, elaborates, “we want to blur the lines so you feel like you're in nature. We don't want you to feel like you're in a contrived space... you might forget for a little while that you're in a building in the Bronx Zoo.”⁷⁰

⁶⁸ Andrew Polaszek, *Systema Naturae 250-The Linnaean Ark* (Boca Raton, FL: CRC Press, 2010).

⁶⁹ Jon Coe, “Immersion Design,” Jon Coe Design, accessed September 5, 2018, http://www.joncoedesign.com/trends/exhibit_trends.htm#immersion.

⁷⁰ “What Is an Immersion Exhibit?,” Saint Louis Zoo, accessed September 5, 2018, <https://www.stlzoo.org/visit/thingstoseeanddo/riversedge/immersion>.

No information is given to visitors regarding any artificial design elements. This is done to preserve the authenticity of the experience for the audience, majority of who will never be able to travel to such exotic habitats. In addition, artificial components are used for easier maintenance and practicality; they are constructed in a very precise way down to the number of branches.⁷¹ To truly pull off a zoo immersion experience, it is important to conceal any artificial elements and hide any human activity. Large exhibits rely on a team of “architects, zoologists, botanists, graphic designers, construction workers, welders, carpenters, painters, electricians, plumbers, audio specialists, gardeners, cabinet-makers, and glaziers”, all working in the same location, and all of whom must be made invisible. In a telling remark, former Director of the Bronx Zoo, William Conway, joked that “the most dangerous animal in the zoo is the architect.” This comment reveals the cautious approach that many zookeepers have toward the zoo infrastructure and their architects.⁷² Nevertheless, despite efforts to be as authentic as possible, the zoo ensures that some aspects are unknown. The zoo must still be distinguishable from the wild in the aspect of safety, health, age, and predation is also subdued.

Nature at the zoo is a sanitized version of itself – it is the nature humans desire it to be. Therefore, certain acts of predation are hidden from the public. Fish are fed to zoo animals everyday in front of audiences, however snakes and whole prey are done discreetly. It seems as though humans are unoffended by the killing of animals that are on the lower parts of the food chain.⁷³ In addition, anything that would elicit negative feelings from the

⁷¹ Paul Shephard, *Thinking Animals: Animals and the Development of Human Intelligence* (Athens, GA: University of Georgia Press, 1998).

⁷² Bob Mullan, *Zoo Culture* (Illinois: University of Illinois Press, 1999).

⁷³ Edward Ludwig, “People at Zoos: A Sociological Approach,” *ZOO*, January 1, 1981, 316.

audience must be kept concealed. To justify this, zoo directors explain that visitors would complain if they saw animals that looked ill and tired, when it could just be from old age. “Do you want us to kill everything when it’s in its prime and breed more so that everything is bright eyed and bushy tailed, or is it okay to exhibit older animals or animals with handicaps?”⁷⁴

Zoogeography organizes nature based on their location, first implemented at Toronto Zoo. Zoo manager, Paul Harpley, explains that the zoo commissioned for the entire world to be exhibited⁷⁵. The grand endeavor to reduce the entire world into a small-scale model that fits a person’s vision or perspective was first accomplished by Wylde’s Great Globe at the Great Exhibition in 1851.⁷⁶ The exhibit showcased a giant hollow globe containing plaster casts of the Earth’s landforms and seas. Wylde’s design gave the viewer a higher vantage point over the shrunken world that represented our much larger reality. This design strategy showed the audience a vantage point of a model of the whole world. Zoos as heterotopias also defy space and time restrictions.⁷⁷ Animals from opposite sides of the Earth are a short distance away from each other; and exhibits of dinosaurs and extinct species are seen at the same time as living creatures. The zoo’s visitors move through different continents and time periods, much like channel surfing on television – catering to their amusement and pace.⁷⁸

⁷⁴ Irus Braverman, *Zooland: The Institution of Captivity* (Palo Alto, CA: Stanford Law Books, 2013): 38.

⁷⁵ Ibid

⁷⁶ Tony Bennett, “The Exhibitionary Complex,” *New Formations* 4 (1988): 97.

⁷⁷ Michel Foucault and Jay Miskowic, “Of Other Spaces,” *Diacritics* 16, no. 1 (1986): 22–27 (24).

⁷⁸ Scott Montgomery, “The Zoo: Theatre of the Animals,” *Science as Culture* 4, no. 4 (1995): 565–600.

The utopian and dystopian implications of zoological gardens are further highlighted within the framework of consumption. Zoos must survive in an economic environment where entertainment businesses compete for their customers' increasingly limited incomes. Certainly, consumerism defines the zoogoer's experience. Zoos depend highly on retail, including tickets, toys, food, and memorabilia. And this consumerism attitude is justified by claims to save nature at the same time that consumption is believed to be the main reason behind habitat loss.⁷⁹ Gift shops found near entrances and exits are the most obvious consumerist places within the zoo. There are no established guidelines in determining what products to sell at the gift shop other than profit. Despite this, more and more zoos are considering selling green products. While the gift shop is the main venue for consumption within the zoo, consumerism is evident throughout the entire park. Visitors are encouraged to buy food for the animals, and vending machines are strategically placed throughout the zoo. Certain animals and exhibits may also be sponsored by corporations, which advertise this fact in numerous sign posts all throughout the park. For example, the two tigers at Buffalo Zoo are aptly named "Thyme" and "Warner," because they are sponsored by Time Warner Brothers. As recounted by Susan Davis, in reference to the San Diego park, "the virtual maze of advertising, public relations, and entertainment renders this zoo an exhaustively commercial space."⁸⁰ However, this act of consumerism is viewed as more charitable, since what is spent supports animal conservation projects. In a sense, the zoo markets nature itself; thus, consumerism here is distinct from consumerism at the mall.⁸¹

⁷⁹ Alan Aldridge, *Consumption* (Cambridge, UK: Polity Press, 2003).

⁸⁰ Susan G Davis, *Spectacular Nature: Corporate Culture and the Sea World Experience* (Berkeley, CA: University of California Press, 1997).

⁸¹ *Ibid*, 8.

Ben Minter, Professor of Environmental Ethics and Conservation, explains that as much as zoos like to consider themselves as centers of research, education, and conservation, they have also always been associated with the entertainment industry.⁸² In order to reconcile the opposing ideas of recreational consumption and anti-consumerism, virtuous ideals like “buy in order to save” are injected into consumerist acts within the zoo. Humans at the zoo are framed rather carefully. They are portrayed as the cause for habitat loss and environmental degradation, and simultaneously depicted as those who have the power to animal salvation. By staging such a harsh contrast, the zoo is greatly emphasizing the divide between humans and species. This dualistic presentation promotes the romanticized image of nature that is under the mercy and consumption of humans⁸³. As environmental historian Jennifer Price puts it, buying and consuming zoo products are legitimate ways to express concern for the environment within the confines of consumerism, even if such activities might downplay the conscienceless and abusive nature of mass consumerism itself.⁸⁴ It may even be argued that a zoo is, in fact, is a utopia because of the ideals it sells. By buying, a person contributes in erecting a more beautiful world, rich in nature and biodiversity. In ideal scenario, commercial choices are affected by the principles of responsibility for the environment.⁸⁵

⁸² Ben A. Minter, “*Can zoos save the world?*” (October 30,2016). <https://theconversation.com/can-zoos-save-the-world-32356> (accessed April 18, 2017).

⁸³ Neil Smith, *Uneven Development: Nature, Capital and the Production of Space*. (Oxford: Blackwell, 1984).

⁸⁴ Jennifer Price, “Looking for Nature at the Mall: A Field Guide to the Nature Company,” *Uncommon Ground: Toward Reinventing Nature*, 1995, 186–203.

⁸⁵ Annette Giesecke and Naomi Jacobs, *Earth Perfect? Nature, Utopia, and the Garden* (London: Black Dog Publishing, 2012).

Artificial Nature

Humans are the ultimate ‘hyper keystone’ species, meaning that they command complex interaction chains that affect multiple others.⁸⁶ As a higher order species human beings have a global reach and through their actions can impact numerous ecosystems. Our so-called natural areas have in more ways than one been proven to be a result of human intervention. According to scientific journalist Charles C. Mann, the Amazon forest for example is a wonderful construction of mankind, "a cultural artifact—that is, an artificial object".⁸⁷ Mann draws his conclusion from the studies of anthropologist Clark Erickson that tells of the human intervention and cultivation of the lowland tropical forests of South America.⁸⁸ Currently the results of studies around the topic point to the planting and nurturing efforts of Mesoamericans in the Amazon forest long before Columbus discovered it. Nature has for a long time now lost its pristineness at the hands of humans. Man’s ability to manipulate nature makes the thought of reshaping it an enticing one. "...nature has not been natural, in the sense of pure and untouched by human works, for millennia. More provocatively nature’s malleability offers an “invitation” to the artificial.”⁸⁹ The story of the Amazon is not a unique one. The Niagara Falls vistas are the brainchild of Frederick Law Olmstead, a landscape architect.⁹⁰ The falls were designed in the late nineteenth century and

⁸⁶ Boris Worm and Robert T Paine, “Humans as a Hyperkeystone Species,” *Trends in Ecology & Evolution* 31, no. 8 (2016): 600–607.

⁸⁷ Laina Farhat-Holzman, “Charles C. Mann, 1491—New Revelations of the Americas before Columbus,” *Comparative Civilizations Review* 59, no. 59 (2008): 318.

⁸⁸ Clark L Erickson, “Amazonia: The Historical Ecology of a Domesticated Landscape,” in *The Handbook of South American Archaeology* (Springer, 2008), 157–183.

⁸⁹ Paul Rabinow, *Essays on the Anthropology of Reason* (Princeton, NJ: Princeton University Press, 1996).

⁹⁰ Anne Whiston Spirn, “Constructing Nature: The Legacy of Frederick Law Olmstead,” *Uncommon Ground: Toward Reinventing Nature*, 1995, 91–113.

the design was later revised in 1920 with more water being diverted to the falls for a more appealing visual effect.

“We must acknowledge that ‘nature’ is gone. ‘Nature’, in the sense of places and processes uninfluenced by human actions, no longer exists, and those places where the impact of human actions is still small will rapidly decrease in number and importance until all of Earth, as well as all of society, will be ‘artificial’ and require continual human invention, creation, maintenance and re-imagination; that the task of ethics and governance from now on is, as Walt Anderson said, ‘to govern evolution.’”⁹¹

The story of human interference on “natural” landscapes is evident throughout the protected habitats that exist today. National parks and wildlife preserves exist all over the world due to human interference. The survival of these areas in their ‘pristine’ state is likely not to have occurred had it not been for government legislation, and management by humans.⁹² In this sense, even the most pristine of lands are a manifestation of our cultural initiatives as humans. Historian Richard White’s definition of wilderness is perhaps one of the more sincere observations: “wilderness is managed land, protected by three-hundred page manuals specifying what can and cannot be done on it.”⁹³

Cities such as New York and Berlin, even with their technological and structural advancements, have been a topic of discussion at one point or another as to whether or not

⁹¹ Jim Dator, “13 Assuming ‘Responsibility for Our Rose,’” *Environmental Values in a Globalizing World: Nature, Justice and Governance*, 2004, 215.

⁹² David Grazian, *American Zoo: A Sociological Safari* (Princeton, NJ: Princeton University Press, 2015).

⁹³ N Katherine Hayles, “Simulated Nature and Natural Simulations: Rethinking the Relation between the Beholder and the World,” *Uncommon Ground: Toward Reinventing Nature*, 1995, 410.

they are organic or simply mechanical in their design and operation.⁹⁴ *Cities are like living organisms* is an analogy that has been around for a long time and has been used with varying degrees. The city has been described in numerous ways over the years. However, all the different definitions seem to agree that cities are either organic, mechanic or both.

Landscape architect Ian McHarg⁹⁵ in the 50s and 60s viewed cities as being more organic than mechanic, a school of thought that was challenged in the 70s. The constant shift between organic and mechanic views of the city space is attributed to changes in social, economic and political patterns. How then does a city compare to an organism? In what ways is a city alive? Despite being inanimate in their nature, cities possess a number of qualities that can be classified as being organic. On the one hand, they consume things and give off waste. The very rhythm of everyday city life is pulse like. Alan Berger, Professor of Landscape Architecture, in the essay “Drosscape” describes American cities as either being “natural”, “organic”, “nature” or as “living” multiple times.⁹⁶ The primary aim of the use of these terms is to emphasize the similarities between cities and living organisms in their way of operation. “Cities are not static objects, but active arenas marked by continuous energy flow and transformation of which landscape and building and other hard parts are not permanent structure but transitional manifestations. Like a biological organism the urbanized landscape is an open system.”⁹⁷

⁹⁴ Florian Urban, “Recovering Essence through Demolition: The “Organic” City in Postwar West Berlin,” *Journal of the Society of Architectural Historians* 63, no. 3 (2004): 354–369; Matthew Gandy, *Concrete and Clay: Reworking Nature in New York City* (MIT Press, 2003).

⁹⁵ Ian L McHarg and Lewis Mumford, *Design with Nature* (New York: American Museum of Natural History New York, 1969).

⁹⁶ Alan Berger, “Drosscape,” *The Landscape Urbanism Reader*, 2006, 197–217.

⁹⁷ *Ibid*, 203.

If we are to better plan for our cities or simply be more aware of that which entails the daily activities in the cities, we need not only pay attention to the structural and inanimate aspects of it but also to the actual living, breathing organisms that are found within it.

“View the entire metropolis as a living arena of processes and exchanges over time, allowing new forces and relationships to prepare the ground for new activities and pattern of occupancy. The designation Terra Firma (firm, not changing; fixed and definite) gives way in favor of the shifting processes coursing through and across the urban field: terra fluxus.”⁹⁸

The concept of landscapes that are devoid of human interference on the planet today is one that is largely discredited, and the differentiation between the history of nature and that of humans is increasingly becoming difficult.⁹⁹ The fifth assessment report by the Intergovernmental Panel on Climate Change (IPCC) paints a rather clear picture of the anthropogenic effects of the industrialized man on the planet.¹⁰⁰ In this report, the rapid intensification of production processes has been pointed out as the lead contributor to greenhouse gases; notably methane, nitrous oxide, and carbon dioxide. The resultant effect is the increase in atmospheric, earth surface, and oceanic temperatures. This in turn has hastened the rate of oceanic acidification and melting of polar ice and glaciers, which in turn has seen a rise in sea levels globally.¹⁰¹ The impacts of our actions on the environment has

⁹⁸ James Corner, *Terra Fluxus. The Landscape Urbanism Reader (Charles Waldheim Ed.)* (New York: Princeton Architectural Press, 2005), 30.

⁹⁹ David Grazian, *American Zoo: A Sociological Safari* (Princeton, NJ: Princeton University Press, 2015).

¹⁰⁰ “IPCC, 2013: Summary for Policymakers,” in *Climate Change 2013: The Physical Science Basis. Contribution of Working Group 1 to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change* (Cambridge: Cambridge University Press, 2013).

¹⁰¹ Bill McKibben and Schumann McKibben, *Eaarth: Making a Life on a Tough New Planet* (Toronto, Canada: Vintage Books Canada, 2011).; Paul Crutzen et al., “The New World of the Anthropocene,” *Environmental Science and Technology* 44, no. 7 (2010): 2228–31.

seen a species going extinct 1000-10000 times as fast when compared to past extinction rates.¹⁰² The anthropogenic effects on the planet are such that the soil, water, and air are either directly or indirectly suffering the consequences of man’s actions. The ever-growing human population results in the need to produce more food for the human race. In order to achieve this, forest and woodlands are cleared of their natural vegetation and room and livestock production has taken on a more intensified approach. Continued mechanization of production processes has seen the human race unabashed in its consumption of fossil fuels.

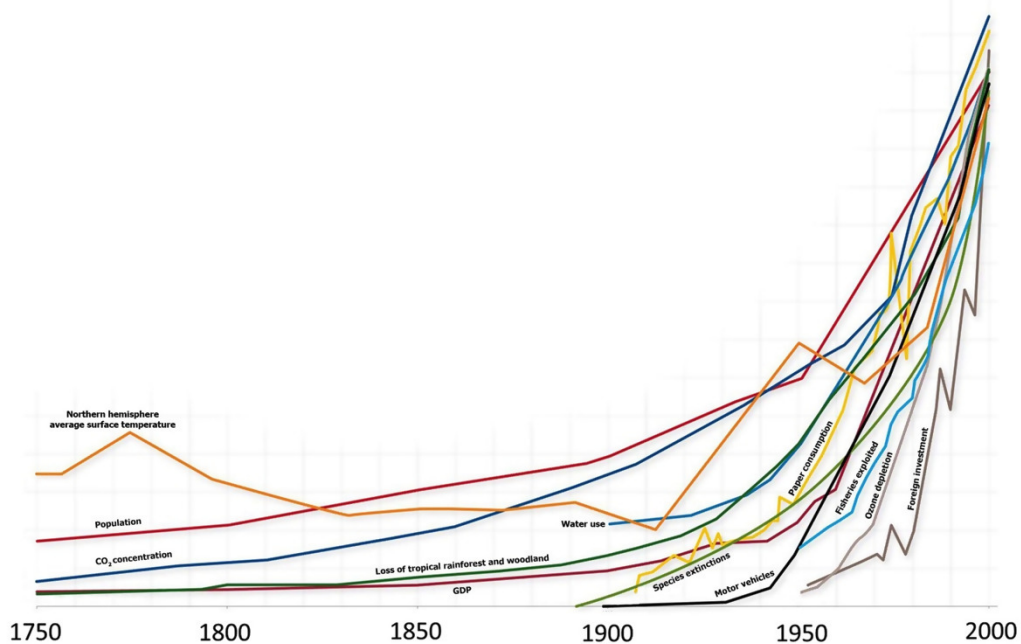


Figure 3. Measures of the Anthropocene¹⁰³

¹⁰² Elizabeth Kolbert, “The Sixth Extinction: An Unnatural History (New York: Henry Holt),” *Google Scholar*, 2014; Nigel E Stork, “Re-Assessing Current Extinction Rates,” *Biodiversity and Conservation* 19, no. 2 (2010): 357–371.

¹⁰³ New Scientist (2008).

Changes in the world today are characterized by a globalization of markets and economies as well as a rise in human populations and consequently consumption.

"Civilization is faced with massive challenges within the natural environment and if reports have us believe, there is the potential that in the coming decades our natural world will look and be very different."¹⁰⁴ With this in mind, there is need to expand our focus not only on local needs and solutions, but also upscale solutions of local challenges to a global level. This specifically applies to managing animal populations. Whatever design we come up with to solve local problems, their effects when applied on a global level must be considered.

Environmental scientist and attorney, Braden Allenby, explains that Earth Systems Engineering and Management (ESEM) projects must need to be flexible and adjustable.¹⁰⁵ This is because ESEM systems acknowledge the fact that we live in a changing world and as such, any attempts to manage the systems of this earth will need to accommodate that change whenever and wherever it happens. ESEM systems should be designed in such a way that they contribute to the resilience of earth systems, providing a safety net. In the event that ESEM systems fail, their design should allow them to fail in a manner that causes the least harm to the earth's systems. The recognition of the fact that there are major changes happening to the systems that govern our world should not be a source of doom and gloom. Instead, we should acknowledge the Anthropocene and embrace it as a new beginning for the relationship between mankind and the planet as well as a learning opportunity.

¹⁰⁴ Daniel William Mackenzie Wright, "Cloning Animals for Tourism in the Year 2070," *Futures* 95 (2018): 59.

¹⁰⁵ Braden Allenby, *Reconstructing Earth: Technology and Environment in the Age of Humans* (Washington D.C.: Island Press, 2013).

Human societies are also affected by these anthropogenic triggered climatic and environmental changes. This is clear from the extreme weather conditions, punishing storms, failed agricultural harvests, diminishing water supplies, and flooding events in coastal regions.¹⁰⁶ The Anthropocene is characterized by warmer temperatures, higher sea levels, changing precipitation patterns, dwindling ice cover, a damaged biosphere and landscapes largely controlled by humans. However, thanks to the Anthropocene, humankind can see that we too are part and parcel of nature. It gives humans the chance to realize and appreciate the fact that we are a force just like any other in the natural world, capable of impacting long lasting changes on the natural world.¹⁰⁷



¹⁰⁶ Dipesh Chakrabarty, “The Climate of History: Four Theses,” *Critical Inquiry* 35, no. 2 (2009): 197–222.

¹⁰⁷ David Grazian, *American Zoo: A Sociological Safari* (Princeton, NJ: Princeton University Press, 2015).

David Grazian¹⁰⁸, Professor of Sociology, explains that zoos in the modern world serve as a reminder of our struggle to differentiate between nature and culture. The very design of the zoos, the animals we choose to put in them, the conservation education offered, and even the entertainment aspects of zoos are centered on our idea and understanding of what constitutes as nature. They tell the tale of our struggle to bring order in an otherwise chaotic world. Zoos also serve as reminders of human dominance over the earth; its success stories as well as its shortcomings.¹⁰⁹ The changes effected on zoos as desired by different stakeholders is a living testament to the impacts of human interference on the earth's biosphere as well as its geological processes. An understanding of the zoos, their coming into being as well as their management, may perhaps give insight on how we view the world. It may further help us to reconsider our preconceived notions of what nature should be. This change in ideologies is a much-needed one in a world that is plagued with extreme weather events, raging forest fires, unmanageable heat waves, and a mass extinction of species. Zoos in their construction and rules of engagement may not completely represent the complexities of our understanding and conceptualization of our world. They, however, paint a good picture of the moral norms and realities, modes of conservation and captivity that we subject ourselves to, based on what society has considered to be our reality.¹¹⁰

¹⁰⁸ David Grazian, *American Zoo: A Sociological Safari* (Princeton, NJ: Princeton University Press, 2015).

¹⁰⁹ Bryan G Norton et al., *Ethics on the Ark: Zoos, Animal Welfare, and Wildlife Conservation* (Washington D.C.: Smithsonian Institution, 2012).

¹¹⁰ Angus Martin and others, "Zoo Ethics: The Challenges of Compassionate Conservation [Book Review]," *Australian Humanist, The*, no. 128 (2017): 18.

In his book *Wildlife in the Anthropocene: Conservation after Nature*, Jamie Lorimer, Professor of Human Geography, claims that pure nature that is untouched by humans no longer exists.¹¹¹ The book presents a comprehensive assessment of the Anthropocene, an epoch in which humans have impacted every living system on Earth. Lorimer discusses the consequences for this drastic change in nature and the policies of wildlife conservation. He introduces key concepts for a world where humans are simultaneously responsible for the large habitat loss and in charge of species survival. He contends that Nature has conventionally been comprehended as being ‘out there’ outside the impact of humans¹¹². Conservation efforts have echoed this and aimed to ‘preserve a fixed Nature from modern, urban, and industrial society by enclosing it in National Parks’.¹¹³ Lorimer argues that such projects have been incredibly successful, but in the Anthropocene they won’t work. He investigates conservation as an educational method and discusses the notions of nonhuman charisma and sentimental rationalities in conservation. The main animal beneficiaries are usually species that are either connected with humans, valuable to humans, or loved by humans. The notion of “nature” that humans have instinctively used for ages, is a wild and severely extraordinary place where humans are just playing one part, is (Lorimer claims) now being substituted by a completely manipulated space by humans. We are approaching a period of “after nature” that requires that we deeply transform our methods of conservation to reflect this. Future conservation methods should steer away from the ‘national park’ prototype and be open to investigation and possibility. We have to look at the ‘cene’ not as a series of chronological events but as the chaos of the now, and the happenings between

¹¹¹ Jamie Lorimer, *Wildlife in the Anthropocene* (Minneapolis: University of Minnesota Press, 2015).

¹¹² Ibid: 120.

¹¹³ Ibid: 5.

what was and what shall be. In this way, we create room for change-oriented research where terrestrial animals are concerned.¹¹⁴

Animal Clients

Architecture is influenced by the human story.¹¹⁵ Different architectural practices and outcomes are informed by our religion, history, culture and the styles that came with them. As these aspects changed with time, so did the need and functionality of our architecture. Our need to separate ourselves based on our social status has also played a role in determining the intricacies of our architecture. Animal architecture on the other hand seems to be believed to be constant, to be stuck in a state of limbo nature. This seemingly constant state of being is what leads to the architectural dilemma witnessed in zoo architecture. The question is, since we are introducing animals into a new environment, do we try and recreate that which they are already used to, introduce them to something new, or design zoos that marry the two?

¹¹⁴ Donna Haraway, “Anthropocene, Capitalocene, Plantationocene, Chthulucene: Making Kin,” *Environmental Humanities* 6, no. 1 (2015): 159–165.

¹¹⁵ Anna-Lisa Müller and Werner Reichmann, *Architecture, Materiality and Society: Connecting Sociology of Architecture with Science and Technology Studies* (Berlin, Germany: Springer, 2015).



The human thought process is clearly represented in all aspects of the world as we know it today. This is true for animal enclosures that zoos are made up of. By paying close attention to these human made homes for animals, you are bound to see the influence of time, geographic location and culture.¹¹⁶ If the construction of these enclosures is left purely to animals, then the ‘homes’ of the different creatures would be similar regardless of when they were built. This, however, is not the case with human-made enclosures. They differ in style and materials used depending on the temporal and spatial disposition of the creators. The shape, form, and composition of animal enclosures created by man are a testament to

¹¹⁶ Bob Mullan, *Zoo Culture* (Illinois: University of Illinois Press, 1999).

the way in which humans view and relate to the said animals. Architect Bernard Tschumi relied on these concepts when designing the new Parc zoologique de Paris:¹¹⁷

1. **Duality.** Instead of insisting on a form of architecture that separates the human and animal histories, we could instead design one that takes into account the cultural and natural influences of both. This form of architecture could also borrow from the best technologies that are at our disposal without necessarily letting go of the exotic aspects of the natural world.
2. **Envelope.** Architecture has shifted from being structured to being more fluid. Structures are longer limited by walls and roofs but are thought of as being part of a larger permeable environment.
3. **Filter.** Architects must view structure in such a way that they are both protective yet porous.

Documentary filmmaker and author, Robert Mullan¹¹⁸, explains that the creation of enclosures within human dominated and governed spaces is our attempt to ‘tame’ that which we consider to be wild. Even in the spaces that we allocate to the nonhuman others, we tend to claim a piece of it for ourselves. Take zoos for instance, you cannot simply design it by placing enclosures randomly within it. Each enclosure must be well thought out and be able to accommodate and display the animal. The placement of these enclosures must be such that there is enough room for humans to move around and interact with the different animals in a controlled environment. Some architects go the extra mile and attempt to

¹¹⁷ Bernard Tschumi, *Architecture Zoo: Parc Zoologique De Paris. The Architectural Project*. (Paris, France: Somogy Editions d’Art, 2014).

¹¹⁸ Bob Mullan, *Zoo Culture* (Illinois: University of Illinois Press, 1999).

incorporate the cultures found in the different regions of the animals' origins.¹¹⁹ Elephant enclosures often include hints of the Hindu culture with other architecture inspired by traditional and religious buildings like mosques, temples, palaces, and castles. Such designs seem to be entirely missing the point when it comes to naturalizing the animal's enclosures. This only helps to distance the world of the animals on display from that of the humans viewing them.

Carl Hagenbeck, animal dealer and zoo owner, sought to break the over complication of designing a zoo at the onset of the twentieth century.¹²⁰ In 1907, he opened the doors of his zoo to the public in Hamburg, Germany. The setting and creation of animal enclosures for his zoo was inspired by observations of actual animal behavior in the wild. He preferred open-air enclosures as opposed to completely closed off ones that required a massive amount of technology and effort just to keep the temperatures at an optimum. He strived to minimize the barrier between the animal on display and its viewers. By so doing, he succeeded in achieving active rather than passive engagement between the animals on either side of the enclosure. He also succeeded in transporting humans to the jungles from which these animals came. Simply put, to Hagenbeck, the point of the zoo was not to promote the human-animal separation but to demystify it. Prior to Hagenbeck's bold move to do away with the elaborate separation of animals in enclosures from the rest of the world, zoo enclosures often took on the shape and feel of a prison cell.¹²¹ The animals were

¹¹⁹ Barbara Creed, "Apes and Elephants: In Search of Sensation in the Tropical Imaginary," *ETropic: Electronic Journal of Studies in the Tropics* 12, no. 2 (2016).

¹²⁰ Carl Hagenbeck, Hugh Samuel Roger Elliot, and Arthur Gordon Thacker, *Beasts and Men, Being Carl Hagenbeck's Experiences for Half a Century Among Wild Animals* (Longmans, Green, 1911): 40.

¹²¹ Lisa Uddin, *Zoo Renewal: White Flight and the Animal Ghetto* (Minneapolis: University of Minnesota Press, 2015).

evidently perceived by a number of zoo architects to be dangerous and as such the enclosures were designed to keep humans from harm's way.

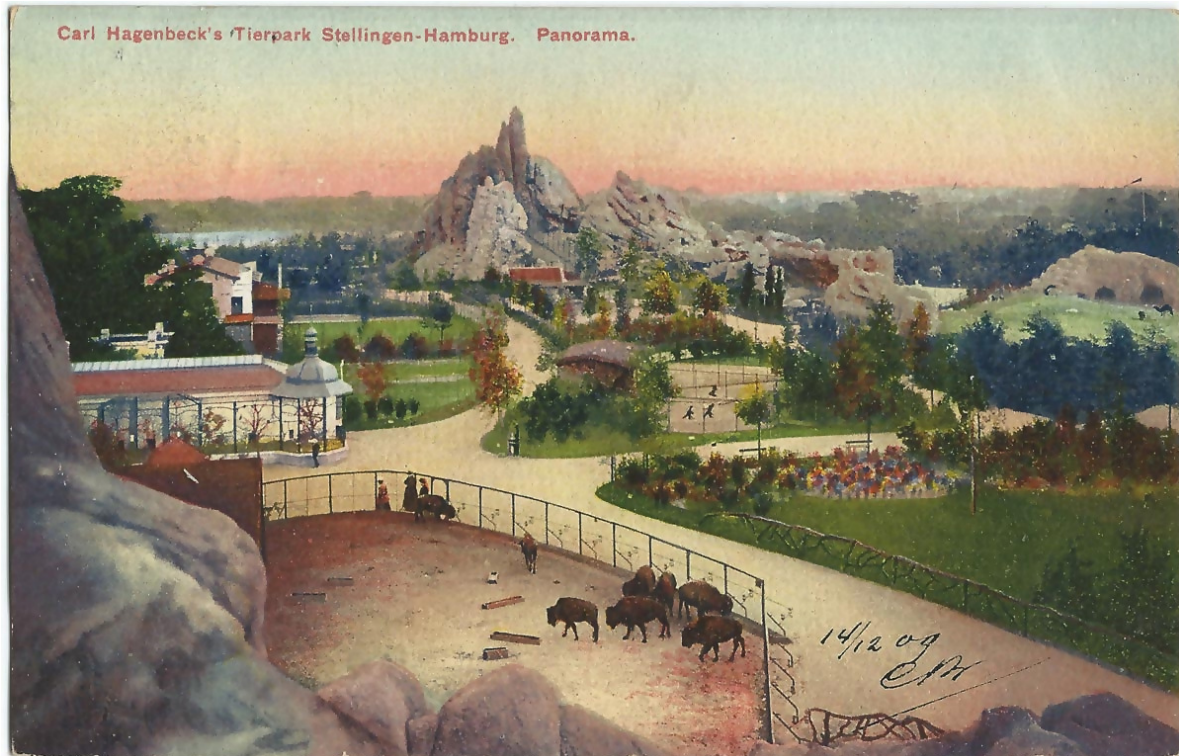


Figure 4. Panorama view of Hagenbeck's Tierpark¹²²

The creation of place by animals differs from that by humans.¹²³ Daniel Nuttall, architect and scientist, introduces a new theory for Zoo Exhibit Design that focuses on how animal needs should drive the design process.¹²⁴ Where zoo architecture is involved, 'the customer, the creature that is going to live in the building, cannot be consulted.... Few if any wild

¹²² *Vue de Hambourg Au Début Du XXe Siècle*, postcard, December 14, 1909, Vintage postcards private collection.

¹²³ Thom Van Dooren, Deborah Bird Rose, and others, "Storied-Places in a Multispecies City," *Humanimalia* 3, no. 2 (2012): 1–27.

¹²⁴ Daniel B. Nuttall, "An animal-as-client (AAC) theory for zoo exhibit design." *Landscape Research* 29, no. 1 (2004): 75-96.

animals, for instance, would choose to live in full view of human beings, yet in a zoo they must'.¹²⁵ Nuttall proposes a new design theory where the animal is the client that you are designing for, and the success of the design depends on the animal's behavior in the space. He links this theory to broader issues of sustainability and animal survival, and involves both ecological and design disciplines. This theoretical paper questions how animals could contribute in creating plans to sustain their existence, and asks how are the needs of animals represented in design process? And, are there more inclusive and interdisciplinary design approaches that focus on the welfare of animals in zoos? Currently, "there is no theory that describes how designers might consider animal needs, and how these needs might be interpreted in the design process",¹²⁶ so Nuttall explains that this is a foundation paper that requires further refinement through an ongoing process that adapts to both humans and animals. He questioned how we can create a power shift during design, and described his proposed process of animal participation in two steps. First, we must invest in gathering general and comprehensive information about all species characteristics and behavioral patterns. Second, we must compare our gathered knowledge with thorough observations at the zoo. Animals communicate with us through the way they respond to their designed environments, and if they are placed in an undesirable setting they will make it known through their behavior. Hence, animal collaboration in the design process can only occur after we truly understand and observe them.

¹²⁵ AHN Green-Armytage, *Story of Bristol Zoo*, 1964: 71.

¹²⁶ Daniel B. Nuttall, "An animal-as-client (AAC) theory for zoo exhibit design." *Landscape Research* 29, no. 1 (2004): 75.

The success of zoos is largely attributed to the continued separation between culture and nature.¹²⁷ “Cultural rifts between humans and animals tend to obscure animal participation, collaboration and choice.”¹²⁸ This separation is apparent even within the management structure of the zoos. We have animal care oriented departments such as the vets and zookeepers on one hand, and separate socio-cultural oriented departments that handle the visitors and staff at the zoo. While zoos cater to three main end-users: visitors, staff, and animals, they have habitually given the staff the authority over curatorial and design decisions.¹²⁹ Driven by the new epoch and massive habitat loss, notions of alternative space and power must be explored. After all, “thinking like an elephant, an insect, or even a molecule – can help attune to the diverse ways in which nonhuman life inhabits the novel ecosystems of an Anthropocene planet.”¹³⁰ The term *locus of control* was initially introduced by psychologist Julian B. Rotter as a person’s belief that s/he has power over the occurring events in their lives, as opposed to external forces controlling them¹³¹. It is time that we shifted the locus of control towards the animals, so that they can be involved in appropriating future zoo design, themes, and contents.

One such project that tests the value and extent of communication across species is

¹²⁷ Freddy Winston Castro, “Andrew Abbott: Chaos of Disciplines,” *Acta Sociologica* 44, no. 3 (2001): 277–279.

¹²⁸ ¹²⁸ Daniel B. Nuttall, "An animal-as-client (AAC) theory for zoo exhibit design." *Landscape Research* 29, no. 1 (2004): 93.

¹²⁹ Gail Dexter Lord and Kate Markert, *The Manual of Strategic Planning for Cultural Organizations: A Guide for Museums, Performing Arts, Science Centers, Public Gardens, Heritage Sites, Libraries, Archives and Zoos* (Rowman & Littlefield, 2017).

¹³⁰ Jamie Lorimer, *Wildlife in the Anthropocene* (Minneapolis, MN: University of Minnesota Press, 2015):176.

¹³¹ Julian Rotter, *Social Learning and Clinical Psychology* (New York: Johnson Reprint Corporation, 1954).

titled Ooz¹³², zoo spelled backwards. Its interactive interface enables both humans and animals to control different aspects of each other's environments. It allows animals to communicate with humans in a way the humans can understand; in their own voice that is. Animals are able to capture video footage of human behaviors and mannerisms in the same way that humans are able to capture those of animals through an intricate web of webcams. The next phase of the experiment is the virtual actualization. The aim of this phase is to test knowledge of each sides of the divide. Here, both humans and animals can make recordings of behavior and interactions of the other in a bid to build a library from which gainful information can be acquired. The library of recordings, despite the party that triggered it, can be cross-referenced with others in order to gain a full understanding of the animals and, or humans in question. From this library and the information held within it, we can either agree or disagree with preconceived notions of species behavior and traits. We can test the variations, if any, in interpretation of various animal behaviors from the human perspective. This constant comparison of the different interpretations of animal behavior will eventually amount to well researched and well-represented schools of thought. The concept of the "Ooz" allows for "loco-liberty" of species, acknowledges the roles of the human species in the transition and more so the role of technology in achieving an ecological equilibrium between species.

"Ooz" is work of designer Natalie Jeremijenko, and is aimed at re-engineering contemporary ideals of zoos that hold animals as objects of entertainment and visual consumption by humans.¹³³ While not all may agree with some of these interactive antics, the

¹³² "Ooz: Zoo Backwards," accessed October 23, 2018, www.nyu.edu/projects/xdesign/ooz/.

¹³³ "Ooz: Zoo Backwards," accessed October 23, 2018, www.nyu.edu/projects/xdesign/ooz/.

designer argues that in this piece animals are free to react by staying and confronting the intruders or walk away unlike in zoos. Another point of concern would be the introduction of yet another gadget, such as her robotic geese, into the already technologically laden conservation and nature space. A counter argument to this would be that rather than viewing technology as the villain in the natural world, we could embrace it as a tool of transformation and a bridge of communication between species. The ideal represented by the Ooz is the abolishment of distinctions between species, and the spaces and roles that can be occupied by any of these species and the creation of shared spaces and mutualism between species. There has always been uncertainty regarding animal intellect and sentiment. "All human descriptions of animal behavior are in human language, and there is a significant risk of anthropomorphic projection getting things wrong. We do not have unmediated access to the experience of other species."¹³⁴ Therefore, we can only understand animals through their qualitative and quantitative characteristics. Animals cannot directly tell us about their culture and design preferences, instead we must depend on human observations, and this knowledge is not available for all species¹³⁵.

In order to achieve a seamless interaction between nature and culture, zoos have made an effort to replace the old barriers with more interactive ones.¹³⁶ An attempt to do so has seen the introduction of glass enclosures, naturalistic enclosures and razor-thin

¹³⁴ Martha C. Nussbaum, "Animal Rights: The Need For A Theoretical Basis." *Harvard Law Review* 114, no. 5 (2001): 1508.

¹³⁵ William Conway, "The species survival plan and the conference on reproductive strategies for endangered wildlife." *Zoo Biology* 4 (1985): 219-223; K. Ralls, "Why is behaviour so rarely incorporated into conservation planning?" *Proceedings of the Twenty-Fourth International Ethological Conference Abstracts*. (Honolulu: University of Hawaii, 1995).

¹³⁶ David Grazian, *American Zoo: A Sociological Safari* (Princeton, NJ: Princeton University Press, 2015).

electrically charged, high voltage wires. The point is to allow humans to have that ideal interaction with the “wild” without being exposed to any dangers. Each of these solutions, however, presents a different set of challenges. The high voltage razor-thin fences can cause more harm than good to some animals and therefore go against the principles of protection and care that zoos are founded on. Also, some animals are seemingly immune to the electric shock and others amused by the sensation.¹³⁷ Elephants will often use sticks or tusks to short circuit the wires and render themselves free.

Glass barriers are basically a clear version of the iron cages. However, in order to contain some animals in a glass enclosure, a great deal of planning, engineering and designing has to be applied. Architect Jeffrey Smith explains how “We always look for the magic barrier where there's ‘nothing’ there.... We joke about a ‘force field’ where the animals can't get out-you're always trying to get rid of the barriers, or not see the barriers, to get this interaction with the animals.”¹³⁸ Another challenge presented by the use of thick, multi-layered glass barriers is the removal of the audio and smell interactions between the human audience and animals in captivity.¹³⁹ The thick glass is necessitated by the need for safety both for the visitor and the animal. It, however, keeps visitors from experiencing the sounds made by the animals as well as their scents. They are also a cause of stress for the animals especially when visitors insistently tap on them. Agitated animals are in turn a source of stress for the zookeepers.

¹³⁷ David Hancocks, “The Design and Use of Moats and Barriers,” *Wild Mammals in Captivity Principles and Techniques* (1996): 191–203.

¹³⁸ David Grazian, *American Zoo: A Sociological Safari* (Princeton, NJ: Princeton University Press, 2015): 22.

¹³⁹ David Hancocks, “The Design and Use of Moats and Barriers,” *Wild Mammals in Captivity Principles and Techniques* (1996): 191–203.

Moats provide a likely solution to this safety-experience dilemma that is brought forth by the use of glass barriers. They keep enough distance between the visitors and the animals to avoid any potential harm to both the visitor and the animal. At the same time such a barrier will allow visitors to not only see the animals, but also to hear them and even interact with the smells of the animal and its habitats. A shortcoming of moats is that the increased distance between the visitor and the animal may make the visual appreciation of the animal rather difficult. If the animals are too difficult to see then the chances of visitors actually stopping to appreciate, bond and get excited by the animal are reduced.¹⁴⁰ Another challenge is that moats are space intensive. If used, they reduce the utilizable habitat space for the animals and pose potential threats to some animals. Great apes for example have drowned in the moats.¹⁴¹ In other cases, the threats take the form of outside feral creatures coming into the enclosures.¹⁴²

In order for zoos to provide their visitors with a wholesome experience of being in the wild, zoo designers have been forced to mimic the natural habitats of the animals in question. This close resemblance to the natural surroundings of the animal not only helps to easily assimilate the animal into zoo condition, but also helps to captivate the visitor's interest. Conservation education offered to zoo visitors is inclusive of the natural surroundings of the animals. The inclusion and labeling of vegetation within the enclosures helps make the visitors aware of the floral and faunal aspects of wildlife. These backdrops of

¹⁴⁰ Stephen Bitgood, Donald Patterson, and Arlene Benefield, "Exhibit Design and Visitor Behavior: Empirical Relationships," *Environment and Behavior* 20, no. 4 (1988): 489.

¹⁴¹ Tom de Jongh et al., "2.1. Accommodation: Gorilla Accommodation," *EAZA Best Practice Guidelines*, 2017, 32.

¹⁴² David Grazian, *American Zoo: A Sociological Safari* (Princeton, NJ: Princeton University Press, 2015).

plants and nature also set the stage for zoo operators to educate their audiences on various issues that pertain to the current environmental processes and changes our world is experiencing.

A predicament faced by zoo designers in attempting to recreate natural habitats is the temperature difference between the geographic regions of the natural habitats and the zoos themselves.¹⁴³ Plants that are indigenous to tropical regions are definitely going to have a hard time adapting to and surviving in temperate regions. Therefore, naturalistic outdoor exhibitions take more work to pull off on account of Mother Nature's differences. Another challenge faced by nature makers is the destruction of plants by the animals in captivity. Chimpanzees for example have an innate behavior of tearing down branches to play with or turn into tools.¹⁴⁴ A proposed solution for this problem is the use of synthetic plants. This is because unlike the latter, the former does not provide a conducive habitat for pests such as cockroaches, mice, and others. What is interesting though is that these insects and rodents that are considered pests in this case are featured in some zoos as specimens for display. The use of synthetic vegetation in attempt to mimic the natural surroundings of the animals in captivity is best exhibited at the San Diego Zoo. Here, to keep orangutans from destroying the already difficult to maintain trees, zoo designers have made use of steel in trees. These trees are manufactured by Nature Maker¹⁴⁵ and claim to have an 87% botanical accuracy and are fire proof. The manufacturing firm's advertisement and promotion of its nature

¹⁴³ David Grazian, *American Zoo: A Sociological Safari* (Princeton, NJ: Princeton University Press, 2015).

¹⁴⁴ Stephanie Wehnelt, S Bird, and A Lenihan, "Chimpanzee Forest Exhibit at Chester Zoo," *International Zoo Yearbook* 40, no. 1 (2006): 313–322.

¹⁴⁵ "The Art of Nature: Artisan Crafted Steel Art Trees™," NatureMaker Steel Art Trees, accessed September 18, 2018, naturemaker.com.

mimicking products is designed to tug at the heartstrings of nature lovers. They sell the ideal of having ‘nature’ that can withstand a great deal. ‘Idyllic. Majestic. And perfectly imperfect. Exactly as Mother Nature intended.... Bug holes. Fungus, moss and decay. Twisted, knobby, contorted and distorted trunks and limbs.’¹⁴⁶

As much as they strive to produce an environment that is as close to nature as possible, nature makers cannot do without borrowing from human culture which has led to an ongoing debate on the use of nature simulators. Arguments against nature simulators are brought forth on the premise that using artificial plants and other stimulators is a form of deceit. The result of this ongoing debate is the gravitation towards non-naturalistic enclosures. One such example is the exhibition of Sumatran orangutans as well as western lowland gorillas in the Philadelphia Zoo in enclosures designed to mimic an industrial district.¹⁴⁷ These primates are seen swinging and hanging from metal cranes. Within the children’s pavilion in the same zoo, a rat exhibit is designed to depict the happenings of a scientific lab and paint a rather accurate picture of what lab rats are subjected to. The specimen is, however, labeled and their natural origins explained. One such case is the design modification carried out in the Philadelphia zoo in 2011 that allowed for small mammals to walk freely throughout the zoo using a series of walkways, lookouts and overhead bridges set at 700 feet. These modifications were further added upon to accommodate primates at 1735 feet and at a later date a 330-foot expansion added to accommodate big cats at a 14 feet

¹⁴⁶ David Grazian, *American Zoo: A Sociological Safari* (Princeton, NJ: Princeton University Press, 2015): 33.

¹⁴⁷ Jon C. Coe, “Steering the Ark toward Eden: Design for Animal Well-Being,” *Journal of the American Veterinary Medical Association* 223, no. 7 (2003): 977–80.

elevation.¹⁴⁸ Modern day zoos prove that the very concept of nature is as a result of human constructs and ideas. This constant interaction between cultural and natural aspects of our world is proof that these two concepts are hardly mutually exclusive.

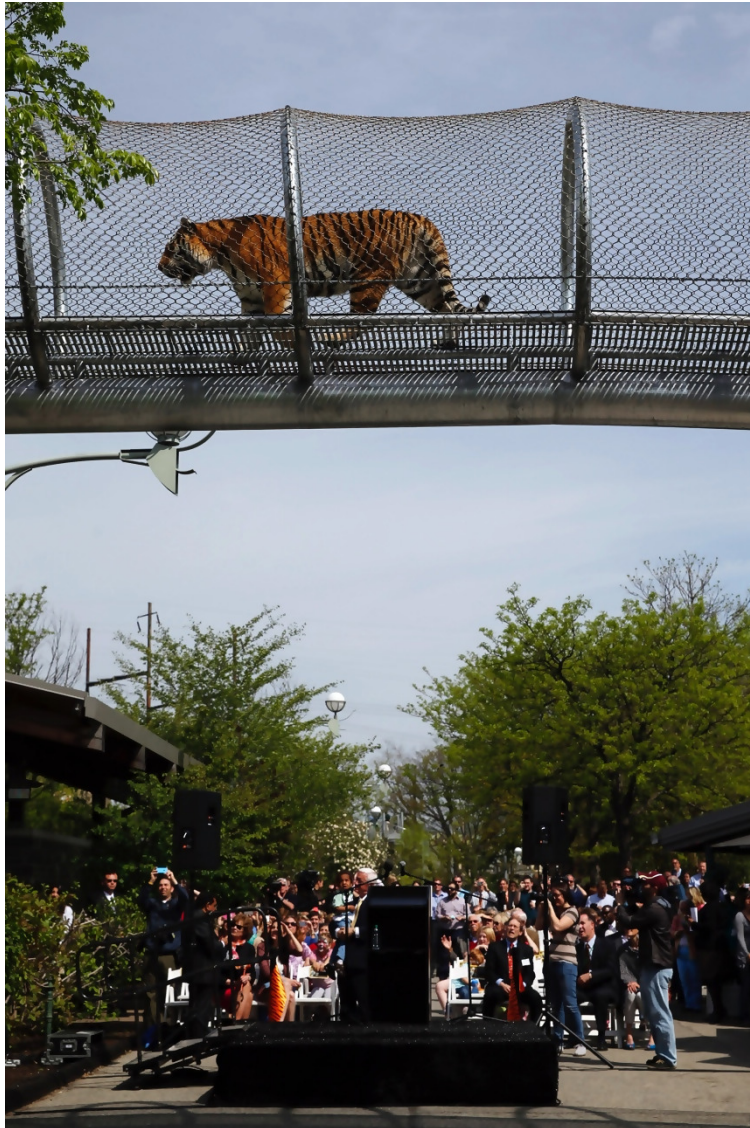


Figure 5. Big Cat Crossing at the Philadelphia Zoo¹⁴⁹

¹⁴⁸ Sandy Bauers, "Philadelphia Zoo's Big Cat Crossing Gets a Test Run," *philly.com*, 2014, http://www.clrdesign.com/pr_pdfs/Philadelphia_Zoo_Big_Cat_Crossing.pdf.

¹⁴⁹ Matt Socum, *Big Cat Crossing*, 2014, Associated Press.

While it can be argued that animals within the zoo space are free to roam within their ‘territories’ and adapt and shape these spaces into their own individual spaces, the ideal situation is one where they are let out of the confines of the zoos. Zoos in general act as a safe haven for animals threatened in the wild. However, in order to maintain these spaces as the havens they are set out to be, we need to understand the past and contemplate the future of the very animals we are trying to care for. The animals within the zoo’s enclosures play an important role, they are a reflection of the future and the enclosures themselves offer hope for a more inclusive urban planning. Shifting the locus of control means looking for innovative custom design solutions and not relying on outdated zoo approaches. Animal choices need not be reduced to mimicking what they had in the wild.¹⁵⁰ Shifting the locus of control means allowing species to lead a dignified life by giving them the chance to develop and grow in the way they choose. “The fact that so many animals never get to move around, enjoy the air, exchange affection with other members of their kind — all that is a waste and a tragedy, and it is not a life in keeping with the dignity of such creatures.”¹⁵¹ Animals in their natural habitat experience a variety of temperature, light, breeze, and shade; they fulfill their needs by selecting from the microclimatic choices available. Instead of living submissively in unchanging environments governed by standards, animals should experience a variety of senses and be given the choice to customize their ideal space without human mediators.

¹⁵⁰ Jon C. Coe, "Steering the ark toward Eden: design for animal well-being." *Journal of the American Veterinary Medical Association* 223, no. 7 (2003): 977-980.

¹⁵¹ Martha C. Nussbaum, "The Moral Status of Animals." *Chronicle of Higher Education* 52, no. 22 (2006): 33.

Motion-activated switches are one way of shifting the locus of control; animals could activate heaters, coolers, audio-visual displays, or food dispensers¹⁵².

Shifting the locus of control means designing a zoo where the visitor is not a superior onlooker¹⁵³ rather an unpretentious guest. For years animal survival relied not only on the skill to choose well, but also the capability to exercise choice. “What is “freedom”? Can it not be equated to choice? Would we not consider the organism with the most choices to have the greatest freedom? We punish our own conspecifics with death or imprisonment - we remove their choices.”¹⁵⁴ Conventionally, captive animals occupy the same enclosure all their life. Shifting the locus of control means designing enclosures as intersecting experiences, rather than stand-alone displays, and adopting concepts such as rotation, where the animal has the choice to visit multiple areas everyday, accessing more space and diverse settings.¹⁵⁵ An example of rotation was presented early on by Heini Hediger, “father of zoo biology”, when he described an enclosure with multiple pathways linking different areas, mimicking intersecting territories in the wild.¹⁵⁶ Rotation exhibits provide opportunities for exercise, stimulation, and time for landscaped spaces to recover from animal usage.¹⁵⁷

¹⁵² Jon C. Coe, "Giving laboratory animals choices." *Lab Animal* 2 (1995): 41-42.

¹⁵³ Rebecca Bishop and others, “Journeys to the Urban Exotic: Embodiment and the Zoo-Going Gaze,” *Humanities Research* 11, no. 1 (2004): 106.

¹⁵⁴ Jon Coe, “Giving Laboratory Animals Choices,” *Lab Animal* 2 (1995): 43.

¹⁵⁵ Jon Coe, "Steering the ark toward Eden: design for animal well-being." *Journal of the American Veterinary Medical Association* 223, no. 7 (2003): 977-980.

¹⁵⁶ Heini Hediger, *Wild Animals in Captivity*. (London: Butterworth, 1950): 14.

¹⁵⁷ Jon Coe, "Mixed Species Rotation Exhibits." *ARAZPA Conference, NZ* (2004).



Geographer David Lulka in "Boring a Wormhole in the Zoological Ark" seeks to reshape our notion of what a zoo should be like.¹⁵⁸ Instead of focusing on the aesthetic appeal of having species boxed-in in their pseudo environments, we should consider a more mobile and vibrant zoo. Here, animals can occupy different spaces and sceneries within the zoo with the exception of those that have a tendency to be sedentary. By doing so the zoo is constantly shaped and reshaped by the different movements animal groups and thus constantly being supplied with a new lease of life. Lulka 's choreographic model of zoology aims to ensure that all species within the zoo make use of the entire zoo. By allowing movement of animals within the various environments and spaces within their zoos, we

¹⁵⁸ David Lulka, "Boring a Wormhole in the Zoological Ark," in *Metamorphoses of the Zoo: Animal Encounter after Noah*, by Ralph R Acampora (Oxford, UK: Lexington Books, 2010), 123.

allow their senses to be stimulated and reduce the stress that comes with captivity and confinement. Creating a dynamic environment within the zoo space, “like a multisensory Rubik's cube.”¹⁵⁹

Shifting the locus of control also means designing for the animal’s complete life span and accommodating future generations. Zoos refrain from mimicking wild nature when it threatens the agreeable image they have constructed, like concealing illness, rivalry, aging and death. The Director of the Bronx Zoo explains:

“We have animals here that get old. Sometimes they don't move as good or their coats aren't as shiny and they may be blind in one eye. They're not attractive to look at. You'd be surprised that we get letters [complaining] about that. So which is it? Do you want us to kill everything when it's in its prime and breed more so that everything is bright eyed and bushy tailed, or is it okay for us to exhibit older animals or animals with handicaps?”¹⁶⁰.

Another moral dilemma for zoo operators is the way in which to rid themselves of unprofitable animals. Zoos will opt for young animals to draw crowds. This means that ever so often, the older generation must be removed from the zoo and room created for cute babies. Unwanted animals are often sold to dealers and may end up either being resold as circus animals, to be experimented on in labs, or as exotic pets.

“You hear about them all the time lately—exotic pets are constantly in the news—on TV, the radio, and in the newspaper. Monstrously large, nonnative Burmese pythons are being released into the Everglades, threatening native species. Nonindigenous

¹⁵⁹ Ralph R Acampora, *Metamorphoses of the Zoo: Animal Encounter after Noah* (Oxford, UK: Lexington Books, 2010): 6.

¹⁶⁰ Jim Breheny, "Interview." In *Zootopia: Utopia and Dystopia in the Zoological Garden*, ed. Irus Braverman, (London, UK: Black Dog publishing, 2012): 249.

Quaker parrots have escaped captivity and are now breeding so successfully outdoors in the Northeast that they have become a menace, nesting on power lines and disturbing electrical service. Seemingly docile large wildcats, raised captive in preserves, suddenly turn on their caretakers with sometimes fatal consequences. Human-like primates, bottle fed from birth in people's homes, like child substitutes, suddenly snap and inflict severe injury on their human family members."¹⁶¹

These are just a few of the many stories showcased in media, raising questions on how safe exotic animals are when treated as pets, and whether or not they can be properly taken care of.¹⁶² This is a lesson learnt from Lucy, a chimpanzee that was brought up in the comforts of a human home and taught how to communicate via sign language.¹⁶³ As she grew older and stronger it was deemed wise to return her back into the wild in Africa. Though she constantly signed for help she was released into the wild only to be found dismembered days later. A gibbon named Beanie is another sad story. Having been an adorable zoo baby, he was sold to researchers once he became too old for the zoo. After falling ill and eventually becoming both epileptic and blind at the research facility, it took the intervention of the International Primate Protection League to keep him from being euthanized.¹⁶⁴ Those sold to circuses are denied the right to engage in their natural behavior by being conditioned to

¹⁶¹ Laurie Hess, "Exotic Animals: Appropriately Owned Pets or Inappropriately Kept Problems?," *Journal of Avian Medicine and Surgery* 25, no. 1 (2011): 50.

¹⁶² Rachel Grant, V Montrose, and Alison Wills, "ExNOTic: Should We Be Keeping Exotic Pets?," *Animals* 7, no. 6 (2017): 47.

¹⁶³ Evelyn B Pluhar, *Beyond Prejudice: The Moral Significance of Human and Nonhuman Animals* (Durham, NC: Duke University Press, 1995).

¹⁶⁴ Shirley McGreal and Sharon E Strong, "International Primate Protection League," *The International Encyclopedia of Primatology*, 2016, 1–2.

perform tasks and tricks for the entertainment of humans. This conditioning is often done using chains, bullhooks, electric prods, human fists and muzzles.¹⁶⁵ While there is a call to release animals from captivity, it is prudent to adequately prepare them for life outside confinement.

Shifting the locus of control means evolving from enclosure design to multispecies experience, from standard working schedule to full day and night access, and from economically driven to focusing on the maximum benefits for the species.¹⁶⁶ Overnight and extended day programs that cater to larger crowds are not new concepts, but they do have an untapped potential. The Night Safari which first started in Singapore showcases this, “night time immersion displays are easy to develop because desirable areas are subtly spotlighted while areas to be hidden (barriers, service areas) are simply left in the dark. Many animals, including diurnal species are more active during cooler evening hours.”¹⁶⁷ Nocturnal animals can be displayed in their natural settings without requiring costly dim enclosures. Also, opening for longer hours means higher income from admissions, and visitor spending which helps upkeep the zoo.

¹⁶⁵ Tom Regan, *Empty Cages: Facing the Challenge of Animal Rights* (Lanham, MD: Rowman & Littlefield, 2004): 130.

¹⁶⁶ Ibid

¹⁶⁷ Jon Coe and Ray Mendez, "The Unzoo Alternative." *Work as Play*. (2005): 9.

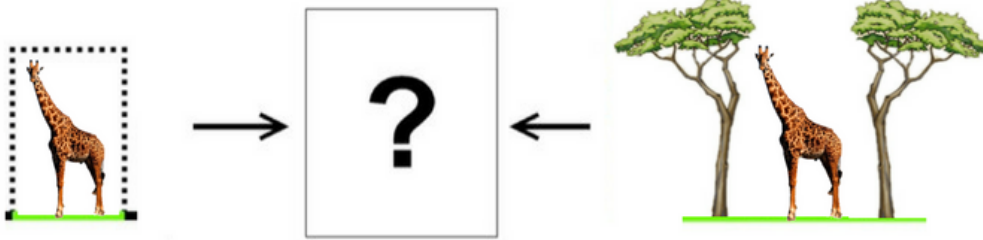


Figure 6. The search for a new zoo typology that is neither captivity nor the wild

It is important that we develop a new zoo typology that respects the capabilities of species to make decisions regarding their wellbeing and self-governance, “to uninvent zoos as we know them and to create a new type of institution, one that praises wild things, that engenders respect for all animals, and interprets a holistic view of nature.”¹⁶⁸ Due to habitat loss, many captive animals cannot be rereleased into the wild, so we must embrace this environmental degradation and begin designing zoos as a final refuge. By shifting the locus of control, we will be reconsidering our relationship with nature, and will no longer view captive animals as downcast dependents.

“For the animal shall not be measured by man. In a world older and more complete than ours they move finished and complete, gifted with extensions of the senses we have lost or never attained, living by voices we shall never hear. They are not brethren, they are not underlings; they are other nations, caught with ourselves in the net of life and time, fellow prisoners of the splendor and travail of the earth”¹⁶⁹.

¹⁶⁸ David Hancock, *A Different Nature: The Paradoxical World of Zoos and Their Uncertain Future*. (Berkeley: University of California Press, 2001): xv.

¹⁶⁹ Henry Beston, *The Outermost House: A Year of Life on the Great Beach of Cape Cod* (New York: Henry Holt and Company, 2003): 25.

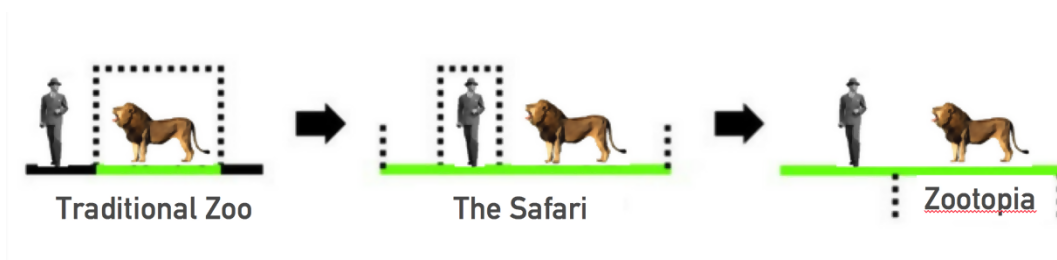


Figure 7. Considering new possibilities of zoo design

Only with this awareness can we begin to create zoological parks where species can more freely participate in their lives and ours. It is time we questioned our beliefs relative to the ability and competence of animals to take control of their own lives. For millenniums, wild animals thrived and evolved in environments filled with danger and strong competition. They managed on their own with no caretakers to prepare their food or clean them. It is unfair to compare captive born animals to their wild counterparts, but it is also unfair to disregard their ability to fulfill their own needs. In their original habitats, they learned the hard way; today they can be trained in our modern facilities. Behavior enhancement can include encouraging active foraging for their food, or simulated hunting to retrieve a natural livelihood trait and increase physical activity.¹⁷⁰ “We have been training animals for thousands of years, and we almost never ask them to do this! To bring their own abilities to the table, to think.”¹⁷¹ It is important that we admit that we are fairly oblivious to the best lifestyle choices for each species being greatly inclined to our supremacy. Therefore, our efforts to assess the capabilities of species maybe flawed.

¹⁷⁰ Jon C. Coe, "Steering the ark toward Eden: design for animal well-being." *Journal of the American Veterinary Medical Association* 223, no. 7 (2003): 977-980.

¹⁷¹ Karen Pryor, "Annual Award for Excellence in the Media." *Association for Behavioral Analysis*. (1997).

“We humans have a pervasive, often unconscious sense of our own importance. We are the caretakers. We know what is best for our animals. Like over-protective mothers, we fail to realize that our charges may prefer to do things for themselves...that choice and self-esteem and stress and health may be strongly linked. Can we conceive that mere animals, given a choice, may be able to meet their own needs better than we can?”¹⁷²

Shifting the locus of control means accepting our ignorance, asking the difficult questions, and reordering the hierarchy at the zoo.

¹⁷²Jon Coe, “Giving Laboratory Animals Choices,” *Lab Animal* 2 (1995): 41.

CHAPTER 3

ALTERNATIVE FUTURE SCENARIOS

Anthropogenic changes are testing the manageability of social-biological frameworks.¹⁷³ It is, hence, important to envision potential future directions of nature and see how these progressions may reshape the future outlooks of biological communities. The lack of responsiveness and failure to tackle environmental degradation has been the downfall of some past civilizations.¹⁷⁴ In the anthropocene, environmental changes have a vast impact across both local and global scales, and are intangible in nature. These changes are mainly interconnected with social and technological aspects.¹⁷⁵ As a result of this complexity, environmentalists refer to it as a 'wicked problem'.¹⁷⁶ These environmental problems lack a good definition, because each stakeholder views them differently. Solutions are hard to come by because of the relentless shift in the natural and political context.¹⁷⁷ Pertinent stakeholders should push for expansive resolutions that go beyond conventional scientific-

¹⁷³ Erik J Nelson et al., "Climate Change's Impact on Key Ecosystem Services and the Human Well-Being They Support in the US," *Frontiers in Ecology and the Environment* 11, no. 9 (2013): 483–893.

¹⁷⁴ Jared Diamond, *Collapse: How Societies Choose to Fail or Succeed* (New York: Penguin, 2005).

¹⁷⁵ Angela Wilkinson and Esther Eidinow, "Evolving Practices in Environmental Scenarios: A New Scenario Typology," *Environmental Research Letters* 3, no. 4 (2008): 045017.

¹⁷⁶ Horst WJ Rittel and Melvin M Webber, "Dilemmas in a General Theory of Planning," *Policy Sciences* 4, no. 2 (1973): 155–169.

¹⁷⁷ Angela Wilkinson and Esther Eidinow, "Evolving Practices in Environmental Scenarios: A New Scenario Typology," *Environmental Research Letters* 3, no. 4 (2008): 045017.

inquiry methods.¹⁷⁸ These chaotic environmental challenges can best be tackled by looking at them in their historical and future perspectives.¹⁷⁹

Methodology

Scenarios are multi-faceted; you need at least two, and they guarantee less certainty than different kinds of future predictions.¹⁸⁰ As far as probabilities, they can describe what might happen, not what is most likely to occur. “Unlike predictions and forecasts, scenarios do not imply a probability or likelihood.”¹⁸¹ Rather, scenarios have been characterized as conceivable portrayals of how the future maybe, using reasonable speculation.¹⁸² The investigative nature of scenario procedures makes it a great method to explore vulnerable situations.¹⁸³ This is certainly helpful with regards to issues that are too dubious to ever be settled by conventional techniques. Scenarios have been utilized at the neighborhood to worldwide scales to encourage long haul consideration and investigation of social-natural

¹⁷⁸ Silvio O Funtowicz and Jerome R Ravetz, “Science for the Post-Normal Age,” *Futures* 25, no. 7 (1993): 739–755.

¹⁷⁹ Angela Wilkinson and Esther Eidinow, “Evolving Practices in Environmental Scenarios: A New Scenario Typology,” *Environmental Research Letters* 3, no. 4 (2008): 045017.

¹⁸⁰ Edward A Parson et al., “Global-Change Scenarios: Their Development and Use,” 2007.

¹⁸¹ Detlef P Van Vuuren et al., “Scenarios in Global Environmental Assessments: Key Characteristics and Lessons for Future Use,” *Global Environmental Change* 22, no. 4 (2012): 884–895.

¹⁸² Joseph Alcamo et al., “Methodology for Developing the MA Scenarios,” *Carpenter, SR et Al.(2005), Ecosystems and Human Well-Being: Scenarios 2* (2005).

¹⁸³ Angela Wilkinson and Esther Eidinow, “Evolving Practices in Environmental Scenarios: A New Scenario Typology,” *Environmental Research Letters* 3, no. 4 (2008): 045017.

frameworks.¹⁸⁴ This methodology has been embraced by various governmental and private organizations, think tanks, and NGOs for over 50 years.¹⁸⁵

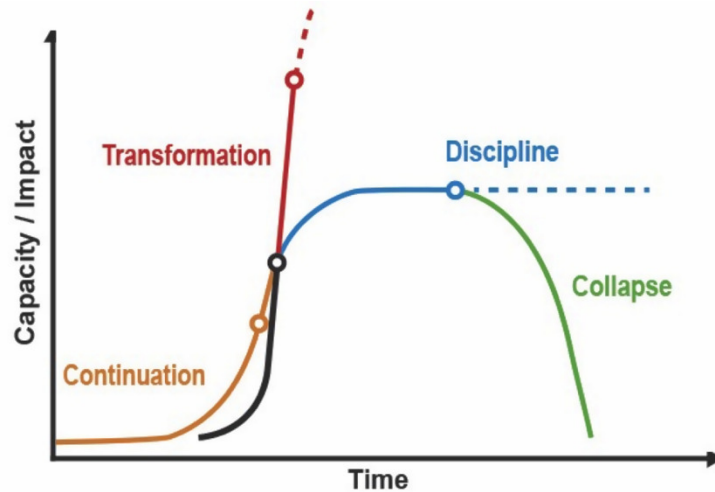


Figure 8. Alternative futures scenario model

Originating in the business field, scenario planning is an effective way to predict the future specifically in risky environments. Later adopted by schools of future studies, this methodology depends on an accumulation of strong concepts, responsiveness, and strategies that adopt a thinking and playing culture.¹⁸⁶ A scenario is not a final result, but rather a rich narrative that describes one future possibility that provides several logical answers to questionable futures. Scenarios build meaning and direction; they also focus the strategies with well-defined expectancies. According to Masini's¹ theorization of future visions, the purpose is to search the past and the present while considering the future. It needs to be

¹⁸⁴ Elisa Oteros-Rozas, F Ravera, and I Palomo, "Participatory Scenario Planning in Place-Based Social-Ecological Research: Insights and Experiences from 23 Case Studies," *Ecology and Society*, 2015.

¹⁸⁵ Angela Wilkinson and Esther Eidinow, "Evolving Practices in Environmental Scenarios: A New Scenario Typology," *Environmental Research Letters* 3, no. 4 (2008): 045017.

¹⁸⁶ Mats Lindgren, *Scenario Planning* (Basingstoke, UK: Palgrave, 2003).

based on that which is, that which was, and that which shall be in order for it to be impactful in achieving the necessary future.¹⁸⁷ When used in the context of post-zoo spaces, we are able to tell present day facts that influence the vision of the future, especially when it comes to research, ecology, and education. We are also able to see the vision’s negation from schools of thought that have been dominant in the past such as anthropocentrism and the cultural domination.

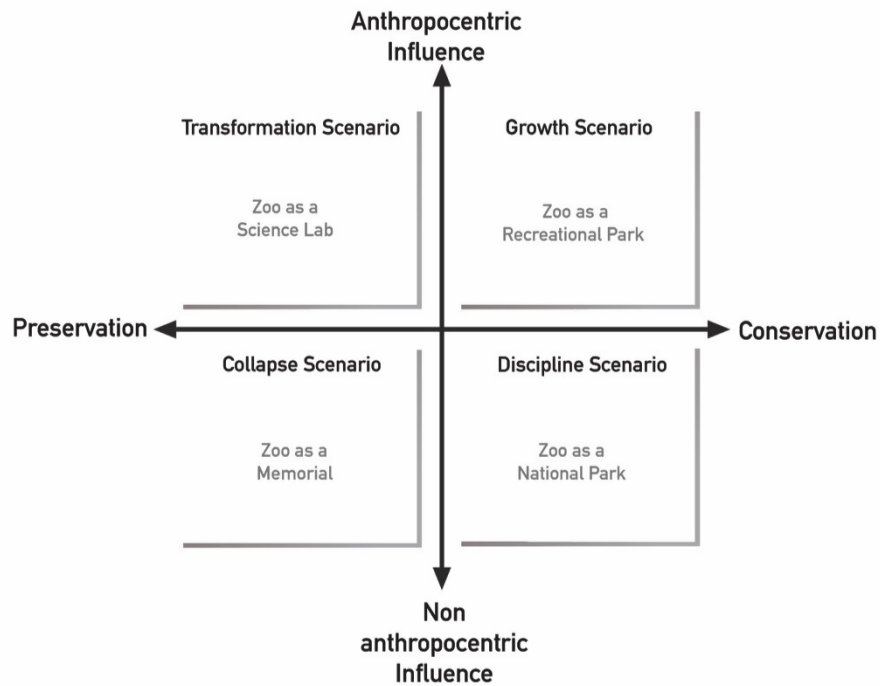


Figure 9. Scenario planning diagram

Jim Dator, a prominent futurist, developed a scenario-planning model that presents alternative “images” of the future.¹⁸⁸ This Manoa School method produces a quartet of scenarios that narrate alternative descriptions of the future. Each of the four scenarios is

¹⁸⁷ Eleonora Masini, “Rethinking Futures Studies,” *Futures* 38, no. 10 (2006): 1158–1168.

¹⁸⁸ Jim Dator, “Alternative Futures at the Manoa School,” *Journal of Futures Studies* 14, no. 2 (2009):1-18.

based on a different course of events describing the future change as growth, discipline, collapse, or transformation. In my dissertation, I use this method to explore possible futures of the zoo typology. The first scenario that I work through is a “Growth” scenario that sees a future driven by economy and development. In this scenario, the current recreational zoo will continue to grow as part of the entertainment industry. Under the “Discipline” scenario archetype, a second possible future zoo prototype could very well be re-wilding projects, where humans experiment with artificially created biomes. Discipline is a future scenario that sees human efforts to mitigate environmental crises and restore habitats. The “Collapse” scenario archetype investigates the extinction of wildlife due to “one of a variety of different reasons such as environmental overload and/or resource exhaustion, economic instability, moral degeneration, external or internal military attack, meteor impact, etc.”¹⁸⁹ Collapse is a future scenario in which extinction of all animal species becomes a sad reality. The “Transformation” scenario “sees the end of current forms, and the emergence of new forms of beliefs, behavior, organization and perhaps intelligent life forms.”¹⁹⁰ In the transformation scenario, people embrace technology and science to resurrect animals from the dead. After analyzing the four scenarios and their opportunities and challenges, I will propose a fifth “Synthesis” scenario.

“Once developed, the four alternative futures can be presented and studied in varying ways. Most common is simply reading and discussing a well-crafted written description of each of the four. However, we also stress finding ways by which relevant decision-makers can somehow “experience” the environment of each of the four futures so as better to consider how X might respond to the unique as well as

¹⁸⁹ Jim Dator, *Advancing Futures: Futures Studies in Higher Education* (Greenwood Publishing Group, 2002):10.

¹⁹⁰ Ibid

common features of each.”¹⁹¹

A scenario is a “story” that depicts potential future conditions and assists “sense-making”.¹⁹² Scenarios regularly contain a lot of conceivable differentiating anecdotes about the future and can be incorporated with “narratives are an integral part of human expression.”¹⁹³ Utilizing storylines that coordinate problematic financial, political, and social elements,¹⁹⁴ might be as critical as quantitative models since stories enhance the situations' believability and pertinence.¹⁹⁵ Which in return can encourage creating fruitful plans to accomplish reasonable fates.¹⁹⁶ Scenarios allow for various mediums to communicate their story, and a visual narrative is one of them. “Certain images perform upon and with their readers. Among the performative capabilities of imagery is narrative function.”¹⁹⁷ Therefore, I am accompanying my short fictional narratives with digital collages inspired by theory, history, and case studies that work to paint a clearer picture of the animal imaginaries.

¹⁹¹ Jim Dator, “Alternative Futures in Architecture,” in *The Routledge Companion for Architecture Design and Practice: Established and Emerging Trends*, by Mitra Kanaani and Dak Kopec (London: Routledge, 2015): 42.

¹⁹² Michael Burnam-Fink, “Creating Narrative Scenarios: Science Fiction Prototyping at Emerge,” *Futures* 70 (2015): 48–55.

¹⁹³ Neil Cohn, “Visual Narrative Structure,” *Cognitive Science* 37, no. 3 (2013): 413–452.

¹⁹⁴ Jan Hanspach et al., “A Holistic Approach to Studying Social-Ecological Systems and Its Application to Southern Transylvania,” *Ecology and Society*, 2014.

¹⁹⁵ Michael Burnam-Fink, “Creating Narrative Scenarios: Science Fiction Prototyping at Emerge,” *Futures* 70 (2015): 48–55.

¹⁹⁶ James Butler et al., “Framing the Application of Adaptation Pathways for Rural Livelihoods and Global Change in Eastern Indonesian Islands,” *Global Environmental Change* 28 (2014): 368–382.

¹⁹⁷ Matthew Peterson, “The Production of Narrative through Static Imagery: Examples from a Peculiar Medieval Illustration,” *Visual Communication*, 2018, 1470357217749998.

CHAPTER 4

ZOO HISTORY

Tracing Spatial Mechanisms in Zoo History

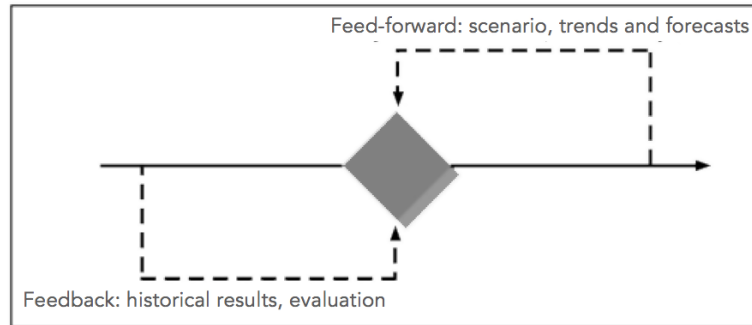


Figure 10. Using historical and future feedback loops

Scenario planning comes naturally, since human minds learn from what happened in the past and use that feedback to make future decisions. We also collect possible information about the future through ‘feed-forward’ systems.¹⁹⁸ The first essential step of a futures visioning process is “appreciating the past”, to go as far back as possible and understand the countless aspects of history.¹⁹⁹ “Historical research will show that the main drivers in the past explain *why X began; how and why it was structured the way it was; and how and why it changed (or did not change)* over time.”²⁰⁰

The ease of this model makes it ideal for helping to understand spatial mechanisms related to the history of zoos. History shows us some of the most fascinating stories of how

¹⁹⁸ Mats Lindgren, *Scenario Planning* (Basingstoke, UK: Palgrave, 2003): 22.

¹⁹⁹ Jim Dator, “Alternative Futures at the Manoa School,” *Journal of Futures Studies* 14, no. 2 (2009): 1–18.

²⁰⁰ Jim Dator, “Researching Futures of X,” March 2018.

animal archetypes have come a long way and how the terminology has evolved. The names that were given to different animal archetypes are a consequence of human interpretations of the way in which the natural world was perceived and presented. The birth of the menagerie began in ancient China with a large animal reserve named “*Lingyou*” meaning the ‘*Garden of Intelligence*’ where the Emperor used to meditate in nature.²⁰¹ Years later, the term ‘*Exotique*’ made its appearance in French literature around the 1500s.²⁰² Then comes the abbreviation of zoological gardens, the term ‘*Zoo*’ (as we know it), was first used in 1867 through a hit music hall song ‘*Walking in the Zoo on Sunday*’.²⁰³ From then onwards, several changes associated to the world of zoos were witnessed, and in the late 20th century new terms like ‘*Conservation Parks*’ were coined and adopted. These name changes were intended to separate these zoological establishments from the critiqued zoos of the 1800s.²⁰⁴ In the 1980s, The National Zoo in Washington D.C introduced the term ‘*Bio Park*’. Following a similar direction, the New York Zoological Society was renamed to the Wildlife Conservation Society in 1993 making the zoos under their management “wildlife conservation parks”.²⁰⁵ With current developments, it could be well predicted that the zoos will act and look radically different in the upcoming 20 years leading up to various new terminologies such as

²⁰¹ Christine Van Tuyl, *Zoos and Animal Welfare* (Farmington Hills, MI: Greenhaven Publishing LLC, 2009): 7.

²⁰² Eric Baratay and Elisabeth Hardouin-Fugier, *Zoo: A History of Zoological Gardens in the West* (London, UK: Reaktion Books, 2004).

²⁰³ David Hancock, *A Different Nature: The Paradoxical World of Zoos and Their Uncertain Future* (Berkeley, CA: University of California Press, 2001): 43.

²⁰⁴ Terry Maple, “Toward a Responsible Zoo Agenda. In M.H.B. Norton, *Ethics on the Ark*” (Washington: Smithsonian Institution Press, 1995), 25.

²⁰⁵ Farhad Uddin, “History of Zoo, Comparison of Different Zoo and Success of Captive Breeding in Bangladesh,” *IOSR Journal of Agriculture and Veterinary Science* 10, no. 2 (February 2017): 13–16.

virtual zoos.²⁰⁶

Some of the earliest public displays of animals go far back to 1513 in the Capital of Switzerland, Bern.²⁰⁷ Following the Battle of Novara, a bear was caught and taken back to the city. The bear was housed in a moat creating a separation through an underground level, which opened the way for several other bear pits in the city. In the 16th century the Cabinets of Curiosities followed representing encyclopedic collections of objects, encasing and encapsulating the animals.²⁰⁸ In 1777, there is evidence that painting influenced the remodeling menageries as picturesque garden, leading to more green animal enclosures.²⁰⁹ Unlike the formal gardens the picturesque garden was designed with artificial winding paths that were built on the element of surprise.²¹⁰ By 1801 most of the habitats designs were ignored in favor of the conventional buildings, this practice generated a sense symbolizing man's control over nature by housing animals in artificial environments.²¹¹

²⁰⁶ Jen Fields, "AZA and Microsoft's 'Zoo Tycoon' Collaboration Unites a Virtual Zoo Community with Real-World Conservation Initiatives," 2014.

²⁰⁷ Sean Mowbray, "How the Bear Became the Symbol of Bern," Culture Trip, February 13, 2018, <https://theculturetrip.com/europe/switzerland/articles/how-the-bear-became-the-symbol-of-bern/>.

²⁰⁸ Paula Findlen, "Inventing Nature: Commerce, Art, and Science in the Early Modern Cabinet of Curiosities," *Merchants and Marvels: Commerce, Science, and Art in Early Modern Europe*, 2002.

²⁰⁹ Eric Baratay and Elisabeth Hardouin-Fugier, *Zoo: A History of Zoological Gardens in the West* (London, UK: Reaktion Books, 2004): 78.

²¹⁰ Susan Taylor-Leduc, "The Pleasures of Surprise: The Picturesque Garden in France," *The Senses and Society* 10, no. 3 (2015): 361–380.

²¹¹ Eric Baratay and Elisabeth Hardouin-Fugier, *Zoo: A History of Zoological Gardens in the West* (London, UK: Reaktion Books, 2004): 76.



Figure 11. The bear pit at the Zoological Gardens in Regents Park²¹²

²¹² Charles Hullmandel, *The Bear Pit at the Zoological Gardens, Regent's Park*, 1835, engraved and pub, 1835.

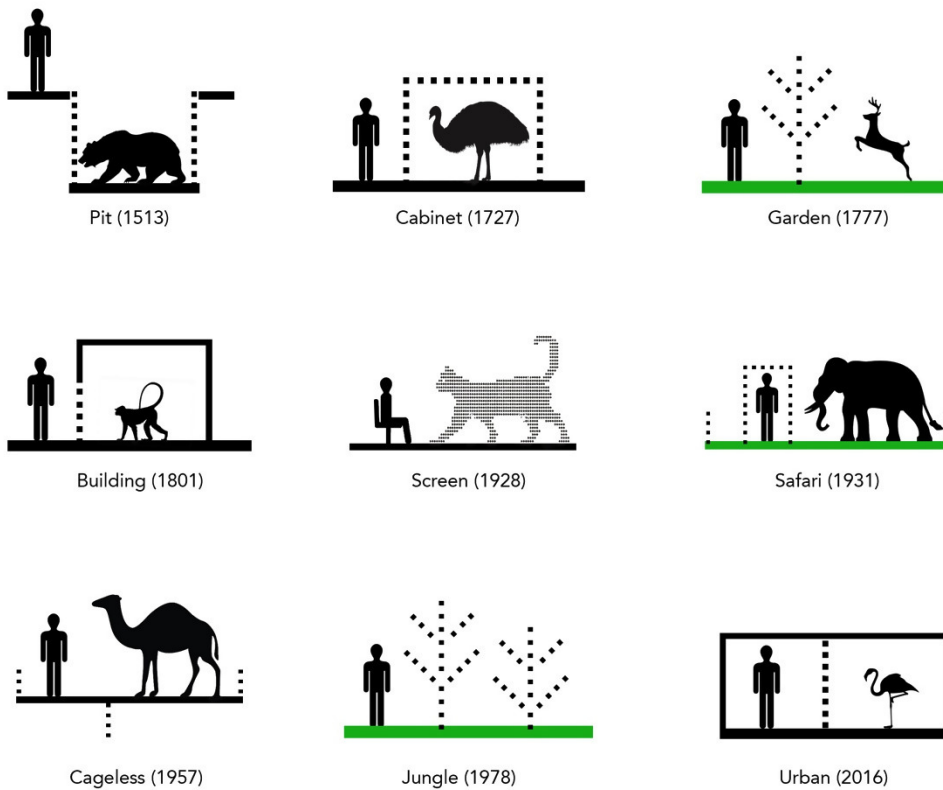


Figure 12. Spatial Mechanisms across zoo history

1928 ushered in the golden era of animation. From then onwards the spread of Disney animated films that anthropomorphized the behavior of animals and the reality of animals to being fantastical creatures larger than life.²¹³ Historians Eric Baratay and Elisabeth Hardouin-Fugier explain that in order to promote the conservation of animals and their habitats, the concept of safari parks was introduced by the Zoological Society of London, and for the first time humans are now the ones that are confined in space²¹⁴. By 1957, there was a remarkable

²¹³ Zoe Jaques, "The Idea of Nature in Disney Animation," *The Lion and the Unicorn* 33, no. 3 (2009): 409.

²¹⁴ Eric Baratay and Elisabeth Hardouin-Fugier, *Zoo: A History of Zoological Gardens in the West* (London, UK: Reaktion Books, 2004): 268.

decline in zoo vandalism as the cages and bars were removed and the safari park culture was being promoted globally. By the late 1970s landscape immersion exhibits were introduced to replicate natural green environments. But, many visitors complained that the newly made zoological gardens were so lush that they were hardly able to see any animals within.²¹⁵ The changes of mechanism in zoo history lead up to more and more removal of boundaries and impressive animal adaptations to artificial environments. Most recent events show more and more wild animals in the urban space whether intentional or accidental, as seen in the famous images of Hurricane Andrew in 2016 where animals were pictured hiding in a public toilet.²¹⁶

²¹⁵ Stacey M. Ludlum, "The Next Zoo Design Revolution?," *Designing Zoos*, July 15, 2008, <https://designingzoos.com/2008/07/15/the-next-zoo-design-revolution/>.

²¹⁶ Cara Giaimo, "The Story Behind the Most Famous Photo from Hurricane Andrew," *Atlas Obscura*, September 6, 2016, <https://www.atlasobscura.com/articles/the-story-behind-the-most-famous-photo-from-hurricane-andrew>.

Tracing the Growth Scenario

The history of zoos doesn't tell the story of a very considerate approach to animals²¹⁷, and that unsympathetic past is responsible in part for much of the opposition to the establishment. Studying the growth scenario through the past years indicates that economical and exploitation strategies were the impetus to human- animal interactions. Obsession with animal collection began long ago. Evidence to this can be traced back to 2,300 BC where in Alexandria, Egypt there existed the world's largest zoo.²¹⁸ In 300 BC, the Romans invented gladiatorial games that involved animal slaughter through arranged fights.²¹⁹ Animals were also put on display inside private estates. In 116 BC Italy, Marcus Terentius Varro, built an aviary composed of several flight cages, he invited his dinner guests here where they could listen to and watch the birds in cages.²²⁰ Fast forward to 1600s, where wild fantastical inaccuracies in representing animals in art were witnessed.²²¹

European colonizers exhibited their animal collections to the public as rewards of imperialism.²²² Other practices of animal captivity followed including menageries, circuses, and even human freak shows. The Hertz Theatre in Vienna, Austria, staged the first animal

²¹⁷ Barbara Woods, "Good zoo/bad zoo: Visitor experiences in captive settings." *Anthrozoös* 15, no. 4 (2002): 343-360.

²¹⁸ Nourhan H Abdel-Rahman, "Alexandria's Cultural Landscapes: Historical Parks Between Originality and Deterioration," *WIT Transactions on The Built Environment* 170 (2017): 73–83.

²¹⁹ Garrett G Fagan, *The Lure of the Arena: Social Psychology and the Crowd at the Roman Games* (Cambridge, UK: Cambridge University Press, 2011): 191.

²²⁰ Carin MC Green, "Free as a Bird: Varro de Re Rustica 3," *The American Journal of Philology* 118, no. 3 (1997): 427–448.

²²¹ Eric Baratay and Elisabeth Hardouin-Fugier, *Zoo: A History of Zoological Gardens in the West* (London, UK: Reaktion Books, 2004): 61.

²²² Ann C Colley, *Wild Animal Skins in Victorian Britain: Zoos, Collections, Portraits, and Maps* (London: Routledge, 2016): 17.

combat in 1755, this paved way for the involvement of animals in entertainment industry.²²³ London, in 1770 had the first circus customary format, that was invented by Phillip Astley.²²⁴ The circus involved circular rings, equestrian spectacles, and acrobatics. There arose a sensational approach in 1774, that was encouraged by showmen to attract more customers. Trans-location for animal trade begun in 1827, where the first giraffe Zafara, was successfully transferred from Egypt to Paris, this gave rise to a 3 day inspiring parade.²²⁵ Zoos were declared open to the public who could afford the fee in the year 1846.²²⁶ Shortly after, the working class were targeted as an audience, since zoos at that time were proposed as venues for their moral improvement and entertainment.²²⁷ Stockholding societies opened restaurants, sold rides on animals, and sold surplus animals in 1850s, after being granted subsidies by their respective governments.²²⁸ The 1851 Crystal Palace exhibitions in London further aided in developing the wild into organized spectacles.²²⁹ The public started forming emotional bonds with zoo animals. In 1865, the famous beloved Jumbo elephant was sold to an American circus and that caused a large public uproar in Britain.²³⁰ This all leads up to

²²³Ann C Colley, *Wild Animal Skins in Victorian Britain: Zoos, Collections, Portraits, and Maps* (London: Routledge, 2016): 17.

²²⁴ Steve Zeitlin, “The Bell Tolls for Ringling,” *Voices* 43, no. 3/4 (2016): 13–15.

²²⁵ Anne Innis Dagg, *Giraffe: Biology, Behaviour and Conservation* (Cambridge University Press, 2014).

²²⁶ Eric Baratay and Elisabeth Hardouin-Fugier, *Zoo: A History of Zoological Gardens in the West* (London, UK: Reaktion Books, 2004).

²²⁷ April Louise Austin, “Illustrating Animals for the Working Classes: The Penny Magazine (1832–1845),” *Anthrozoös* 23, no. 4 (2010): 365–382.

²²⁸ Eric Baratay and Elisabeth Hardouin-Fugier, *Zoo: A History of Zoological Gardens in the West* (London, UK: Reaktion Books, 2004).

²²⁹ Jeffrey Auerbach, “Empire under Glass: The British Empire and the Crystal Palace, 1851–1911,” in *Exhibiting the Empire* (Manchester University Press, 2017).

²³⁰ Susan Nance, *Animal Modernity: Jumbo the Elephant and the Human Dilemma* (Springer, 2015).

1922, where publicity professionals started to work at zoos full-time, they were known as ‘show-oriented directors’.²³¹



Figure 14. Award-winning Disney’s Bambi, that follows the story of woodland creatures²³²

The spread of Disney animated films, portrayed anthropomorphized behavior of animals, and their reality was fantasized.²³³ The years 1930 to 1950, witnessed individualization of animals, which emerged along with the craving to know more about their lives.²³⁴ There was spread of children’s illustrated books and comic strips in 1931 that relied on animal imagery, for instance Babar the Elephant became part of the French

²³¹ Eric Baratay and Elisabeth Hardouin-Fugier, *Zoo: A History of Zoological Gardens in the West* (London, UK: Reaktion Books, 2004).

²³² David Hand, *Bambi* (Walt Disney, 1942).

²³³ Lorraine Daston, Gregg Mitman, and others, *Thinking with Animals: New Perspectives on Anthropomorphism* (New York: Columbia University Press, 2005).

²³⁴ Eric Baratay and Elisabeth Hardouin-Fugier, *Zoo: A History of Zoological Gardens in the West* (London, UK: Reaktion Books, 2004): 216.

national heritage.²³⁵ During the same year in England, safari parks experienced a success in their operations.²³⁶ In order to attract public attention, in 1935 training and taming of animals was adopted by zoos²³⁷. Public awareness was enhanced with the commencement of airing of wildlife programs filmed at zoos on television in 1950s.²³⁸ Programs targeting children on public television networks started airing series like *Zoobilee Zoo* that feature actors dressed as animal characters in the 1980s.²³⁹ The gaming industry was also hit by the zoo analogy, this was evident in 2003, when *Zoo Tycoon*, a business simulation game was released in which the player operates a virtual zoo and tries to make a profit out of it.²⁴⁰ Profiteering from animals was also a sad reality, a Chinese zoo in 2013, angered its visitors when they staged Tibetan mastiff dog as an African lion.²⁴¹

Tracing the Discipline Scenario

Tracing the Discipline Scenario over the years shows efforts to mitigate environmental degradation and focus on the restoration of untouched notion of virgin nature. In the Mughal empire, Akbar the Great championed the calls to respect animals back in 1580 by

²³⁵ Jean Perrot, “The French Avant-Garde Revisited: Or, Why We Shouldn’t Burn Mickey Mouse”, *Critical Perspectives on Postcolonial African Children’s and Young Adult Literature*, 1998, 79–85.

²³⁶ Eric Baratay and Elisabeth Hardouin-Fugier, *Zoo: A History of Zoological Gardens in the West* (London, UK: Reaktion Books, 2004): 270.

²³⁷ Ibid: 190.

²³⁸ Gail Davies, “Science, Observation and Entertainment: Competing Visions of Postwar British Natural History Television, 1946-1967,” *Ecumene* 7, no. 4 (2000): 432–460.

²³⁹ Jeffrey E. Brand, “9. Cultural Diversity on Saturday Morning Television,” *Children and Television*, 1993, 132.

²⁴⁰ Andy Opel and Jason Smith, “ZooTycoon: Capitalism, Nature, and the Pursuit of Happiness,” *Ethics and the Environment*, 2004, 103–120.

²⁴¹ Randi Hacker, *Chinese Zoo Lion Fraud*, Recording, oral, Postcards from Asia (Center for East Asian Studies, University of Kansas, 2013).

building grand zoos.²⁴² In the 1700s, there was opposition of princely menageries in England since they were cut off from the environment, artificially composed, and constraining in nature.²⁴³ The year 1792 witnessed a cascade of defining events, first in Paris, after a successful French revolution, the Versailles was to be abolished since it symbolized tyranny.²⁴⁴ Philosophers of Enlightenment also had an impact to this course by championing for animal liberation.²⁴⁵

Bernardine de Saint-Pierre in 1792 advocated for physical integrity in natural enclosure design.²⁴⁶ More naturalistic behaviours started to be encouraged, such as feeding animals wild prey and adopting the first outdoor enclosure in 1870 to aid breeding²⁴⁷. The goal of protecting extinct animals was proclaimed in 1889 by the US National Zoo in Washington.²⁴⁸ This opened the way for global actions towards protection of endangered species. As such, the president South Africa created the first reserve to protect the rhinos in 1898.²⁴⁹ Policies

²⁴² Kathleen Krull, *What's New? The Zoo!: A Zippy History of Zoos* (New York: Arthur A. Levine Books, 2014).

²⁴³ Eric Baratay and Elisabeth Hardouin-Fugier, *Zoo: A History of Zoological Gardens in the West* (London, UK: Reaktion Books, 2004): 73.

²⁴⁴ Amandine Péquignot, "The Rhinoceros (Fl. 1770–1793) of King Louis XV and Its Horns," *Archives of Natural History* 40, no. 2 (2013): 213–227.

²⁴⁵ Eric Baratay and Elisabeth Hardouin-Fugier, *Zoo: A History of Zoological Gardens in the West* (London, UK: Reaktion Books, 2004): 194.

²⁴⁶ Giulia Pacini, "Environmental Concerns in Bernardin de Saint Pierre's Paul et Virginie," *Interdisciplinary Studies in Literature and Environment* 18, no. 1 (2011): 87–103.

²⁴⁷ Eric Baratay and Elisabeth Hardouin-Fugier, *Zoo: A History of Zoological Gardens in the West* (London, UK: Reaktion Books, 2004): 149.

²⁴⁸ Mary Anne Andrei, "The Accidental Conservationist: William T. Hornaday, the Smithsonian Bison Expeditions and the US National Zoo," *Endeavour* 29, no. 3 (2005): 109–113.

²⁴⁹ Kathleen Krull, *What's New? The Zoo!: A Zippy History of Zoos* (New York: Arthur A. Levine Books, 2014).

of wildlife preservation were thereafter introduced between 1900 and 1930s. New York, in 1907 oversaw the first case of re-introduction of endangered animals, buffaloes in this case, to their original habitat.²⁵⁰ In 1960, trained acts and lion-taming activities were stopped, and the zoos were distanced from circuses since performance animals were exposed to a constant state of fear, confinement and discomfort. This led to increased criticism of zoos in 1970s.²⁵¹

France, in 1976 recognized the status of animals as sentient beings, and they had to be treated as such.²⁵² In 1981, Switzerland set minimum surface area to be covered by the enclosures.²⁵³ A significant drop in visitors due to the opposition of animal captivity raised concerns in early 1990s.²⁵⁴ Therefore, the Association of Zoos and Aquariums (AZA) reversed its priorities in 1990s, making recreation their least priority.²⁵⁵ The major focus and attention currently has shifted to the future, where a much-anticipated third generation conservation is set occur.²⁵⁶

²⁵⁰ Kathleen Krull, *What's New? The Zoo!: A Zippy History of Zoos* (New York: Arthur A. Levine Books, 2014).

²⁵¹ Todd Bayma, "Rational Myth Making and Environment Shaping: The Transformation of the Zoo," *The Sociological Quarterly* 53, no. 1 (2012): 116–141.

²⁵² Servière Jacques, "Science and Animal Welfare in France and European Union: Rules, Constraints, Achievements," *Meat Science* 98, no. 3 (2014): 484–489.

²⁵³ Eric Baratay and Elisabeth Hardouin-Fugier, *Zoo: A History of Zoological Gardens in the West* (London, UK: Reaktion Books, 2004): 232.

²⁵⁴ Sophie K Turley and others, "Conservation and Tourism in the Traditional UK Zoo," *Journal of Tourism Studies* 10, no. 2 (1999): 2.

²⁵⁵ Eric Baratay and Elisabeth Hardouin-Fugier, *Zoo: A History of Zoological Gardens in the West* (London, UK: Reaktion Books, 2004): 213.

²⁵⁶ Jon Coe, "Design and Architecture: Third Generation Conservation, Post" (FUTURE OF ZOOS SYMPOSIUM, New York, 2012).

Tracing the Collapse Scenario

By the start of the 15th century, significant improvements were made in the fields of astronomy and cartography.²⁵⁷ Europeans took advantage of these advancements to further their understanding of the world and what lay beyond their borders. Their adventures into the world of the unknown resulted in captivating tales and creatures that they were able to bring back, dead or alive. In their living forms, they were a source of sustenance, beauty, and awe. When dead, they took on a prominent significance and in some instances a religious one.²⁵⁸ Mummified cats, for example, acted as totem objects for ancient Egypt communities. The celebrated aspect of animal remains is frequently displayed as animal trophies and zoomorphic design in public and private spaces.

The 1600s saw the improvement of the art and science of preserving dead animals. The curiosity of the unknown and things yet to be discovered was such that even dead animals were a sight to behold.²⁵⁹ It was in 1682 that scores of people who were unable to interact with a live elephant first saw its dead body. The preservation of animal remains was further improved in the 1740s courtesy of ornithologist Jean Becoeur.²⁶⁰ The introduction of chemicals such as arsenic soap by the apothecary saw the practice of taxidermy attract the interest of royals, aristocrats, physicians, and others with a curiosity. The result was the

²⁵⁷ Melody Amsel-Arieli, “Cabinets of Curiosity (Wunderkammers),” *History Magazine* 13 (2012): 40–42.

²⁵⁸ Karen Jones. “The Rhinoceros and the Chatham Railway: Taxidermy and the Production of Animal Presence in the ‘Great Indoors.’” *History* 101, no. 348 (2016): 710–735.

²⁵⁹ Eric Baratay and Elisabeth Hardouin-Fugier, *Zoo: A History of Zoological Gardens in the West* (London, UK: Reaktion Books, 2004): 65.

²⁶⁰ Karen Jones. “The Rhinoceros and the Chatham Railway: Taxidermy and the Production of Animal Presence in the ‘Great Indoors.’” *History* 101, no. 348 (2016): 710–735.

accumulation of specimens as art objects, objects of religious significance, and objects from which to draw inspiration, stature, and authority. The collections were neatly arranged in cabinets that later came to be referred to as cabinets of curiosity, *Wunderkammers* (German) which translate to wonder rooms or *Kunstkammers*, which translate to art rooms.²⁶¹ The trend of *wunderkammers* reached zoological parks, and in 1801 live animal collections were arranged by zoos in cages similar to the cabinet displays.²⁶² Later on in 1874, glass ‘cages’ replaced their metal counterparts, and the use of glass gave the specimen the allure of objects found in fine art museums and, or exhibitions. The dead zoo continued to play a significant role, especially in a time where there were numerous threats to the survival of animals.²⁶³ Scientists in the 19th century still chose to study animal corpses rather than living species.²⁶⁴ The year 1910 saw the display of life-sized reconstructions of prehistoric animals while 1984 saw the display of extinct animals.

²⁶¹ Karen Jones. “The Rhinoceros and the Chatham Railway: Taxidermy and the Production of Animal Presence in the ‘Great Indoors.’” *History* 101, no. 348 (2016): 710–735.

²⁶² Eric Baratay and Elisabeth Hardouin-Fugier, *Zoo: A History of Zoological Gardens in the West* (London, UK: Reaktion Books, 2004): 31.

²⁶³ Ibid

²⁶⁴ Oliver Hochadel, “Science in the 19th-Century Zoo,” *Endeavour* 29, no. 1 (2005): 38–42.



Figure 15. Hannibal Crossing the Alps²⁶⁵

Throughout history, natural and human caused disasters led to massive animal fatalities. The year 2002 saw the loss of zoo animals during the Prague floods.²⁶⁶ Although

²⁶⁵ Heinrich Leutemann. *Hannibals Übergang Über Die Alpen*, 1866, colored engraving, 1866.

zoological parks are rarely a military target, many are destroyed during combat.²⁶⁷ The Animals in War memorial was opened in London in 2004, and it showcases the effects of war on nonhumans. Millions of animals were enlisted in the army and many suffered atrocious deaths from injuries, hunger, dehydration, fatigue, illness, and combat.²⁶⁸ In 218 BC, during the Second Punic War, The Carthaginian general Hannibal crossed the Alps with 37 elephants, only one which survived.²⁶⁹ During the mid 1870s, Euroamerican hunters exterminated millions of American bison as a means to control the Native Americans.²⁷⁰ Their instructions were to "kill every buffalo you can! Every buffalo dead is an Indian gone."²⁷¹ 2003 marked the destruction of the Bagdad zoo due to the invasion of Iraq, proving that zoo animals endure at least as atrociously as civilians and combatants.²⁷² Similarly the bombing of Berlin Zoo in 1943 saw:

“zoo buildings set alight by incendiary bombs; antelope houses destroyed; a third of the animals dead; deer and monkeys escaping, birds escaping through broken glass roofs; lions charred and suffocated in their cages; crocodiles writhing in pain beneath

²⁶⁶ “Zoo Animals Killed in Prague Floods.” *BBC News World Edition*, August 14, 2002. <http://news.bbc.co.uk/2/hi/europe/2193483.stm>.

²⁶⁷ Leslie Irvine, *Filling the Ark* (Temple University Press, 2009).

²⁶⁸ “Information About Animals In War,” The Animals in War Memorial, accessed September 3, 2018, http://www.animalsinwar.org.uk/index.cfm?asset_id=1375.

²⁶⁹ Jacob Edwards. “The Irony of Hannibal’s Elephants,” *Latomus* 60, no. Fasc. 4 (2001): 900–905.

²⁷⁰ Andrew C Isenberg, *The Destruction of the Bison: An Environmental History, 1750-1920*, 18 (Cambridge, UK: Cambridge University Press, 2001).

²⁷¹ J. Weston Phippen, ““Kill Every Buffalo You Can! Every Buffalo Dead Is an Indian Gone,”” *The Atlantic*, May 13, 2016, <https://www.theatlantic.com/national/archive/2016/05/the-buffalo-killers/482349/>.

²⁷² Randy Malamud, *Reading Zoos: Representations of Animals and Captivity* (New York: New York University Press, 1998).

lumps of concrete; dead elephants cut up; humans crawling around their rib cages and burrowing through mountains of entrails”.²⁷³

2010 saw the death of animals in a Shenyang, China private zoo due to poor management and starvation of the animals.²⁷⁴ Furthermore, animals were eaten during the Jardin des Plantes Siege of Paris in 1870.²⁷⁵

Tracing the Transformation Scenario

The past findings on the transformation scenario explores how animals were contemplated and tested upon on the grounds of knowledge acquisition in the fields of medicine, science, and technology. The first encyclopaedia named, “The History of Animals” was written in the year 2,400 BC in Greece by Aristotle.²⁷⁶ Francis Bacon in 1627 presented a Utopian scientific facility named New Atlantis that enabled scientists to study live animals.²⁷⁷ In the year 1735, animals were first classified by the “System of Nature” at the Swedish Royal family zoo and this led to the establishment of the Science of Zoology.²⁷⁸ London too could not lag behind, and in 1835 a Zoological Garden was opened, but could only be

²⁷³ Winfried Georg Sebald. “Against the Irreversible: On Jean Améry.” *On the Natural History of Destruction*, 2004, 92.

²⁷⁴ Amanda Whitfort. “Evaluating China’s Draft Animal Protection Law.” *Sydney L. Rev.* 34 (2012): 347.

²⁷⁵ Sara Salih. “The Animal You See: Why Look at Animals in Gaza?” *Interventions* 16, no. 3 (2014): 299–324.

²⁷⁶ D’Arcy Wentworth Thompson, trans., *The History of Animals—Aristotle* (London: John Bell, 1907).

²⁷⁷ Francis Bacon, *New Atlantis and the Great Instauration* (Hoboken, New Jersey: John Wiley & Sons, 2016).

²⁷⁸ Paul Lawrence Farber, *Finding Order in Nature: The Naturalist Tradition from Linnaeus to EO Wilson* (Baltimore, MD: JHU Press, 2000).

accessed by scientists.²⁷⁹ The health condition of the animals kept in zoos had to be addressed and this saw the appointment of the first vet at the zoo in Madrid in 1869.²⁸⁰ In the year 1871, Charles Darwin proposed the theory of evolution dubbed “Descent of Man” which opened a lot of discussion on our similarities with animal species.²⁸¹ An association named the American Association of Zoological Parks and Aquariums (AAZPA), developed in 1924, and it was mandated with accrediting zoos and aquariums and ensuring they met standards.²⁸²

In recent years, modernization and technological advancements are being employed in zoos, but this trend first appeared in science fiction. Many film storylines see that intelligence enhancement technologies may result in uplifted animal prowess.²⁸³ For example, “Zoo” a thriller TV series shows animal species all over the world begin attacking humans.²⁸⁴ Other plots revolve around monsters and hybrid creatures such as: the man-horse centaur, the woman-lion sphinx, the snake-woman-lion, the woman-hawk Harpy and so on. Interest in animals on a genetic level grew, leading to the establishment of “Frozen Zoo” in San Diego that aimed to avert the extinction of the species.²⁸⁵ Also, the preservation of genetic resource

²⁷⁹ Eric Baratay and Elisabeth Hardouin-Fugier, *Zoo: A History of Zoological Gardens in the West* (London, UK: Reaktion Books, 2004): 94.

²⁸⁰ Ibid

²⁸¹ Charles Darwin, *The Descent of Man and Selection in Relation to Sex*, vol. 1 (Murray, 1888).

²⁸² Janaea Martin and Joseph O’Reilly, “The Emergence of Environment-Behavior Research in Zoological Parks,” *Public Places and Spaces* 10 (2012): 173.

²⁸³ MM Aalders, “‘There Is a Riddle Here’: Uplift Fiction and the Question of the Animal” (B.S. thesis, 2017).

²⁸⁴ Jeff Pinkner et al., “Zoo” (CBS, 2017 2015).

²⁸⁵ Subrat Kumar, “Extinction Need Not Be Forever,” *Nature News* 492, no. 7427 (2012): 9.

material was made easier by modern techniques, and the expense of genome sequencing has drastically reduced in the past decade. Cloning projects have had more success with “dolly the sheep” becoming the first mammal cloned in 1996.²⁸⁶ Another transformation direction is “de-extinction” which tries to bring back the animals from the dead. World-renowned geneticist Professor George Church and his team at Harvard University have been working for the past couple of years on recreating the DNA blueprint of the woolly mammoth through a Revival Project.²⁸⁷



Figure 16. The carcass of a baby mammoth discovered in 2007²⁸⁸

²⁸⁶ Ewen Callaway, “Dolly at 20: The inside Story on the World’s Most Famous Sheep,” *Nature News* 534, no. 7609 (2016): 604.

²⁸⁷ Ellen Shrock and Marc Güell, “CRISPR in Animals and Animal Models,” in *Progress in Molecular Biology and Translational Science*, vol. 152 (Elsevier, 2017), 95–114.

²⁸⁸ Aaron Tam, *Lyuba the Baby Woolly Mammoth*, April 10, 2012, April 10, 2012, AFP/Getty Images.

Tracing the Synthesis Scenario

Synurbization is experiencing an upward surge globally as an aftermath to urbanization worldwide.²⁸⁹ Observation of this phenomenon over the years indicates the potential of wildlife management in cities. In 1801, pits and conventional buildings were given preference to habitat designs and animals were placed in artificial environments.²⁹⁰ The London public, and most often children in 1855 fancied giving food to the animals, due to an increased desire for contact and friendship.²⁹¹ In 1861, French naturalist Saint-Hilaire applied the objective of acclimatization and domestication so as to introduce foreign species to the society.²⁹² Humanization of animals in the zoos was achieved in the year 1885, by naming, training, and taming the animals.²⁹³ In 1993, Frederick Wiseman an acclaimed filmmaker analysed the interrelation between animals and their human captors at Miami's Metro zoo in a documentary.²⁹⁴ The relationship between zoo animals and man continued to make news globally. In 1996 at the Brookfield Zoo, a gorilla saved a child that had fallen into its

²⁸⁹ Maciej Luniak, "Synurbization—Adaptation of Animal Wildlife to Urban Development," in *Proceedings of the 4th International Urban Wildlife Symposium*, 2004, 50–55.

²⁹⁰ Eric Baratay and Elisabeth Hardouin-Fugier, *Zoo: A History of Zoological Gardens in the West* (London, UK: Reaktion Books, 2004): 322.

²⁹¹ *Ibid.*: 183.

²⁹² Oliver Hochadel, "Science in the 19th-Century Zoo," *Endeavour* 29, no. 1 (2005): 38–42.

²⁹³ Eric Baratay and Elisabeth Hardouin-Fugier, *Zoo: A History of Zoological Gardens in the West* (London, UK: Reaktion Books, 2004): 190.

²⁹⁴ Assimakis Tseronis and Charles Forceville, "The Argumentative Relevance of Visual and Multimodal Antithesis in Frederick Wiseman's Documentaries," *Multimodal Argumentation and Rhetoric in Media Genres*, 2017, 165–188.

enclosure.²⁹⁵ Similarly in Detroit zoo, a man risked his life to jump into a zoo so as to save a drowning chimp in 1990.²⁹⁶

²⁹⁵ Jeffrey Bils and Stacey Singer, "Gorilla Saves Tot in Brookfield Zoo Ape Pit," *Chicago Tribune* 17 (1996): 1.

²⁹⁶ Jon Cohen, *Almost Chimpanzee: Redrawing the Lines That Separate Us from Them* (London, UK: Macmillan, 2010): 9.

CHAPTER 5

SCENARIO ARCHETYPES

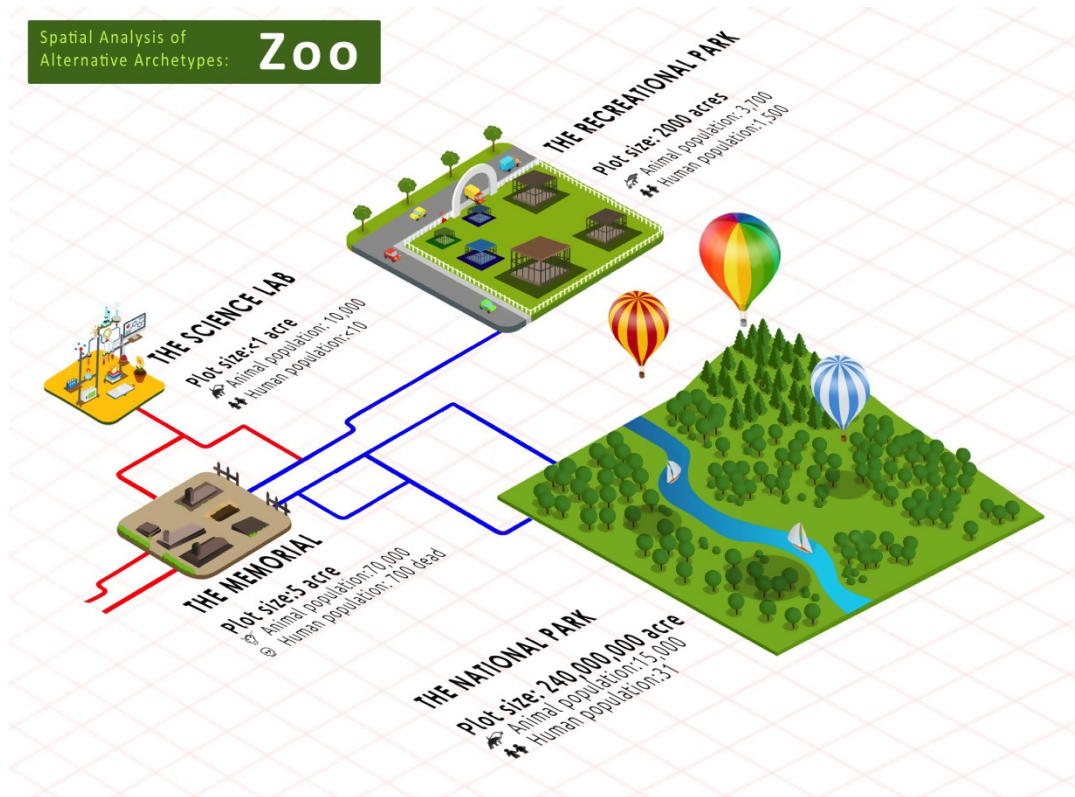


Figure 17. Spatial Analysis of Alternative Zoo Archetypes

1. Growth Scenario Archetype

- The first growth scenario discusses the commercialization of the zoo model, captivity in zoos, and animal exploitation for entertainment purposes. Zoos become the only place to see live animals, creating a rare luxury experience.
- The archetype would be an elitist recreational park.

The last public zoo saw its final day in the year 2043, all because it refused to subsidize its tickets to the government. What began as a stand taken to protect the inhabitants of the zoo ultimately led to its crippling downfall and the animals the zoo fought so hard to protect were auctioned off. This highest bidder

just happened to be: Dr. Frank, the founder of the world's largest private military supplier. Not only was she distinguished in her peculiarity, but also she appeared to be the owner of a defective moral compass; one which only pointed south. Her hunger for the twin flames of profit and spectacle drove all his actions; drowning her in desire to use her newfound collection for an outlandish new project. Advertised as a "rare experience", Dr. Frank decided to open up her private live animal collection to a small group of highly wealthy visitors, the kind with money to burn.

According to Dr. Frank's website, a luxury package consisted of the following: transportation to and from the private island where the zoo was housed. A park pass with a two-hour validity. A pre-visit Zoophobia Program that helps visitors overcome any animal phobias. One souvenir photo with an animal of the visitor's choice. And finally, an entry into a lottery from which one visitor will be selected for the Grand Prize: an overnight stay in the park and dinner with the owner.

The only package available was the luxury package. If you wanted to economize, you were not the kind of clientele that Dr. Frank was after. The process of reserving an admission was fraught with anxiety; one simply requested a ticket and was given a confirmation email that the request was received. After a background check, a credit check, a review of bank accounts and statements, and a thorough investigation of the prospective client's medical record could be conducted, then that client could receive a personal invitation from Dr. Frank, provided that everything is acceptable to her.

The world was fascinated by Dr. Frank's brash and pompous tone during her first public interview. "If I charge thousands of dollars as an entry fee, no one can stop me," she was quoted as saying when the interviewer posed the question of whether the park was too selective. "As a matter of fact, I don't need any visitors. That is the appeal of the park. If you have to question the price tag, then you most definitely can't afford this." Needless to say, my curiosity and spectacular credit score far outweighed my need to keep money in my bank account. Even if just for two hours, I felt a gripping, pulling need to understand what takes place in the island, the last piece of the wild.

We checked our phones and cameras at the loading dock before boarding the ferry to the island. Some wealthy teenagers tried to sneak their phones in their underwear, but the folly didn't make it past the full-body security team. Plus, that stunt would have fallen apart anyway when they were given 5D virtual reality suits to don for the duration of the visit. We were astounded at the antique park entrance, what struck us most was the long, spiraling queue waiting areas, preserved from a time when exclusivity wasn't the name of the game here.

The virtual reality suits allowed visitors to intensify the already-unbelievable sights, sounds, and particularly smells of the animals. Moreover, the animals were suddenly totally customizable; visitors could modify the bodies into hybrids by adding wings, horns, or other animalistic features. It was an extreme theme park experience with extravagant technology. To see live animals alone was a miracle, but this setup superseded the expectations of every guest.

"Wow, all of this design must of cost a fortune, how can it turn a profit?!" one visitor marveled.

“There are a lot of rich people in the world,” replied another. “So a few guests, countered by the higher fee means it’s undoubtedly at least breaking even.”

The nine other guests left the park excited to share what they have experienced with the crowd of journalists waiting at the ferry terminal. Only myself, the lotto winner was able to stay. I made sure of it. The dinner with Dr. Frank was in the central watchtower with a view out into the billowing greens of the island. But, looking out the window without the VR suit, the park area suddenly appeared to be nothing but exceedingly vast miles of barren desert land sparsely populated; an abandoned military range.

“Where did all the habitats go? The green?!” I exclaimed.

“Have a seat,” Dr. Frank crooned behind me. “We use applications of the technology that have not been pursued yet. It’s an uncomfortable truth, but a lot of what you saw is staged. That way, if an animal dies off, no one would ever know.”

“What do you mean?” I stammered, unable to comprehend the reality stretching itself in front of me. “If you’re taking care of the animals, why would they die off?”

“Mechanical failure, mostly,” she replied, almost a little too coolly. “Our engineers already work around the clock, but sometimes the machine substitutes have a mind of their own attacking the real animals” she swirled the water in his glass as she spoke, “...becomes too dangerous to interfere. At some point, we just have to let them fight it off, survival of the fittest.”

It was too much. My mind was ablaze with the possibilities; wondering how machines could bubble up with their own strains of intelligence. The dinner was served at once, forcing me to swallow her arguments against inclusivity, access, and populism for the rest of the evening.



It is quite evident that traveling is an activity that people enjoy, and especially to areas where they can view wildlife and experience nature's complexity.²⁹⁷ "Tourism is traditionally a hedonistic activity, with animals viewed as one of its many 'objects'."²⁹⁸ Therefore, wildlife destinations are a key player in the tourism industry. Jeffrey A. McNeely, chief scientist, explains that when considering why individuals like to visit natural landscapes, it is important to take a look back in time.²⁹⁹ Only a century back, Earth had just about a quarter of our current population, and substantial urban areas were rare. Untamed animals were regularly seen in the wide open, "with flocks of birds so dense they darkened the sky,

²⁹⁷ Karen Higginbottom, *Wildlife Tourism: Impacts, Management and Planning* (Champaign, IL: Common Ground Publishing, 2004).

²⁹⁸ Georgette Leah Burns, "Animals as Tourism Objects: Ethically Refocusing Relationships between Tourists and Wildlife," *Animals and Tourism: Understanding Diverse Relationships* 67 (2015): 44.

²⁹⁹ Jeffrey A. McNeely, "Foreword," in *Wildlife Tourism: Impacts, Management and Planning*, by Karen Higginbottom (Champaign, IL: Common Ground Publishing, 2004).

teeming herds of antelope migrating across the savannas, and schools of fish so thick that in some places the sea seemed solid with life.”

Design methodologies in zoos can be categorized into two broad categories. On one hand, you have the naturalistic approach, which endeavors to recreate to the closest possible degree the natural habitats, as seen at the Paris and Hamburg zoos. The second approach takes on a more abstract theatrical effect. In this approach the architectural inspiration seems to be that of the circus.³⁰⁰ London zoo was founded to act as a bridge between man and nature.³⁰¹ The modern structures and overall designs of this space are such that they do not emphasize on the nature-culture separation but find a common space in which both can co-exist without one necessarily dominating the other. This approach was evident in Lubetkin’s designs. His was an approach of functionality over sentimentalism.³⁰² While zoos should provide a much needed home for the animals housed within their boundaries, they are equally a source of entertainment for the visitors. Going by this logic, the architecture of the zoo should be such that introverted animals are coerced into showing themselves. In so doing, Lubetkin’s architectural approach dampens the notion of camouflage as mankind interferes in nature.³⁰³ Lubetkin’s creation, the Penguin Pool at the London Zoo, while it manages to transcend the limitations brought about by nature faces yet another huddle, the

³⁰⁰ John Allan, *Berthold Lubetkin: Architecture and the Tradition of Progress* (London, UK: RIBA publications, 1992).

³⁰¹ Chris Philo and Chris Wilbert, *Animal Spaces, Beastly Places* (London, UK: Routledge, 2004): 1–34.

³⁰² John Berger, *Why Look at Animals?* (London, UK: Penguin, 2009).

³⁰³ John Allan, *Berthold Lubetkin: Architecture and the Tradition of Progress* (London, UK: RIBA publications, 1992): 201.

efficiency that comes with modernism.³⁰⁴ We, therefore, need to come up with zoo models and designs that are fluid rather than structured.

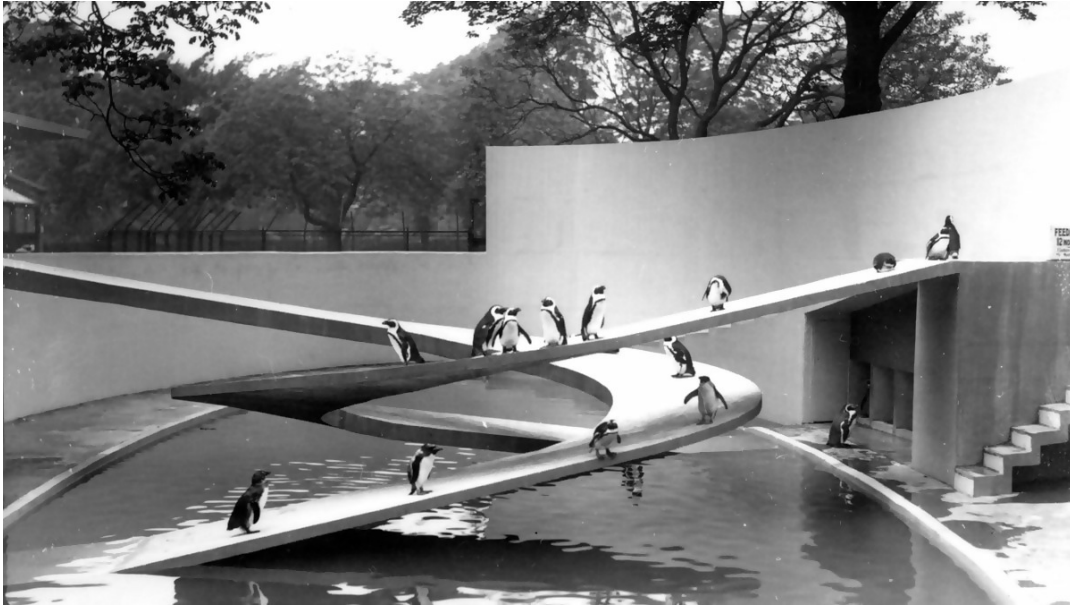


Figure 18. Penguin Pool designed by Berthold Lubetkin³⁰⁵

Currently zoos depend greatly on public support; therefore, they find it problematic to provide hiding spaces such as dens or thick shrubs, because visitors expect great photo opportunities.³⁰⁶ Shifting the locus of control should result in prioritizing animal comfort while providing noteworthy visitor experience. Using Hediger’s terminologies, “flight distance” and “reaction distance” can be significantly minimized without distressing the

³⁰⁴ Pyrs Gruffudd, “Biological Cultivation: Lubetkin’s Modernism at London Zoo in the 1930s,” in *Animal Places, Beastly Places: New Geographies of Human Animal Relations*, by Chris Philo and Chris Wilbert (London: Routledge, 2000), 222–42.

³⁰⁵ Frederick William Bond, *The Penguin Pool at London Zoo*, 1934, ZSL.

³⁰⁶ David Ehrenfeld, “Foreword.” In *Ethics on the Ark*, ed. M. Hutchins, E. Stevens, T. Maple and B. Norton, xvii–xxi. (Washington: Smithsonian Institution Press, 1995).

animals.³⁰⁷ Walk-through exhibits, aviaries, and safaris that house multiple species in one perimeter, reverse the conventional zoo approach by confining people inside the cage. Besides, sometimes a simple handrail is enough of a boundary between the public and the animals, and if the animal holding spaces are accessible and big enough, smaller species from the surroundings and migratory birds may create a home within the area.³⁰⁸ Shifting the locus of control means minimizing the barriers between visitors and species, and delivering notable encounters without excessive romanticism or decor.



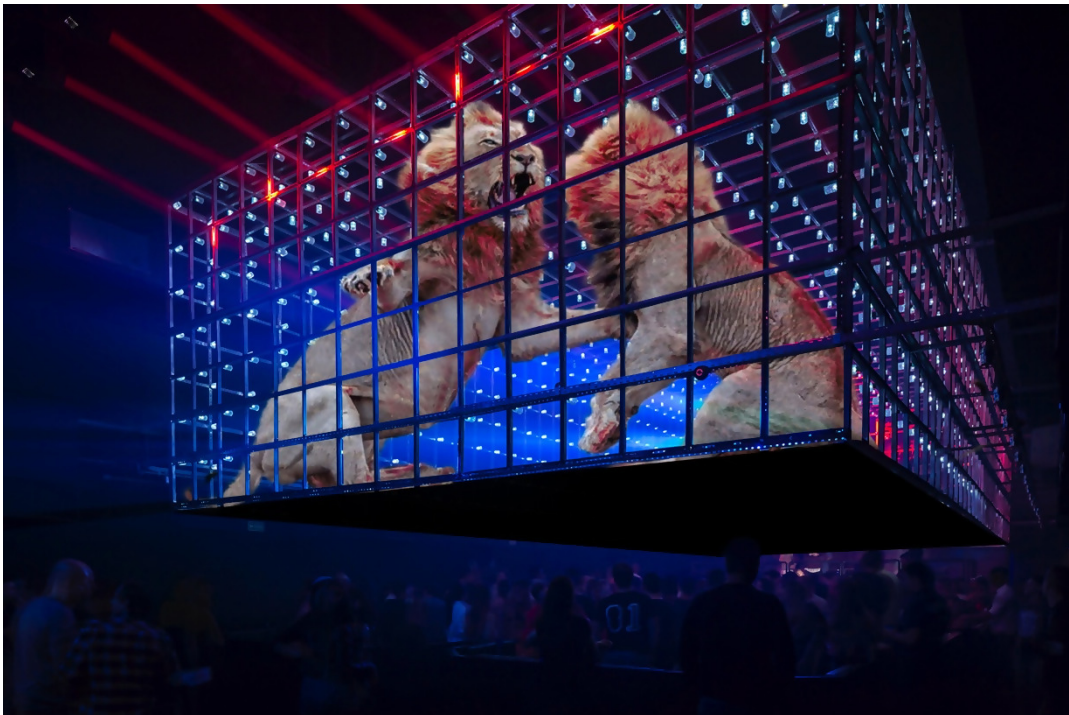
Figure 19. Animal Kingdom Nighttime Activity (©Disney)

The Animal Kingdom theme park situated in Florida is one of many human attempts to reinstate the status quo. Since 1998, this park has, in a sense, endeavored to accommodate

³⁰⁷ Heini Hediger, *Wild Animals in Captivity*. (London: Butterworth, 1950).

³⁰⁸ Jon C. Coe and Ray Mendez, "The Unzoo Alternative." *Work as Play*. (2005).

nature and culture in the same space. It offers displays of animals in a safari enclosure, displays of mythical creatures that make use of high technology animatronics all the while working on virtual displays that when complete run the risk of replacing nature as we know it. Furthermore, the need to merge the two worlds has seen the creation of electronic zoos such as the Wildscreen in Bristol. Wildscreen offers its visitors a chance to interact with the natural world through wildlife films, ARKive and IMAX experiences³⁰⁹. Virtual databases like ARKive.org imply that the disappearance of animals can be compensated by the storage and promotion of their images online. In this digital era, environmentalists believe that by partnering with ARKive they can use their comprehensive records on animals as a sort of emotive tool to promote conservation efforts. Such zoos allow us to experience nature and the biodiversity without removing the species from their natural habitat.



³⁰⁹ “Wildscreen Arkive,” Online Encyclopedia, accessed September 7, 2018, www.arkive.org.

Today, the vision of abundant nature is readily seen digitized on screens. This has opened us to a “zoomed-in” view of animal species in ways that were unthinkable a while back.³¹⁰ Today, individuals may only be in physical proximity to urban animals like pigeons and raccoons, yet might possess wide knowledge on the lives of many nonnative creatures. “The real paradox is how a superficial and increasingly flat screen can trigger such a deep nature interest.”³¹¹ Although people may seem detached from nature in a bodily sense, they are likely to be more perceptually connected to nature. The inclusion of digital, film and telecommunication technologies offer a platform on which to reintroduce and rebrand the image of nature.³¹² These new platforms, however, borrow heavily from those already created by traditional zoos. By comparing the quality and level of interaction between the two experiences (traditional vs. electronic zoos) we quickly become aware of the fact that our current reality of nature is highly virtualized.³¹³ While electronic zoos are deficient in providing an accurate natural experience, traditional zoos do not necessarily do a better job at it. However, visual technologies have always been employed in the definition, understanding, and general aesthetics of the zoo concept. It is for this reason that electronic zoos have the power to create biases towards different animals and natural spaces in general. The ‘recreation’ of nature through imagery has the potential to create nepotisms in the interpretation of the animal world and the various aspects of their management from an

³¹⁰ Karen D Scott, “Popularizing Science and Nature Programming: The Role of ‘Spectacle’ in Contemporary Wildlife Documentary,” *Journal of Popular Film and Television* 31, no. 1 (2003): 29–35.

³¹¹ Frans J Sijtsma, Michiel Daams, and Samantha van der Sluis, “Nature on TV: Deep Interests on Flat Screens,” *Recreation, Tourism and Nature in a Changing World*, 2010, 258.

³¹² Bruno Latour, *Science in Action: How to Follow Scientists and Engineers through Society* (Cambridge, MA: Harvard University Press, 1987).

³¹³ Nick Bingham, “Object-Ions: From Technological Determinism towards Geographies of Relations,” *Environment and Planning D: Society and Space* 14, no. 6 (1996): 635–657; George Robertson et al., *FutureNatural: Nature, Science, Culture* (Psychology Press, 1996).

environmental perspective.³¹⁴The art of image making as employed in electronic zoos has the power to portray animals not only as sensational creatures, but also a guarantee of visibility for the visitors. Images of animals can be created in such a way that the behavior is in line with scientific evidence. It is for this reason that this process would be rather incomplete without the joint efforts of filmmakers and scientists.³¹⁵ The availability of the resulting animal images allows us the luxury of ageless reproduction and circulation.³¹⁶

Traditional and electronic zoos bring nature and all its constituents closer to us, yet modulate animal agency. Animals are no longer active players in the zoos; their life stories either narrated on film by humans or their bodies stand representatives of their wild counterparts. Visual technologies allow us the ability to see animals in their natural element and understand what is essential and crucial to their existence and general behavior without having to necessarily see the animal with our naked eye, further downplaying the need for their corporeal presence.³¹⁷ The upside to the emergence of electronic zoos and the various virtual technologies is that animals no longer have to face cruel treatment and other injustices within the confine of zoos all for human entertainment. However, even with this added advantage, there is concern over the widening of the divide between animals and humans thanks to the lack of sensorial contact and actual interaction between the two. By

³¹⁴ Chris Philo and Chris Wilbert, “Animal Spaces, Beastly Places,” in *Animal Spaces, Beastly Places* (London: Routledge, 2004), 15–50.

³¹⁵ Gail Davies, “Networks of Nature: Stories of Natural History Film-Making at the BBC” (PhD Thesis, UCL, 1998).

³¹⁶ Sarah Whatmore and Lorraine Thorne, “Wild (Er) Ness: Reconfiguring the Geographies of Wildlife,” *Transactions of the Institute of British Geographers* 23, no. 4 (1998): 435–454.

³¹⁷ Chris Sandbrook, William M Adams, and Bruno Monteferri, “Digital Games and Biodiversity Conservation,” *Conservation Letters* 8, no. 2 (2015): 118–124.

being immortalized in imagery, animals lose a sense of realism to the human eye that comes with actual interactions. This only works to foster the indifference between humans and animals.³¹⁸ Mountain trekker Jack Turner terms “abstract nature” as a key threat to the environment.³¹⁹ He describes it as the virtual experience that entities such as Nature Company profit off of in the form of documentaries, films, or simply the weather forecast. He points out the ironic failure of conservation attempts by city dwellers due to their lack of understanding of nature in the first place.

The European Tourism Futures Institute came up with four possible scenarios for the future of zoological parks.³²⁰ However, in all of their scenarios, there is an emphasis on the commercial aspect:

1. The 5th Generation Zoo: a blend between “the experience economy” and advocacy for biodiversity.
2. The Commercial Zoo: a park that utilizes sponsors, commercial venues, and the media; all while supporting sustainability.
3. The Modern Zoo: focusing on functionalism, commercialization, and animal enrichment.
4. The Design Zoo: Using cartoon imagery whilst educating the visitors.

³¹⁸ Marthe Kiley-Worthington and others, *Animals in Circuses and Zoos: Chiron's World*. (Basildon, UK: Little Eco-Farms Publishing, 1990).

³¹⁹ Jack Turner, *The Abstract Wild* (Tucson, AZ: University of Arizona Press, 1996): xv.

³²⁰ “The Zoo of the Future,” European Tourism Futures Institute, 2012, <http://www.etfi.nl/en/projects/zoo-future>.

Nature for some is a means to a financial end. “Every animal science is a training ground, every lab a circus, every zoo a theatre.”³²¹ This is clear from the commoditization of nature by businesses such as Sea World.³²² In order to reverse this, environmentalists need to understand the role of nature from a cultural standpoint. Instead of dividing man and nature, teach mankind how to live in a sustainable and respectful relationship with it. The debate of the human’s ability to respect wildlife in its inherently wild state is strengthened by our incessant need to dominate other species, as in the case of our pets and livestock. Despite nature’s importance to their lives, humans have not yet learned how to respectfully coexist with it. Are we capable of tapping into the sentimentality that is applied to domesticated animals in order to adequately and respectfully conserve wild animals?

As demand for wildlife tourism has increased, so have worries for those species’ populations and their habitats.³²³ “The allure of travel used to be the new, but as climate change continues to alter the environment, focus is shifting towards the nearly- extinct.”³²⁴ The craving of tourists to see endangered species and to venture out to more inaccessible zones worsens this concern. Therefore, proper administration and critical monitoring of wildlife habitats are vital, and a few species may even be put off limits from the tourism industry entirely. There has been a recent acknowledgment that if preservation is to be effective in the long haul, it must be advanced both inside and outside protected habitats,

³²¹ Mathew Chrulew, “Animals as Biopolitical Subjects,” *Foucault and Animals*, 2016, 223.

³²² Susan G Davis, *Spectacular Nature: Corporate Culture and the Sea World Experience* (Berkeley, CA: University of California Press, 1997): 15.

³²³ Jeffrey A. McNeely, “Foreword,” in *Wildlife Tourism: Impacts, Management and Planning*, by Karen Higginbottom (Champaign, IL: Common Ground Publishing, 2004).

³²⁴ Lucy Ingham, “Last to See: The Future Rise of Extinction Tourism,” Factor, February 2015, <https://www.factor-tech.com/feature/last-see-future-rise-extinction-tourism/>.

and should be coordinated with the structures of the present day economies and surrounding community needs.³²⁵ Authorities and significant stakeholders support the view that sustainable tourism is one type of land utilization that can meet these shared objectives. In regions with wildlife habitats, improvement of the tourism industry can increase monetary value and income that in turn helps subsidize conservation efforts.³²⁶

Protected habitats have nearly tripled in size, and now add up to almost 12% of Earth's land surface area.³²⁷ The majority of these wildlife parks cater to local sightseers and foreign tourists. In many cases, building these protected habitats has had a positive effect on neighboring areas like increasing employment opportunities as well as wildlife services.³²⁸ It has also led to a massive reduction in the exploitation of natural consumption resources.³²⁹ Since wildlife is most commonly located away from main urban areas, it has been argued that tourists have helped the economies in such rural regions to prosper.³³⁰ For instance, the Scottish Seabird Center has reinstated the city as a tourist destination, and locals have taken

³²⁵ SR Shea et al., "Sustainable Conservation: A New Integrated Approach to Nature Conservation in Australia," *Hale, P. and Lamb, D.(Eds)*, 1997, 39–48.

³²⁶ K Higginbottom, CL Northrope, and RJ Green, "Wildlife Tourism Research Report No. 6, Status Assessment of Wildlife Tourism in Australia Series," *Positive Effects of Wildlife Tourism on Wildlife and Habitats*, 2001.

³²⁷ Jeffrey A. McNeely, "Foreword," in *Wildlife Tourism: Impacts, Management and Planning*, by Karen Higginbottom (Champaign, IL: Common Ground Publishing, 2004).

³²⁸ Hannah Nielsen and Anna Spenceley, "The Success of Tourism in Rwanda: Gorillas and More," *Yes, African Can: Success Stories from a Dynamic Continent*, 2011, 231–249.

³²⁹ Jeffrey A. McNeely, "Foreword," in *Wildlife Tourism: Impacts, Management and Planning*, by Karen Higginbottom (Champaign, IL: Common Ground Publishing, 2004).

³³⁰ Anna Spenceley, "Impacts of Wildlife Tourism on Rural Livelihoods in Southern Africa," in *Responsible Tourism* (London: Routledge, 2012), 187–214.

pride of this accomplishment.³³¹ Also, polar bear viewing is the chief income generator for the town of Churchill, Canada.³³² Similarly, in certain areas of southern Africa, wildlife watching has been substantially more important than livestock and is the most significant source of income.³³³

Apart from entrance fees, zoos have progressively utilized various different outlets for extra income.³³⁴ Urban sociologist, Nicole Mazur, explains how zoos rely on sponsorships from local and global organizations, enrollment plans and annual tickets, retail and restaurants on site.³³⁵ Lately, numerous zoos have offered nighttime visits to increase income, along with hosting birthdays, weddings and other private functions. Mazur states that the trend towards `economic rationalism` is one of the most current developments that has had a great effect on the zoo industry. This theory affirms that a flourishing economy relies upon “efficiency” and free market competition, and its impact on zoos has been double-edged.

“Firstly, public zoos have received less and less government support. These institutions are being told that they need to become more efficient and economically viable by reducing their dependence on ‘government handouts’ and more fully

³³¹ T. Brock, “Wildlife Tourism: A Visitor Attraction’s Perspective. Presentation to ‘It’s Wild! People, Nature and Tourism in Scotland,’” (2002), www.greentourism.org.uk/prog.html.

³³² Harvey Lemelin, “The Gawk, the Glimpse, and the Gaze: Ocular Consumption and Polar Bear Tourism in Churchill, Manitoba, Canada,” *Current Issues in Tourism* 9, no. 6 (2006): 516–534.

³³³ John S Akama, “Western Environmental Values and Nature-Based Tourism in Kenya,” *Tourism Management* 17, no. 8 (1996): 567–574.

³³⁴ David Hancocks, *A Different Nature: The Paradoxical World of Zoos and Their Uncertain Future* (Berkeley, CA: University of California Press, 2001).

³³⁵ Nicole A Mazur, *After the Ark?* (Melbourne, Australia: Melbourne University Press, 2001).

developing their commercial potential. Secondly, the managerial values of private industry have been increasingly forced upon zoos.³³⁶

This has implied that most of the new ranking staff positions at zoos have been filled with advertisers and business experts as opposed to individuals with any zoo experience.

Therefore, zoo managers are viewing their institutions initially as a business that must run profitably rather than prioritize animal welfare.

2. Discipline Scenario Archetype

- The discipline scenario elaborates on the low-tech extreme of human experimental spaces; where animals are set free in artificially created biomes. Predatory skills are encouraged and hunters are introduced as the “eye of the wolf” to manage population growth.
- The archetype will be an extreme sport hunting ground.

What was first designed to be an ecological haven for a number of species, the CSE drew a lot of negative publicity and safety concerns, in respect to both humans and animals. With sea levels rising at an alarming rate in this coastal city, this 6500-hectare slab of land was clutched from below the waves to make up for what was lost. However, the plan was shoddy and underfunded which resulted in governmental abandonment. It was a blank slate: a canvas to paint any sort of artificial landscape or habitat they could engineer. And yet, geese were the species to make the executive decisions. Their grazing habits suppressed the vegetation and inhibited woodland growth, which in turn created a refuge for a number of rare migratory birds.

This newly forged bird sanctuary influenced the decision to declare the island as a nature reserve in the year 2025. The faunal composition of the CSE was now in the hands of humans who didn't take this opportunity for granted. Herbivores were introduced one by one: camels, elk, and buffalos, followed by carnivorous animals for population control. They grazed alongside the geese, generating a more natural landscape. This was just one experiment of many; the CSE seemed to be the testing ground for a myriad of hypotheses. Manmade elements like pumps and dikes controlled the hydrology (and, subsequently, the topography) of the island. Introducing wetlands and pockets of water where they saw fit. The floral aspect was also micro-managed, old military planes were repurposed for seed bombing plants of choice in select areas.

Despite its natural façade, concerns over the allocation of animal welfare rang out across boards rooms and meeting halls as photos surfaced of carcasses. It was argued that the grazers that built the crucial

³³⁶ Karen Higginbottom, *Wildlife Tourism: Impacts, Management and Planning* (Champaign, IL: Common Ground Publishing, 2004): 41.

ecological landscape should be outfitted with the same welfare rights as other experiment subjects. Perhaps the most troublesome objection of all was the widespread belief that the CSE was operating under faulty management. As a result, two separate international inquiry efforts were launched to inspect the way the island was run, both of which were eventually dismissed in court. Though the island reserve's management was able to squeeze itself from the grips of the judicial system, it couldn't escape public scrutiny. Having to bend over backwards to convince the community that the CSE was safe haven for animals as well as a secure place to visit, the island ran a series of initiatives to save face.

One notable decision was the hiring and implementation of a mercy killer; a fully armed ranger to spot and cull weak animals that wouldn't survive the winter conditions. The intentions, once again, were strictly positive, however disaster bloomed. The CSE morphed quickly into an extreme hunting ground when the job of the ranger was opened to volunteer hunters who were willing to do it for free. They targeted species marked by the management for recreation and bragging rights. Taxidermy services to preserve trophy kills were provided on site. Many were horrified by this development, but the management was able to turn a profit from the on site services whilst betraying their original foundation as a sanctuary of life.

As the animals succumbed in droves to the inevitable, park officials focused their efforts to repopulate the park. To keep the thrill alive, keep the park running as a hunting reserve they had to carefully manage the population. In order to up the ante, they soon hatched the idea to ban all firearms; the rush of killing now was limited to primal hunting tools. This method of hunting, of course, requires closer proximity and, naturally, increased risk of injury or death. Given the circumstances the safety ratings dropped but the adventure appeal grew. During the first year only, upwards of 800,000 visitors have trailed the park grounds, and the rate of injury at 11 percent. Mortality rates creep at a fraction of a three percent.

The site was especially popular for coming of age ceremonies for indigenous communities. The elders of the tribe would stand on the outside of the fence enclosure and beckon the young man towards the East End of the park. This ritual began the festivities of the special day when a boy would venture into the unknown to prove his maturity, his skill set, and his utter worth. Against all odds, the boy would face harrowing challenges constructed by human hands: predators that never slept, silent vultures, and vines that coiled around idle, resting limbs.

The young man, upon emerging from the manmade cocoon of safety, had hardly slept the nights before; nervously anticipating the test he would soon undergo. As he approached the elders, he was mindful of a sharp churning in his stomach: he was fasting for the last ten days as he cleansed his body of impurities. The hunt would start at sunset and he was expected to return before dawn having slain a buffalo, claiming its horn. This was the true rite of passage that marked adulthood; the test each man of the tribe must relentlessly endure before earning respect. The festival is particularly gruesome as the boy is unarmed with no light source. The young men would return exhausted, traumatized, and bloodied...if they returned at all.

The park grounds were exploited for various agendas. Before long, though, the general public caught wind of the corruption within the confines of the CSE. The island tainted its reputation over time, by hosting illegal hunts out of season and targeting threatened species and their younglings, alongside a number of criminal investigations. For all the effort poured into the island to create a safe haven, in the CSE death had become a sport.



The history of mankind, his evolution, his culture, economy, and religion heavily rely on nature. For these reasons, it would be highly inaccurate to try and impose a universal meaning on nature, and rather difficult to talk about preservation without acknowledging the social construction of it. Some find the interaction with animals that they seek through nature photography, bird watching, hiking, or nature walks. Hunting, as contradictory as that may be, is another avenue that have been explored in search of the primal experience.³³⁷ Over the years, people began to believe that hunting is not solely intended for consumption, which led to the development of Hunting Tourism. Recreational hunting started by the time

³³⁷ Ralph R Acampora, *Metamorphoses of the Zoo: Animal Encounter after Noah* (Oxford, UK: Lexington Books, 2010): 89.

of European imperialism³³⁸:

“The affluent British gentleman-adventurer, often also a naturalist, travelled to remote places, to explore first-hand the wonders of the tropics, the confronting dangers of a tiger or elephant hunt, the thrill of a safari, or the quiet pastime of the insect collector. It is not surprising that such a person would take home a trophy, such as skins, horns, teeth, dried penises, skulls or tails, in order to verify their adventures. Although, in later years, photographic evidence could have replaced this method of verification, tiger skins and elephant tusks had, by that time, become such an essential part of a residential display that its waste would have been unthinkable.”³³⁹



Bringing wildlife management into the commercial sphere is a move introduced by

³³⁸ John M MacKenzie, *The Empire of Nature: Hunting, Conservation and British Imperialism* (Manchester, UK: Manchester University Press, 1997).

³³⁹ Johannes Bauer and Alexander Herr, “Hunting and Fishing Tourism,” in *Wildlife Tourism: Impacts, Management and Planning* (Altona: Common Ground Publishing, 2004), 58.

Westerners in the seventies.³⁴⁰ Commercializing wildlife is like adding a price tag to a species existence, and as a result “changes our relationship with nature, and, if taken to the point of commodification, can subject the fragility of nature’s balance to the destructive logic and volatility of markets.”³⁴¹ The recreational hunting industry is popular among more developed countries.³⁴² Hunting tourism creates a multi-billion recreational business in the United States alone.³⁴³ This also contributes to the growing economy of less developed countries mainly in Southern Africa³⁴⁴ through Safari hunting.³⁴⁵ They have enjoyed these benefits and the need to protect these resources led to the adoption of conservation models like CAMPFIRE organized in Zimbabwe.³⁴⁶ Questions, however, are still raised by western conservationists, but for the hosts this is considered just an initiative to earn income.³⁴⁷ Rural areas benefit from accommodation, tourist guides, and other services that they can offer to

³⁴⁰ Alex Wilson Lewis Hawley, *Commercialization and Wildlife Management: Dancing with the Devil* (Malabar, FL: Krieger, 1993).

³⁴¹ Barbara Unmülsig, “Monetizing Nature: Taking Precaution on a Slippery Slope,” *Great Transition Network*, 2014, 5.

³⁴² Robin Sharp and Kai-Uwe Wollscheid, “An Overview of Recreational Hunting in North America, Europe and Australia,” *Recreational Hunting, Conservation and Rural Livelihoods*, 2009, 25–38.

³⁴³ Jason Henderson, “Wildlife Recreation: Rural America’s Newest Billion Dollar Industry,” *Ag Decision Maker Newsletter* 9, no. 2 (2015): 2.

³⁴⁴ Simon Chiutsi et al., “The Theory and Practice of Ecotourism in Southern Africa,” *Journal of Hospitality Management and Tourism* 2, no. 2 (2011): 14–21.

³⁴⁵ Brian TB Jones, “Community Benefits from Safari Hunting and Related Activities in Southern Africa,” *Recreational Hunting, Conservation and Rural Livelihoods: Science and Practice*, 2009, 158–177.

³⁴⁶ Russell Taylor, “Community Based Natural Resource Management in Zimbabwe: The Experience of CAMPFIRE,” *Biodiversity and Conservation* 18, no. 10 (2009): 2563–2583.

³⁴⁷ Johannes Bauer and Jack Giles, “Recreational Hunting- An International Perspective,” *Wildlife Tourism Research Report Series* (Goldcoast, Australia, 2002).

tourists in the community.³⁴⁸ Even those with a conservative attitude towards hunting acknowledge the fact that Africa's wildlife might just be saved by none other than those who go on trophy hunting.³⁴⁹ Nevertheless, there are factors to consider as soon as hunting activities start to generate income within the locality. Oftentimes, as the economy grows, the traditions and social values involved are weakened.³⁵⁰

Hunting has deep roots in culture.³⁵¹ Anthropologist Tim Ingold and environmentalist Paul Shepard, both point out the mutualistic and trust based relationship between hunter-gathers and animals, and the lessons that the rest of western societies can learn from such relationships.³⁵² Hunter-gathers live in an understanding of sorts with animals, that if they are kind and respectful in their dealings then the animals are happy to provide for them. One of many traditions is Baka music, derived from the people of the Southwestern Central African Republic, is a combination of vocals and dance usually done to prepare for a hunt or showcase the skills of a hunter. This initiation is made to bring

³⁴⁸ Robin Naidoo et al., "Complementary Benefits of Tourism and Hunting to Communal Conservancies in Namibia," *Conservation Biology* 30, no. 3 (2016): 628–638.

³⁴⁹ Dilys Roe, *Making a Killing or Making a Living: Wildlife Trade, Trade Controls, and Rural Livelihoods*, 6 (London, UK: IIED, 2002).

³⁵⁰ Margaretha Pangau-Adam, Richard Noske, and Michael Muehlenberg, "Wildmeat or Bushmeat? Subsistence Hunting and Commercial Harvesting in Papua (West New Guinea), Indonesia," *Human Ecology* 40, no. 4 (2012): 611–621.

³⁵¹ Johannes Bauer and Jack Giles, "Recreational Hunting- An International Perspective," Wildlife Tourism Research Report Series (Goldcoast, Australia, 2002).

³⁵² Paul Shepard, "On Animal Friends," *The Biophilia Hypothesis*, 1993, 275–300; T. Ingold, "From Trust to Domination: An Alternative History of Human — Animal Relations," in *Animals and Human Society* (London: Routledge, 1994).

people closer together and share surviving techniques when they go out hunting.³⁵³ Although hunting is not just legally binding in terms of supervision, yet most countries take into consideration the ancient ways of hunting activities including "traditional ecological knowledge" (TEK).³⁵⁴ A local community may have certain taboos regarding hunting, therefore the community has the right to impose regulations and penalize individuals who break these rules. The regulations are made not only to protect the wildlife resources, but also to take into consideration the local traditions and ways of living. The German *Waidgerechtigkeit* concept or "clean death" was formulated to exercise caution during hunting, and to minimize animal pain suffering.³⁵⁵ State law acknowledges these policies, since they are significant to the existence of these communities.³⁵⁶ While there is a lot to be learned and admired in such traditions, the sad reality is that for many hunting is a sport.³⁵⁷ Therefore, any lack of respect to these customs and traditions can result in denying access of these resources to all tourists.

For the longest time, hunters and conservationists have been divided on their stand

³⁵³ Doerte Weig, "Chapter Eight Resonating with Different Worlds: How Baka Musical Practices Generate Sociality, Identities, and Connection to Ritual Spirits," in *Making Music, Making Society*, by Sara Revilla (Cambridge, UK: Cambridge Scholars Publishing, 2018), 191.

³⁵⁴ Elisabeth Padilla and Gary Kofinas, "Letting the Leaders Pass: Barriers to Using Traditional Ecological Knowledge in Comanagement as the Basis of Formal Hunting Regulations," *Ecology and Society* 19, no. 2 (2014).

³⁵⁵ Thorsten Gieser, "Killing a Wounded Sow," *The Situationality of Human-Animal Relations: Perspectives from Anthropology and Philosophy* 15 (2018): 129.

³⁵⁶ Johannes Bauer and Alexander Herr, "Hunting and Fishing Tourism," in *Wildlife Tourism: Impacts, Management and Planning* (Altona: Common Ground Publishing, 2004), 57–77.

³⁵⁷ Richard Tapper, "Animality, Humanity, Morality, Society [in] What Is an Animal?," in *What Is an Animal?*, ed. Tim Ingold, vol. One World archaeology (London: Routledge, 1994), 56.

on tourist and trophy hunting.³⁵⁸ Therefore, governing bodies have put in place action plans to rehabilitate species and establish measures of where trophy hunting is allowed to take place.³⁵⁹ For example, WWF monitors safari hunting of the Himalayan Ibex in Pakistan, as part of a community wildlife conservation plan.³⁶⁰ Also in the past thirty years, new partnerships and legislative changes were established leading to a change in attitude towards the protection of wildlife resources.³⁶¹ For instance, The International Council for game and Wildlife Conservation (CIC) joined the World Conservation Union (IUCN). The German State Hunting Organization (LJV Baden-Württemberg) also became recognized an official conservation organization. In the year 2003, Australia created the NSW Game Council in a bid to clarify the rights and obligations of tourist hunters. Africa followed with redefining the rules for wildlife activities. The move gained community support for the conservation efforts, knowing that along with this, their economic status will also improve even in times of drought. As a result, many protected animal reserves double as hunting grounds for tourists with permits.

“Private game reserves with open fences to Kruger Park have applied for approval to shoot and kill 34 elephants, including a trophy bull, and 5444 other animals such as rhinos, lions, leopards and buffaloes. The reserves in discussion are Associated Private Nature Reserves (APNR), consisting of Timbavati, Klaserie, Balule and Umbabat, reserves that contain luxury lodges catering for tourists who pay high rates

³⁵⁸ Lucille Palazy et al., “Rarity, Trophy Hunting and Ungulates,” *Animal Conservation* 15, no. 1 (2012): 4–11.

³⁵⁹ Barney Dickson, Jonathan Hutton, and William A Adams, *Recreational Hunting, Conservation and Rural Livelihoods: Science and Practice* (Hoboken, New Jersey: John Wiley & Sons, 2009).

³⁶⁰ Lisa Palmer, “Indigenous Interests in Safari Hunting and Fishing Tourism in the Northern Territory,” Wildlife Tourism Research Report Series (Goldcoast, Australia: Sustainable Tourism, 2002).

³⁶¹ Johannes Bauer and Alexander Herr, “Hunting and Fishing Tourism,” in *Wildlife Tourism: Impacts, Management and Planning* (Altona: Common Ground Publishing, 2004), 57–77.

to experience exciting wild animal sightings. Hunting is perfectly legal in a reserve like Timbavati, and primary hunting accounts for 61% of the reserves income, 17% of which was provided from tourism.”³⁶²

As hunting and wildlife tourism grows, so is the need to modify existing policies to preserve wildlife resources. The goal is to achieve the “Triple Bottom Line” which aims to be responsible to towards the economy, protect the environment, and be socially adept.³⁶³ To attain this in the future, we need to consider the following:³⁶⁴

- Create guidelines aimed to improve sustainability clearly identify the benefits that the local community can enjoy
- Create initiatives to promote conservation and wildlife usage with the involvement of local partners in the community
- Study and monitor hunting activities by linking ties with research entities
- Foster group discussion and awareness among major key players in the hunting industry
- Prioritize the conservation of species habitat including the participation of the locals to address sustainability
- Justify the importance of the hunting tourism industry in the development of the environment and the community as a whole

³⁶² Cape Argus, “When Game Parks Become Killing Fields,” Pressreader, March 2017, <https://www.pressreader.com>.

³⁶³ Timothy F Slaper and Tanya J Hall, “The Triple Bottom Line: What Is It and How Does It Work,” *Indiana Business Review* 86, no. 1 (2011): 4–8.

³⁶⁴ Johannes Bauer and Alexander Herr, “Hunting and Fishing Tourism,” in *Wildlife Tourism: Impacts, Management and Planning* (Altona: Common Ground Publishing, 2004), 57–77.



Figure 20. Cecil the lion and his poacher³⁶⁵

Hunting tourism comes with some challenges surrounding the industry such as the amount of wildlife resources used, the ability of hunters to respect local traditions, and most of all, the regulations that surround the entire industry. The incident involving an American who killed an African lion, called Cecil; while on a hunt in 2015, reignited the argument of whether it is ethical to hunt for endangered animals.³⁶⁶ The move questions the relationship between trophy hunting and conservation making this even more controversial.³⁶⁷ What happened to Cecil, the lion, sparked an interest and reevaluation of the existing policies of

³⁶⁵ “Hunters in Court over Cecil the Lion’s Death,” *CBS News*, 2015, <https://www.cbsnews.com/news/cecil-the-lion-hunters-in-court-over-illegal-poaching-in-zimbabwe/>.

³⁶⁶ Christina Capecchi and Katie Rogers, “Killer of Cecil the Lion Finds out That He Is a Target Now, of Internet Vigilantism,” *New York Times*. [Http://Www. Nytimes. Com/2015/07/30/Us/Cecil-the-Lion-Walter-Palmer. Html](http://www.nytimes.com/2015/07/30/us/cecil-the-lion-walter-palmer.html), 2015.

³⁶⁷ Enrico Di Minin, Nigel Leader-Williams, and Corey JA Bradshaw, “Banning Trophy Hunting Will Exacerbate Biodiversity Loss,” *Trends in Ecology & Evolution* 31, no. 2 (2016): 99–102.

the US Fish and Wildlife Services and questioned the motives of killing animals.³⁶⁸ African lions are on the list of the US Endangered Species Act (ESA) but there is a constant conflict with another rule allowing for the importation of lion parts obtained from legal trophy hunts.³⁶⁹ Supporters of trophy argue two key points.³⁷⁰ One, trophy hunting is not a threat to the population and second, trophy hunting helps in the accumulation of funds for conservation purposes.³⁷¹ Academic research was also made showing the benefits of trophy hunting towards species and the population.³⁷² Other scientists claim that regulating hunting does not mean endangering the lives of other species of wildlife.³⁷³ In another published article, those who approve of hunting see it as an opportunity to fund the protection of endangered species through expensive license fees.³⁷⁴ Moreover, hunting tourism produces less emission of carbon footprint as compared to ecotourism³⁷⁵ Trophy hunting is not the sole answer to the challenges of Africa's wildlife but it is a strong contributor to the local

³⁶⁸ Michael Paul Nelson et al., "Emotions and the Ethics of Consequence in Conservation Decisions: Lessons from Cecil the Lion," *Conservation Letters* 9, no. 4 (2016): 302–306.

³⁶⁹ Ibid

³⁷⁰ Enrico Di Minin, Nigel Leader-Williams, and Corey JA Bradshaw, "Banning Trophy Hunting Will Exacerbate Biodiversity Loss," *Trends in Ecology & Evolution* 31, no. 2 (2016): 99–102.

³⁷¹ Niki Rust and Diogo Verissimo, "Why Killing Lions like Cecil May Actually Be Good for Conservation," *The Conversation*, 2015.

³⁷² Adrian Treves, "Hunting for Large Carnivore Conservation," *Journal of Applied Ecology* 46, no. 6 (2009): 1350–1356.

³⁷³ Brian Clark Howard, "Can Lion Trophy Hunting Support Conservation," *National Geographic*. [Http://Www. Nationalgeographic. Com/2015/07/150729-Liontrophy-Hunting-Conservation-Animals-Cecil](http://www.nationalgeographic.com/2015/07/150729-Liontrophy-Hunting-Conservation-Animals-Cecil), 2015.

³⁷⁴ Christina Capecchi and Katie Rogers, "Killer of Cecil the Lion Finds out That He Is a Target Now, of Internet Vigilantism," *New York Times*. [Http://Www. Nytimes. Com/2015/07/30/Us/Cecil-the-Lion-Walter-Palmer. Html](http://www.nytimes.com/2015/07/30/Us/Cecil-the-Lion-Walter-Palmer.html), 2015.

³⁷⁵ Enrico Di Minin, Nigel Leader-Williams, and Corey JA Bradshaw, "Banning Trophy Hunting Will Exacerbate Biodiversity Loss," *Trends in Ecology & Evolution* 31, no. 2 (2016): 99–102.

community, providing³⁷⁶:

- Lucrative income for the local communities
- An alternative to raising cattle
- Motivation for conservation efforts
- Encourages responsible land use
- A positive attitude towards wildlife
- Increase in government revenues through the establishment of conservatory bodies
- Restoration of wildlife
- Growth of other secondary services to support tourism

Hunting by animals is also not a pleasant scene for humans. However, in the wild the act of acquiring food by foraging or hunting takes up the majority of the animal's day and therefore should be reflected in the design.³⁷⁷ The nature on display at the zoo is a human fantasized nature, and “the extension of the human idea to the wild will see in the behaviors and interrelationships among animals infinite cruelties.”³⁷⁸ Shifting the locus of control means allowing animals to practice their predatory activities openly and not excluding them from

³⁷⁶ Johannes Bauer and Alexander Herr, “Hunting and Fishing Tourism,” in *Wildlife Tourism: Impacts, Management and Planning* (Altona: Common Ground Publishing, 2004), 57–77.

³⁷⁷ Heini Hediger, *Wild Animals in Captivity*. (London: Butterworth, 1950).

³⁷⁸ Paul Shephard, *Thinking Animals: Animals and the Development of human Intelligence*. (Athens, GA: University of Georgia Press, 1998): 248.

the exhibit space. "You don't see animals killing animals. Our visitors could never see that, they make no connection between a piece of hamburger on a Styrofoam plate and a cow."³⁷⁹

Cindy Lee at the Toronto Zoo, equally agrees:

“you wouldn't want that seal to do what it does in the wild, which is balance a fish or a penguin on its head and rip it up into pieces while throwing it into the air. You wouldn't want your child to see a lion tear up a goat. It's inhumane. They do eat animals here but the animals are killed humanely.”³⁸⁰

However, selective predatory actions are incorporated in the romanticized zoo; such as fish killed daily in front of the visitors. Therefore, it appears to be that the lower down the food chain the species is the less people care about them.³⁸¹ Consequently, the closest remaining act to hunting that takes place at the majority of American zoos is serving snakes un-butchered prey, and this feeding occurs in the back holding areas away from the public visitors.³⁸²

Lorimer presents an appeal for "a more open mode of *wilding*."³⁸³ It is an inquisitive exercise of biopolitics that sees wildlife as uncontrollable and not agreeable to control or commodification. He offers an acute evaluation of a leading rewilding case in the managing of the Oostvaardersplassen in the Netherlands.³⁸⁴ In Rewilding projects experts are restoring habitats by using existing proxy species such as livestock to take the place of similar species

³⁷⁹ Braverman, "Zootopia: Utopia and Dystopia in the Zoological Garden," 248.

³⁸⁰ Cindy Lee, "Curator of Fishes, Toronto Zoo interview." In *Zooland: The Institution of Captivity*, ed. Irus Braverman, (Stanford, California: Stanford University Press, 2013): 36.

³⁸¹ Ehmke Lee, *Director, Minnesota Zoo and Former Director of Design at Bronx Zoo* (July 21 & 22, 2009).

³⁸² Edward G. Ludwig, "People at Zoos: A Sociological Approach." *International Journal for the Study of Animal Problems* 2, no. 6 (1981): 316.

³⁸³ Ibid: 190.

³⁸⁴ Jamie Lorimer, *Wildlife in the Anthropocene* (Minneapolis: University of Minnesota Press, 2015): 5.

that used to exist centuries ago. Environmentalists have debated for a long time the notion that for nature to prosper, humans must be removed.³⁸⁵ That is why rewilding projects involve minimal human intervention after the perimeters have been set, and encourage wild behavior and predatory actions for survival.

If we choose to do away with the ‘fake real’ mentality that surrounds the conceptualization and management of modern day zoos, what next for the interspecies interactions? With the rising extinction rates, the future tourism industry may resort to cloning animals in order to fulfill hunting aspirations. “What price will wealthy sports hunters be willing to part with for a once in a lifetime opportunity to hunt a formerly extinct animal in a South African private game reserve?”³⁸⁶ The practice of hunting has always been controversial, but if cloning animals for hunting purposes ever becomes a reality then it will most definitely incite moral and ethical debates. It may start as “a taboo of the near future, but eventually, it could become a more common and recognizable tourism activity.”³⁸⁷

Moreover, futurist Natalie Dian and theorist Helena Pedersen propose the creation of "Earth Trusts" where nature is not treated as a commodity and interactions between humans and non-human others are unadulterated.³⁸⁸ This futuristic stewardship of nature allows for experimentation with various policies, architectural designs and trends in order to

³⁸⁵ William Cronon. *Uncommon Ground: Rethinking the Human Place in Nature*. WW Norton & Company, 1996, 79.

³⁸⁶ Daniel William Mackenzie Wright, “Cloning Animals for Tourism in the Year 2070,” *Futures* 95 (2018): 58–75.

³⁸⁷ Daniel William Mackenzie Wright, “Cloning Animals for Tourism in the Year 2070,” *Futures* 95 (2018): 58–75.

³⁸⁸ Helena Pedersen and Natalie Dian, “Earth Trusts : A Quality Vision for Animals?,” in *Metamorphoses of the Zoo: Animal Encounter after Noah*, by Ralph R Acampora (Oxford, UK: Lexington Books, 2010), 171–92.

come up with a working prototype. We must also understand that humans are equally influencers in the process of ecological change and consequently influence the evolution and development of our nonhuman counterparts whether or not we intended to do so.³⁸⁹ Simply put, we need to look at our interactions with other species from a holistic perspective rather than a fragmented one. Only by so doing do we create room for innovative research into the designing of spaces where nature is not secluded or boxed off but incorporated into the very fabric of the space.

3. Collapse Scenario Archetype

- The collapse scenario will discuss the sixth mass extinction, the loss of all wildlife. Film, photographs, and taxidermy are as close as you can get to experiencing the artificial wild.
- The archetype will be a memorial.

With each new extinction, zoologists feared the worst. Animal populations withered and waned, dropping in numbers until finally collapsing under the weight of environmental overload, exhaustion of resources, and world wars. In these hard times, people were limited in the ways they could glimpse the diminishing wildlife. With technology rarely available, they turned to what little shoddy film and worn photography that was saved. At first, the practice of taxidermy seemed almost barbaric: hordes of people were in disbelief that such an uncivilized and boorish method would gain popularity again, but it provided the only physical satisfaction that all other mediums lacked.

Das Paradies blossomed into existence as a way to memorialize the forever removed Animal Kingdom, opening the doors to the largest wildlife experience available. The first curator of Das Paradies recruited the now jobless conservationists and zoologists to supply taxidermy specimens by gathering what little remains in the wild. By his death, his collection encompassed every major group of animals and birds, which his heirs sold to the memorial for a trifling \$200 million; a sum substantially lower than the real value of the collection. What began as a measly collection of mounts, grew into an emporium of creatures from the past.

In 2029, Das Paradies opened its doors to the public, ushering them to take a closer look at a world they'd only read about in fables. Upon first glance, the towering sight of an African

³⁸⁹ Sarah Whatmore, *Hybrid Geographies: Natures Cultures Spaces* (Thousand Oaks, CA: Sage, 2002): 36.

elephant suspended above the entry foyer greets visitors. It is the newest piece of taxidermy in the building; having been able to work with such tough skin is proof that taxidermists have finally mastered their art. In the first six weeks alone, over 800,000 guests arrived to marvel at this seemingly mythical world of wildness. Flamingos were petrified with outstretched wings in mid-flight, raccoons bared jagged fangs at onlookers. Rabbits jutted up through makeshift burrows in the artificial dirt of the display enclosures, and snakes froze themselves in an eternal slither along the manufactured grasslands.

Over the years, Das Paradies boomed in popularity; the memorial set itself apart from other collections with its exquisite details of the displays and the hand painted backdrops. Visitors basked in the notion that the animals were actually alive rather than stuffed relics of a bygone era. By 2035, innovative types of taxidermy had fallen into favor. Pets sprung up first: the famed dogs of past presidents could be seen suspended in mid-frolic alongside the demure poses of royal falcons. When domesticated animals were no longer exciting enough for the ever-hungry audience, Das Paradies started arranging animals into human positions, personifying them. A black bear could be seen wearing a three-piece suit on its way to a high-powered corporate job. A peacock stood, apron-clad in a hectic kitchen looming over a cookbook open to a page on how to bake a cake. No one was interested in creating (or seeing) precise, factually accurate habitats anymore. This trend paved the way to the gradual alteration of thinking in museums, resulting in the introduction of artificial dioramas and narratives that never existed in the wild.

This led to great debates between the curators, who placed great importance on correct labeling, let alone genuine representations. The chief debate among them was the ever-churning topic of natural history vs. entertaining spectacle. In a society where the original and the counterfeit are seemingly put on the same pedestal, the importance of originality was weakened. Das Paradies itself was seen by some to be attacking the intelligence of its audience; creating a mockery of what was once a beautiful, natural world. With this train of thought, many argued that the curators and staff of Das Paradies also jabbed at their own integrity. Questioning the credibility of the memorial, some employees began to quit their jobs. Most of the members of staff who resigned were elderly. They still held memories of zoo and farm visits. All their letters of resignation were signed with ominous warnings: “you should tread carefully and be cautious of falsifying history for future generations.”

*Taxidermy has been cherished and despised, but slowly accepted as a respectful tribute to the beauty of the natural world. It flowed from a scientific tool to an in vogue art form. Where the stigma of owning taxidermy once starkly stood, trendiness rushed in to take its place. When asked about the ethical dilemmas in the face of this assertion, a taxidermist answered: “This is what we consider preservation,” he says. “The best animal experience available, because it is authentic.” As she speaks, one can see a disclaimer sign behind her: **No Animals Were Harmed in This Process.***



The art and science of taxidermy has evolved over the years motivated by different intentions.³⁹⁰ For some, taxidermy is a means through which they can show off their hunting prowess, for others it is a way in which they can achieve continued interaction with their beloved pets even after death. From an artistic perspective, taxidermy is used as a medium and form of expression. In the scientific world, taxidermy is important in maintaining an inventory of nature's species and wonders. It also serves as a reminder that life is short and fleeting. So far, taxidermy has been used as an educational, conservational, artistic, as well as a nostalgic tool. It has been used to tell tales of the journey of mankind through time and the gains and losses that man has suffered. It is also a great reminder of man's recklessness that has seen a number of species driven to extinction.

³⁹⁰ Helena Pedersen, "Animals on Display: The Zoocurriculum of Museum Exhibits," *Critical Education* 1, no. 8 (2010).

No matter what shape the drive behind the evolution and continued use of taxidermy takes, to create these shells of their former existence we attempt to defy life's natural processes. This desire stems from mankind's need to associate and be associated with the natural environment. Our actions are responsible for the extinction of a number of species yet we strive to keep monuments of them. Taxidermy is perhaps our attempt to defy the natural order of life, death, and decomposition. By preserving animals we hold on to what was, in the hope of extending its existence for times to come.³⁹¹ We essentially cheat the life cycle and keep traces of life from being completely wiped off the earth. Mankind's need to be associated with the natural world and therefore the need for taxidermy can best be described in the *Breathless Zoo*, by curator Rachel Poliquin, in seven chapters: wonder, beauty, spectacle, order, narrative, allegory, and remembrance.³⁹² There is the need to preserve the beauty within nature, the need to tell the story of mankind, the need to derive metaphors, the need to invoke wonder, the need to remember, the need to create order, and spectacles for our enjoyment. Each of these needs have a different influence on the shape and form that taxidermy takes.

³⁹¹ Dave Madden, *The Authentic Animal: Inside the Odd and Obsessive World of Taxidermy* (New York: St. Martin's Press, 2011): 27.

³⁹² Rachel Poliquin, *The Breathless Zoo: Taxidermy and the Cultures of Longing*, vol. 1 (University Park, PA: Penn State University Press, 2012): 7.



Figure 21. Hundreds of taxidermy displayed at Melbourne Museum³⁹³

The movement of bodies throughout history is sometimes concealed by museums for one reason or the other. The concept of “Zoo/mbie” and animal taxidermy reflects knowledge construction and the nature-culture dualism that still exists.³⁹⁴

“Museums can be understood as performative and panoptical places where body parts are reconstructed and frozen in choreographed positions to tell stories of purified nature – where they are disciplined beyond discipline, but also moved between front stage and backstage and between frames, depending on shifting ideas.”³⁹⁵

³⁹³ Rodney Start, *The Animals on Display in Wild: Amazing Animals in a Changing World*, Museum Victoria.

³⁹⁴ Anna Samuelsson, “Zoo/Mbie Spaces: Museums as Humanimal Places,” in *Animal Places* (London: Routledge, 2017), 154–179.

³⁹⁵ Tora Holmberg and Jacob Bull, “Introducing Animals, Places and Lively Cartographies,” in *Animal Places* (London: Routledge, 2017), 1–2.

Taxidermy has been used as a tool to tell the tale of who we are as a species from cultural, religious, political, and scientific standpoints.³⁹⁶ We tend towards immortalizing creatures of parts of the natural world that have in one way or another played a significant role in our intellectual, aesthetic, and cultural evolution. It is through such species that we can completely tell the story of mankind. In the past we have associated animals with religious events, even carving out animal silhouettes in cave walls. This awe and admiration of animals has seen the domestication of some as pets and the conservation of others in zoos. It is in the same awe-inspiring breath that we preserve these creatures as trophies, a mark of our conquest over nature.

The desire to interact with wildlife is an inquisitive one especially now that we live in an age where life in the wild is broadly televised. Nature channels and programs continue to lift the veil of the pristine wilderness and its mysteries. We are provided with a platform where we can achieve some form of interaction with the wild world from the comfort of our homes³⁹⁷. However, this does not seem to be enough. We seem to still require that physical interaction with our nonhuman counterparts. Whatever the nature of the display, the realization that the preserved animal is an animal nonetheless is an emotionally evoking one.³⁹⁸ Viewing taxidermy conjures a different emotional reaction than seeing animals on photos or on television. That ability to see, and feel the remnants of the beauty that once was, to experience the differences in height and size between different animals and between

³⁹⁶ Rachel Poliquin. "The Matter and Meaning of Museum Taxidermy." *Museum and Society* 6, no. 2 (2008): 123–134.

³⁹⁷ Derek Bousé. "False Intimacy: Close-Ups and Viewer Involvement in Wildlife Films." *Visual Studies* 18, no. 2 (2003): 123–132.

³⁹⁸ Merle Marshall Patchett, "Putting Animals on Display: Geographies of Taxidermy Practice" (PhD Thesis, University of Glasgow, 2010).

ourselves and these animals is what makes taxidermy such a powerful tool. It plays on our intrinsic attraction towards animals and all things wild. As much as the practice of taxidermy takes on an educational guise, it is equally an artistic tool. It works towards capturing the details of animals in their purest and truest forms and displaying these details for the world to see. One can, therefore, not disassociate taxidermy from the aesthetic appeal and that raw attraction that we as a species have towards our fellow animals.

The term taxidermy means the arrangement and stuffing of skin³⁹⁹. Taxidermy however, is a process that is associated with death. For taxidermy to be possible, something has to die⁴⁰⁰. While it does not seek out death, it thrives in the presence of it. Perhaps the most sobering of all preservations are those that can no longer be found in the current world. The preservation of species that are now extinct is a desolate reminder of what was. Here, taxidermy almost fails to cheat the cycle of life. Here, taxidermy is the final and only avenue of interaction between us and these animal species; interactions that are shadowed by sadness and loss.⁴⁰¹ However, without the practice of taxidermy we would not have the chance to interact with some of these lost yet profound animals. We would rely on two dimensional paintings, photos, and drawings to interact with these animals without getting to really appreciate their actual sizes and forms. As confusing as taxidermy may be from a moral and even philosophical standpoint, it is a unique conservation medium that can't be replaced.

³⁹⁹ "Taxidermy." Merriam-Webster.com. Accessed April 27, 2018. <https://www.merriam-webster.com/dictionary/taxidermy>.

⁴⁰⁰ Donna Haraway. "Teddy Bear Patriarchy: Taxidermy in the Garden of Eden, New York City, 1908-1936." *Social Text*, no. 11 (1984): 20–64.

⁴⁰¹ Rachel Poliquin, *The Breathless Zoo: Taxidermy and the Cultures of Longing*, vol. 1 (University Park, PA: Penn State University Press, 2012).

The key to making headway in all conservation initiatives rests on curbing extinction.⁴⁰² Therefore, a significant portion of the funds is channeled to the removal of threats or the recovery of endangered species. Thousands of professionals commit themselves towards this cause; the main reason behind its appeal is the sense of urgency and the need for human interference.⁴⁰³ Australia harbors the most guilt as far as extinction is concerned, due to the loss of 19 mammal species in that region.⁴⁰⁴ This figure represents nearly half of the mammal losses in the world throughout the same timeframe. The thylacine (Tasmanian tiger) extinction especially has been narrated countless times.⁴⁰⁵ It was hunted for profit, a reward per head, as retribution for it killing their livestock. Although some people are convinced that disease caused their extinction, an array of human-triggered causes such as habitat loss, the introduction of dogs, and hunting played the largest role.⁴⁰⁶ Extinction is such a weighty occurrence that it marks a conservation reference point, a threshold signifying humanity's exorbitance. The thylacine loss is a noteworthy point of

⁴⁰² Peter B Banks and Dieter F Hochuli, "Extinction, de-Extinction and Conservation: A Dangerous Mix of Ideas," *Australian Zoologist* 38, no. 3 (2017): 390–394.

⁴⁰³ Josep Maria Mallarach et al., "In Defence of Protected Landscapes: A Reply to Some Criticisms of Category V Protected Areas and Suggestions for Improvement," in *Defining Protected Areas: An International Conference in Almeria, Spain* (International Union for Conservation of Nature (IUCN): Gland, Switzerland, 2008), 31–37.

⁴⁰⁴ Chris Johnson, *Australia's Mammal Extinctions: A 50,000-Year History* (Cambridge, UK: Cambridge University Press, 2006).

⁴⁰⁵ Peter B Banks and Dieter F Hochuli, "Extinction, de-Extinction and Conservation: A Dangerous Mix of Ideas," *Australian Zoologist* 38, no. 3 (2017): 390–394.

⁴⁰⁶ Stephen R. Sleightholme and Cameron R. Campbell, "A Retrospective Assessment of 20th Century Thylacine Populations," *Australian Zoologist*, 2015.

reference, primarily because humans hunted it to disappearance and sadly our efforts to save it were too little too late.⁴⁰⁷

Most historic human-triggered extinctions are not owed to deliberate extermination efforts, but mostly bad management, lack of knowledge, and negligence. Humans are known to have accidentally triggered the loss of hundreds of animal species, especially through what is commonly referred to as the “evil quartet” of the forces of extinction – over-harvesting, co-extinction, habitat loss, and new species introduction.⁴⁰⁸ However, intentionally triggering the loss of a given species is considered a cultural taboo in developed nations.⁴⁰⁹ There are astoundingly several instances whereby human beings (cooperatively) wiped out a species completely, and triumphed. In cases like the great auk *Pinguinus impennis*, protective measures were implemented to curb the declines, but they were too late to keep the unavoidable at bay.⁴¹⁰ “Buttons” represents the last passenger pigeon to be spotted in the wild before being shot by a teenager called Press Clay Southworth in the year 1900.⁴¹¹ At the time, Press wasn’t aware that the bird he shot was the last passenger pigeon. In spite of the increased violent hounding of the pigeon, there was still a widespread view that it was impossible for a species

⁴⁰⁷ Peter B Banks and Dieter F Hochuli, “Extinction, de-Extinction and Conservation: A Dangerous Mix of Ideas,” *Australian Zoologist* 38, no. 3 (2017): 390–394.

⁴⁰⁸ Jared Diamond, “Overview of Recent Extinctions. In ‘Conservation for the Twenty-First Century’.(Eds D. Western and MC Pearl.) Pp. 37–41,” *Wildlife Conservation International, New York Zoological Society: New York*, 1989.

⁴⁰⁹ Nigel Pleasants, “The Question of the Holocaust’s Uniqueness: Was It Something More Than or Different From Genocide?,” *Journal of Applied Philosophy* 33, no. 3 (2016): 297–310.

⁴¹⁰ Symington Grieve, *The Great Auk, or Garefowl* (Cambridge, UK: Cambridge University Press, 2015).

⁴¹¹ Walk Koenig, “Hope Is the Thing with Feathers,” *The Condor* 102, no. 4 (2000): 963.

that exist in billions to be wiped out entirely.⁴¹² The Falkland Island Wolf *Dusicyon australis* might be the only case of a completely premeditated eradication of species. The wolves were poisoned and hounded for killing sheep, and there is no existing proof of efforts to stop this extinction.⁴¹³

Certain environmentalist hold the view that conservation should do away with its attempts to save endangered species and instead channel the limited conservation money towards curbing declines.⁴¹⁴ They are convinced that it is irrational to dedicate resources to the most endangered species as opposed to devoting them to making sure that other species do not follow the same path. However, agreeing with this point of view means that several species will certainly be extinct once costly human involvement efforts are withdrawn.⁴¹⁵ This controversial approach is called ‘economic rationalism’, and supporters of this view believe that all resultant extinctions due to this are considered unintentional. Nonetheless, it is difficult to envision general support for ideas that advocate for humans to speed up the extinction of threatened species in a bid to better utilize conservation resources, especially since extinction is still a cultural taboo that is hard to discard.

⁴¹² Peter B Banks and Dieter F Hochuli, “Extinction, de-Extinction and Conservation: A Dangerous Mix of Ideas,” *Australian Zoologist* 38, no. 3 (2017): 390–394.

⁴¹³ Jeremy J Austin et al., “The Origins of the Enigmatic Falkland Islands Wolf,” *Nature Communications* 4 (2013): 1552.

⁴¹⁴ Madeleine C Bottrill et al., “Finite Conservation Funds Mean Triage Is Unavoidable,” *Trends in Ecology & Evolution* 24, no. 4 (2009): 183–184.

⁴¹⁵ David S Jachowski and Dylan C Kesler, “Allowing Extinction: Should We Let Species Go?,” *Proc. Natl. Acad. Sci. USA* 105 (2009): 2919–2922.

Intentionally causing the extinction of a given species is termed an ethical crime, but some see it justifiable in the case of the small pox.⁴¹⁶ Even though the virus *Variola major* has for long been sentenced to destruction, it still exists. It is locked away in two hidden spots; one in the United States and the other in Russia.⁴¹⁷ The virus is behind the deaths of millions of human beings, leading the infected to experience an excruciating death. For humans in general, smallpox has to be one of the species that deserves destruction. However, we are still too far from making it happen.⁴¹⁸ Several views against the eradication of smallpox factor in the future use of vaccines in curbing an unidentified outbreak.⁴¹⁹ However, there is an existing argument that microbes, like all other species, has intrinsic rights to live, and that it would be immoral to force its execution.⁴²⁰ Since extinction is irreversible (for the time being), those species that have been lost are considered martyrs, and symbols for conservation.⁴²¹ Each campaign needs its own mascots that represent the cause, and in the case of extinction, if those charismatic species die then they can transform into more iconic figures for conservation. This will be seen at the MEMO (Mass Extinction Monitoring

⁴¹⁶ Patrick Berche, “The Threat of Smallpox and Bioterrorism,” *Trends in Microbiology* 9, no. 1 (2001): 15–18.

⁴¹⁷ Raymond S Weinstein, “Should Remaining Stockpiles of Smallpox Virus (*Variola*) Be Destroyed?,” *Emerging Infectious Diseases* 17, no. 4 (2011): 681.

⁴¹⁸ David A Koplow, “Deliberate Extinction: Whether to Destroy the Last Smallpox Virus,” *Suffolk UL Rev.* 37 (2004): 1.

⁴¹⁹ Wolfgang K Joklik et al., “Why the Smallpox Virus Stocks Should Not Be Destroyed,” *Science* 262, no. 5137 (1993): 1225–1227.

⁴²⁰ Charles S Cockell, “The Rights of Microbes,” *Interdisciplinary Science Reviews* 29, no. 2 (2004): 141–150.

⁴²¹ Peter B Banks and Dieter F Hochuli, “Extinction, de-Extinction and Conservation: A Dangerous Mix of Ideas,” *Australian Zoologist* 38, no. 3 (2017): 390–394.

Observatory) project in the UK, where extinct species will be remembered in a stone-built monument that acts as an extinction shrine.⁴²²



Figure 22. Rendered image for the £20 million 'Memo' project⁴²³

Although many agree that any animal extinction is a huge loss, the best way of describing it is not always clear-cut.⁴²⁴ Professor of Environmental Ethics, Philip Cafaro highlights “three of the most common and plausible ways to think about anthropogenic

⁴²² Anita Bakshi, “Responding to Emotional Aspects of Environmental Loss: Implications for Landscape Architecture Theory and Practice,” *Landscape Research Record*, no. 7 (2018): 56.

⁴²³ Andy Martin, “For Whom the Bell Tolls: £20m ‘Memo’ Project Takes Shape on Dorset’s Jurassic Coast,” *Independent*, June 2012, <https://www.independent.co.uk/news/uk/this-britain/for-whom-the-bell-tolls-20m-memo-project-takes-shape-on-dorsets-jurassic-coast-7848566.html>.

⁴²⁴ Elizabeth Kolbert, *The Sixth Extinction: An Unnatural History* (New York: Henry Holt and Co, 2014).

mass extinction: as a mistake, as a crime, and as an inevitability.”⁴²⁵ Investigating the following three alternatives helps to explain the ethical significance and meaning behind the sixth mass extinction:

1st alternative: extinction as a result of squandering resources (a mistake)

One of the most shared views that modern-day conservationists hold is that extinction is huge waste of precious resources. The sustained loss of species has considerable effects on the present and future well being of human beings.⁴²⁶ Numerous ecosystem services are at risk due to declines in biodiversity. Biodiversity also possess important aesthetic, recreational, educational, religious, and spiritual values. At times, we could be ruling out vital opportunities through losing habitats and species.⁴²⁷ Nature enthusiasts anticipate that this kind of conversation on resources will be helpful, providing them with a way of persuading people who are apathetic to extinction that they ought to back prevention endeavors.⁴²⁸ Nonetheless, this viewpoint is yet to encapsulate what the sixth mass extinction fully entails, for various reasons. For starters, it maintains its focus solely on humans’ needs and wants, and identifies the possible loss in an unsuccessful attempt to satisfy them, presently or in the future. However, this appears unreasonable, as humanity’s endeavors to

⁴²⁵ Philip Cafaro, “Three Ways to Think about the Sixth Mass Extinction,” *Biological Conservation* 192 (2015): 388.

⁴²⁶ Erik J Nelson et al., “Climate Change’s Impact on Key Ecosystem Services and the Human Well-Being They Support in the US,” *Frontiers in Ecology and the Environment* 11, no. 9 (2013): 483–893.

⁴²⁷ Edward O Wilson, *The Meaning of Human Existence* (New York: WW Norton & Company, 2014).

⁴²⁸ Jérôme Cimon-Morin, Marcel Darveau, and Monique Poulin, “Fostering Synergies between Ecosystem Services and Biodiversity in Conservation Planning: A Review,” *Biological Conservation* 166 (2013): 144–154.

meet our needs and wants are behind the continued loss of the world's biodiversity.⁴²⁹ Averting mass loss of species would essentially require restricting the egocentric economic actions of people.⁴³⁰ It also calls for the management of human populations, since growing numbers each place a considerable burden on the already existing strained resources required by the other species.⁴³¹

Secondly, associating animals with resources strongly suggests “substitutability”, and this translates to the go-ahead for wiping out other species.⁴³² The problem with this mentality is that most animal species, especially the endangered ones, have little economic value.⁴³³ However, most of us are convinced that the significance of pandas for example cannot be entirely justified by looking at how helpful they are to humans. Lastly, focusing on resource aspect mostly means concentrating on the short-term. Nevertheless, most species have been in existence for millions of years, and threatening their existence through present-

⁴²⁹ Rima W Jabado et al., “The Trade in Sharks and Their Products in the United Arab Emirates,” *Biological Conservation* 181 (2015): 190–198.

⁴³⁰ David M Mushet, Jordan L Neau, and Ned H Euliss Jr, “Modeling Effects of Conservation Grassland Losses on Amphibian Habitat,” *Biological Conservation* 174 (2014): 93–100.; Anna M Pidgeon et al., “Systematic Temporal Patterns in the Relationship between Housing Development and Forest Bird Biodiversity,” *Conservation Biology* 28, no. 5 (2014): 1291–1301.

⁴³¹ Richard P Cincotta and Larry J Gorenflo, *Human Population: Its Influences on Biological Diversity*, vol. 214 (Springer Science & Business Media, 2011); Camilo Mora and Peter F Sale, “Ongoing Global Biodiversity Loss and the Need to Move beyond Protected Areas: A Review of the Technical and Practical Shortcomings of Protected Areas on Land and Sea,” *Marine Ecology Progress Series* 434 (2011): 251–266.

⁴³² Douglas J. McCauley, “Selling out on Nature,” *Nature* 443, no. 7107 (September 7, 2006): 27–28.

⁴³³ John A Vucetich, Jeremy T Bruskotter, and Michael Paul Nelson, “Evaluating Whether Nature’s Intrinsic Value Is an Axiom of or Anathema to Conservation,” *Conservation Biology* 29, no. 2 (2015): 321–332.

based consumption is a mistake.⁴³⁴ Focusing on resource and value prevent us from seeing the intrinsic value and histories of the other species.⁴³⁵

2nd alternative: extinction as a result of mass killings (as a crime)

The majority of researchers view anthropogenic extinction as ethically wrong.⁴³⁶ Referring to the loss as interspecies genocide has been one way of describing it. In Craig Sanford's latest book *Planet Without Apes*, he explains how humans have conducted a massive annihilation on the great apes.⁴³⁷ He adds that if such a massacre targeted humans, it would be termed as genocide. Apes are a great example for this moral argument, because of their close similarities to humans and advanced mental systems.⁴³⁸

The definition of 'genocide' is drawn from the Greek word root dubbed 'genos', which means people, group, or tribe. On the other hand, 'cide' is a Latin word meaning killing.⁴³⁹ Generally, the word means going against a whole group's right to existence; the

⁴³⁴ Thom Van Dooren, *Flight Ways: Life and Loss at the Edge of Extinction* (New York: Columbia University Press New York, 2014).

⁴³⁵ Philip Cafaro and Richard Primack, "Species Extinction Is a Great Moral Wrong," *Biological Conservation* 170 (2014): 1–2.

⁴³⁶ J Baird Callicott and William Grove-Fanning, "Should Endangered Species Have Standing? Toward Legal Rights for Listed Species," *Social Philosophy and Policy* 26, no. 2 (2009): 317–352; Eleanor Shoreman-Ouimet and Helen Kopnina, *Culture and Conservation: Beyond Anthropocentrism* (Routledge, 2015).

⁴³⁷ Craig B Stanford, *Planet without Apes* (Cambridge, MA: Harvard University Press, 2012).

⁴³⁸ Oliver Putz, "Moral Apes, Human Uniqueness, and the Image of God," *Zygon*® 44, no. 3 (2009): 614.

⁴³⁹ Damien Short, "Genocide," *The Wiley-Blackwell Encyclopedia of Social Theory*, 2017, 1–4.

same way homicide means the violation of a person's right to live.⁴⁴⁰ When we acknowledge that extinctions are in violation to fairness and morals, the word genocide seems a suitable description for the sixth mass extinction. Some feel that genocide is not a suitable term for describing extinctions, because people are not eliminating the other species deliberately, or since the word only refers to brutality against humans.⁴⁴¹ In agreement with such disapproval, the United Nations Convention on the Prevention and Punishment of the Crime of Genocide describes genocide as deliberate killings with prior intent.⁴⁴² Even though there is no sinister plot to kill all the innocent creatures in the world, we are experiencing a deliberate and persistent human confiscation of resources globally. After we identify human developments as the basic cause of species loss, and keep in mind that such developments involve planning and management by governments and companies across the globe, any assertion that human beings are unintentionally annihilating species is unconvincing. In the last century, the global population has risen by more than 300%, and the world's economy has grown by a minimum of 1500%.⁴⁴³ This population increment has harmed numerous species and habitats. Nevertheless, we are not ready to reduce our population size as a

⁴⁴⁰ Edmund Jan et al., *Encyclopedia of the United Nations and International Agreements: T to Z*, vol. 4 (New York: Taylor & Francis, 2003).

⁴⁴¹ David Sztybel, "Can the Treatment of Animals Be Compared to the Holocaust?," *Ethics and the Environment*, 2006, 97–132.

⁴⁴² Shirley V Scott, *International Law and Politics: Key Documents* (Boulder, CO: Lynne Rienner Publishers, 2006).

⁴⁴³ Will Steffen et al., "The Trajectory of the Anthropocene: The Great Acceleration," *The Anthropocene Review* 2, no. 1 (2015): 81–98.

planet, and we decline to minimize our per capital requirements on natural resources.⁴⁴⁴

Leading to a grave crime against Mother Nature, no different from a genocide.

“As a result, ocean life is reduced to food and bycatch; rainforests are razed for meat production, soybeans, palm oil and timber; boreal and temperate forests are cut down and exploited for their wood, pulp and energy resources; mountains are blown apart for their coal; deep sea floors are punctured for oil; grasslands are overgrazed or converted into strictly-human breadbaskets; freshwaters are channelized, dammed, polluted, and overfished; and animals are exterminated at an unprecedented pace, either displaced, or killed for their meat and lucrative body parts.”⁴⁴⁵

The next objection argues that only humans can be genocide victims. This is rather unfortunate for the bison that were eradicated from America’s Great Plains in the 18th century partially through planned campaigns by the US government to relocate the Native tribes.⁴⁴⁶ There is no scientific or rational reason stopping us from using the word genocide to describe the killing of both human and non-human groups.⁴⁴⁷ Species signify years of evolution and adaption. Similar to every individual, each species is distinct, with its own background and fate. They have considerable intrinsic value, and humanity has to protect

⁴⁴⁴ Garrett Hardin, *Living within Limits: Ecology, Economics, and Population Taboos* (Oxford, UK: Oxford University Press, 1995).

⁴⁴⁵ Philip Cafaro, “Three Ways to Think about the Sixth Mass Extinction,” *Biological Conservation* 192 (2015): 387.

⁴⁴⁶ Andrew C Isenberg, *The Destruction of the Bison: An Environmental History, 1750-1920*, 18 (Cambridge, UK: Cambridge University Press, 2001).

⁴⁴⁷ Philip Cafaro, “Three Ways to Think about the Sixth Mass Extinction,” *Biological Conservation* 192 (2015).

and acknowledge that.⁴⁴⁸ We have a moral duty towards other living things, it is only fair to share the resources between us.⁴⁴⁹



Figure 23. A pile of American bison skulls⁴⁵⁰

⁴⁴⁸ John A Vucetich, Jeremy T Bruskotter, and Michael Paul Nelson, “Evaluating Whether Nature’s Intrinsic Value Is an Axiom of or Anathema to Conservation,” *Conservation Biology* 29, no. 2 (2015): 321–332.

⁴⁴⁹ Reed F Noss et al., “Bolder Thinking for Conservation,” *Conservation Biology* 26, no. 1 (2012): 1–4; Edward O Wilson, *The Meaning of Human Existence* (New York: WW Norton & Company, 2014).

⁴⁵⁰ *Photograph of a Pile of American Bison Skulls Waiting to Be Ground for Fertilizer*, 1892, 1892, Burton Historical Collection, https://commons.wikimedia.org/wiki/File:Bison_skull_pile-restored.jpg.

3rd alternative: extinction as a result of humans' cancerous effect (an inevitability)

As living creatures, human beings have to use up some natural resources for survival. However, as self-aware, ethical individuals, we have the power of limiting such actions. For instance, when environmentalists urge for restrictions on industries, politicians and economists usually react by arguing that restraining growth is unreasonable or unwarranted.⁴⁵¹ Lawrence Summers, an ex-treasury secretary, guaranteed Americans several years back that the world has no limitations to the number of people it can hold, that there is no doomsday threat as a result of global warming, and the thought that we ought to restrict growth is a downright mistake.⁴⁵² Many modern-day environmentalists support “smart growth”, which is less destructive to the environment, while disregarding the population issue.⁴⁵³

During a conference dedicated to the anthropogenic threats on the environment, Thomas Lovejoy, “the godfather of biodiversity”, claimed that earth would soon experience a fever and humanity is the illness.⁴⁵⁴ Several years later, environmental ethicist Rolston Holmes said that cultures have become exploitative, with a never-ending rise of unappeasable needs, to add to a continually growing population.⁴⁵⁵ Anthropogenic growth

⁴⁵¹ Benjamin M Friedman, “The Moral Consequences of Economic Growth,” in *Markets, Morals, and Religion* (London, UK: Routledge, 2017), 29–42.

⁴⁵² Bill McKibben, *Deep Economy: The Wealth of Communities and the Durable Future* (London, UK: Macmillan, 2007).

⁴⁵³ James Speth, *The Bridge at the Edge of the World: Capitalism, the Environment and Crossing from Crisis to Sustainability* (New Haven, CT: Yale University Press, 2009).

⁴⁵⁴ David Brooks, “Journalists and Others for Saving the Planet,” *Wall Street Journal*, 1989.

⁴⁵⁵ Holmes Rolston, *Conserving Natural Value* (Columbia University Press, 1994).

has been exceptionally fast and widespread.⁴⁵⁶ Such an increase has been at the cost of both the integrity and welfare of the environment. This continued rise of the human population globally certainly appears to have lost control: leaders lack the power to stop it, despite their urge to do so; and technological advancements have enabled us to overcome any environmental barriers.⁴⁵⁷ Therefore the human race has been described as cancerous – detrimental and uninhibited.

4. Transformation Scenario Archetype

- The transformation scenario is a high-tech anthropocentric extreme of creating intelligent life forms and de-extinction projects. The scientific mutation of animal cells brings forth new hybrids as well as resurrects ancient ones.
- The archetype will be the science lab.

Nearly every day at Gene-techs Groups, Inc. is a hectic one, but today held a special kind of chaos. After spending the better part of the morning safety-proofing the lab and its surrounding departments, the staff was on high alert for the ambassador and his advisors filtering in for their tour. Once all steps were taken, every staff member planted in their assigned muster station, and all guests present with wide eyes, the tour began in the custom design department. In passing, an overindulged adolescent can be overheard demanding a winged serpent for his birthday. Now, it's not that it can't be done, of course, but a task of this nature certainly does have its obstacles: owing to the complications of adding wings to a snake, a falcon needs to be reverse-engineered from DNA extract.

The head scientist was leading the tour towards the petting zoo and frozen labs. "Budget cuts," he sighed, "dictate the selection of what species we bring back out of all that have been shamelessly exterminated, so we have to take these bizarre requests from elite clients every now and then to make ends meet." He avoided eye contact from the crowd, continuing speedily toward the lab. The lone woolly mammoth gazed longingly from behind a snowy enclosure, passenger pigeons flew above their heads, and with blank eyes, a Dodo bird scrutinized the tour group and continued to ruffle its feathers.

⁴⁵⁶ Dennis Meadows and Jorgan Randers, *The Limits to Growth: The 30-Year Update* (London, UK: Routledge, 2012).

⁴⁵⁷ Craig Dilworth, *Too Smart for Our Own Good: The Ecological Predicament of Humankind* (Cambridge, UK: Cambridge University Press, 2010).

"There's the dodo. Not a flightless bird anymore. Follow me. I'll show you where it is all done." The head scientist was speaking in quick bursts, trying to steal the attention of the group. In the vacuum hall, which leads to the lab, they passed between rows of tall and wide chambers. Inside a row of clear glass cylinders, one could clearly make out a milky, glowing substance, suspended in water. "Those will be Tasmanian tigers," replied the scientist to a question that no one had the nerve to ask. "We plan to create a sizable herd, and then release them on the private government arena."

Finally bursting the bubble of his silence, the ambassador asked, "Tell me, where do you get the records for reformation?"

"Mainly, excavated carcasses and taxidermy from collector auctions. There, almost ready to be taken from the reservoir, are Siberian tiger cubs. They'll be risky as full-grown pets but will be returned here after the adoption contracts expire."

The tour ended, and the ambassador was left to process all that he had seen. It had been years since conservation plans were abandoned, and preserves given up as land grabs. The idea of mimicking the natural environment had long since fallen out of favor, went out of style. Back at the entrance, the spoiled teenager's cries of privilege still rang through the hallways. "So tell me, this creature that you will engineer for me," he demanded, "What will the pedigree certificate say: domestic, wild, captive, feral? "



Figure 24. Interspecies hybrids⁴⁵⁸

Technology thus far has been important in defining natural life, culture, and beliefs. Professors Braden Allenby and Daniel Sarewitz explore the rather complex world where

⁴⁵⁸ Olena Shmahalo, *The Five Big Cats of the Panthera Genus*, 2017, Quanta Magazine.

technology and humanity are intertwining.⁴⁵⁹ The central argument brought forward is that to better manage this fast-changing world, we need to put an end to the schism between the concepts of being human, technology, and of what is considered to be natural. The current anthropogenic era has surpassed the point of being defined by technology and has started manipulating it to define the systems of the earth and realize new life forms. “We could even see the growth of Jurassic Park-like safaris, where visitors can see animals in the flesh that had previously been long-extinct, bringing a whole new meaning to extinction tourism.”⁴⁶⁰ By combining knowledge of genetics, engineering, and agricultural sciences, mankind has been able to form a new hybrid scientific discipline known as synthetic biology.⁴⁶¹ We are now able to view biological pathways as pieces of a puzzle that can be shifted around to create biological templates that can be used to create organisms bearing the desired qualities. By doing so, mankind is now able to create different life forms from scratch; going beyond that which is naturally occurring. Nowadays, cloning methods are even being used commercially. By cloning dead pets and faster racehorses, breeders can “better leverage their most exceptional animals”⁴⁶². Owning pets has actually helped in animal conservation, breeding, and research.⁴⁶³ Hence, an open approach to raise de-extinct animals as pets maybe a likely future. However, “it is not ethical to be purporting science fiction under the guise of

⁴⁵⁹ Braden R Allenby, and Daniel Sarewitz. *The Techno-Human Condition*. MIT press, 2011.

⁴⁶⁰ Lucy Ingham, “Last to See: The Future Rise of Extinction Tourism,” Factor, February 2015, <https://www.factor-tech.com/feature/last-see-future-rise-extinction-tourism/>.

⁴⁶¹ Pier Luigi Luisi, *The Emergence of Life: From Chemical Origins to Synthetic Biology* (Cambridge, UK: Cambridge University Press, 2016).

⁴⁶² Matt Burgess, “Where Are the Human Clones? 20 Years since Dolly Was Unveiled We Look at the Future of Cloning,” Wired, March 2017, <http://www.wired.co.uk/article/human-cloning-technology-dolly-sheep>.

⁴⁶³ Laurie Hess, “Exotic Animals: Appropriately Owned Pets or Inappropriately Kept Problems?,” *Journal of Avian Medicine and Surgery* 25, no. 1 (2011): 50–57.

science.”⁴⁶⁴ As evolutionary biologist Chase Mendenhall explains,

“We need more representations of the future, but we must live and act in the present, and there are far more urgent and tractable ways for creating imagined futures that don’t include bringing back a “pet” for humanity before you’ve had time to prepare its terrarium.”⁴⁶⁵



⁴⁶⁴ David E Blockstein, “We Can’t Bring Back the Passenger Pigeon: The Ethics of Deception around de-Extinction,” *Ethics, Policy & Environment* 20, no. 1 (2017): 35.

⁴⁶⁵ Paul R Ehrlich and A Ehrlich, “The Case against De-Extinction: It’s a Fascinating but Dumb Idea,” *Yale Environment* 360 (2014).

Experimental animals are turned into objects to yield data. Lynch calls this process a transformation from the naturalistic into the analytic animal.⁴⁶⁶ The ‘analytic animal’ resides in a mathematical space of the laboratory; the ‘naturalistic animal’ exists in a space devoid of experimentation.⁴⁶⁷ As far as science is concerned, the analytic animal is what is of importance. It is seemingly an artifact, and figuratively and realistically speaking, a product of the manipulations and designs of humans. The fact that laboratory procedures work to make the animal devoid of its naturalistic attributes provides much needed proof to Descartes’ argument that the animal is just but a machine.⁴⁶⁸ When it comes to laboratory work, animals are viewed as no more than a piece of information to be used in an experiment. Here, they cease to become sentimental objects and take on a more ‘cultural’ role that is defined by the practices, rules and regulations of the laboratory.⁴⁶⁹ However, when dealing with the naturalistic animal they are considered to be living creatures that possess personalities of their own. Here, the animal, in its interactions with humans is viewed to possess the ability to reciprocate emotions, to be empathetic and to even create an emotional bond with its handlers, as is the case with pets. Similarly, many laboratory scientists frequently develop feelings of attachment to their lab animals, and do not consider them as mere scientific

⁴⁶⁶ Michael E Lynch, “Sacrifice and the Transformation of the Animal Body into a Scientific Object: Laboratory Culture and Ritual Practice in the Neurosciences,” *Social Studies of Science* 18, no. 2 (1988): 265–289.

⁴⁶⁷ Alfred Schutz, “Collected Papers I: The Problem of Social Reality . The Hague: Martinus Nijhoff,” *Schutz Collected Papers, I, The Problem of Social Reality* 1962, 1962.

⁴⁶⁸ Michael E Lynch, “Sacrifice and the Transformation of the Animal Body into a Scientific Object: Laboratory Culture and Ritual Practice in the Neurosciences,” *Social Studies of Science* 18, no. 2 (1988): 265–289.

⁴⁶⁹ Michael Lynch, Eric Livingston, and Harold Garfinkel, “Temporal Order in Laboratory Work,” *Science Observed: Perspectives on the Social Study of Science*, 1983, 205–238.

objects. The tendency to do so can be compared to the interactions with inanimate objects such as computers where the objects are assigned characters and personalities.⁴⁷⁰

A video clip from the 1930s showcases a dog scurrying around inside an enclosure.⁴⁷¹ When looking more closely, it becomes apparent that this “dog” has an odd-shaped head, peculiar stripe patterns, and a stiff tail. This is no dog, but rather one of the last surviving Tasmanian tigers. The film was done shortly before humans killed off the last of them. Comparably, old records describe the proliferated presence of passenger pigeons, but by the mid-nineteenth century they were all mass slaughtered.⁴⁷² Many have mourned the loss of this species, and “Martha” in specific, the last survivor. Renowned philosopher and conservationist Aldo Leopold wrote, “we grieve, because no living man will see again the onrushing phalanx of victorious birds, sweeping a path for spring across the March skies, chasing the defeated winter from all the woods and prairies of Wisconsin.”⁴⁷³

But we may not have to grieve anymore. The Long Now Foundation, based in San Francisco, is proactively assisting scientists in recreating the passenger pigeon within what is known as its ‘Revive & Restore’ project.⁴⁷⁴ In the Anthropocene, the possibility of de-

⁴⁷⁰ Sherry Turkle, *The Second Self: Computers and the Human Spirit* (Cambridge, MA: MIT Press, 2005).

⁴⁷¹ *Last Tasmanian Tiger, Thylacine, 1933*, accessed February 17, 2019, <https://www.youtube.com/watch?v=6vqCCI1ZF7o>.

⁴⁷² Ben Minteer, “Is It Right to Reverse Extinction?,” *Nature News* 509, no. 7500 (2014): 261.

⁴⁷³ Leopold Aldo, “A Sand County Almanac,” *New York: Ballantine*, 1949.

⁴⁷⁴ Nathaniel Rich, “The Mammoth Cometh,” *New York Times* 27 (2014).

extinction has become plausible.⁴⁷⁵ De-extinction is a new process of resurrecting extinct species via genetic technology.⁴⁷⁶ Recently, many celebrated the news that the genetic material of extinct gastric-brooding frogs, was resurrected.⁴⁷⁷ Additionally, for a short while the Pyrenean Ibex *Capra* has also been revived.⁴⁷⁸ These two breakthroughs are some of the numerous attempts in progress to utilize genetic technology to resurrect some of the most popular extinct species, including passenger pigeons, Tasmanian tigers, and woolly mammoths.⁴⁷⁹

Assuming de-extinction is a success, what would become of our modern-day conservation efforts? With the ability to address the shortcomings of ecological approaches to conservation, the “genetic techno-fix” of de-extinction is attractive to many.⁴⁸⁰ However, if de-extinction is put into practice, conservationists will have a difficult time arguing against overhunting when the victim of such, the Dodo bird, is revived. Likewise, environmental efforts to stand against climate change will seem futile when its icon, the sabre toothed tiger, is reborn. I personally side with the critics of de-extinction⁴⁸¹ who hold to the belief that,

⁴⁷⁵ Daniel Lunney, “Is a Grumpy Ecologist an Oxymoron?” in *Grumpy Scientists: The Ecological Conscience of a Nation*, by Daniel Lunney, Patricia Hutchings, and Harry F Recher (Royal Zoological Society of New South Wales Sydney, 2013), 95–105.

⁴⁷⁶ Peter B Banks and Dieter F Hochuli, “Extinction, de-Extinction and Conservation: A Dangerous Mix of Ideas,” *Australian Zoologist* 38, no. 3 (2017): 1-5.

⁴⁷⁷ Shlomo Cohen, “The Ethics of De-Extinction,” *NanoEthics* 8, no. 2 (2014): 165–178.

⁴⁷⁸ Lesley Evans Ogden, “Extinction Is Forever... or Is It?,” *BioScience* 64 (2014): 469–75.

⁴⁷⁹ Jacob S Sherkow and Henry T Greely, “What If Extinction Is Not Forever?,” *Science* 340, no. 6128 (2013): 32–33.

⁴⁸⁰ Julien Delord, “Can We Really Re-Create an Extinct Species by Cloning? A Metaphysical Analysis,” in *The Ethics of Animal Re-Creation and Modification* (Berlin, Germany: Springer, 2014), 22–39.

⁴⁸¹ Ronald Sandler, “The Ethics of Reviving Long Extinct Species,” *Conservation Biology* 28, no. 2 (2014): 354–360; Thom van Dooren and Deborah Bird Rose, “Keeping Faith with the Dead:

once accomplished, reviving species that have gone extinct will cripple conservation efforts by being exploited as a backup solution. While some argue that de-extinction will actually encourage conservation by this scientific achievement⁴⁸², “without its extinct martyrs like the thylacine, the passenger pigeon, and the gastric brooding frog, conservation will lose its ability to argue against some of the key threats to wildlife and hence lose its voice in the fight against human impacts on the natural world.”⁴⁸³

Of the various approaches to de-extinction, back-breeding, cloning, and genetic engineering are the three most promising methods.⁴⁸⁴ Back-breeding might be feasible only if there are descendants that are closely related to that extinct specie. This method has been used in the Auroch cattle project in Europe.⁴⁸⁵ Another approach is brought forth through cloning, utilized by a Spanish group that used somatic cell nuclear transfer (SCNT) to revive the extinct subspecies of a mountain goat (Pyrenean ibex) using preserved frozen tissue. However, despite hundreds of efforts, only one fetus survived to term, and even then, ultimately died minutes after birth from lung complications.⁴⁸⁶ This example demonstrates two issues with SCNT: it is neither very safe nor efficient and will only work if viable cell

Mourning and de-Extinction,” *Australian Zoologist* 38, no. 3 (2017): 375–378; Ben Minteer, “Is It Right to Reverse Extinction?,” *Nature News* 509, no. 7500 (2014): 261.

⁴⁸² Patric Brandt et al., “Multifunctionality and Biodiversity: Ecosystem Services in Temperate Rainforests of the Pacific Northwest, USA,” *Biological Conservation* 169 (2014): 362–371.

⁴⁸³ Peter B Banks and Dieter F Hochuli, “Extinction, de-Extinction and Conservation: A Dangerous Mix of Ideas,” *Australian Zoologist* 38, no. 3 (2017): 4.

⁴⁸⁴ Jacob S Sherkow and Henry T Greely, “What If Extinction Is Not Forever?,” *Science* 340, no. 6128 (2013): 32–33.

⁴⁸⁵ Ronald Goderie, “The Tauros Programme: The Search for a New Icon for European Wilderness,” accessed February 17, 2019, <http://www.taurosproject.com>.

⁴⁸⁶ Josep Folch et al., “First Birth of an Animal from an Extinct Subspecies (Capra Pyrenaica Pyrenaica) by Cloning,” *Theriogenology* 71, no. 6 (2009): 1026–1034.

nuclei are present, a condition that will likely be the case in only a few extinctions. The third approach stems from genetic engineering. “Take an extinct species—say, the passenger pigeon—that left sufficient samples to allow high-quality whole-genome sequencing. DNA in cells from a similar living species—perhaps the band-tailed pigeon—could be edited to match the extinct species’ genomic sequence.”⁴⁸⁷ Then, the resulting cells could be utilized to create living birds with the make up of a band-tailed pigeon but also part passenger pigeon.⁴⁸⁸ The majority of the extinct genome would be restored within a couple of generations, if ever.⁴⁸⁹

⁴⁸⁷ Jacob S Sherkow and Henry T Greely, “What If Extinction Is Not Forever?,” *Science* 340, no. 6128 (2013): 32.

⁴⁸⁸ David E Blockstein, “We Can’t Bring Back the Passenger Pigeon: The Ethics of Deception around de-Extinction,” *Ethics, Policy & Environment* 20, no. 1 (2017): 33–37.

⁴⁸⁹ Harris H Wang et al., “Genome-Scale Promoter Engineering by Coselection MAGE,” *Nature Methods* 9, no. 6 (2012): 591.

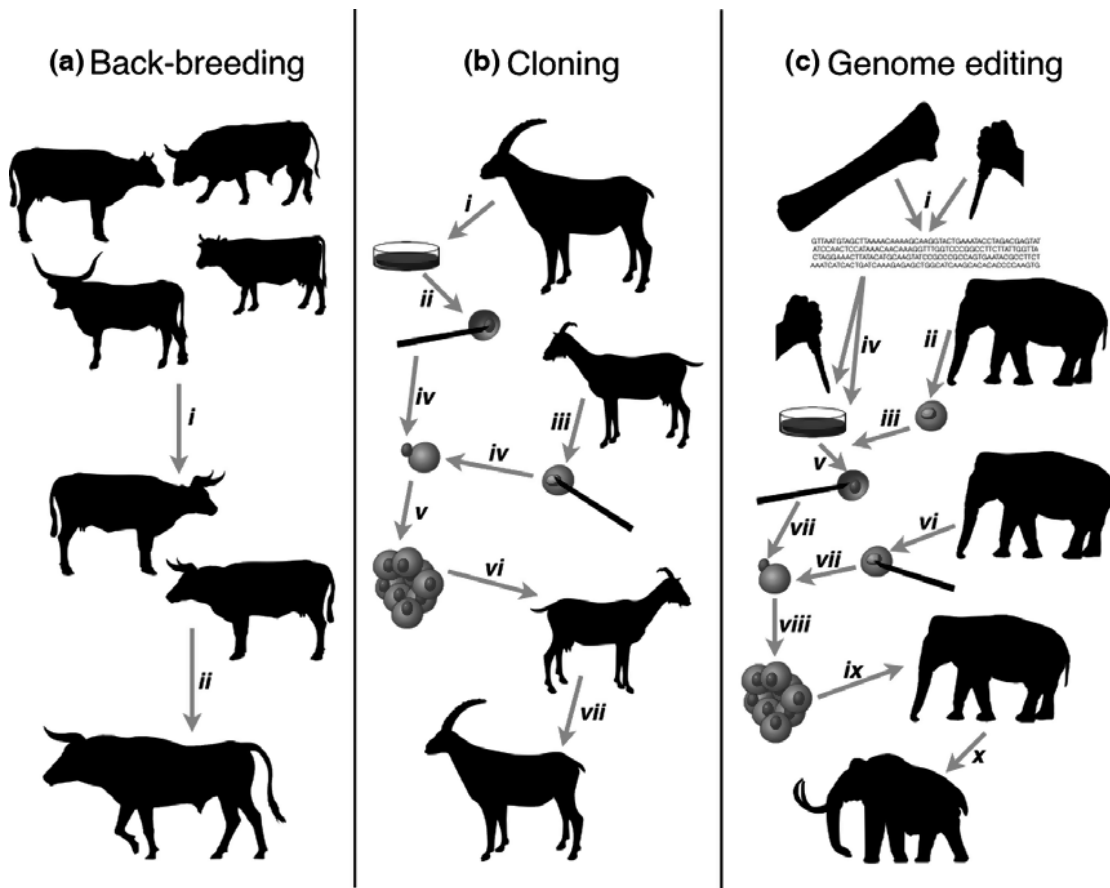


Figure 25. Three approaches to de-extinction⁴⁹⁰

Despite its promise, critics of de-extinction question what benefits are brought forth with the return of seemingly insignificant creatures.⁴⁹¹ Those who are against de-extinction base their arguments on one or more of the following: animal welfare, health, environment, politics, and/or ethics.⁴⁹² Animals produced via de-extinction may ultimately endure pain

⁴⁹⁰ Beth Shapiro, “Pathways to De-Extinction: How Close Can We Get to Resurrection of an Extinct Species?,” *Functional Ecology* 31, no. 5 (2017): 996–1002.

⁴⁹¹ Ronald Sandler, “The Ethics of Reviving Long Extinct Species,” *Conservation Biology* 28, no. 2 (2014): 354–360; Jacob S Sherkow and Henry T Greely, “What If Extinction Is Not Forever?,” *Science* 340, no. 6128 (2013): 32–33.

⁴⁹² Jacob S Sherkow and Henry T Greely, “What If Extinction Is Not Forever?,” *Science* 340, no. 6128 (2013): 32–33.

during the process. It has been proven that SCNT can result in significant levels of abnormality and premature mortality.⁴⁹³ Furthermore, animal rights activists might also stand against de-extinction for the same reason they oppose zoos, and unnecessary animal exploitation.⁴⁹⁴ Additionally, the genome of an extinct animal could also carry unknown dangerous viruses, which may result in widespread epidemics. The same landscapes that used to host these species have greatly evolved and may consider these creatures as unwelcome pests. Apart from this, there are concerns about whether such organisms would, and could, be successfully reintroduced into their habitats. De-extinction will most likely trigger political debates as well. The public would prefer if their tax money was going to research that would directly help human kind rather than resurrect animal species. Moreover, some will argue that, no matter the results, de-extinction is sinful, a roleplaying of the divine if you will. Others may be cautious of the unknown results and don't see the need for these extinct species in today's environment.

Supporters of de-extinction also base their arguments on five criteria: “scientific knowledge, technological advancement, concrete environmental benefits, justice, and “wonder.”⁴⁹⁵ De-extinction carries potential to allow scientific observation of plant and animal species that were once absent due to extinction. Also, reintroducing species into the wild, can aid in restoring their vulnerable environments. Similarly, the woolly mammoth is a significant grazing creature, and can act as geo-engineers transforming the arctic steppe into

⁴⁹³ Pascale Chavatte-Palmera et al., “Placental Perturbations Induce the Developmental Abnormalities Often Observed in Bovine Somatic Cell Nuclear Transfer,” *Placenta* 33 (2012): 599.

⁴⁹⁴ Jacob S Sherkow and Henry T Greely, “What If Extinction Is Not Forever?,” *Science* 340, no. 6128 (2013): 32–33.

⁴⁹⁵ Ibid

lush landscapes.⁴⁹⁶ Another popular motivation for the proponents of de-extinction is that of justice, at least for species that have been eliminated due to human action. If we master the ability to bring them back into this world, then it feels like an obligation to do so. Finally, biggest motivation for de-extinction is “wonder” and satisfying our curiosity.

“Wouldn’t it be great to have vast herds of mammoths roaming the Canadian tundra, or a thrill to see flocks of hundreds of millions of passenger pigeons settling in Michigan forests once again to gobble down vast amounts of beech mast and supply succulent squabs to Chicago restaurants? Or maybe enjoy watching flights of Carolina parakeets over southern farms, or at least observe a living pair of saber-toothed cats in a cage in a zoo.”⁴⁹⁷

Despite all of this, legal complications most certainly ought to be contemplated.⁴⁹⁸ If an extinct species is successfully brought back, would it remain on the endangered species list? They would be protected under the Endangered Species Act in the United States, but not recognized under international groups that tend to judge by population statistics.⁴⁹⁹ There are many unresolved issues, but most importantly is the need for some sort of established protocols that monitor such projects and prioritize safety and animal welfare whilst taking a cautious approach. Assuming de-extinction were to be legalized, what regulations would be put in place? Especially when it comes to the possibility of licensing these resurrected

⁴⁹⁶ “Pleistocene Park: Restoration of the Mammoth Steppe Ecosystem,” accessed February 17, 2019, <http://www.pleistocenepark.ru/en/background/>.

⁴⁹⁷ Paul R Ehrlich and A Ehrlich, “The Case against De-Extinction: It’s a Fascinating but Dumb Idea,” *Yale Environment* 360 (2014).

⁴⁹⁸ Jacob S Sherkow and Henry T Greely, “What If Extinction Is Not Forever?,” *Science* 340, no. 6128 (2013): 32–33.

⁴⁹⁹ Norman F Carlin, Ilan Wurman, and Tamara Zakim, “How to Permit Your Mammoth: Some Legal Implications of de-Extinction,” *Stan. Envtl. LJ* 33 (2013): 3.

species. Certain countries including the United States do permit patents on living creatures.⁵⁰⁰

“Exclusive rights to exhibit resurrected species in a Jurassic or Pleistocene Park could provide a revenue stream to recover past costs or fund de-extinction efforts for additional species. Moreover, there could be a market for resurrected species as pets, not unlike the market for exotic animals.”⁵⁰¹

In most de-extinction projects, the aim is to produce the closest replicas to the extinct species; “ecological proxies that are capable of filling the extinct species’ ecological niche.”⁵⁰²

A functioning copy is sufficient; you do not need an exact replica in order to attain conservation goals. Those in favor of backbreeding aurochs are expected to release these animals into vacant farm areas near what was at one point the aurochs’ grazing grounds.⁵⁰³

Similarly, supporters of the mammoth revival aim to create hairy elephants that can withstand Siberia’s brutal weather.⁵⁰⁴ The revived aurochs and mammoths will be different from their extinct counterparts, so there is no telling if they will possess similar behavioral attributes such as grazing.

“When the animal is born, it will be raised by a surrogate species, with different behaviors and social structures, which will affect its phenotype. It will live in an environment that is different from that which persisted in the past, and consume a

⁵⁰⁰ Roger D Klein, “Patents and Proprietary Assays,” in *Genomic Applications in Pathology* (Springer, 2019), 159–169.

⁵⁰¹ Norman F Carlin, Ilan Wurman, and Tamara Zakim, “How to Permit Your Mammoth: Some Legal Implications of de-Extinction,” *Stan. Envtl. LJ* 33 (2013): 48.

⁵⁰² Beth Shapiro, “Pathways to De-Extinction: How Close Can We Get to Resurrection of an Extinct Species?,” *Functional Ecology* 31, no. 5 (2017): 6.

⁵⁰³ Erik Stokstad, *Bringing Back the Aurochs* (Washington, D.C.: American Association for the Advancement of Science, 2015).

⁵⁰⁴ Sergey A. Zimov, “Pleistocene Park: Return of the Mammoth’s Ecosystem,” *Science* 308, no. 5723 (May 6, 2005): 796–98.

different diet than was consumed by other members of its species.”⁵⁰⁵

There is a legitimate concern that our current landscapes will be incapable of sustaining the resurrected species.⁵⁰⁶ We may be better off focusing our efforts and limited resources on conservation efforts. The greatest concern of de-extinction, though, is what it symbolizes. It proclaims that we have limitless control over nature. But we must tread cautiously with technology, “Our tools are better than we are, and grow better faster than we do. They suffice to crack the atom, to command the tides. But they do not suffice for the oldest task in human history: to live on a piece of land without spoiling it.”⁵⁰⁷ Animal extinction helps us reflect on our own finitude. We can be too smart for our own good. Being enthralled with power and control can be foolish. But we ought to value and defend the reality of nature, including the reality that some creatures are extinct, to ultimately show us something profound about the importance of collective discipline and the limits of human ability. Saying that it is smart to take a step back goes against the goal of progress, but fighting against the urge to increase our power over nature will allow us to repair it.

“We should also cherish and protect the capacity of nature, including those parts of nature that are no longer with us, to teach us something profound about the value of collective self-restraint and human limits. Few things teach us this sort of earthly modesty any more.”⁵⁰⁸

⁵⁰⁵ Beth Shapiro, “Pathways to De-Extinction: How Close Can We Get to Resurrection of an Extinct Species?,” *Functional Ecology* 31, no. 5 (2017): 5.

⁵⁰⁶ Ben Minter, “Is It Right to Reverse Extinction?,” *Nature News* 509, no. 7500 (2014): 261.

⁵⁰⁷ Aldo Leopold, “Conservation Esthetic,” *Bird Lore* 40, no. 2 (1938): 101–109.

⁵⁰⁸ Ben Minter, “Is It Right to Reverse Extinction?,” *Nature News* 509, no. 7500 (2014): 261.

5. Synthesis Scenario Archetype

- The synthesis scenario brings the wild to the urban context. Introducing a sense of equality, agency, and collective ownership of space.
- The archetype will be an urban intervention.

It was truly The City of the Rhino. Everywhere one looked, the rhinoceros was extolled in the form of murals, monuments, art installations, and children's toys. The city flag, dancing through the air atop the roofs of the buildings that sketched out the skyline, was drawn in the unmistakable outline of rhino horns.

This city's government has always walked a fascinating tightrope between intense idolatry and grave mistreatment which escalated to a peak the year 2025. In an effort to expand the city's urban districts, wilderness conservation plots were bulldozed and replaced with skyscrapers and modern apartments. The remaining rhinos, however, were placed in a sort of engineered captivity underground: a viewing pit where passersby and residents of the city could visit and observe the animals they claimed to love so fondly.

This pit, of course, caused much more harm than benefit. The rhinos were cramped inside the confines of the dingy, underground abyss, which in and of itself spelled out a significant decrease in quality of life. In their collective dismay, tempers flared in the crowded quarters of the rhino community, which then led to intense quarrels and severe (often untreatable) injuries. Every now and again, a drunken person would topple down into the rhino pit only to be trampled to death and left to rot by the herbivores.

After about five years of the rhino pit tarnishing the center of the city, the residents began to realize that something must be done. The living conditions for the rhinos were deplorable, the animals moped around in their boredom, and the entire project had become more of a floundering embarrassment than a tourist attraction. Temporary measures were taken to improve the quality of life such as concrete refurbishment, but this only served to jerk the rhinos even further from the wild world to which they were longing to return. Long periods of community deliberation took place until finally a solution was patched together: the rhinos would inhabit one of the many barren, abandoned parks within the residential areas on the outskirts of the city.

With this restructure of their home turf, a new era of urban wilderness interventions was ushered through. These missions were to create a place for animals that was neither captivity, nor the wild (as the first is inhumane and the latter ceased to exist any longer). The general consensus of the public was the idea that an animal shouldn't be caged, but that doesn't mean that its only viable option for a habitat is what was found originally, a millennia ago. A giraffe shouldn't be kept in a traditional enclosure, but that doesn't mean its only acceptable home is an East African grassland.

In the following stage, waterbucks were introduced to graze in the land adjacent to the town lake. A reinforced tunnel for easy access connected both animal plots, which encouraged active foraging for food in addition to an increase in physical activity. The animals could choose their adventures each day with the multiple options set out before them; long gone were the confines of what was always considered "man's land."

With more species introductions and freedom, the animals were flourishing. Hybrid species were able to form: liger, tigon, leopard and even panthera breeds were found roaming around.

City dwellers could now make eye contact with giraffes through their third- and fourth-floor apartment windows. Elephants roared their trunks and snatched food from the hands of excited children on balconies. Back alleys of the city were transformed into wildlife running corridors. These wild interventions gained more public support due to the bountiful power source the animals turned out to be. The stampede of the elephants, the rippling in the water where a hippo soaks, the monkey's leap from branch to branch; these movements were able to be harnessed to create a current of kinetic energy that helped power the city.

With all these infrastructural developments, legal transformation closely followed. For the first time in history, the lawmakers successfully granted the once-revered rhinos the same legal rights of human beings. The landmark parliamentary vote caps more than 20 years of struggles, ensuring that the 9 remaining rhinos will be represented by two human guardians in legal matters that concern them.

"We have struggled to locate a legal approximation so we can illustrate that regarding the rhinos as living entities is the only just solution," read the statement issued by the Ministry of Environment in the wake of the legal decision, "in lieu of handling it from a logistics standpoint." The legislation marked a monumental victory, which also included \$25 million settlement in financial redress, followed by an additional \$7 million toward improving the enclosure.

In a televised conference aired worldwide, the minister spoke fondly of the new developments. "Great hornbill nests, prolifically large butterflies, and magic rabbits! We are seeing species in the city like never before. The problem is," he continued, "urbanites are not the most ideal hosts. Animals, unfortunately, can't comprehend zoning or boundaries. We must work together to create a safe space for all animals to roam."

The second stage of the program fell into the laps of engineers, architects, and designers to create a more secure environment for animals to thrive amongst humans in the city. Giant piping tubes where small animals could play shot up and whirled around skyscrapers. Traffic was limited to underground driving as the surface became a pedestrian-only zone. The placement of the animals within the urban space stirred a sense of social responsibility in the city dwellers who started viewing these animals as communal pets rather than unwanted trespassers. A landmark change was fostered; with these contemporary landscapes protecting every animal, it became the peoples' turn to adapt.

	Discipline	Collapse	Transformation	Growth	Synurbization
Human Action	Non-human containment	Deliberate or unintended destruction of non-humans	Scientific investment	Sensationalist production	Usher animals in, accept risks
Animal reaction	Avoidance	Hostility	Surrender	Performance	Synanthropy
Exhibitory	Immersion Exhibits	Dioramas	Lab experiment	Cages	Urban intervention
Probable outcomes	Segregation	Misrepresentation	Fragmentation	Imposed profiteering	Co-existence

Table 2. Scenario synthesis

"The future cannot be "predicted", but "preferred futures" can and should be envisioned, invented, implemented, continuously evaluated, revised, and re-envisioned."⁵⁰⁹ By considering the four generic alternative futures, their weaknesses and prospects, we can arrive at a "preferred future" or "the best possible real world imaginable". This fifth scenario is not a utopia, but a "eutopia" perfectly imperfect.

"Just the best that is humanly (and post-humanly) possible. Eutopias are far, far harder to imagine and strive for than are either utopias or dystopias, so only brave, hardworking, and ethical architects are likely to rise to the challenge. It is far easier to engage in irresponsible utopianism, or just keep your nose to the grindstone of the present."⁵¹⁰

⁵⁰⁹ Jim Dator, "What Futures Studies Is, and Is Not," in *The Knowledge Base of Futures Studies*, by Richard Slaughter, 3 Vols (Hawthorn, Australia: DDM Media Group, 1996), Foreword.

⁵¹⁰ Jim Dator, "Alternative Futures in Architecture," in *The Routledge Companion for Architecture Design and Practice: Established and Emerging Trends*, by Mitra Kanaani and Dak Kopec (London: Routledge, 2015): 54.

The ideal scenario should move away from the old standard of conservation to contemporary landscapes. An archetype that contests the science and procedure connected with the conventional typical conservation. It will be a primarily investigational space where there is a surrendering of power and the goal is not to reinstate a recognized and foreseeable ecosphere, rather to be exposed to a unexpected different one; a space far better capable to survive in the Anthropocene for it endorses a nature which depends neither on humans nor everlasting stability. The term synurbization was recently coined to describe the adaptation of animals to urban areas. This means that they are able to occupy areas where the conditions are favorable to survive (as well as breed) as they naturally would in their wild habitats. Synurbization goes beyond animals being introduced accidentally into urban spaces by humans (or otherwise) and thriving within these spaces in the short term. This concept is explored primarily for mammals and birds, but is evident in other animal species.⁵¹¹ With growing cityscapes around the globe, more animals are forced to acclimate to urban environments for their survival. The hooded crow, red fox, magpie, striped field mouse, red squirrel, and the black bird are living proof of wild animals' abilities to inhabit urban environments and thrive in them.⁵¹² Successful cases of synurbization are proof of the ability of humans and non-human animals to co-exist and give hope for the management of wildlife species within city boundaries.

⁵¹¹ Maciej Luniak, "Synurbization—Adaptation of Animal Wildlife to Urban Development," in *Proceedings of the 4th International Urban Wildlife Symposium*, 2004, 50–55.

⁵¹² Christian Rutz, "The Establishment of an Urban Bird Population," *Journal of Animal Ecology* 77, no. 5 (2008): 1008–1019.



Urban geographies definitely offer the potential of accommodating both human and non-human counterparts, as “anyone who believes that only pigeons, sparrows and rats live in cities is seriously mistaken.”⁵¹³ German zoologist Josef Reichholf, argues that animal counterparts are indeed capable of establishing their own space within the cities.⁵¹⁴ Such adaptation for survival and even proliferation are seen in the moose, black bears and grizzlies that stroll through Anchorage; the growing hare populations near the Frankfurt airport

⁵¹³ Dirk Maxeiner and Michael Miersch, “The Urban Jungle,” *Living for the City—A New Agenda for Green Cities*, Policy Exchange, London, 2006, 58.

⁵¹⁴ Josef Reichholf, *The Demise of Diversity: Loss and Extinction* (London, UK: Haus Publishing, 2009).

where hawks are no longer seen due to the never-ending air traffic; the dense population of indigenous marten in Cottingen; and the peregrine falcons that settled in Cologne Cathedral. Synanthropes is a term used to refer to animal species that in one way or the other thrive on the presence of humans and human engineered environments during part or the entirety of their life cycle.⁵¹⁵ Such species, while having some form of dependency on humans, do not fall under domesticated or pet categories.⁵¹⁶ Some examples of this would be house sparrows, house mice, rock pigeons, just to name a few.⁵¹⁷ Such animals rely on humans for better food resources, habitats and dispersal. The American crow is one such synanthrope that has adapted to changes along the North American agricultural and urban history and thrived within these changes. By virtue of their adaptive nature, they have successfully out competed ravens within human dominated spaces.⁵¹⁸ Pigeons, although not originally urban dwellers, have carved out a niche for themselves that enables them to thrive in the urban environment as compared to their more 'natural' environments. Jerolmack describes them as follows:

“This animal is what I would call a double hybrid. It was created by humans for domestic use but then escaped to become feral. Its physical and biological structure, as well as its reproductive abilities and habits such as dwelling on window ledges, are

⁵¹⁵ Greger Larson and Dorian Q Fuller, “The Evolution of Animal Domestication,” *Annual Review of Ecology, Evolution, and Systematics* 45 (2014): 115–136.

⁵¹⁶ Elizabeth A Johnson and Michael W Klemens, *Nature in Fragments: The Legacy of Sprawl* (New York: Columbia University Press, 2005): 207.

⁵¹⁷ John Edward Wall, “Spaces of Co-Existence: The Processes and Prospects of Living with Endangered Species” (PhD Thesis, Carleton University, 2011): 17.

⁵¹⁸ Daniel W Gade, “Shifting Synanthropy of the Crow in Eastern North America,” *Geographical Review* 100, no. 2 (2010): 152–175.

the product of millennia of human intervention in nature. This particular type of pigeon *never* existed ‘in the wild;’ its ‘natural habitat’ is among humans.”⁵¹⁹

However, Jerolmack draws attention to the numerous ways that pigeons are redefined from a taxonomic stand point and are declared (from a social, cultural, and spatial stand point) as unwanted within the urban setting due to them getting too comfortable.⁵²⁰ The exotic New York parakeets while ideally being outsiders are not accorded the same treatment as pigeons. These are taken to be a welcome addition, because they keep reasonable distance.⁵²¹ Urban foxes are also known to breach boundaries put in place for the different spaces.⁵²² They are known for their adaptability and ‘plasticity’ in the city compared to the countryside in order to ensure their overall pack longevity.⁵²³ Their adaptive capacities make them part of the distinct urban wild. “They are coming closer, collecting food, rolling over, even allowing petting – in some instances the behaviour is more dog-like than fox-like”.⁵²⁴

Adaptation to the urban space is not only evident in urban hybrids, but also in humans. The growing numbers and frequency of interactions with nonhuman others and the fact that it is tolerated is a clear sign of adaptation on both sides of the nature-culture

⁵¹⁹ Colin Jerolmack, “Animal Archeology: Domestic Pigeons and the Nature-Culture Dialectic,” *Qualitative Sociology Review* 3, no. 1 (2007), 90.

⁵²⁰ Colin Jerolmack, “How Pigeons Became Rats: The Cultural-Spatial Logic of Problem Animals,” *Social Problems* 55, no. 1 (2009): 72–94.

⁵²¹ Mona Seymour, “‘Support Your Local Invasive Species’: Animal Protection Rhetoric and Nonnative Species,” *Society & Animals* 21, no. 1 (2013): 54–73.

⁵²² Angela Cassidy and Brett Mills, “‘Fox Tots Attack Shock’: Urban Foxes, Mass Media and Boundary-Breaching,” *Environmental Communication: A Journal of Nature and Culture* 6, no. 4 (2012): 4.

⁵²³ Philip J Baker et al., “Activity Patterns of Urban Red Foxes (*Vulpes Vulpes*) Reduce the Risk of Traffic-Induced Mortality,” *Behavioral Ecology* 18, no. 4 (2007): 716–724.

⁵²⁴ “Who, What and, Why: Are Urban Fox Numbers Rising,” BBC News, 2013, www.bbc.com/news/magazine-21409631.

divide. Such relationships and interactions shed light on possible cordial interactions between humans and their nonhuman counterparts across a temporal geography.⁵²⁵ It is for this reason that cordiality within the city space has to be designed for rather than engineered.⁵²⁶ “Hence the spatial fetishism, the taxonomic absolutism, and nonhuman exclusivity of the ‘wild’ needs to be overcome.”⁵²⁷ This is especially true for synanthropes that are considered to be harmless. These can be easily found within the same space and at the same time as their human counterparts without drawing unnecessary attention from the latter, such as squirrels. However, such relationships can easily be compromised should the animals be viewed as a menace for whatever reason. Animals that are viewed to be dangerous to humans are capable of co-existing with humans from a spatial standpoint but not a temporal one. Studies have shown adaptive change in urban animals and temporal change in behaviors.⁵²⁸ By making use of the same space at different times, we avoid confrontation between species and foster a peaceful co-existence. This can also be planned for by using seasonal closures, population determined closures, fences, and animal relocation strategies.

⁵²⁵ John Edward Wall, “Spaces of Co-Existence: The Processes and Prospects of Living with Endangered Species” (PhD Thesis, Carleton University, 2011): 18.

⁵²⁶ Lisa Peattie, “Convivial Cities,” in *Cities for Citizens: Planning and the Rise of Civil Society in a Global Age*, by Mike Douglass and John Friedmann (John Wiley & Son Ltd, 1998), 247–53.

⁵²⁷ Thom van Dooren, Garry Marvin, and Susan McHugh, *Routledge Handbook of Human-Animal Studies* (London: Routledge, 2014): 240.

⁵²⁸ Stephen S Ditchkoff, Sarah T Saalfeld, and Charles J Gibson, “Animal Behavior in Urban Ecosystems: Modifications Due to Human-Induced Stress,” *Urban Ecosystems* 9, no. 1 (2006): 5–12.

CHAPTER 6

EXCLUSIVITY AND INCLUSIVITY

Human-animal Divide

The field of animal studies is a direct offshoot of growing interest in animals. The central theme of it, however, seems to revolve around the need for humans to define and identify themselves in relation to the non-human others.⁵²⁹ Interest in the field of urban ecology is also growing with recent research focusing on the transpecies urban theory.⁵³⁰ The various forms of the presence of animals in historic cities are being explored with the literature,⁵³¹ as well as growing attention towards modern day cultural beliefs about animals within the urban environment.⁵³² In addition to an increasing number of studies done on the inclusion and exclusion of certain animals from urban areas.⁵³³ It is, however, safe to say that inclusivity in modern day cities governed by the concepts of cosmopolitanism and multiculturalism is still restricted to the diversity within humans.⁵³⁴ The inclusion and consideration of the non-human others within city spaces is not only important for the wellbeing of the animals, but also for the human life as well. Philosopher Gilles Deleuze and

⁵²⁹ Chris Wilbert, “Animal Geographies,” *International Encyclopedia of Human Geography*, 2009, 122–26.

⁵³⁰ Jennifer Wolch, “Zoopolis,” *Capitalism Nature Socialism* 7, no. 2 (1996): 21–47.

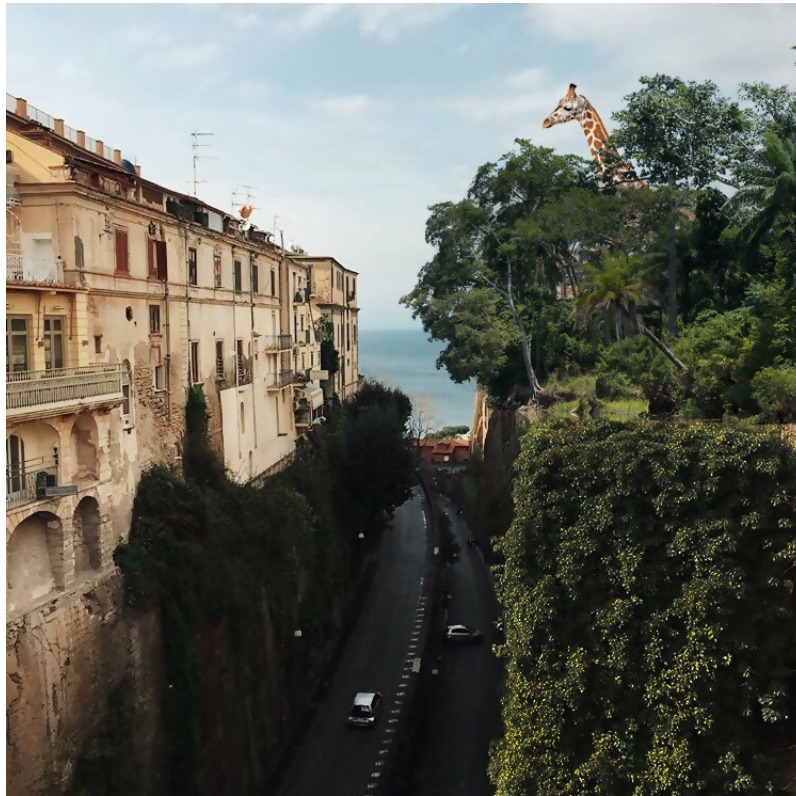
⁵³¹ Philip Howell, “Flush and the Banditti: Dog-Stealing in Victorian London,” in *Animal Spaces, Beastly Places: New Geographies of Human–Animal Relations*, by Chris Philo and Chris Wilbert (London and New York: Routledge, 1998), 35–55.

⁵³² Jennifer Wolch, Alec Brownlow, and Unna Lassiter, “Constructing the Animal Worlds of Inncercity Los Angeles,” in *Animal Spaces, Beastly Places: New Geographies of Human–Animal Relations*, by Chris Philo and Chris Wilbert (London and New York: Routledge, 2000), 71–97.

⁵³³ Huw Griffiths, Ingrid Poulter, and David Sibley, “Feral Cats in the City,” in *Animal Spaces, Beastly Places: New Geographies of Human–Animal Relations*, by Chris Philo and Chris Wilbert (London and New York: Routledge, 2000), 56–70.

⁵³⁴ Shelley Burgin and Daniel Lunney, *Urban Wildlife: An Emerging Discipline* (Sydney, Australia: Royal Zoological Society of New South Wales, 2004).

psychoanalyst Felix Guattari explain that encounters between humans and animals transports humans from their usual "haecceity," into a "smooth space".⁵³⁵ The presence of nonhuman animals within the urban centers may just be the only way in which we can interact with them, especially with the rapid rate of immigration of humans into urban cities as well as the expansion of the cities themselves. This may also prove as an avenue through which we instill conservation values amongst humans; a much needed effort.⁵³⁶



The presence of animals in human dominated spaces is key in human-animal relationships. However, these relationships are no longer governed by spatial or ecological

⁵³⁵ Gilles Deleuze and Felix Guattari, *A Thousand Plateaus*, trans. Brian Massumi (Minneapolis: University of Minnesota Press, 1987).

⁵³⁶ Shelley Burgin and Daniel Lunney, *Urban Wildlife: An Emerging Discipline* (Sydney, Australia: Royal Zoological Society of New South Wales, 2004).

predispositions. They are controlled more by human wants and needs, whether factual or abstract.⁵³⁷ The placement and ordering of animals and, or their representations within certain spaces is seen to be a language of sorts⁵³⁸, and resonates with art critic John Berger's argument, that the presence of animals within the human space was initially metaphorical rather than physical.⁵³⁹ Anthropologist Brian Morris draws similarity to this school of thought in his accounts of the roles of animals within the Malawian culture and the power that came with them.⁵⁴⁰ Here, the animal space is seen as chaotic and lacking order while the human space is viewed as being the opposite. It is upon this premise that much of the culture and social interactions and practices are built. Numerous works of art, literature, and film rely on animals as their subjects, while reducing them to symbols, stereotypes or even vilifying them.⁵⁴¹

The evolution of the human-animal relationship was for a long time one where a separation between the two was encouraged. "Half of the world's population now lives in cities, and their relationship with the wild remains distant, even almost mythical."⁵⁴² It is in this light that writer and academic Edward Said 'coined the term 'imaginative geography'.'⁵⁴³

⁵³⁷ Henry Buller, "Reconfiguring Wild Spaces: The Porous Boundaries of Wild Animal Geographies" (London: Routledge, 2014).

⁵³⁸ David Lewis-William, *The Mind in the Cave* (London: Thames and Hudson, 2002).

⁵³⁹ John Berger, *Why Look at Animals?* (London, UK: Penguin, 2009): 253.

⁵⁴⁰ Brian Morris, *The Power of Animals: An Ethnography* (Oxford, UK: Berg Publishers, 1998).

⁵⁴¹ Arnold Arluke, "Our Animals Ourselves," *Contexts* 9, no. 3 (2010): 34–39.

⁵⁴² Jeffrey A. McNeely, "Foreword," in *Wildlife Tourism: Impacts, Management and Planning*, by Karen Higginbottom (Champaign, IL: Common Ground Publishing, 2004): iii.

⁵⁴³ Edward Said, "Imaginative Geography and Its Representations: Orientalizing the Oriental," in *The Cultural Geography Reader* (New York: Routledge, 2008), 369–376.

This concept separates animals and humans in terms of both behavior and geography. This school of thought was, however, challenged by the emergences of zoos within urban spaces. The geographical divide that was put between animals and humans was altered when the ideally ‘wild’ animals were invited into the urban space, albeit in a controlled manner. The terms “animals/ non-humans” versus “people/humans” must be explained for a full understanding to happen. The difference between the two is not always easily seen. Many cultures believe in shape shifting or drifting of souls, by continuity or by chance.⁵⁴⁴ However, in the West animals were defined for many centuries as essentially unlike and distinct from humans. The benchmarks for determining the human-animal divide have altered over the years, based on reason, intelligence, and emotion. Always questioning what animals can’t do, rather than what humans lack in animal skills; such as flying, acute night vision, and speed.

Gradually the division between humans’ and animals was weakened. The foundations on which post- enlightenment science are based face tremendous criticism, and thus challenge the much asserted differences between humans and animals, baring for all to see the anthropocentric nature of modern science.⁵⁴⁵ Finally, animals are seen as intelligent and gifted creatures with a great variety of skills and advanced social life. Human biology is key in asserting the similarities between animals and us.⁵⁴⁶ Furthermore, assertions about human superiority are now treated with greater scrutiny due to sociobiological theory. Previous rooted viewpoints of humans as the social beings and animals as the biological

⁵⁴⁴ Jennifer Wolch, “Zoopolis,” *Capitalism Nature Socialism* 7, no. 2 (1996): 21–47.

⁵⁴⁵ Lynda Birke and Ruth Hubbard, *Reinventing Biology: Respect for Life and the Creation of Knowledge* (Washington D.C.: Georgetown University Press, 1995).

⁵⁴⁶ Christophe Boesch, “What Makes Us Human (Homo Sapiens)? The Challenge of Cognitive Cross-Species Comparison,” *Journal of Comparative Psychology* 121, no. 3 (2007): 227.

object are rapidly disappearing. Toward this end theorists such as Noske, Haraway, Plumwood offer the most compelling arguments relative to the animal-human divide. They assert that animals are quite similar to us in many aspects, but their differences as touted by the life sciences aren't the only factor that contributes them being seen as "others".⁵⁴⁷ Such a focus on their biological features ignores the realities and understandings that animals have.

A great array of animals once lived in ancient cities, even greater variation than modern day cities, as they played a crucial role in the economy and entertainment of societies.⁵⁴⁸ With that came the age-old question of urban spaces – which animals should be located where. Given the challenge of discipline, it was not uncommon to see laws and jurisdictions bent as these animals roamed "uncontrollably" in ancient society. Similar to the way humans are viewed as "animals" of the modern city or "zoo" by modern geographers, the boundaries between humans and non-human animals often became gray in the ancient world.⁵⁴⁹ In the last two decades, the anthropocentricity that characterized the twentieth-century urban theory was challenged with animals returning to the cities across multiple disciplines, including (but not limited) to urban geography, anthropology, and zoology. In the late 1990s, there was increasing focus on animal-human relations as animal welfare experts, social anthropologists and even urban scientists shed light on "why animals matter (even in cities)" as animals took a place in the urban theory agenda.⁵⁵⁰ In *Animal Cities: Beastly Urban Histories*,

⁵⁴⁷ Donna Haraway and others, *Simians, Cyborgs, and Women* (New York: Routledge, 1991); Val Plumwood, *Feminism and the Mastery of Nature* (London: Routledge, 2002).

⁵⁴⁸ Edmund Thomas, "Urban Geographies of Human-Animal Relations in Classical Antiquity," *Interactions between Animals and Humans in Graeco-Roman Antiquity*, 2017, 339.

⁵⁴⁹ Peter Atkins, *Animal Cities: Beastly Urban Histories* (London: Routledge, 2016).

⁵⁵⁰ Tim Ingold, "From Trust to Domination: An Alternative History of Human — Animal Relations," in *Animals and Human Society* (London: Routledge, 1994).

geographer Peter Atkins explores the role of animals in urban history.⁵⁵¹ Christopher Philo and Chris Wilbert, urban geographers, have also explored ‘humanimal relations’ – or human-animal relations – in modern cities.⁵⁵² Donna Haraway, an American feminist, explored the interactions between humans and non-human animals within cities.⁵⁵³ Tora Holmberg, a Swedish sociologist, who compared these interactions to “zoocities” in her work *Urban Animals*, furthered this outlook.⁵⁵⁴ Geographers Chris Philo and Chris Wilbert⁵⁵⁵ propose the concept of establishing geographic zones for different types of animals, where pets will be in cities, livestock in country sides, and exotic animals in the wilderness. This rational idea is challenged by critiques that point out how these zones easily merge and hybrids are created,⁵⁵⁶ resulting in a “zoological gaze”.⁵⁵⁷

In order to fully understand the current interactions within the urban space today, this dissertation chooses to view animal from a “hybrid geographies” approach, and consider them as being “more-than-human”.⁵⁵⁸ As it stands, the concept and practice of urbanization

⁵⁵¹ Peter Atkins, *Animal Cities. Beastly Urban Cities* (Vermont: Farnham & Burlington, 2012).

⁵⁵² Chris Philo and Chris Wilbert, “Animal Spaces, Beastly Places,” in *Animal Spaces, Beastly Places* (London: Routledge, 2004), 15–50.

⁵⁵³ Donna Haraway, *When Species Meet*, vol. 224 (Minneapolis: University of Minnesota Press, 2008).

⁵⁵⁴ Tora Holmberg, *Urban Animals: Crowding in Zoocities* (London: Routledge, 2015).

⁵⁵⁵ Chris Philo and Chris Wilbert, “Animal Places, Beastly Places: An Introduction,” *Animal Places, Beastly Places: New Geographies of Human^ Animal Relations* Eds C Philo, C Wilbert (London: Routledge), 2000, 1–34.

⁵⁵⁶ Mike Michael, *Technoscience and Everyday Life: The Complex Simplicities of the Mundane* (Maidenhead, UK: McGraw-Hill Education (UK), 2006): 150.

⁵⁵⁷ Adrian Franklin, *Animals and Modern Cultures: A Sociology of Human-Animal Relations in Modernity* (Thousand Oaks, CA: Sage, 1999): 62.

⁵⁵⁸ Sarah Whatmore, “Materialist Returns: Practising Cultural Geography in and for a More-than-Human World,” *Cultural Geographies* 13, no. 4 (2006): 600–609; Steve Hinchliffe and Sarah Whatmore, “Living Cities: Towards a Politics of Conviviality,” *Science as Culture* 15, no. 2 (2006): 123–138.

is one where nature is excluded.⁵⁵⁹ Arguments brought forward by urban theorists, including Matthew Gandy, point to the fact that nature has always been a means to an end in the urbanization process.⁵⁶⁰ The age transcending thought that animals can be easily divided into “nature/culture: wild/domestic” is challenged today, Haraway has termed these overlapped regions as “contact zones”.⁵⁶¹ The environments, technologies, and prostheses that surround these beings are also parts of these zones and shape the behavior of the inhabitants. The remedy varies as absolute exclusion of animals from urban areas may lead to emotional detachment; simultaneously, animals battle with habitat destruction and extinction. Therefore, it is important to introduce animal spaces within cities, areas where animals and humans can interact with one another, and where humans can embrace “animal standpoints”⁵⁶² so that the city-country or wild-domestic dualisms can be reduced.⁵⁶³

Our world today defies a number of rules that previously were set by society and passed down from generation to generation. As we continue to explore our surroundings and evolve, we are slowly coming to the realization that a good number of the principles and divides that govern our societies are nothing but the results of man’s own convenience.⁵⁶⁴ “We organize social life itself according to further refinements of this primary culture/nature

⁵⁵⁹ Maria Kaika, *City of Flows: Modernity, Nature, and the City* (London, UK: Psychology Press, 2005): 5.

⁵⁶⁰ Matthew Gandy, *Concrete and Clay: Reworking Nature in New York City* (Cambridge, MA: MIT Press, 2003): 7.

⁵⁶¹ Donna Haraway, *When Species Meet*, vol. 224 (Minneapolis: University of Minnesota Press, 2008).

⁵⁶² Edmund Thomas, “Urban Geographies of Human-Animal Relations in Classical Antiquity,” *Interactions between Animals and Humans in Graeco-Roman Antiquity*, 2017, 339.

⁵⁶³ Ibid

⁵⁶⁴ David Grazian, *American Zoo: A Sociological Safari* (Princeton, NJ: Princeton University Press, 2015): 8.

distinction: modern and primitive, mind and body, love and lust, order and chaos, artifice and authenticity."⁵⁶⁵ Despite this realization, we remain adamant in our refusal to change how we view the relationship between culture and nature. We remain transfixed on the notion that culture and nature are mutually exclusive, that the concepts of civilization and wilderness cannot exist in the same breath, that humans and animals are distinct concepts that cannot be married. We have a strong conviction of the separation of these concepts, yet we are constantly seeking solace for our minds and bodies in those 'pristine' areas that have seldom been tampered with by mankind. Areas such as the Amazon rainforests, the Great Barrier Reef, and Antarctica appeal to us due to their natural state. Sandy beaches and mountainous country sides have a similar effect on a majority of urbanites.⁵⁶⁶

The late nineteenth and early twentieth centuries saw the establishment of a number of zoos, parks, and gardens that were founded and managed on the premise of the separation between culture and nature.⁵⁶⁷ As a matter of fact, the first zoo in the U.S. was established in Philadelphia with the idea of having a natural retreat from the hustle and bustle of downtown and away from poor neighborhoods. Zoos in the U.S. were historically situated within ever growing urban areas. The Baltimore Zoo in Druid Hill Park, the Buffalo Zoo in City Park, the Chicago's Lincoln Park Zoo, the New York's Central Park Zoo, and the Philadelphia Zoo in Fairmount Park serve as a point of contact between man and nature

⁵⁶⁵ Jennifer Price, *Flight Maps Adventures with Nature in Modern America* (New York: Basic Books, 1999).

⁵⁶⁶ David Grazian, *American Zoo: A Sociological Safari* (Princeton, NJ: Princeton University Press, 2015): 3.

⁵⁶⁷ Georg Simmel and Donald Nathan Levine, *On Individuality and Social Forms. Selected Writings. Edited and with an Introduction by Donald N. Levine* (Chicago, IL: University of Chicago Press, 1971).

amidst the changing relationship and continued separation between the two.⁵⁶⁸ “Indeed, the zoo is identified as a product and symbol of the alienation of urban life: over-crowding, anxiety, aggression, and nervous disorders characterizing both.”⁵⁶⁹ In a sense, cities are like human zoos, in the same way that zoos represent the modern city.⁵⁷⁰ You find work place dynamics that are similar in nature to many other businesses, such as dedicated workers asking for better pay, recognition and overall working conditions, and colleagues bonding over their love for a particular animal. Zoos are therefore as much a product of human invention as the concept of nature.

Frederick Law Olmsted was a pioneer of the American landscape design.⁵⁷¹ He was primarily inspired by the theory of the informal landscape, which has its origins in English gardens. Olmsted believed that nature could provide a valuable respite to worn-out city workers. For him, an ideal natural sanctuary is characterized by undulating walkways, the alleged absence of human influence, and access to beautiful panoramas. Zoological gardens added to this theme by incorporating animals into this backdrop. While Olmsted was against the London Zoo because it took up valuable space, in America there was plenty of space for animal parks that would appeal to the public. Thus, American zoos were designed differently

⁵⁶⁸ Vernon Kising, “The Origin and Development of American Zoological Parks to 1899,” in *New Worlds, New Animals: From Menagerie to Zoological Park in the Nineteenth Century*, by Robert J Hoage and William A Deiss (Baltimore: JHU Press, 1996): 109.

⁵⁶⁹ Morris Desmond, *The Human Zoo* (New York: McCraw Hill, 1969).

⁵⁷⁰ Eric Baratay and Elisabeth Hardouin-Fugier, *Zoo: A History of Zoological Gardens in the West* (London, UK: Reaktion Books, 2004): 224.

⁵⁷¹ Annette Giesecke and Naomi Jacobs, *Earth Perfect? Nature, Utopia, and the Garden* (London: Black Dog Publishing, 2012).

from the European model.⁵⁷² American Zoos avoided using colonial architecture, opting in favor of design that merged with the environment and enhanced natural experience.

“Nature in the zoo presents all sorts of contradictions. What could be more unnatural than polar bears in Miami or giraffe in New York City? Zoos present a peculiar blend of nature and culture... they are parks that constitute a middle ground between the wilderness and the city, specially constructed meeting places for wild animals and urban Americans.”⁵⁷³

However, despite our efforts to turn our cities into greener environments designed to suit human existence we are constantly faced with the tension due to nonhuman outsiders. Cities frequently witness predators such as coyotes and mountain lions that defy the confinement of national park perimeters. More simply, we constantly come into contact with aspects of the ‘wild’ when we come across a pigeon, a flying hawk, an opossum, raccoons, and even bears within the city.⁵⁷⁴ There is a constant interaction of the ‘tamed’ and ‘the wild’ in everyday city life if we are being completely honest with ourselves.

The concept of nature is another of mankind’s inventions that has its roots in our cultures. We live in a world that is in a perpetual state of chaos where there is a constant interaction between living and non-living things, and between organic and inorganic matter. The names by which we refer to the different components of nature are as a result of our

⁵⁷² Thomas Veltre, “Menageries, Metaphors, and Meanings,” *New Worlds, New Animals: From Menagerie to Zoological Park in the Nineteenth Century*, 1996, 22.

⁵⁷³ Elizabeth Hanson, *Animal Attractions: Nature on Display in American Zoos* (Princeton, NJ: Princeton University Press, 2004): 2.

⁵⁷⁴ Colin Jerolmack, *The Global Pigeon* (Chicago, IL: University of Chicago Press, 2013): 230.

interactions and perceptions of them.⁵⁷⁵ They have little to do with the realities of ecology and more to do with our human understanding of them. Colonial settlers in North America regarded forested areas that for thousands of years served as a home to indigenous as “virgin wilderness”.⁵⁷⁶ Since the settlers had no interaction with these areas and had not explored them, they considered them untapped. It is this same logic that has seen the Amazon basin considered by many as a pristine and unadulterated space. It seems the only way for mankind to fathom all that surround him is to group it within the constraints of his understanding of the culture of nature.

The separation between nature and culture and between man and animals seems to have changed with the dawn of the 20th century. Many works literature across various fields focused on the animal subject.⁵⁷⁷ Up until the mid-nineteenth century, animals were welcome in urban centers. They were important in nutrient cycling within cities as their waste acted as fertilizer for agricultural produce. However, with the conception of the sanitary awareness came the separation of human and animal worlds. This separation was, however, not evident in some parts of the world until the late 80s.⁵⁷⁸ The concept of urban spaces took on a more humanistic approach thus downplaying the roles and need of animals in such spaces. Where they did come up, it was only for their use as food or as pets. The Chicago School of Sociology further widened the rift when they applied the term ‘Urban Ecology’ to refer to

⁵⁷⁵ Carol Kaesuk Yoon, “Naming Nature: The Clash between Instinct and Science,” *The Chautauqua Journal* 1, no. 1 (2016): 19.

⁵⁷⁶ William Cronon, “The Trouble with Wilderness: Or, Getting Back to the Wrong Nature,” in *Uncommon Ground: Rethinking the Human Place in Nature* (New York: Norton, 1996), 79.

⁵⁷⁷ Jennifer Wolch, “Zoopolis,” *Capitalism Nature Socialism* 7, no. 2 (1996): 21.

⁵⁷⁸ Peter Atkins, *Animal Cities. Beastly Urban Cities* (Vermont: Farnham & Burlington, 2012): 50.

the behavior and land use patterns of humans, and not that of other members of the animal kingdom.⁵⁷⁹ The categorization of urban animals was based on four broad groupings⁵⁸⁰:

- a) Useful- providing meat, milk or labor
- b) Aesthetically pleasing- beautiful to look at or listen to
- c) Desirable- pets
- d) Vermin

Those considered to be vermin are frowned upon leading to increased efforts to ‘purify’ the cities of them. The need for extermination with regards to animals within the urban space is drawn from the health concerns brought forth in the nineteenth and early twentieth centuries following the association of some animals to epidemics. Rats have for a long time been viewed as a source of pollution and disease.⁵⁸¹ This view of animals as outsiders within the urban space is, however, beginning to shift. Mammalian and avian habitats within cities are drawing growing attention from geographers and eco-historians alike. Tourism researcher Michael Campbell for example, describes city spaces as shared entities between humans and birds.⁵⁸² The expansion of these spaces provides birds with unique feeding and nesting opportunities. The presence of dumpsites and the intermittent feeding of birds by humans, especially during the colder seasons, play a role in influencing the behavior and

⁵⁷⁹ Jianguo Wu, “Urban Ecology and Sustainability: The State-of-the-Science and Future Directions,” *Landscape and Urban Planning* 125 (2014): 209–221.

⁵⁸⁰ Peter Atkins, *Animal Cities. Beastly Urban Cities* (Vermont: Farnham & Burlington, 2012).

⁵⁸¹ Jonathan Burt, *Rat* (Reaktion Books, 2006): 49.

⁵⁸² Michael O’Neal Campbell, “An Animal Geography of Avian Ecology in Glasgow,” *Applied Geography* 27, no. 2 (2007): 78–88.

survival of some birds such as pigeons, gulls, hooded crows, and mug pies.⁵⁸³ For such species, the younglings become accustomed to their urban habitat and seem to favor it over their rural, natural habitats.

As nature and culture were undergoing a divide, there were some efforts to preserve or create some aspects of nature within the urban spaces.⁵⁸⁴ In the nineteenth century, city parks, albeit controlled spaces, were integral in maintaining the health and well being of city residence. The need for clean air and a place to relax led to the introduction of select and tolerated plant and animal species. These saw the replication of smaller parks in the name of suburban gardens. The progression of the twentieth century saw an increase in the number of animals thought to be wild in city spaces. This growing number was at first considered an anomaly by ecologies but later became a point of interest. It was observed that urban-wild land areas around cities are extremely penetrable. Even when work is done via extermination, the animal populations within the inner cities remains high.⁵⁸⁵ Research into the co-existence of plant, animals, and man within the city spaces has now shifted focus from European cities to others around the globe. The mindset towards cities is changing from being a space of exclusion and purification to being a complex and ever changing socio-ecological system. Cities are now considered ‘biophilic cities’,⁵⁸⁶ socio-ecological

⁵⁸³ Timo Vuorisalo, “Environmental History and Urban Colonizations from an Avian Perspective,” *Urban Biodiversity and Design*, no. 7 (2010): 191.

⁵⁸⁴ Peter Atkins, *Animal Cities. Beastly Urban Cities* (Vermont: Farnham & Burlington, 2012): 7.

⁵⁸⁵ Jennifer R Wolch, Kathleen West, and Thomas E Gaines, “Transspecies Urban Theory,” *Environment and Planning D: Society and Space* 13, no. 6 (1995): 735–760.

⁵⁸⁶ Timothy Beatley, “Biophilic Cities: What Are They?,” in *Biophilic Cities* (Springer, 2011), 45–81.

systems’,⁵⁸⁷ and “spaces of inclusion” where animals and plants are considered and even encouraged when planning for the space and its resources.⁵⁸⁸

There are differing schools of thought on the evolution of urban space alongside nature and vice versa has. The Marxist argument of “second nature” and the “production of nature” theories both seem to agree on man’s role in shaping that which we perceive to be natural.⁵⁸⁹ This notion is carried further by David Harvey, distinguished Professor of anthropology and geography, who considers all nature to be urban nature.⁵⁹⁰ Political ecologists also take an interest the dynamics that surround the relationship between humans and animals within the city space. The technological advancements witnessed throughout the years also play a role in shaping the post-human urban dynamics. In one way or the other, the behavior of animals, including the human animal, is influenced by technology. This is true for the interventions of medicine in prolonging animal life, clothing for temperature mitigation, leashes and harnesses to control movement, just to mention a few. According to Donna Haraway, all these animals have in common a sense of hybridization creating “cyborg” cities.⁵⁹¹

⁵⁸⁷ Ulrike Weiland and Matthias Richter, “Lines of Tradition and Recent Approaches to Urban Ecology, Focussing on Germany and the USA,” *GALA-Ecological Perspectives for Science and Society* 18, no. 1 (2009): 49–57.

⁵⁸⁸ Norbert Müller and Peter Werner, “Urban Biodiversity and the Case for Implementing the Convention on Biological Diversity in Towns and Cities,” *Urban Biodiversity and Design*, no. 7 (2010): xv.

⁵⁸⁹ Natasha Gill, *Educational Philosophy in the French Enlightenment: From Nature to Second Nature* (London: Routledge, 2016): 8.

⁵⁹⁰ David Harvey and Bruce Braun, *Justice, Nature and the Geography of Difference*, vol. 468 (Oxford: Blackwell, 1996).

⁵⁹¹ Donna Haraway and others, *Simians, Cyborgs, and Women* (New York: Routledge, 1991): 2.

It is safe to conclude that nature as we know it may not be as natural and pristine as it was once thought to be. With respect to urban cities, nature is engineered from a biogeochemical, hydrological, and social standpoint.⁵⁹² The divide between nature and culture, human and animal within the urban space is beginning to lose its hold. Thanks to a growing interest in urban ecology, habitats, ecosystems and nature as a whole, urban spaces are slowly being viewed and accepted as areas of inclusion that are habitats to the different animal categories and rightfully so.⁵⁹³

Philosopher Jacques Derrida spent much of his latter years breaking down the binary differences between the animal and the human.⁵⁹⁴ Within his work Derrida came to the conclusion that most European philosophy had significant bias in its assumptions by highlighting the differences between humans and animal. This speciesist like thinking has lead to physical separation of humans and animals. His approach suggests getting rid of the divide between man and animal and promoting unity between them.⁵⁹⁵ Modern day companies like Google, Amazon, and Ben and Jerry's recognize the importance of shared space between humans and animals, even in the workspace.⁵⁹⁶ Furthermore, society is increasingly involving animals by promoting their usage in hospitals, old-age homes, care

⁵⁹² Eric Katz, "Another Look at Restoration: Technology and Artificial Nature," *Restoring Nature: Perspectives from the Social Sciences and Humanities*, 2000, 38.

⁵⁹³ Peter Atkins, *Animal Cities. Beastly Urban Cities* (Vermont: Farnham & Burlington, 2012).

⁵⁹⁴ Jacques Derrida, *The Animal That Therefore I Am* (New York: Fordham University Press, 2008).

⁵⁹⁵ Harry Wels, "'Animals like Us': Revisiting Organizational Ethnography and Research," *Journal of Organizational Ethnography* 4, no. 3 (2015): 242–259.

⁵⁹⁶ Christa L Wilkin, Paul Fairlie, and Souha R Ezzedeen, "Who Let the Dogs in? A Look at Pet-Friendly Workplaces," *International Journal of Workplace Health Management* 9, no. 1 (2016): 96–109.

farms, as Animal Assisted Therapy is rapidly on the rise.⁵⁹⁷ The increasing presence of wildlife in previously human spaces has implications for how we see animal welfare. This is important as previously the major viewpoint was maintaining the separation of humans and animals and simply viewing them as objects.⁵⁹⁸

Animals as Place Making Agents

Philosopher Jozef Keulartz categorized environmental thinking into two planes perpendicular to each other, ecological thinking and evolutionary processes.⁵⁹⁹ These two planes exist in a state of constant tension. This is typified by the role of animals in reshaping and changing the environment, which occurs when they start constructing niches.⁶⁰⁰ By so doing, they go against the grain of ecological succession. The resultant process is therefore not an “autopoietic” process, but one that is largely regulated by factors outside the animal itself.⁶⁰¹ The ensuing effect is the constant transformation of both the animal and its environment. An understanding of such processes is as important to natural spaces as it is to man-made ones. Of importance are the different points at which these processes diverge and reconstitute and how they affect nature and animals as well as the interaction between these

⁵⁹⁷ Aubrey H Fine, *Handbook on Animal-Assisted Therapy: Foundations and Guidelines for Animal-Assisted Interventions* (Cambridge, MA: Academic Press, 2015).

⁵⁹⁸ Mick Smith, *An Ethics of Place: Radical Ecology, Postmodernity, and Social Theory* (Albany, NY: Suny Press, 2001).

⁵⁹⁹ Jozef Keulartz, *Struggle for Nature: A Critique of Radical Ecology* (London, UK: Psychology Press, 1998).

⁶⁰⁰ F John Odling-Smee, Kevin N Laland, and Marcus W Feldman, *Niche Construction: The Neglected Process in Evolution*, 37 (Princeton, NJ: Princeton University Press, 2003): 116.

⁶⁰¹ Humberto R Maturana and Francisco J Varela, *Autopoiesis and Cognition—The Realization of the Living, Ser. Boston Studies on the Philosophy of Science. Dordrecht, Holland: D* (Dordrecht, Netherlands: Reidel Publishing Company, 1980): 101.

two entities.

Animal locomotion can be sub-categorized into three types: migration, transgression, and spatial autonomy.⁶⁰² Each of these sub-categories causes concern to human inhabitants. Migration is generally concerned with the safe travel of animal species. Resolving this issue, San Diego has come up with a large corridor system to facilitate the transition of the animals, and bridges distant landscapes together.⁶⁰³ Transgressions involve invading a community such as opossum behavior in domestic areas.⁶⁰⁴ The main concerns in this type of behavior include vandalism, hygiene, and security. Due to these concerns, the aim of animal management is to hinder or repel such transgressions as opposed to the concept of corridors that enable the transitional movements. Currently, urbanization itself acts as a repellent for animals since it creates a threatening habitat. Spatial autonomy mainly concerns domesticated animals. Discussions on freedom given to these animals involve the usage of harnesses, boundaries, or unrestricted movement. The example of a common cat can elaborate on the range of views. One opinion suggests that cats should stay indoors at all times and others believe the opposite.⁶⁰⁵ These diverse thoughts are, however, built on anthropomorphism and cultural points of view within which humans are the point of

⁶⁰² David Lulka, "The Posthuman City: San Diego's Dead Animal Removal Program," *Urban Geography* 34, no. 8 (2013): 1119–1143.

⁶⁰³ Sandra J Ng et al., "Use of Highway Undercrossings by Wildlife in Southern California," *Biological Conservation* 115, no. 3 (2004): 499–507.

⁶⁰⁴ Emma R Power, "Border-Processes and Homemaking: Encounters with Possums in Suburban Australian Homes," *Cultural Geographies* 16, no. 1 (2009): 29–54.

⁶⁰⁵ David Lulka, "The Posthuman City: San Diego's Dead Animal Removal Program," *Urban Geography* 34, no. 8 (2013): 1119–1143.

reference.⁶⁰⁶



Figure 26. Domestic/feral/city cats⁶⁰⁷

The simple categorization of animals as either being wanted or unwanted within urban spaces does little to explain the complex interactions between the animals themselves and with humans. Geographer Henry Buller argues that in order to fully account for the long standing co-existence between wanted and unwanted animals within the city space we either need rework the definition of the city or we need to redefine the wild.⁶⁰⁸ Efforts towards the latter are already being made with L'Ecole du Chat' of Paris lobbying for the recognition of

⁶⁰⁶ Henry Buller, "Animal Geographies," *Progress in Human Geography* 38, no. 2 (March 21, 2013): 308–18.

⁶⁰⁷ Leo Burnett, *Black Cats*, 2009, print advert.

⁶⁰⁸ Henry Buller, "Animal Geographies," *Progress in Human Geography* 38, no. 2 (March 21, 2013): 308–18.

feral cats and according them citizenship and all the perks that come with that status that have been previously enjoyed by their domesticated counterparts.⁶⁰⁹ This school of thought is further amplified by the works of geographer Alice Hovorka⁶¹⁰, her ‘transspecies urban theory’ points out the importance of the role of animal life within the cities by focusing on livestock within Africa’s urban spaces. Political ecologist Krithika Srinivasan further emphasizes the blurring of the defining lines between the different spatial categories that animals are subjected to by focusing on the cohabitation status of India’s street dogs with humans and nonhuman others alike.⁶¹¹

It goes without saying that humankind and animals have a rather complicated relationship that evokes numerous feelings. This is easily deduced from the labels, often of a spatial nature, that human-animal relationships receive.⁶¹² In different spaces, different animals can either be considered as being part of the cultural landscape or outsiders. Such variation from a spatial and relationship point of view has led to an ethical disenfranchisement of the non-human other. This spatial fragmentation and its resulting relationships all need to be taken into account when questioning the interactions between animals and humans, making it a design problem. The impact of animals on human lives is far reaching as their existence can shape political practices and positions. As stated by anthropologist Kersty Hobson animals should be considered socio-political subjects because

⁶⁰⁹ Xavier de Planhol, *Le Paysage Animal: L’homme et La Grande Faune: Une Zoogéographie Historique* (Fayard, 2004), 399.

⁶¹⁰ Alice Hovorka, “Transspecies Urban Theory: Chickens in an African City,” *Cultural Geographies* 15, no. 1 (2008): 95–117.

⁶¹¹ Krithika Srinivasan, “The Biopolitics of Animal Being and Welfare: Dog Control and Care in the UK and India,” *Transactions of the Institute of British Geographers* 38, no. 1 (2013): 106–119.

⁶¹² Chris Philo and Chris Wilbert, *Animal Spaces, Beastly Places* (London, UK: Routledge, 2004): 1–34.

of how they affect and shape political practices and policies.⁶¹³ In 2016, *Rattus norvegicus*, a subspecies of the brown rat made headlines as it ‘overrun’ the streets and parks of Malmö, Sweden after floods hit.⁶¹⁴ The change in environment forced a change in behavior in the rats. For animals that are known to shy away from ‘public’ spaces, their appearance in parks and within the urban space was necessitated by the need to survive. The reaction of humans to these non-human urban dwellers was one of disgust with calls to sanitize and eradicate for normalcy to be restored. These reactions shed light on the spatial divide and allocation between human and non-human animals within city spaces.⁶¹⁵ By daring to emerge from the shadows in the search for food, the rats go against the rules of engagement that allow them to co-exist with humans in the cities. They move from creatures that should only exist within the shadows to intolerable pests.⁶¹⁶

The Malmö rats bring to light the ways in which the concepts of place, space, and human-animals interactions overlap. Key issues that can be drawn from this case are “first, how human spaces are always already built *with* nonhuman animals rather than in spite of them, and second, that animals have their own geographies.”⁶¹⁷ The perception of the rat, therefore, takes on different shapes depending on the space it occupies and the category it is

⁶¹³ Kersty Hobson, “Political Animals? On Animals as Subjects in an Enlarged Political Geography,” *Political Geography* 26, no. 3 (March 1, 2007): 250–67.

⁶¹⁴ Tora Holmberg and Jacob Bull, “Introducing Animals, Places and Lively Cartographies,” in *Animal Places* (London: Routledge, 2017), 1–14.

⁶¹⁵ Kelsi Nagy and Phillip David Johnson II, *Trash Animals: How We Live with Nature’s Filthy, Feral, Invasive, and Unwanted Species* (Minneapolis: University of Minnesota Press, 2013).

⁶¹⁶ Tora Holmberg and Jacob Bull, “Introducing Animals, Places and Lively Cartographies,” in *Animal Places* (London: Routledge, 2017), 1–14.

⁶¹⁷ Lynda Birke, “Who—or What—Is the Laboratory Rat (and Mouse),” *Society and Animals* 11, no. 3 (2003): 211.

relegated to (pet, pest, or science experiment). Rats are often seen as a pest deserving of extermination but within the confines of a laboratory they often are of huge benefit to mankind. Highlighting the concept of place while focusing on the interactions between humans and animals points out the role of animals as place making agents, that is, their role in giving places such as farms, home, meaning. The connections made by the non-human animals go beyond the ordering of space by mankind. Their very movements ignite our imagination and stir social orders.⁶¹⁸ “Paradoxically, perhaps, it is within cities that we will best learn to live with the wild.”⁶¹⁹

Despite the energies that are channeled towards making naturalistic displays to replicate jungle instincts, parks for wildlife embed new habits in animals through their human interactions.⁶²⁰ Since evolution is inevitable, we must stop limiting our thought on what animals conventionally experience, and also consider what animals are and who they might become in future. Zoology and other branches of science that deal with animals, their habits, and behavior are part of an “anthropological machine” through which the relationship between humans and animals is described.⁶²¹ French philosopher Dominique Lestel tries to question what an animal subject is and what it takes for an individual to be recognized in a community that is made up of different beings. To him, an animal can become a subject and individual, making this a considerable change in the animal science of the past two decades,

⁶¹⁸ Tora Holmberg and Jacob Bull, “Introducing Animals, Places and Lively Cartographies,” in *Animal Places* (London: Routledge, 2017), 1–14.

⁶¹⁹ HJ Buller, “Reconfiguring Wild Spaces: The Porous Boundaries of Wild Animal Geographies” (London: Routledge, 2014), 242.

⁶²⁰ Mathew Chrulew, “Animals as Biopolitical Subjects,” *Foucault and Animals*, 2016, 222–239.

⁶²¹ Giorgio Agamben, *The Open: Man and Animal* (Palo Alto, CA: Stanford University Press, 2004): 29.

and the fourth wound to human narcissism:⁶²²

1. Copernicus (man is not the center of the world)
2. Darwin (man and animals are of common descent)
3. Freud (man is not “supreme of his own soul”)
4. Lestel (nonhuman subjects can be recognized as individuals)

The growing numbers of wild animals in the city, and the challenges they bring, are the result of years of territorialization, where humans have dominated various environments.⁶²³

The expansion of urban centers and the promotion of urbanization and civilization as a whole has played a key role in the creation of strays.⁶²⁴ Its destructive nature renders other animals homeless forcing them to resort to scavenging within cities for food and resources to survive. Humans took the liberty of deciding where each animal belonged and furthermore, which animals are allowed to cohabit, leading to a franchise of domestication. According to geography Professor Kay Anderson, the practice of domestication in itself points out the inability of humans to understand their senses and instincts and the understanding that animals are more than just pieces of the earth’s biological puzzle.⁶²⁵ Undomesticated animals are considered as outsiders and strays, they are forced to leave, through force or negligence. According to Barbara Creed, Professor of Cinema Studies, stray ethics is built of five

⁶²² Dominique Lestel, “The Question of the Animal Subject: Thoughts on the Fourth Wound to Human Narcissism,” *Angelaki* 19, no. 3 (2014): 113–125.

⁶²³ Marina Zurkow and Una Chaudhuri, “Animalizing Interlude: Zoöpolis,” in *The Stage Lives of Animals* (London: Routledge, 2016), 115–130.

⁶²⁴ Jennifer Wolch, “Zoopolis,” *Capitalism Nature Socialism* 7, no. 2 (1996): 21–47.

⁶²⁵ Kay Anderson, “A Walk on the Wild Side: A Critical Geography of Domestication,” *Progress in Human Geography* 21, no. 4 (1997): 446.

interconnected pillars:⁶²⁶

1. Marginalization

To be marginalized is to be considered an outsider, someone not fit to be part of the rest of the community. The commonality between strays, human or otherwise, is their lack of a place to call home. Where stray ethics are concerned, we are reminded of the vulnerability and fragility of the homeless and friendless. From an ethical standpoint, mankind has not only abandoned strays, but also created a new type of strays. The animals that we mass-produce for our own consumption are born strays. They are born into a world devoid of the beauties of nature and are denied the freedom to explore them and thus have no sense of what their natural habitats are like and, therefore, bred into artificial environments.

⁶²⁶ Barbara Creed, *Stray: Human-Animal Ethics in the Anthropocene* (Sydney, Australia: Power Publications, 2017).



2. Abandonment

Humans created 'boxes' in which to fit everything around them. These boxes are based on their interactions with their surroundings. It is a result of this compartmentalization that we have the marginalized and the abandoned. The concept of stray ethics points out the lack of empathy in this way of thinking. Thanks to the boundaries that we erect, we created new subjectivities namely the animal, the marginalized, and the inhuman.

3. Resistance

The stray is often thought to be a fragile and vulnerable creature. While this is rightfully so, the stray ethics points out not only to the vulnerability of the stray, but also its strength.

Since strays are marginalized, they lack equal access to resources necessary for their survival. For this reason, strays have to find a way to survive. Both human and animal strays often develop a heightened use of their senses in order to make it in the urban underworld and on the streets. They are, therefore living proof that being fragile does not necessarily mean a lack of resilience.

4. Empathy

Stray ethics try to bridge this emotional and empathetic gap by focusing on compassion towards nonhuman strays. Only by putting ourselves in the stray's position do we stand a chance of really understanding what goes on, on the other side. This way, we get to understand the need to afford strays the same rights to survival. Without compassion, the relationship between humans and nonhuman others is not feasible.

5. Change

A stray ethics is important in shaping the way we view our world and a powerful tool for change. The thought provoking nature of the concept of the stray inspired the works of artists, filmmakers, photographers, and writers focused on the outsider nature of the stray in a world where all things are fit into boxes or categories. In this way, the concept of the stray and the resultant stray ethics are catalysts for much needed societal changes and the redefinition of our surroundings.

CHAPTER 7

THE IDEAL SCENARIO

Accommodating Multispecies

In the summer of 2011, I visited Switzerland with my family. During our first day walking in the capital city Bern, I looked down from a bridge and saw a bear. I thought for a moment that I had been imagining. We were after all in the heart of the city, and everyone around us was going about their day. But there I was, standing still looking at a large bear down by the river. There was no crowd gawking at it (apart from my tourist self), no signage, and no fencing that I could see. I could never get over how “natural” it looked and how seamlessly it fit in with the city. The ingenious animal intervention was called the Bärengraben, meaning BearPark, and plays host to Finn, Björk, and their little cub Ursina.⁶²⁷ The animals have lived beside the Aare River since 2009. The new Bearpark stretches across 6,000 square meters and provides enough area for climbing, fishing, resting, and playing. The landscape design includes more densely vegetated areas, caves, tunnels, and a large pool. As it is part of the public space, it is open all day, everyday. The park is a Swiss heritage site, and the bear is a significant symbol featured in their coat of arms, flags, fountains, and buildings. The city of Bern has had a strong connection with bears since its establishment, and the city owes its name to the bear. The story goes that in 1191 Duke Berthold the Fifth vowed to name his town after the first creature he would hunt in the nearby forest, and that ending up being a bear. The town that would be called Bern, bear in German, thought that they ought to house a few bears. In 1513, the main bear pit was constructed in what is now known as Bärenplatz or Bear Square. It was later moved, and the last existing bear pit was opened in

⁶²⁷ “The Bear Park,” Bern, accessed March 1, 2019, <https://www.bern.com/en/detail/the-bearpark>.

1857. Throughout the years, famous figures and rulers have traveled to the city to visit the bears.

For many years, the bear pit was criticized due to the poor state of the animals.⁶²⁸ There wasn't much space to meander or hide when we people began to harass them. Before the establishment of animal rights, the bears were brutally mistreated. The tight space often led to bear fights and injuries. The bears were put on a vegetarian diet accompanied with cheese and peanuts thrown at them from visitors. They occasionally ate meat when people fell into the pit by accident. In 1903 an alcoholic spent the night with the bears, but was luckily rescued the next day. The space was improved throughout the years, but the bears needed more area. By the new millennium, the filthy pit and exhausted bears became a source of embarrassment for the modern capital. This led to a million dollar project that was up to modern zoo standards. The new design by the river utilizes the rotation exhibit method⁶²⁹, by allowing the bears access to their old bear pit.

⁶²⁸ "Bärengraben," Atlas Obscura, accessed March 1, 2019, <https://www.atlasobscura.com/places/barengraben>.

⁶²⁹ Jon Coe, "Mixed Species Rotation Exhibits" (ARAZPA Conference, NZ, 2004).



Figure 27. One of several bears that inhabit the capital of Switzerland⁶³⁰

Geographer David Lulka describes how in the post-human concept of cities, nonhuman animals form an integral part of the urban fabric.⁶³¹ The recent research however obscures this by focusing on a few species and their private habitats, hence not contributing to the development of this concept. The underlying concept in post-human cities is not about reverting cities to their natural wild state or increasing the nonhuman population in urban areas, but acknowledging that animal inhabitants have already adjusted themselves within the urban landscapes. In the expansion of the human geography field, animal geography came into being. Dean of UC Berkeley College of Environment and Design Jennifer Wolch and geographer Jody Emel introduce the contents of their book, *Animal Geographies: Place, Politics and Identity in the Nature-Culture Borderlands*, by describing the “animal

⁶³⁰ “City of Bears,” accessed February 17, 2019, <https://www.bern.com/en/detail/city-of-bears>.

⁶³¹ David Lulka, “The Posthuman City: San Diego’s Dead Animal Removal Program,” *Urban Geography* 34, no. 8 (2013): 1119–1143.

moment”.⁶³² They see this as a period where the views and perceptions around animals are changing and more attention is being paid to their needs and wants.⁶³³ Wolch and Emel elaborate on the role of feminism and other postmodern schools of thought in bringing about this change in perceptions towards animals. They credit feminism with demystifying the masculine theory of dominance over nature. Similar views can be seen throughout the arguments brought forward for transspecies cities. This is best emulated in the literary works titled, “Are You Man Enough, Big and Bad Enough? Wolf Eradication in the USA”.⁶³⁴

Postmodern schools of thought are synonymous with ideologies that gained popularity in the 20th century such as the animal rights philosophy that gained traction in 1975, thanks to philosopher Peter Singer’s literary work titled, “Animal Liberation”.⁶³⁵ It is such ideologies that led to arguments in favor of animal rights and have inspired the change in moral perceptions of animals. This school of thought is also responsible for the growth in popularity of vegetarian or vegan lifestyles.⁶³⁶ The foundation laid by Singer, Rollin, and Regan, just to mention a few, was built upon by geographers such as Yi-Fu Tuan. In his work dubbed, “Dominance and Affection”, Tuan takes his readers on a journey of how

⁶³² Jennifer R Wolch and Jody Emel, *Animal Geographies: Place, Politics, and Identity in the Nature-Culture Borderlands* (New York: Verso, 1998).

⁶³³Ibid: 1.

⁶³⁴ Jody Emel, “Are You Man Enough, Big and Bad Enough? Ecofeminism and Wolf Eradication in the USA,” *Environment and Planning D: Society and Space* 13, no. 6 (1995): 707–734.

⁶³⁵ Peter Singer, *Animal Liberation: A New Ethic for Our Treatment of Animals* (New York: Harper Collins, 1975).

⁶³⁶ Ibid; Bernard E Rollin, Bernard E Rollin, *Animal Rights and Human Morality* (Amherst, NY: Prometheus Books, 1981); Tom Regan, “Animal Rights, Human Wrongs,” in *Ethics and Animals* (Berlin, Germany: Springer, 1983), 19–43.

humans have come to perceive animals over time.⁶³⁷ He recounts the god-like status accorded to animals in the past, looks into their domestication over time. He argues that while humans look after pets, we derive a level of satisfaction from our dominance over them; hence the seemingly love-hate relationship between humans and our pets.

The article, “Animals, Ethics, and Geography” by research scientist William Lynn, looks into the role of geography in shaping ethical and moral judgment of humans; a phenomenon he refers to as “geoethics”.⁶³⁸ He uses this phenomenon to explain the role of place in the evolution of the different perceptions towards animals. Engineer Catherine Johnston, author of, “Beyond the Clearing: Towards a Dwelt Animal Geography,” brings forth an argument for the importance of living in proximity with animals when it comes to shaping our understanding of them.⁶³⁹ She argues that in doing so, we allow ourselves to experience animals in a way that is different from our human centered understanding of animal life. In the literary work “Placing Animals”, scholar Julie Urbanik attributes the growing interest in animal place and geography to our seemingly conscious state of how we affect our environment, a generally animal loving society, the introduction and evolution of the postmodern schools of thought, and the growing numbers of animal-rights as well as other animal welfare movements.⁶⁴⁰ As the field of animal geography grows in popularity and humans begin to appreciate and even draw similarities between themselves and the

⁶³⁷ YF Tuan, *Dominance and Affection: The Making of Pets*. (New Haven, CT: Yale University Press, 1984).

⁶³⁸ William S Lynn, “Animals, Ethics and Geography,” in *Animal Geographies: Place, Politics and Identity in the Nature-Culture Borderlands*, by Jennifer Wolch and Jody Emel (London: Verso, 1998), 281.

⁶³⁹ Catherine Johnston, “Beyond the Clearing: Towards a Dwelt Animal Geography,” *Progress in Human Geography* 32, no. 5 (October 1, 2008): 633–49.

⁶⁴⁰ Julie Urbanik, *Placing Animals: An Introduction to the Geography of Human-Animal Relations* (Lanham, MD: Rowman & Littlefield, 2012): 21-49.

animal around them, the part animals play in shaping the society will be even greater than it currently is.

The last couple of decades have seen a growth in the number of literary works that deal with human-animal interactions. One such literary work, is “Colonization, Urbanization, and Animals,” by theologian Clare Palmer.⁶⁴¹ Here, Palmer focuses on the impact of development and urbanization on animals in general as well as on how we relate to them and vice versa. She draws comparisons between the disregard for the needs and wants of wildlife when it comes to development to the disregard for the traditions and way of life of indigenous communities during colonization.

Philo’s “Animals, Geography, and the City: Notes on Inclusions and Exclusions” borrows from Tuan’s works and focuses on factors taken into account when deciding whether or not to include animals within human dominated spaces.⁶⁴² “A Place for the Animal Dead: Pets, Pet Cemeteries and Animal Ethics in Late Victorian Britain,” by historical geographer Philip Howell focuses on how spaces designated as final resting places for animals came to being in England and the significance of such spaces in defining human-animal interactions.⁶⁴³ Lulka’s article, “The Post-Human City: San Diego’s Dead Animal Removal Program,” looks into the challenges faced by nonhuman others as they attempt to

⁶⁴¹ Clare Palmer, “Colonization, Urbanization, and Animals,” *Philosophy & Geography* 6, no. 1 (2003): 47–58.

⁶⁴² Chris Philo, “Animals, Geography, and the City: Notes on Inclusions and Exclusions,” *Environment and Planning D: Society and Space* 13, no. 6 (1995): 655–681.

⁶⁴³ Philip Howell, “A Place for the Animal Dead: Pets, Pet Cemeteries and Animal Ethics in Late Victorian Britain,” *Ethics, Place & Environment* 5, no. 1 (2002): 5–22.

adapt to changes in their environs as a result of development and urbanization.⁶⁴⁴ Biologist Maciej Luniak's article, "Synurbization-Adaptation of Animal Wildlife to Urban Development," looks into the process of synurbization, the destruction of natural habitats of some animals and the creation of new ones for others.⁶⁴⁵ Different animals are able to take advantage of new opportunities brought about by the presence of an urban space. It is in focusing on these opportunities and the way in which different animals take advantage of them that we shall be able to develop cities that truly take into account the needs of all.

Urbanik explains that we are in the third wave of animal geography.⁶⁴⁶ Geographers focused the first wave on listing wild species, their spatial distributions, and their environmental adaptations. The second wave was directed towards the study of domesticated animals and their involvement in human cultures. The final wave of animal geography emerged with the rising visibility of animal-based social movements, understanding how animals and human impacts biodiversity. The focus revolves around the spectrum of human-animal relations and how animals act as cultural signifiers. It explains how human-animal division is interpreted by various animal geographers. According to these interpretations, humans are not only distinct from all other living species; but also superior and extraordinary. The major proposition of the third wave animal geography includes suggesting places where animals and humans could coexist. This shared space could help in

⁶⁴⁴ David Lulka, "The Posthuman City: San Diego's Dead Animal Removal Program," *Urban Geography* 34, no. 8 (2013): 1119–1143.

⁶⁴⁵ Maciej Luniak, "Synurbization–Adaptation of Animal Wildlife to Urban Development," in *Proceedings of the 4th International Urban Wildlife Symposium*, 2004, 50–55.

⁶⁴⁶ Julie Urbanik, *Placing Animals: An Introduction to the Geography of Human-Animal Relations* (Lanham, MD: Rowman & Littlefield, 2012).

re-establishing the networks of moral care among humans and animals.⁶⁴⁷ Succeeding geographers studied the possibilities of human-animal coexistence in urban spaces⁶⁴⁸, domestic gardens⁶⁴⁹, and in the human body at a micro level.⁶⁵⁰ The aim of this study was to identify how humans and animals could interact in territories that belonged to humans while highlighting the moral possibilities of supporting animals within these shared territories. They build much of this concept from Haraway's work, which suggested that to coexist with animals, we as humans need to interact with these animal species in close proximities.⁶⁵¹

The growing literary wealth surrounding the fields of animal geography sheds some light on how and why humans perceive animals the way they do some have had significant impact in furthering this field. Wolch's works had great influence in shaping postmodern theories that put nonhuman others on an equal pedestal to humans.⁶⁵² She criticizes the anthropocentric way in which we regard and govern over natural resources. In order to move the concept of a zoopolis from a utopian one to reality, Wolch urges that we need to reconsider our interactions with our non-human counterparts and shift them towards a more

⁶⁴⁷ Jennifer R Wolch and Jody Emel, *Animal Geographies: Place, Politics, and Identity in the Nature-Culture Borderlands* (New York: Verso, 1998): xii.

⁶⁴⁸ Alice Hovorka, "Transspecies Urban Theory: Chickens in an African City," *Cultural Geographies* 15, no. 1 (2008): 95–117; Jennifer Wolch, "Anima Urbis," *Progress in Human Geography* 26, no. 6 (2002): 721–742.

⁶⁴⁹ Emma R Power, "Border-Processes and Homemaking: Encounters with Possums in Suburban Australian Homes," *Cultural Geographies* 16, no. 1 (2009): 29–54; Franklin Ginn, "Sticky Lives: Slugs, Detachment and More-than-Human Ethics in the Garden," *Transactions of the Institute of British Geographers* 39, no. 4 (2014): 532–544.

⁶⁵⁰ Myra J Hird, "Meeting with the Microcosmos," *Environment and Planning D: Society and Space* 28, no. 1 (2010): 36–39.

⁶⁵¹ Donna Haraway, *When Species Meet*, vol. 3 (Minneapolis: University of Minnesota Press, 2013).

⁶⁵² Jennifer R Wolch and Jody Emel, *Animal Geographies: Place, Politics, and Identity in the Nature-Culture Borderlands* (New York: Verso, 1998): 120.

amicable status. Lastly, she urges that we not only speak out more for the needs of our nonhuman counterparts, but also consider their needs when planning for urban spaces. To do this, policy changes must be made when it comes to issues of animal control. Secondly, we need to change perceptions towards animals and their needs. Albeit not the perfect approach, taking the educational route will go a long way in improving our understanding of the aims of the transspecies cities. She applauds the Endangered Species Act for its efforts in positively impacting policy changes that pertain to the protection of animals, but faults it for not doing enough.

The existence of transspecies cities is both as a result of and in rebellion to the existence of urban spaces as we know them. As it stands, urban spaces are highly human-focused with little regard to the need and wants of the nonhuman others.⁶⁵³ Even with lobbying from environmentalists, urban planning remains highly anthropocentric. Animal species are preserved for the aesthetic consumption of humans while at the same time having their populations controlled by one or more human interventions. By so doing, we deny animals and nature as a whole the right to govern itself. We, therefore, need to reconsider the morals and ethics that govern our relationships with animals both from a human and animal perspective.⁶⁵⁴

An ever-changing environment is replacing the concept of a static nature in a city. Therefore, the changes in the definition of city spaces will have to be reflected in architectural realities. Designs will need to move from a space of rigidity to one of flexibility

⁶⁵³ Jennifer R Wolch, Kathleen West, and Thomas E Gaines, "Transspecies Urban Theory," *Environment and Planning D: Society and Space* 13, no. 6 (1995): 735–760.

⁶⁵⁴ Ibid

and accommodation. Human organization will have to change to being more accommodating to the needs and wants on non-human others. In so doing, we will take on a more responsible and reactive approach to the needs of other species within the city space. The transspecies social theory seeks to reintroduce animals within the societal moral space and undo the damage done by their exclusion in the first place by various philosophical, religious, and evolutionary schools of thought.⁶⁵⁵ It is on this premise that animals are granted a platform for their concerns to be heard, considered, and taken into account when planning for urban spaces. The result of this is the creation of safer cities for animals to thrive alongside humans.

Geographer Margaret Fitzsimmons and journalist David Goodman sense the growing need amongst the humanities and social sciences to ‘reintroduce’ nature within the society by denying the initial separation.⁶⁵⁶ The existence of animals within the urban setting is not a new phenomenon. However, urban studies showed a growing interest in the relationship between humans and animals since the mid-90s.⁶⁵⁷ This interest is not only confined to the theoretical realms, but also can be seen in the fields of urban planning and green design.⁶⁵⁸ The interest in the relationship between humans and animals within urban spaces is growing in momentum especially in the fields of cultural and human geography.

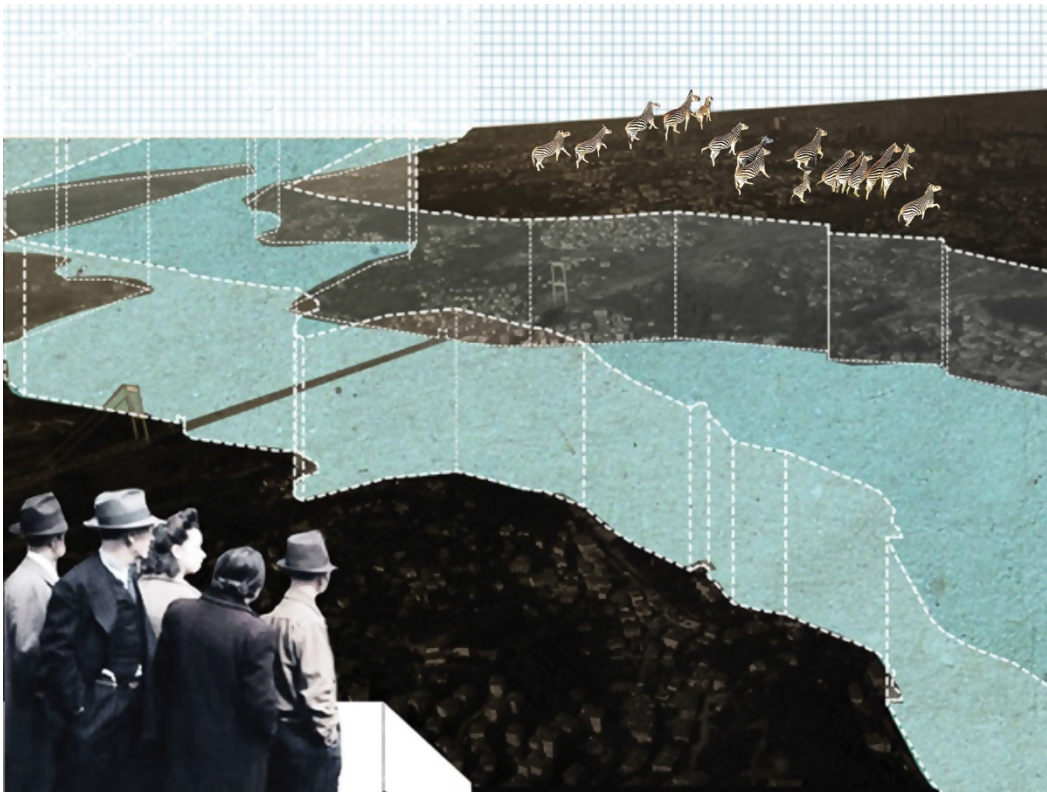
⁶⁵⁵ Jennifer Wolch and Jacque Emel, “Bringing the Animals Back In,” *Environment and Planning D Abstract* 13, no. 6 (1995): 632–636.

⁶⁵⁶ Margaret Fitzsimmons and David Goodman, “Incorporating Nature: Environmental Narratives and the Reproduction of Food,” in *Remaking Reality: Nature at the Millennium*, ed. B. Braun and N. Castree (London: Routledge, 1998), 194.

⁶⁵⁷ Tora Holmberg, *Urban Animals: Crowding in Zoocities* (London: Routledge, 2015).

⁶⁵⁸ AL Harrison, “Animal Interfaces for a Post-Human Territory,” in *ACSA Annual Meeting Proceedings, New Constellations, New Ecologies*, 2013.

Here, the focus was on the social definition and positioning of animals in human societies.⁶⁵⁹ The field of animal geography shines a light on non-human animals dwelling within urban spaces.⁶⁶⁰ Urban geography however, is focused on the relationship between humans and animals from a power and conflict perspective. Little research is being done to demystify the grouping of animals in various spatial and temporal groups by human societies.⁶⁶¹ The questions to be answered in this regard deal with the acceptance of humans and animals within various urban spaces as well as the rules of engagement that come with it.⁶⁶²



⁶⁵⁹ Jennifer Wolch, “Anima Urbis,” *Progress in Human Geography* 26, no. 6 (2002): 721–742.

⁶⁶⁰ Bruce Braun, “Environmental Issues: Writing a More-than-Human Urban Geography,” *Progress in Human Geography* 29, no. 5 (2005): 635–650.

⁶⁶¹ Chris Philo and Chris Wilbert, *Animal Spaces, Beastly Places* (London, UK: Routledge, 2004): 1–34.

⁶⁶² Tora Holmberg, “Trans-Species Urban Politics: Stories from a Beach,” *Space and Culture* 16, no. 1 (2013): 28–42.

The level of tolerance and consequently the space allocated to animals within the human society is dependent on the animals value to human life as well as whether or not they are considered to be domesticated.⁶⁶³ Cities are ideally meant for human occupation. Pets and companion animals are allowed into the city space while livestock are allocated the countryside. Wild animals, on the other hand are allocated areas that are considered to be equally wild. The categorization and consequent allocation of space for animals by humans is dependent on the cultural perspective of humans about nature (animals). Conflict between humans and animals, therefore, arises whenever animals step out of the boundaries of spaces allocated to them. Lorimer acknowledges the interactions and overlapping of territories that are defined as urban or wild, a concept he terms as ‘fluid biogeography’.⁶⁶⁴ According to social scientist Steve Hinchliffe and geographer Sarah Whatmore animals exist within cities because they are capable of finding suitable habitats in existing city structures ‘with and against the grain of urban design’.⁶⁶⁵

An understanding of the nature-culture divide could provide new insight on the human-animal relationship and provide a possible solution for the co-existence of the two in urban spaces.⁶⁶⁶ In order to come up with a more cordial living arrangement, we need to account for the animal populations found within cities and consider the effects of increased urbanism

⁶⁶³ Chris Philo and Chris Wilbert, “Animal Spaces, Beastly Places,” in *Animal Spaces, Beastly Places* (London: Routledge, 2004), 15–50.

⁶⁶⁴ Jamie Lorimer, “Living Roofs and Brownfield Wildlife: Towards a Fluid Biogeography of UK Nature Conservation,” *Environment and Planning A* 40, no. 9 (2008): 2042–2060.

⁶⁶⁵ Steve Hinchliffe and Sarah Whatmore, “Living Cities: Towards a Politics of Conviviality,” *Science as Culture* 15, no. 2 (2006): 128.

⁶⁶⁶ Ibid

on such populations whenever we embark on urban planning and green design.⁶⁶⁷ To manage animals in an urban setting, we must first understand the needs and wants of the different species that inhabit the urban spaces from both a sociological and environmental stand point.⁶⁶⁸ As it is, cities are designed mainly with human needs in mind, excluding those of the non-human animals that inhabit them.⁶⁶⁹ We must think critically of and define the space that we set aside for our nonhuman neighbors. This is not only in reference to the physical space but also the ideological one as well.

Even where urban areas are designed to accommodate animals, there are restrictions put in place. Urban dog parks, for example, are designed accommodate the presence of dogs within cities while at the same time controlling them.⁶⁷⁰

“Dog parks, as spaces for living dogs, also have the potential to challenge urban morals by reconfiguring dogs as worthy of needing, sharing, and utilizing public spaces. Dog parks can be then a place where the history of human–nature and human–animal divisions is broken down – or at minimum reconfigured.”⁶⁷¹

⁶⁶⁷ Timothy Beatley and Marc Bekoff, “City Planning and Animals: Expanding Our Urban Compassion Footprint,” in *Ethics, Design and Planning of the Built Environment* (Berlin, Germany: Springer, 2013), 185–195.

⁶⁶⁸ Stephen R Kellert, “Urban American Perceptions of Animals and the Natural Environment,” *Urban Ecology* 8, no. 3 (1984): 209.

⁶⁶⁹ Elvira Tarsitano, “Interaction between the Environment and Animals in Urban Settings: Integrated and Participatory Planning,” *Environmental Management* 38, no. 5 (2006): 799–809.

⁶⁷⁰ Julie Urbanik and Mary Morgan, “A Tale of Tails: The Place of Dog Parks in the Urban Imaginary,” *Geoforum* 44 (2013): 292–302.

⁶⁷¹ Ibid: 293.

Recent ontological developments are, however, shifting the focus from limiting space allocation to the human understanding when it comes to urban design and the fields of architecture to an understanding of post-human territory.⁶⁷² The field of architecture in its consideration for the environment, therefore, has to consider the number of species whose needs are been included in green design.⁶⁷³ Despite efforts to draw clear lines between human and animal spaces, these lines are constantly broken. Animals considered to be the epitome of wildness are often found closer to cities and more so country sides than previously imagined. Fritz Lang's *Metropolis* (1927) and the film *Madagascar* (2005) all point out the exclusion of flora and fauna within anthropocentric spaces.⁶⁷⁴ These two works both elude to the “foundational” differences between human ordered spaces such as towns and the animal dominated spaces labeled ‘the wild’.⁶⁷⁵ This distinction is well captured by the penguins in *Madagascar*, “do you ever see any penguins running free around New York City? Of course not. We don't belong here. It's just not natural.”⁶⁷⁶

People existing in cities became mindful of the “other” species when there is a conflict. The so-called interference of wildlife species into the built-environment, for instance, the exponential rise in the deer population, or invasion of coyotes into suburban

⁶⁷² Ariane Lourie Harrison, *Architectural Theories of the Environment: Posthuman Territory* (London: Routledge, 2013).

⁶⁷³ Edward M Dodington, *How to Design with the Animal: Lessons in Cross-Species Architecture and Design* (Houston, TX: Animal Architecture Press, 2013).

⁶⁷⁴ Michael Minden and Holger Bachmann, *Fritz Lang's Metropolis: Cinematic Visions of Technology and Fear* (Rochester, NY: Camden House, 2002); Eric Darnell and Tom Mcgrath, *Madagascar*, 2005

⁶⁷⁵ Steve Hinchliffe, “Cities and Natures: Intimate Strangers,” in *Unsettling Cities*, by J Allen, D Massey, and M Pryke (London: Routledge, 1999), 138–76.

⁶⁷⁶ Eric Darnell and Tom Mcgrath, *Madagascar*, 2005.

life, have all been met with a significant sense of distaste.⁶⁷⁷ However, the fact that we perceive the occurrence of nature in the built environment as a nuisance is proof that we created a community that fails to accommodate or appreciate the beauty of nature and its diversity. We have little connection with these creatures, consequentially we fail to embrace them as part of our world and opt for inhumane measures of dealing with conflict. Mark Bekoff, a Professor of Ecology and Evolutionary Biology has extensively worked towards changing people's response to coyote invasions in the suburban life.⁶⁷⁸ He has worked towards changing the rhetoric that animal life should be killed. As a science advisor in the Project Coyote, Bekoff together with his partners work to spread awareness and appreciation for coyotes.⁶⁷⁹ As an adaptable creature, the coyote's appearance in suburban life is its attempt to survive in a world that was transformed by human action. Rather than seek to kill them, the Project Coyote team resort to other humane and ecologically sound approaches to dealing with the issue.

Urbanization transformed humans into people detached from nature.⁶⁸⁰ Rivers became highways, trees became buildings, and the only animals welcomed are the pets living with us. Rather than plant our own food like our forefathers, we developed the lifestyle of

⁶⁷⁷ Daniel Rondeau and Jon M Conrad, "Managing Urban Deer," *American Journal of Agricultural Economics* 85, no. 1 (2003): 266–281.

⁶⁷⁸ Timothy Beatley and Marc Bekoff, "City Planning and Animals: Expanding Our Urban Compassion Footprint," in *Ethics, Design and Planning of the Built Environment* (Berlin, Germany: Springer, 2013), 185–195.

⁶⁷⁹ Earth Island Institute, "Project Coyote," accessed September 3, 2018, www.projectcoyote.org.

⁶⁸⁰ Timothy Beatley and Marc Bekoff, "City Planning and Animals: Expanding Our Urban Compassion Footprint," in *Ethics, Design and Planning of the Built Environment* (Berlin, Germany: Springer, 2013), 185–195.

shopping for food.⁶⁸¹ This approach also detached humanity from appreciating the value of the earth. However, there are consequences for our actions. Issues such as climate change, human-wildlife conflict, and food insecurity plague the present society. The expansion of cities has fuelled a loss of biodiversity and habitat loss.⁶⁸² As urbanization continues, discovering ways to coexist with nature will become an even bigger task. Therefore, urban planning and development should take on a more sustainable approach that caters to not only the needs of the people but also the animals that co-inhabit our landscape. Our urban fabric consists of fragmented landscapes with a variety of trees, shrubs, and patches of grass. How we have approached urban policy and development reflects our indifference towards flora and fauna. However, in light of the prevalent issues in our society such as the invasion of wildlife into our built-environment, urban planners are afflicted with the question: How do we design spaces that incorporate coexistence in our urban planning?

Nature is not some backdrop that we can only watch from afar, nature exists with us, and there are cities that have tried to accommodate multispecies. Brisbane, Australia for example, has proposals to link their parks to create safe passages for wild animals.⁶⁸³ The city has also invested in developing structures built over streets to facilitate protected movement. Another example of this co-existence is the relationship between Texans and their free-tailed bats. Initially, when the species invaded the Congress Avenue Bridge in downtown Austin, Texas, locals were alarmed. Gradually, the city transformed from being

⁶⁸¹ Minna Autio et al., “Consuming Nostalgia? The Appreciation of Authenticity in Local Food Production,” *International Journal of Consumer Studies* 37, no. 5 (2013): 564–568.

⁶⁸² Thomas Elmqvist et al., *Urbanization, Biodiversity and Ecosystem Services: Challenges and Opportunities: A Global Assessment* (Berlin, Germany: Springer, 2013): 133.

⁶⁸³ Timothy Beatley and Peter Newman, *Green Urbanism down Under* (Washington D.C.: Island Press, 2009): 154.

apprehensive about the bats to celebrating them as part of their identity. The free-tailed bats became a major tourist attraction and a significant economic engine.⁶⁸⁴ In response to their popularity, Austin’s highway department developed bridges that double as bat housing.



Figure 28. South Congress bridge bats, in Texas⁶⁸⁵

There are other cities that have tried to foster a bridge of co-existence such as San Francisco’s Sea Lions at Pier 99, Chicago’s Coyotes, and deer at the Metropolitan area, and the bears and moose that adorn the city of Anchorage. Experiencing these animals not only adds excitement, but also incorporated educational and other conservation efforts that reflect a new interest in coexistence. A survey on the people of Anchorage Alaska’s outlooks

⁶⁸⁴ Kenneth J Bagstad and Ruscena Wiederholt, “Tourism Values for Mexican Free-Tailed Bat Viewing,” *Human Dimensions of Wildlife* 18, no. 4 (2013): 307–311.

⁶⁸⁵ David Brendan Hall, *Austin Bats at the South Congress Bridge*, 2018.

revealed that people who were more knowledgeable about the local moose recognized the value that they add to their quality of life.⁶⁸⁶ To a certain extent, it is the animal presence in a region that defines a place. Perhaps, if we embrace these creatures, we combat the dullness of suburban life. The Vancouver co-existing with Coyotes (CWC) aims to reduce violent encounters between coyotes and people.⁶⁸⁷ The program is effective in its approach as it has a short-term emergency response and a long-term awareness program. One short-term approach is the existence of a hotline that deals with conflicts as peacefully as possible. The CWC also partners with schools and communities to educate them in in facilitating co-existence with the coyotes. Similarly, Virginia's GeesePeace, prioritizes public education as a means of facilitating co-existence.⁶⁸⁸ The project creates awareness of alternative means such as limiting feeding of the birds.

Human coexistence with wildlife requires a commitment from an individual to a community level. Rather than kill the bats that get stuck in crevices or unwelcome raccoons, people can opt for more humane approaches, for instance, relocation. The development of care centers as well considering the needs of the animals in a policy and planning level are also great measures towards extending our compassion footprint. Development projects and designs should be revised in consideration to the other species that share this space with us. Switzerland made it mandatory for buildings to incorporate more green areas by installing

⁶⁸⁶ "Living with Wildlife in Anchorage: A Cooperative Planning Effort," Alaska Department of Fish and Game, April 2000, <http://www.adfg.alaska.gov/index.cfm?adfg=anchoragewildlifeplanning.main>.

⁶⁸⁷ Robyn E Worcester and Robert Boelens, "The Co-Existing with Coyotes Program in Vancouver, BC," 2007, 393.

⁶⁸⁸ "GeesePeace," non-profit corporation, accessed September 3, 2018, www.geesepeace.com.

green roofs to cater for urban wildlife.⁶⁸⁹ Unoccupied spaces in cities could also become places where native vegetation grows and animals thrive.⁶⁹⁰ Skyscrapers should also be redesigned based on the needs and safety of animals. Every year, two to ten percent of a country's bird population dies from colliding into glass building structures.⁶⁹¹ In response to this issue, the city of Toronto set up specific bird-friendly building codes that mitigate bird injuries and death.⁶⁹² They also initiated a "lights-out" campaign geared towards encouraging light owners to turn off their nighttime lights during the season of bird migration.

Aberrant environmental conditions continue to challenge current design methods. Designers must work around climate change and resource limitation, as they continue to impact urban life. For urbanism, this might translate to increasingly resourceful interventions or a focus on practical systems while being socio-culturally sensitive.⁶⁹³ Chris Reed, a landscape architect, stresses the need for "new civic realm, one created by appendage and insertion."⁶⁹⁴ Changing the nature of urban city dwellers by "expanding our compassion

⁶⁸⁹ Stephan Brenneisen, "Space for Urban Wildlife: Designing Green Roofs as Habitats in Switzerland," *Urban Habitats* 4 (2006): 27.

⁶⁹⁰ Christoph DD Rupprecht et al., "Informal Urban Green Space: A Trilingual Systematic Review of Its Role for Biodiversity and Trends in the Literature," *Urban Forestry & Urban Greening* 14, no. 4 (2015): 883–908.

⁶⁹¹ Susan Milius, "Life & Environment: Windows Are Major Bird Killers: Small Buildings Do Much More Damage than Skyscrapers," *Science News* 185, no. 6 (2014): 8–9.

⁶⁹² Lesley J Evans Ogden, "Summary Report on the Bird Friendly Building Program: Effect of Light Reduction on Collision of Migratory Birds," 2002, 3.

⁶⁹³ Caryn Brause and Carey Clouse, "The Ark: Grafting Productive Programs onto Contemporary Waste-Space," 2014, 1.

⁶⁹⁴ W. V. Holt and A. R. Pickard, "Role of Reproductive Technologies and Genetic Resource Banks in Animal Conservation," *Reviews of Reproduction* 4, no. 3 (September 1999): 143–50.

footprint”⁶⁹⁵ or “rewilding our hearts”⁶⁹⁶ will need commitment and a sense of social responsibility. The changes we make should not only be for the endangered or threatened species. We need to change our design guidelines for the better understanding of all creatures. When a forest is cleared for the purpose of a new development, we take little consideration of the biodiversity lost or the unique ecosystem destroyed. This reality creates an urgency in coming up with more considerate approaches to animals. We can begin by documenting all the species that exist in our localities. Camera traps are another affordable solution that can also help in creating awareness concerning the species that surround us.⁶⁹⁷

The non-profit website called Expanded Environment (previously Animal Architecture), hosted by architect Ned Dodington, showcases global design projects for urban animal habitats.⁶⁹⁸ Designs that go past conventional animal-human relationships and push the limits of creativity for urban interspecies mingling. The collaborative nature of biologists and naturalists with urban designers is evident through examples like the bird-safe windows, green roofs and underpasses for animal and amphibians. Designer Gitta Gschwendtner explored how green designs can further incorporate animal needs, in her Animal Wall project. Where she constructed over a thousand dwellings for birds and bats in a housing project.⁶⁹⁹ Marine biologists Fawcett and Warkentin in their work push for space

⁶⁹⁵ Marc Bekoff, *The Animal Manifesto: Six Reasons for Expanding Our Compassion Footprint* (Novato: New World Library, 2010): 19.

⁶⁹⁶ Marc Bekoff, *Rewilding Our Hearts* (Novato: New World Library, 2013): 12.

⁶⁹⁷ Marcus Rowcliffe and Chris Carbone, “Surveys Using Camera Traps: Are We Looking to a Brighter Future?,” *Animal Conservation* 11, no. 3 (2008): 185–186.

⁶⁹⁸ Ned Dodington, “The Expanded Environment,” accessed September 7, 2018, <http://www.expandedenvironment.org>.

⁶⁹⁹ Rose Etherington, “Animal Wall by Gitta Gschwendtner,” *Dezeen*, August 28, 2009, <https://www.dezeen.com/2009/08/28/animal-wall-by-gitta-gschwendtner/>.

where the vulnerability and novelty that characterizes the interaction between humans and other species is mutual and not one way.⁷⁰⁰ One such suggestion is derived from the interactive space between humans and whales, they suggest that we illuminate the human viewing areas in aquariums and dim the actual enclosures. This way, humans are aware that the species they are meant to be viewing is in equal measure viewing them.

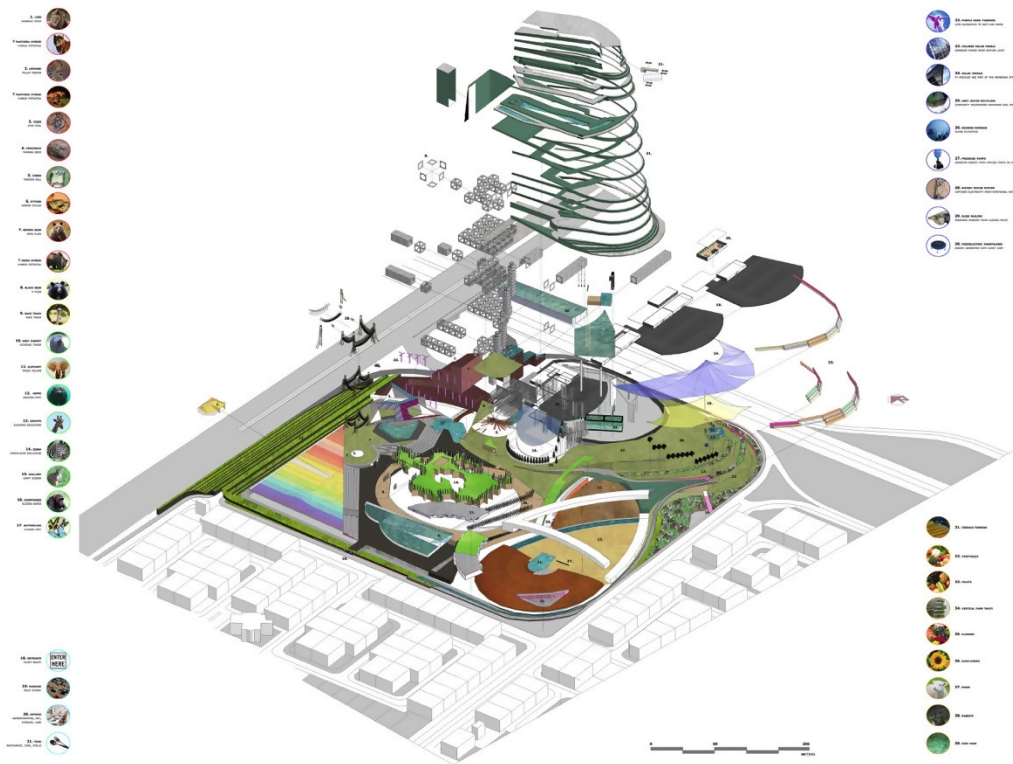


Figure 29. Self-sustaining animal plug-in community⁷⁰¹

⁷⁰⁰ Traci Warkentin and Leesa Fawcett, “Whale and Human Agency in World-Making: Decolonizing Whale-Human Encounters,” in *Metamorphoses of the Zoo: Animal Encounter after Noah* (Lanham, MD: Lexington Books, 2010): 104.

⁷⁰¹ Rua Alshaheen, *Zoo?! Embracing Environmental Degradation*, 2015, Architecture Graduation Project, Kuwait University.

Another initiative to accommodate animal species in the urban space is the National Wildlife Federation's Backyard Habitat Program.⁷⁰² Creating a Certified Wildlife Habitat is a rather simple and enjoyable activity and “offers wildlife a screen, a place to hide, a place which gives them a certain amount of privacy and seclusion”⁷⁰³, such spaces can be created with little effort, and realizing these ideas can aid a bigger ecological goal. Any green space either at home, school, or work can be turned into a wildlife habitat. By converting your space into a Certified Wildlife Habitat you help alleviate the ever-increasing habitat and resource loss that wildlife are increasingly faced with. You also help to maintain not only their habitats but also their migratory corridors that are equally as important. The inclusion of melliferous plant species in habitat gardens contributes to the Million Pollinator Garden Challenge. In addition to this, the application fee of \$20 charged to each applicant helps to facilitate the National Wildlife Federation's programs that help raise awareness on the nationwide loss of animal habitats. In order to successfully apply for a Certified Wildlife Habitat one needs to ensure that the fundamental needs of the animals are met. The most crucial needs that are to be catered for are: water, shelter/ cover, food, and nesting spaces. You also need to prove that you are employing sustainable practices to manage your habitat.

⁷⁰² “Certify to Show Your Commitment to Wildlife,” non-profit organization, The National Wildlife Federation, accessed September 14, 2018, <https://www.nwf.org/certify>.

⁷⁰³ Alexander Wilson, *The Culture of Nature: North American Landscapes from Disneyland to the Exxon Valdez* (Cambridge, MA: Blackwell Books, 1992): 133.

Downsizing

Zoos and wildlife parks increasingly shape the human experience of animal life.⁷⁰⁴ There are commendable zoos that put the animals first, and other zoos that seem to focus more on the customer satisfaction and less on the welfare of the animals that draw in the crowds in the first place.⁷⁰⁵ It is in such zoos that you find a large collection of species from the wild and very few individuals per species. It is in such zoos that you are likely to encounter sad-looking animals housed in poorly maintained cages. In order to satisfactorily care for the diverse locomotive and otherwise needs of the different species, zoos may be forced to downsize either in terms of general populations or species diversity. While this would be a rather difficult reality for some zoo proprietors and their visitors, it would be a rather accurate one in a world where mainstream venues are striving to stand out from the rest.⁷⁰⁶ In the same way, zoos can choose to identify themselves with a different mix of species from the next thus making them each equally unique. Also, by allowing for fluid movement of species within zoos results in a dynamism of interactions and will keep zoo visitors perpetually entertained and intrigued. However, these proposed changes have to be animal oriented rather than human centered.

⁷⁰⁴Alexander Wilson, *The Culture of Nature: North American Landscapes from Disneyland to the Exxon Valdez* (Cambridge, MA: Blackwell Books, 1992): 335.

⁷⁰⁵ Barbara Woods, "Good Zoo/Bad Zoo: Visitor Experiences in Captive Settings," *Anthrozoös* 15, no. 4 (2002): 343–360.

⁷⁰⁶ Todd Stillman George Ritzer, "The Postmodern Ballpark as a Leisure Setting: Enchantment and Simulated de-McDonaldization," *Leisure Sciences* 23, no. 2 (2001): 99–113.

Zoos offer the chance to safely view and value the magnificence of animals, and form a key part of the tourism industry.⁷⁰⁷ They also provide the opportunity to observe wild animals up close without the need to travel. Yet, some believe that our lingering colonial attitudes have given us a:

“sense of entitlement to see any animal when, where and how we want ... We have become complacent about the animals with whom we share our everyday lives and demand that if we live in, say, Atlanta or Cleveland or San Diego, far away from the African savannahs and jungles of India, we are entitled to see elephants and tigers.”⁷⁰⁸

Criminologist Mark Halsey challenges the restrictions that come with concepts such as ecotourism that limit the interactions of humans and other species, thus denying humans the chance to ‘find themselves’ in other animals.⁷⁰⁹ While eco-tourism is seemingly restrictive, it is in the same breath meant to protect animals. Tourists, especially if in large numbers can disrupt the natural behavior of animals and even separate mothers from their young. Marine mammals are increasingly at physical and emotional risk due to rise in ecotourism.⁷¹⁰ Other risks that come with tourism include, pollution and overall habitat degradation, and road kill.⁷¹¹ The entry fee charged necessitates that these tourism sites, site managers are forced to

⁷⁰⁷ Stephen R. Kellert, *The Value of Life: Biodiversity and Human Society*. (Washington D.C: Island Press, 1996): 86.

⁷⁰⁸ Lori Marino, Gay Bradshaw and Randy Malamud, "The Captivity Industry: The reality of zoos and aquariums." *Best Friends Magazine*. (2011), 27.

⁷⁰⁹ Mark John Halsey, “Molar Ecology: What Can the (Full) Body of an Eco-Tourist Do?” (London: Palgrave Macmillan, 2007).

⁷¹⁰ Daniel Cressey, “Ecotourism Rise Hits Whales,” *Nature* 512, no. 7515 (2014): 358.

⁷¹¹ David Newsome, Ross Kingston Dowling, and Susan A Moore, *Wildlife Tourism*, vol. 24 (Bristol, UK: Channel View Publications, 2005).

re-engineer the landscape in such a way that there are higher chances of animal encounters than there would ideally be.⁷¹² Another point of criticism for animal encounters that take place in zoos and other sites such as game parks is the carbon footprint of visitors. An argument is, therefore, placed that humans should settle for virtual interactions with these animals rather than physical ones.⁷¹³

Zoos and aquariums globally provide an environment for visitors to witness exotic animals; however, only a selected number delve further to make it an in depth local experience. The Arizona-Sonora Desert Museum (ASDM) is one of the few animal parks that incorporates regional, cultural, and natural history to enrich the visitor's experience and understanding.⁷¹⁴ ASDM visitors may even rediscover their own backyards that may spark ideas as to how they can continue to be aware of the natural world they live in. The museum focuses on the Sonoran Desert, blends elements of a traditional zoo, aquarium, botanical garden, art gallery, natural, and cultural history museum. Despite being an AZA accredited zoo, by calling itself otherwise, the museum is able to embrace the multidisciplinary focus that leads to local pride and global popularity. There is a visible change in trends by zoological gardens such as the Healesville Sanctuary in Australia, that show a shift towards local and, or native species.⁷¹⁵ The showcases and teaching practices in such places focus on

⁷¹² Bob Mullan, *Zoo Culture* (Illinois: University of Illinois Press, 1999): 82.

⁷¹³ Marc L Miller and Berit C Kaae, "Coastal and Marine Ecotourism: A Formula for Sustainable Development," *Trends* 30, no. 2 (1993): 35–41.

⁷¹⁴ Debra Colodner and Craig Ivanyi, "The Arizona-Sonora Desert Museum: A Model Regional Biopark," in *The Ark and Beyond: The Evolution of Zoo and Aquarium Conservation*, by George Rabb (Chicago, IL: University of Chicago Press, 2018), 322–26.

⁷¹⁵ David Hancocks, *A Different Nature: The Paradoxical World of Zoos and Their Uncertain Future* (Berkeley, CA: University of California Press, 2001): 213.

local and regional environments, history, conservation trends, and our impact on these environments. Focus on such matters are aligned with travel writer Jim Cheney's description of "environmental ethics as bioregional narrative."⁷¹⁶ According to Cheney, the realization and acknowledgement of the influences of our identity, home, and community is the key to achieving a holistic view of our world. The consideration of the specifics of place can result in a discussion that is geographically oriented and one that includes nature in the construction and composition of community.

Achieving sustainability is a great challenge for zoos due to space constraints, animal management tools, and artificial social groupings. There are a number of considerations that are made when it comes to selecting species to accommodate within a zoo set up. One such consideration is that of space. Given the limited state of this resource, some zoos may opt for smaller species in order to maximize on the space.⁷¹⁷ Another consideration is the cost implication of maintaining and breeding the animals. In this case, the rule of thumb is the more inexpensive a species is to maintain and the easier it is to repopulate then the more ideal it is. Priority of conservation may also be given on a need basis.⁷¹⁸ The more threatened the animal is, the more interest it shall draw from conservationists. Lastly one may consider designing a zoo as a temporary home for species. Once the zoo operators feel that the species can survive competitively in the wild, then it is reintroduced to its natural

⁷¹⁶ Jim Cheney, "Postmodern Environmental Ethics: Ethics of Bioregional Narrative," in *Postmodern Environmental Ethics*, ed. Max Oelschlaeger, vol. 11 (Albany: State University of New York Press, 1995), 23–42.

⁷¹⁷ Jozef Keulartz, "Captivity for Conservation? Zoos at a Crossroads," *Journal of Agricultural and Environmental Ethics* 28, no. 2 (2015): 335–351.

⁷¹⁸ Michael Hutchins, Kevin Willis, and Robert J Wiese, "Strategic Collection Planning: Theory and Practice," *Zoo Biology* 14, no. 1 (1995): 5–25.

environment.

The conception and delivery of a regional zoo comes with its own challenges. The main concern is the ability for a regional zoo to maintain the public's interest when popular flagship species like rhinos, giraffes, and other exotic animals are removed.⁷¹⁹ “Perhaps one day all that education disguised as entertainment will have done its work. People might then derive as much delight from observing a tarantula doing nothing in its burrow as they once did from the riot of a chimpanzees' tea party.”⁷²⁰ Careful planning must take place to ensure the economic success of a regional park. Based on the ASDM, here are key characteristics to keep in mind⁷²¹:

1. Compared to traditional zoos and aquarium, the visitor experience is different
2. As an extension of the local natural environment, there is more realistic immersion from the different focal points of the surrounding environment
3. Possibility for easier maintenance of native species to a climate they are familiar with.
4. May become a liaison for local conservation and a base for sustainable development
5. Local space around the organization can be protected habitats
6. Location for hands-on education that can lead to local pride
7. Decreased cost for educational and research-focused field conservation

⁷¹⁹ Andrew Moss and Maggie Esson, “Visitor Interest in Zoo Animals and the Implications for Collection Planning and Zoo Education Programmes,” *Zoo Biology* 29, no. 6 (2010): 715–731.

⁷²⁰ Jeremy Cherfas, *Zoo 2000: A Look beyond the Bars* (London, UK: British Broadcasting Corporation, 1984).

⁷²¹ Debra Colodner and Craig Ivanyi, “The Arizona-Sonora Desert Museum: A Model Regional Biopark,” in *The Ark and Beyond: The Evolution of Zoo and Aquarium Conservation*, by George Rabb (Chicago, IL: University of Chicago Press, 2018), 322–26.

8. Increase opportunity for greater conservation involvement from the local community
9. Potential involvement for long-term projects
10. Possible partnership with other regional organizations to achieve common conservation missions.

Rarely do zoos and aquariums retain a regional focus; most of the time, the attention is on the exotic or animals from “around the world”. The desire is to condense the entire world, as embodied in collections of exotic species. The rationale behind this approach is questionable, whether the worldwide focus is truly for biodiversity or simply for visitor appeal. Regional zoos that house native species can avoid imprisoning animals indoors for fear of harsh weather. “Zoos that cannot conform to these strictures have not only the wrong attitudes but also the wrong animals in their collection, inhabitants from bioclimatic zones too distant from the zoo’s own biome.”⁷²² Zoo directors and managers need to realize just how unsustainable and futile an effort keeping few numbers per species of a wide variety of species is. More good will come from the specialization of zoos either on a given species or on species from a given region.⁷²³ Such a specialization will not only help to improve the management aspects of the zoos but also their ability to actually educate their visitors.⁷²⁴ Instead of having an enormous amount of information pertaining to species from all over

⁷²² David Hancocks, "The Future of Zoos." *www.zoolex.org* (February 2012).

⁷²³ Terry L Maple and Bonnie M Perdue, “Launching Ethical Arks,” in *Zoo Animal Welfare* (Berlin, Germany: Springer, 2013), 167–183.

⁷²⁴ Martin Lindsey Christoffersen, Joaquim Olinto Branco, and Maria Heloisa Beatriz Cardoso, “Regional Zoos in Brazil and Their Specific Role for Environmental Education,” *Herald Journal of Education and General Studies* 2, no. 3 (2013): 97–106.

the place thrown at you every time you visit a zoo, you will instead have the opportunity to gain in-depth knowledge about your animals of interest when you visit a zoo that specializes in them.

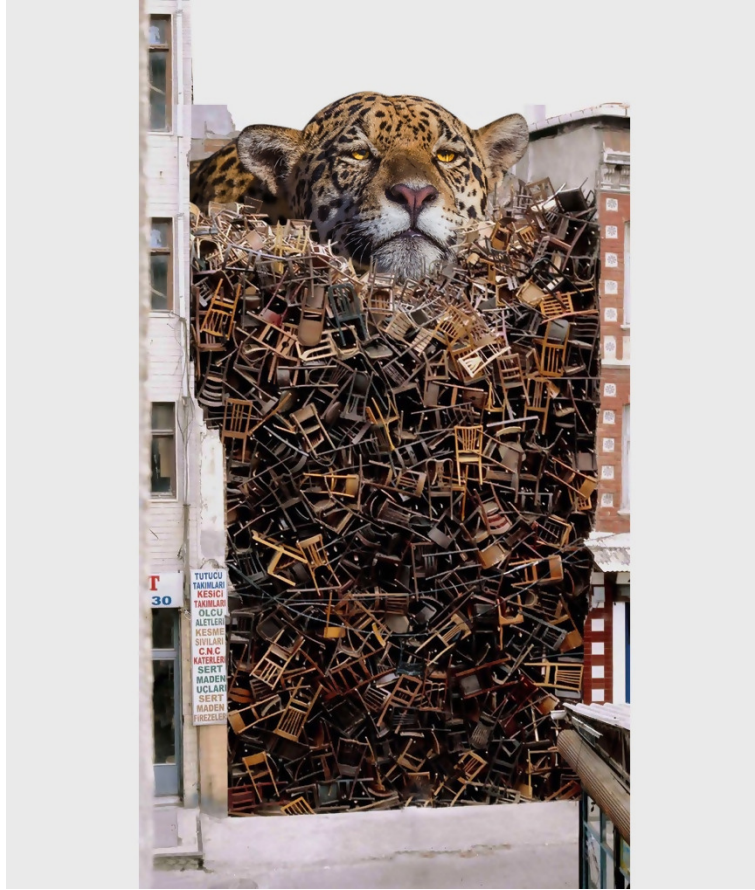
Cohabitation

The concept of urban animals is governed by spatial and temporal changes. The narrative that these animals were introduced overtime and fluctuate in abundance is, however, being challenged.⁷²⁵ Some urban animals are in fact the original inhabitants of these urban spaces and simply lived on in their natural habitats and managed to stay unnoticed. Some animals, albeit being originally found in these areas, were forced to adapt to the changes in their surroundings as a result of urbanization. Lastly, there are those that indeed fit the stereotype and were introduced into urban spaces by humans for one reason or the other. Story writer Esther Woolfson describes her daily interactions with nonhuman others within the city in her book, *Field Note from a Hidden City*:

“I began to think about wildness in relation to creatures who live in cities, about whether or not we consider them less wild than creatures living elsewhere, or think of them as somehow lesser parts of nature itself. [. . .] Their presence may be the only contact many urban people have with the natural world but our relationship with them seems changed by proximity, diminished by the fact of their being here among us.”⁷²⁶

⁷²⁵ Henry J Buller, “Reconfiguring Wild Spaces: The Porous Boundaries of Wild Animal Geographies” (London: Routledge, 2014): 236.

⁷²⁶ Esther Woolfson, *Field Notes from a Hidden City: An Urban Nature Diary* (Berkeley, CA: Counterpoint, 2014).



Cities are essentially created with little regard for wildlife unless it serves a purpose, whether in its living state or as taxidermies.⁷²⁷ However, current ideas of cohabitation require humans, animals, and the environment to be considered simultaneously, and challenge the current human-centric views and attitudes.⁷²⁸ Humans and wild trespass into each other's spaces as populations grow and habitats destroyed, respectively. Historically, the emphasis was to remove wild animals from human environments,⁷²⁹ an anthropocentric attitude towards

⁷²⁷ Henry J Buller, "Reconfiguring Wild Spaces: The Porous Boundaries of Wild Animal Geographies" (London: Routledge, 2014): 235.

⁷²⁸ Susan Boonman-Berson, Esther Turnhout, and Michael Carolan, "Common Sensing: Human-Black Bear Cohabitation Practices in Colorado," *Geoforum* 74 (2016): 192–201.

⁷²⁹ Jennifer R Wolch and Jody Emel, *Animal Geographies: Place, Politics, and Identity in the Nature-Culture Borderlands* (London and New York: Verso, 1998): 199.

preservation.⁷³⁰ However, cohabitation, at its core, relies on active space sharing.⁷³¹ Hence, wild animals must be acknowledged as ‘fellow inhabitants’ and not as ‘other entities’ that actively engage in the dynamics of the evolving space. However, the exact methods to achieve this have only been recently explored as ‘the animal turn’ in social science research.⁷³²

Essentially, cities and their human and nonhuman occupants are ‘inseparable in thought and practice’.⁷³³ Zoos, according to Braverman, are the embodiment of this divisive school of thought. : ‘Without the city, there would also not be a zoo.’⁷³⁴ Cities and zoos alike serve as a reminder of man’s attempts to both separate and reconcile the concepts of man and beast, to marry the concepts of art and science, and create order amidst chaos. Cities have defied man’s attempts at civilization and separation by continuing to host exotic pets, sewer rats, migratory birds, and disease causing pathogens. The evolution of zoos and cities go hand in hand, and so does their future.

The term informal urban green spaces (IGS) is used to refer to empty lots, streets,

⁷³⁰ Paul Jepson, Maan Barua, and Kathleen Buckingham, “What Is a Conservation Actor?,” *Conservation and Society* 9, no. 3 (2011): 229–235; John Knight, *Natural Enemies: People-Wildlife Conflicts in Anthropological Perspective* (London: Routledge, 2013); Paul Robbins and Sarah A Moore, “Ecological Anxiety Disorder: Diagnosing the Politics of the Anthropocene,” *Cultural Geographies* 20, no. 1 (2013): 3–19.

⁷³¹ Steve Hinchliffe, *Geographies of Nature: Societies, Environments, Ecologies* (Thousand Oaks, CA: Sage, 2007): 84.

⁷³² Christopher Bear and Sally Eden, “Thinking like a Fish? Engaging with Nonhuman Difference through Recreational Angling,” *Environment and Planning D: Society and Space* 29, no. 2 (January 1, 2011): 336–52; Henry Buller, “Animal Geographies,” *Progress in Human Geography* 38, no. 2 (March 21, 2013): 308–18.

⁷³³ William Lynn and Eric Sheppard, “Cities,” in *Patterned Ground: Entanglements of Nature and Culture*, by Stephan Harrison, Steve Pile, and Nigel J Thrift (London: Reaktion Books, 2004), 54.

⁷³⁴ Irus Braverman, *Zooland: The Institution of Captivity* (Palo Alto, CA: Stanford Law Books, 2013), 29.

and fields that are not inhabited by humans.⁷³⁵ They can, therefore, be classified as “terrain vague” where vegetation has overgrown,⁷³⁶ unclaimed territories,⁷³⁷ or “loose spaces” that have been appropriated by the public.⁷³⁸ The bone of contention when it comes to city spaces between man, animals, and plants is where each of these belongs. The concept of wild spaces within the urban setting is one that is exciting to a number of scholars.⁷³⁹ IGS offers a nature within which humans and their non-human counterparts are free to co-exist without the space being considered one that is dominated by the former.⁷⁴⁰ Such spaces are ideally devoid of human influence and management. They are not designated as any form of greenspace nor are they managed for the same.⁷⁴¹ This, therefore, makes them the ideal space to accommodate biodiversity within the urban space.⁷⁴²

⁷³⁵ Christoph Rupprecht and Jason Byrne, *Informal Urban Greenspace Perception and Use: Survey Instrument*, 2016.

⁷³⁶ Patrick Barron, “Introduction: At the Edge of the Pale,” in *Terrain Vague* (London: Routledge, 2013), 15–37.

⁷³⁷ Paul Cloke and Owain Jones, “‘Unclaimed Territory’: Childhood and Disordered Space (S),” *Social & Cultural Geography* 6, no. 3 (2005): 311–333.

⁷³⁸ Karen Franck and Quentin Stevens, *Loose Space: Possibility and Diversity in Urban Life* (London: Routledge, 2006).

⁷³⁹ Anna Jorgensen and Richard Keenan, *Urban Wildscapes* (London: Routledge, 2012).

⁷⁴⁰ Christoph DD Rupprecht et al., “‘It’s Real, Not Fake like a Park’: Residents’ Perception and Use of Informal Urban Green-Space in Brisbane, Australia and Sapporo, Japan,” *Landscape and Urban Planning* 143 (2015): 205–218.

⁷⁴¹ Christoph DD Rupprecht and Jason A Byrne, “Informal Urban Green-Space: Comparison of Quantity and Characteristics in Brisbane, Australia and Sapporo, Japan,” *PloS One* 9, no. 6 (2014).

⁷⁴² CDD Rupprecht and JA Byrne, *Informal Urban Greenspace Perception and Use: Survey Instrument*, 2016.

The ecology and interactions within IGS are different from those observed within nature reserves or any other parks.⁷⁴³ They provide ‘territories of encounter’ within which wild flora and animals can co-exist.⁷⁴⁴ However, in order for them to be functional, we need to move away from the idea of a pristine greenspace within which we go to rejuvenate ourselves.⁷⁴⁵ According to landscape architect Werner Nohl, these spaces within the urban setting that are thought to be wastelands with a seemingly sense of disorganization are, in fact, self-organizing.⁷⁴⁶ Nature, in its independent and self-regulating properties, is finding a way to turn, that which was once thought to be of no value into a useful, and aesthetically pleasing space. Not only do these spaces promise of a better future, but also they are hope of a world where the ‘wild’ and ‘civilization’ can coexist within the same space. They deviate from the dominating mankind over nature that is often experienced within cities and other urban spaces. Since humans do not control IGS spaces, their inhabitants are not subject to pre-constructed rules of engagement. They, therefore, provide room for a ‘provisional arrangement’ in which the possibilities of mutuality between the different inhabitants can be explored. As Nohl put’s it, such spaces neither restrict development nor do they inhibit human behavior.⁷⁴⁷

⁷⁴³ Richard J Hobbs et al., “Novel Ecosystems: Theoretical and Management Aspects of the New Ecological World Order,” *Global Ecology and Biogeography* 15, no. 1 (2006): 1–7.

⁷⁴⁴ CDD Rupprecht and JA Byrne, *Informal Urban Greenspace Perception and Use: Survey Instrument*, 2016.

⁷⁴⁵ Peter C Baldwin, *Domesticating the Street: The Reform of Public Space in Hartford, 1850-1930* (Columbus, OH: Ohio State University Press, 1999).

⁷⁴⁶ Werner Nohl, “Gedankenskizze Einer Naturästhetik Der Stadt,” *Landschaft+ Stadt* 22, no. 2 (1990): 62.

⁷⁴⁷ Werner Nohl, “Gedankenskizze Einer Naturästhetik Der Stadt,” *Landschaft+ Stadt* 22, no. 2 (1990): 65.

Several new projects aim to find ways of gradually introducing animals back into the city and to further make room for animal representations. The Animal Estates project by artist Fritz Haeg creates homes for animals that used to inhabit Manhattan.⁷⁴⁸ The urban intervention incorporates sculpture, environmental awareness, and habitat restoration. The Animal Estates are designed to incite thinking about more favorable and healthy human-animal relationships. Haeg's project is constructed in multiple locations, and includes artistic performances inspired by animals. "Representations of animals can have very real effects...For example, a zoo animal is both real and representational."⁷⁴⁹ Therefore, environmentalism must campaign using real and figurative forms of animals in order to arouse human compassion.

The way that we refer to animals and ultimately interact with them is highly dependent on the mode and time of integration within the space. In the modern city, an animal is either categorized as a pet or a pest. Animals considered as pets are adopted as part of the family⁷⁵⁰, clearly treasured⁷⁵¹, and transformed according to our desires.⁷⁵² Creatures like rats⁷⁵³ and cockroaches⁷⁵⁴ are seen as a threat to our very own existence. What is interesting in the acceptance of pets is that they are taught (potty-trained, domesticated) to

⁷⁴⁸ Fritz Haeg, "Animal Estates," accessed September 5, 2018, animalestates.org.

⁷⁴⁹ Mark Feldman, "Where the Wild Things Aren't: Animals in New York City," *The Minnesota Review* THE FERAL ISSUE (2009): 231–42.

⁷⁵⁰ Marc Shell, "The Family Pet," *Representations* 15, no. 1 (1986): 121–153.

⁷⁵¹ Thorstein Veblen, *The Theory of the Leisure Class: An Economic Study in the Evolution of Institutions* (London: Macmillan, 1899).

⁷⁵² Yi-Fu Tuan, *Dominance & Affection: The Making of Pets*, 04; BF632. 5, T8., 1984.

⁷⁵³ Jonathan Burt, *Rat* (London: Reaktion Books, 2006).

⁷⁵⁴ Marion Copeland, *Cockroach* (London: Reaktion Books, 2003).

be in line with our beliefs of animality. On the other hand, pests are the complete opposite. This usually leaves animals with two options i.e. either fitting into the human mode of living or to be dealt away with. These distinctions between pets, feral, alien, and invasive animals are more of a reflection of mankind's ideals rather than any properties held by the animal itself.⁷⁵⁵ It is, therefore, no wonder that spaces such as homes, parks, zoos, cities, and the wild exist. Such spaces not only tell us the way in which to relate with animals that have been placed in these spaces, but also they offer symbolic significance to the animals as well. Defining what an animal is, what its space is, and what role it plays within a largely human society.

The concept of urbanization evolved at the expense of nature.⁷⁵⁶ Humans exploited natural resources and continue to do so in the name of urbanization while giving little regard to the fate of the non-human others who lose their homes for mankind to get more sophisticated ones. Within the western context the concept of urbanization was formed on the idea of advancement based on domination of nature by culture.⁷⁵⁷ City builders pushed their superior ambitions such as progress and revenue while leaving behind territories and persons who were seen as being savage. To this day capitalist urbanization rhetoric shows little concern for wildlife leading to the marginalization of nature and animals.⁷⁵⁸ This blatant

⁷⁵⁵ Gilles Deleuze and Felix Guattari, "A Thousand Plateaus, Trans. Brian Massumi," *London: Continuum*, 1987, 268.

⁷⁵⁶ Jennifer Wolch, "Zoöpolis," *Capitalism Nature Socialism* 7, no. 2 (1996): 21–47; Mona Seymour and Jennifer Wolch, "Toward Zoöpolis? Innovation and Contradiction in a Conservation Community," *Journal of Urbanism* 2, no. 3 (2009): 215–236.

⁷⁵⁷ Jennifer Wolch, "Zoopolis," *Capitalism Nature Socialism* 7, no. 2 (1996): 21–47.

⁷⁵⁸ Jennifer R Wolch and Jody Emel, *Animal Geographies: Place, Politics, and Identity in the Nature-Culture Borderlands* (New York: Verso, 1998), 119.

neglect for animal life is reflected in modern urban theory. Urbanization is seen as the development of “terra nullius” or empty land , and this language reveals a deeply biased thinking, as the wildlands are not actually vacant but rather brimming with animal life.⁷⁵⁹

Nonhumans do more than inhabit the city space. They play an important role in shaping it and in the process end up being shaped by the different urban interactions.⁷⁶⁰

Niche Construction theory is a fairly new addition to the field of evolutionary biology, it does not regard the environment as an independent entity, rather manipulated by the species that resides in it.⁷⁶¹ When adaptation occurs, it either because the species has adjusted to the environment or that it has altered the environment to its liking. For example, the bird builds a nest himself. Or, the bird inherits a nest to which he himself has to adapt to. Or, a bird finds a niche, which he transforms, into a nest for himself. Ultimately corporeal generosity as an ethical measure is, therefore, needed. In order to fully accommodate the different species living within cities and achieve a truly more-than-human city, we must acknowledge the diversity in interactions and ecological requirements within them that dictate the politics of urban nature.⁷⁶² Disrupting the dominant narratives and acknowledging species’ heterogeneity is the only way to attain the benefits of *zooecities*.⁷⁶³ Therefore, “accommodation

⁷⁵⁹ Clare Palmer, “Colonization, Urbanization, and Animals,” *Philosophy & Geography* 6, no. 1 (2003): 47–50.

⁷⁶⁰ Jennifer R Wolch and Jody Emel, *Animal Geographies: Place, Politics, and Identity in the Nature-Culture Borderlands* (New York: Verso, 1998), 127.

⁷⁶¹ F John Odling-Smee, Kevin N Laland, and Marcus W Feldman, *Niche Construction: The Neglected Process in Evolution*, 37 (Princeton, NJ: Princeton university press, 2003).

⁷⁶²Ibid: 135.

⁷⁶³ Tora Holmberg, *Urban Animals: Crowding in Zooecities* (London: Routledge, 2015): 126.

of difference”, is called for.⁷⁶⁴ “Leaks and eddies might help open passages for a praxis of care and response—response-ability—in ongoing multispecies worlding on a wounded terra”.⁷⁶⁵ According to political theorist Chantal Mouffe, in order for this pluralistic approach to occur, there needs to be a breakdown of polarizing dichotomies such as the private-public or we-them dichotomies.⁷⁶⁶ Some have even urged for nonhumans to be categorized as denizens or citizens in relation to their interactions with humans, thus affording them some rights.⁷⁶⁷

Urban development across the globe is seeing more non-human animals move into cities.⁷⁶⁸ Non-human animals become city dwellers either by choice or as a result of circumstance. For some animals, cities were their original homes long before the mushrooming of urban dwellings. Historian Hilda Kean points out, the existence of non-human animals within the metropolis has for a long time been an acknowledged reality.⁷⁶⁹ There is enough evidence proving that our non-human counterparts always have been a part of the cities.⁷⁷⁰ For wildlife to comfortably exist within the city in the past, they had to be

⁷⁶⁴ Tora Holmberg, *Urban Animals: Crowding in Zoocities* (London: Routledge, 2015): 125.

⁷⁶⁵ Donna Haraway, “Awash with Urine: DES and Premarin© in Multi-Species Responseability,” *WSQ: Women’s Studies Quarterly* 4, no. 1–2 (2012): 302.

⁷⁶⁶ Chantal Mouffe, “Deliberative Democracy or Agonistic Pluralism,” *Social Research* 66, no. 3 (1999): 745–758.

⁷⁶⁷ Sue Donaldson and Will Kymlicka, *Zoopolis: A Political Theory of Animal Rights: An Overview* (Oxford, UK: Oxford University Press, 2015): 13.

⁷⁶⁸ Thom Van Dooren, Deborah Bird Rose, and others, “Storied-Places in a Multispecies City,” *Humanimalia* 3, no. 2 (2012): 1–27.

⁷⁶⁹ Hilda Kean, “Traces and Representations: Animal Pasts in London’s Present,” *The London Journal* 36, no. 1 (2011): 54–71.

⁷⁷⁰ Aidan Davison and Ben Ridder, “Turbulent Times for Urban Nature: Conserving and Re-Inventing Nature in Australian Cities,” *Australian Zoologist* 33, no. 3 (2006): 306–314.

able to source their needs within these spaces without attracting unnecessary attention. They had to adapt to the ever-changing plans for mankind and find ways in which to use the new alcoves and resources offered by the city spaces for their survival. Some animals such as poultry and livestock were once welcome but are no longer tolerable within the city space.⁷⁷¹

Wolch coined the concept of “Zoopolis”, and she describes it as a form of co-existing with nature in which the city is “re-naturalized or re-enchanted”.⁷⁷² This movement challenges traditional notions of survival, competition, and even the acts of predation. Wolch’s remedy to the issue of multiple species co-existence is for the creation of cities that make it possible for animals to interact with each other as well as humans. Only in doing so can we develop a culture of caring for nature and the animals found within it. Zoöpolis presents a critique of modern urbanism by rejecting indifferent wildlife park models. However, beyond this fantasy of harmony lies jeopardy and uncertainty. While Wolch’s proposals on a zoopolis are noble, her story is only promising in theoretical terms. A zoopolis can only be realized when various actions and radical changes are put into place.

The idea of transspecies cities that accommodate the needs of both humans and animals is becoming more popular.⁷⁷³ Haraway, while in agreement with Wolch’s argument describes the zoöpolis as a rather chaotic site that results in improved states of the

⁷⁷¹ Andrea Gaynor, “Animal Agendas: Conflict over Productive Animals in Twentieth-Century Australian Cities,” *Society & Animals* 15, no. 1 (2007): 29–42.

⁷⁷² Jennifer Wolch, “Zoöpolis,” *Capitalism Nature Socialism* 7, no. 2 (1996): 21–47; Mona Seymour and Jennifer Wolch, “Toward Zoöpolis? Innovation and Contradiction in a Conservation Community,” *Journal of Urbanism* 2, no. 3 (2009): 215–236.

⁷⁷³ Alex Tidball, “Human Perceptions of Animals in the St. Louis Region: Prospects for a Transspecies City” (PhD Thesis, Southern Illinois University at Edwardsville, 2016): 1.

Anthropocene.⁷⁷⁴ Such arguments work to destabilize the anthropocentric approach to today's life. They call for ethical interactions and resource sharing between the different urban dwelling species; simply put, the call for conviviality.⁷⁷⁵ These arguments are further amplified by tackling the “politics of conviviality,” so as to understand the political implications of the “more-than-human affair” urban theory.⁷⁷⁶ For us to achieve a fully integrated multispecies city environment, we need to develop an ethic of “conviviality”⁷⁷⁷, by making a conscience effort to accommodate others and create shared areas.⁷⁷⁸

⁷⁷⁴ Donna Haraway, “Zoōpolis, Becoming Worldly, and Trans-Species Urban Theory: For Old Cities yet to Come,” in *Playing Cat's Cradle with Companion Species* (paper presented at Playing Cat's Cradle with Companion Species: The Wellek Lectures, UC Irvine, 2011).

⁷⁷⁵ Thom Van Dooren, Deborah Bird Rose, and others, “Storied-Places in a Multispecies City,” *Humanimalia* 3, no. 2 (2012): 1–27.

⁷⁷⁶ Steve Hinchliffe and Sarah Whatmore, “Living Cities: Towards a Politics of Conviviality,” *Science as Culture* 15, no. 2 (2006): 124.

⁷⁷⁷ Thom Van Dooren, Deborah Bird Rose, and others, “Storied-Places in a Multispecies City,” *Humanimalia* 3, no. 2 (2012): 1–27.

⁷⁷⁸ Steve Hinchliffe and Sarah Whatmore, “Living Cities: Towards a Politics of Conviviality,” *Science as Culture* 15, no. 2 (2006): 123–138.



Urban spaces are full of diverse species, but we are plagued by the need to turn back to nature.⁷⁷⁹ It is only by realizing how close to and how often we can interact with nonhuman others will we arrive at better human-animal interactions.⁷⁸⁰ Environmental historian William Cronon in “The Trouble With Wilderness: or, Getting Back to the Wrong Nature,” contends that the current ideology of considering nature to be far away from human activities is deceptive and makes us overlook what little nature we do have in the city.⁷⁸¹ Thus we should prompt ourselves to value all nature near or far. Our daily encounters with animals should act as a “reminder of our place in the world and the other creatures that

⁷⁷⁹ Jennifer R Wolch and Jody Emel, *Animal Geographies: Place, Politics, and Identity in the Nature-Culture Borderlands* (New York: Verso, 1998).

⁷⁸⁰ Jennifer Wolch, “Anima Urbis,” *Progress in Human Geography* 26, no. 6 (2002): 721–742.

⁷⁸¹ William Cronon, “The Trouble with Wilderness: Or, Getting Back to the Wrong Nature,” in *Uncommon Ground: Rethinking the Human Place in Nature* (New York: Norton, 1996): 455.

we share it with."⁷⁸² The cohabitation between humans and animals often occurs below the radar, and we need to highlight this to increase awareness so that populations can be understood and included as cities evolve. The animals' adaptation to urban environments does not need to be viewed as a fight for survival, or 'just holding on', but as a 'story of co-existence'.⁷⁸³ The cross-species kinship that we see between the homeless human and stray dog as they both seek refuge in a city and challenge such boundaries.

⁷⁸² Fritz Haeg, "Animal Estates," accessed September 5, 2018, animalestates.org.

⁷⁸³ Richard Mabey and Iain Sinclair, *The Unofficial Countryside* (London: Collins, 1973), 12.

CHAPTER 8

CONCLUSION

What would a revolutionized animal future look like and how would it come into being? At the risk of seeming too prescriptive, I postulate my manifesto of what a transformed animal future could look like.

Manifesto For Synurbic Space

1. Romanticized notions of nature are in continuous contradiction with current reality.
2. Our living space is constantly evolving by species moving into and through our urban fabric.
3. Architects need to design to cater for the ever-changing flux known as nature.
4. The urban fabric houses unseen synthropes. To manifest them is the challenge of this era.
5. The multispecies landscape requires higher exposure, compound unions, and public support.
6. Design ability is required to make the progressive relationship between humans and nature evident.
7. Unlike popular belief, human interaction with nature, while causing disruption, also enriches the living world and its inhabitants.
8. Investing in skill development, structuring policies, and science and technology can support cohabitation in cities.
9. Decision-making should involve all those that are part of the urban condition.
10. Building inclusive spaces requires tackling urban issues in all scales and temporalities.

An environment is a blend of nature and culture, and nowhere is this interplay more richly expressed than in cities, where we see flowers blooming in sidewalk cracks and deer sprinting across highways. Studies at a species level show that more than half of native plants or animals habitats are found in cities. For example, more than half of the Belgic plant species can be seen in Brussels⁷⁸⁴, and over fifty percent of native birds can be traced back into Rome⁷⁸⁵. Cities are taking major steps towards recognition of potential for progressing biodiversity with the focus of planning efforts to establish green infrastructures, research, policy tools and educational strategies that could engage key stakeholders more closely with urban biodiversity conservation.⁷⁸⁶ The ‘Curitiba Declaration’ especially focuses on developing educational strategies that could lead to sustainability awareness among masses in the generations to come.⁷⁸⁷

Large portions of city people are fond of nature. They take a lot of measures to attract wildlife, by crafting different shelters, and spending a considerable amount of money to create their ecological ideal.⁷⁸⁸ In Britain, garden bird feeding is considered a strong indicator of the structure of patterns of biodiversity, and how they are affected by

⁷⁸⁴ Sandrine Godefroid, “Temporal Analysis of the Brussels Flora as Indicator for Changing Environmental Quality,” *Landscape and Urban Planning* 52, no. 4 (2001): 203–224.

⁷⁸⁵ B. Cignini and R. Zapparoli, “Rome,” in *Birds in European Cities*, by John G Kelcey and Goetz Rheinwald (Ginsterhahn, Germany: Ginster Verlag, 2005), 243–278.

⁷⁸⁶ Norbert Müller and Peter Werner, “Urban Biodiversity and the Case for Implementing the Convention on Biological Diversity in Towns and Cities,” *Urban Biodiversity and Design*, no. 7 (2010).

⁷⁸⁷ “CURITIBA DECLARATION On Cities and Biodiversity” (Curitiba, Brazil, March 26, 2007).

⁷⁸⁸ Ann P Kinzig et al., “The Effects of Human Socioeconomic Status and Cultural Characteristics on Urban Patterns of Biodiversity,” *Ecology and Society* 10, no. 1 (2005).

socioeconomic and cultural factors.⁷⁸⁹ Bottom up approaches are more affected by the individual and household income as well as personal beliefs and values. On the other hand, top down governmental approaches are more constant in their efforts towards increasing biodiversity in urban areas.

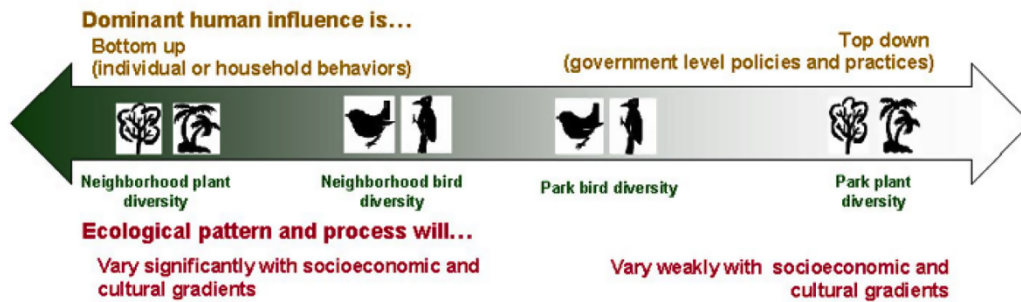


Figure 19. Ecological patterns in biodiversity efforts⁷⁹⁰

One of the main challenges of the 21st century includes the loss of animal populations due to urbanization. To avoid these threats, the Convention on Biological Diversity (CBD) promotes awareness of a sustainable future in cityscapes, because ‘the battle for life on earth will be won or lost in urban areas’⁷⁹¹, since:

1. Ecosystems in cities are much more diverse with defining attributes.
2. Species in cities and suburbs are genetically evolving to deal with the omnipresence of humans.
3. Cities are a significant reservoir for different species that blend together for regional

⁷⁸⁹ Richard A Fuller et al., “Garden Bird Feeding Predicts the Structure of Urban Avian Assemblages,” *Diversity and Distributions* 14, no. 1 (2008): 131–137.

⁷⁹⁰ Ann P Kinzig et al., “The Effects of Human Socioeconomic Status and Cultural Characteristics on Urban Patterns of Biodiversity,” *Ecology and Society* 10, no. 1 (2005).

⁷⁹¹ Ahmed Djoghlaif, “Convention on Biological Diversity” (2007).

biodiversity

4. Quality of living shows a progressive trend with increasing global urban biodiversity.
5. City dwellers can directly experience urban biodiversity, and for many this is the only the nature they can interact with.

Urban homogeneity led to a vicious run of anthropocentrism. Therefore, the modern ark has to challenge the interaction and interdependence of species beyond the basic survival of Noah's Ark.⁷⁹² The world is only as good as its various inhabitants, and animals and humans must interact on a deeper level if we are to share this world. Environmentalism, as we know it today, is stuck on the idea that we can retain and even recreate the romanticized conditions that were once present.⁷⁹³ It is time we transport movements like Deep Ecology and the Gaia hypothesis to the context of the 21st century.⁷⁹⁴ Today's environmental discussions are governed by a sense of doom and gloom.⁷⁹⁵ With a long list of environmental disasters and extinctions, some have even argued that the world may be better off without humans, where slogans like "Earth Without Us" or Church of Euthanasia's "Save the Planet, Kill Yourself".⁷⁹⁶ With changes in the way we interact with the environment on a cultural, social, or even technological level, there is a need to change the conventional concepts and

⁷⁹² Vicki Croke, *The Modern Ark: The Story of Zoos: Past, Present, and Future* (New York: Simon and Schuster, 2014).

⁷⁹³ Rupert Read, "Culture, Nature, Ecosystem (or Why Nature Can't Be Naturalized)," *Feminist Interpretations of Ludwig Wittgenstein*, 2002, 408–31.

⁷⁹⁴ Max Oelschlaeger, "Deep Ecology and the Future of the Wild in the Anthropocene," *Trumpeter* 30, no. 2 (2014): 231–246.

⁷⁹⁵ Steve Vanderheiden, "Rethinking Environmentalism: Beyond Doom and Gloom," *Global Environmental Politics* 11, no. 1 (2011): 108–113.

⁷⁹⁶ Marina Zurkow and Una CHaudhuri, "Animalizing Interlude: Zoöpolis," in *The Stage Lives of Animals* (London: Routledge, 2016), 115–130.

principles of environmentalism. Conservation cannot freeze the present in time, should not be tackled only by charismatic animals, and must not enforce limits to conserved areas.

Synurbic space provides a remedy to what lepidopterist Robert Michael Pyle calls “extinction of experience”, as the modern world is less attuned to our sensory surroundings.⁷⁹⁷ Animal places can be used to provide a level of sensuality and purification when put into context of a human city. Perspectives can be changed even from our views of companion species, where we do not simply walk a dog, but *walk with* a dog as we follow and learn from its olfactory dominant world.⁷⁹⁸ We live in world with potentially multiple perspectives, the artificial, ‘anthropo-city’, and the more naturalistic view – the world that a dog’s differing sensory register perceives.⁷⁹⁹ Some humans deliberately try to limit the interaction and exposure to our more sensory-adept counterparts. This separation of nature being external to the city is done to ‘create order by negating certain truths’.⁸⁰⁰ These preconceived mindsets then rationalize the joint presence of human and non-human animal within cities as either a deliberate shaped interaction or a boundary cross needing restraint. These biases are seen especially when non-domesticated animals transverse into cities and the response is often a call for a stronger separation, and not a demand for cohabitation.

We find ourselves in a space where humankind removed itself from the rest of

⁷⁹⁷ Robert M Pyle, *The Thunder Tree: Lessons from an Urban Wildland* (Lyons, New York: Lyons Press, 1998).

⁷⁹⁸ Hamish Win, “12 Companion Species and a Multisensory Urbanism,” *Senses in Cities: Experiences of Urban Settings*, 2017.

⁷⁹⁹ Christopher Brian Daniels and others, *A Guide to Urban Wildlife: 250 Creatures You Meet on Your Street* (Sydney, Australia: ABC Books, 2011): 8.

⁸⁰⁰ Annabelle Sabloff, *Reordering the Natural World: Humans and Animals in the City* (Toronto, Canada: University of Toronto Press, 2001), 72.

nature and labeled things to be “natural” or “unnatural” based on its interaction with and understanding of these things. The very concept of the Anthropocene is proof of this. It glorifies human’s capabilities to dominate, control, and change ecological processes within the planet. According to writer Roy Scranton, there is a need to redefine the concept of humanity and the rules that govern it.⁸⁰¹ Poet and naturalist Diane Ackerman echoes these thoughts by pointing out the levels to which we strive to separate ourselves from nature.⁸⁰²

The manifestation of animals in cities is identified as either common or unlawful. Even thinkers who are supportive towards non-human animals often describe these places as ‘beastly places’,⁸⁰³ mainly to differentiate them from human behavior; nonetheless, it is notable that even such labels reveals a level of superiority. Given these inherent biases, it is important to holistically view animals in cities. In regards to the feral, we should view the presence of these animals in cities less as an ‘embodiment of disorder’ but more as an ‘imagined order from an equally imaginary chaos’.⁸⁰⁴

Synurbic space is designed to syndicate people, animals, and nature in harmony while providing a basic understanding of animal lifestyles. This requires a change in mindset from

⁸⁰¹ Roy Scranton, *Learning to Die in the Anthropocene: Reflections on the End of a Civilization* (San Francisco, CA: City Lights Publishers, 2015).

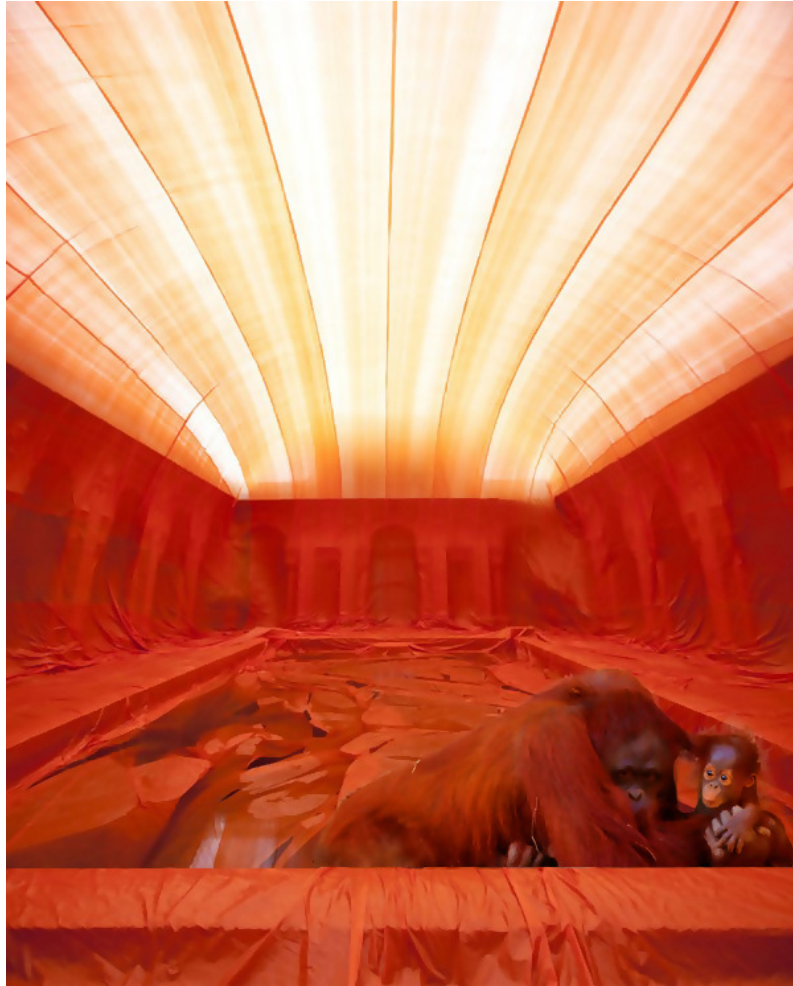
⁸⁰² Diane Ackerman, *The Human Age: The World Shaped by Us* (New York: WW Norton & Company, 2014).

⁸⁰³ Chris Philo and Chris Wilbert, “Animal Spaces, Beastly Places,” in *Animal Spaces, Beastly Places* (London: Routledge, 2004), 25.

⁸⁰⁴ Nigel Clark, “Wildlife: Ferality and the Frontier with Chaos,” in *Quicksands: Foundational Histories in Australia & Aotearoa New Zealand*, by Klaus Neumann and Hilary Ericksen (Sydney, Australia: UNSW Press, 1999), 152.

an anthropocentric one to one of coevolution.⁸⁰⁵ Before *re-naturalizing the city*, an awareness campaign needs to be setup for the residents so that they can show better behavior towards the animals introduced. This knowledge also creates an avenue for a reconsidering of many urban regulations. This not being limited to animal control practices, but also landscaping, green design, infrastructure, energy use, and pollution mitigation — basically all that may affect wildlife. Synurbic space also provides the chance for interaction between animals and humans and can provide the motivation needed to take political action necessary to protect animal habitats and rights. In order to transform synurbic space into a reality, humans would need to rethink their planning for urban spaces and incorporate elements that would allow for their non-human counterparts to thrive. Synurbic space differs from zoos as we know them in the nature and quality of interaction between humans and animals. In the latter, there is a separation that exists between humans and animals; one that is promoted partly by the architecture of the space. In the former, humans and animals are encouraged to interact in a space of mutual respect. Here animals are free to interact and are welcome to stay not forced. The interactions between humans and animals in this space are governed by principles of reciprocity, mutual observation, and expression. The concept of the synurbic space is meant to poke holes in our documented knowledge of animals. Do we have a comprehensive enough understanding of animal behavior, wants and needs to enable us create suitable enclosures for them to inhabit? Do we sufficiently understand what constitutes a quality life for the different animals? In this space, it is up for the animals to judge the extent of our understanding.

⁸⁰⁵ Froma Walsh, “Human-Animal Bonds I: The Relational Significance of Companion Animals,” *Family Process* 48, no. 4 (2009): 462–480.



Synurbic spaces are stewarded based on geographical and ecological rather than political borders. They are often green spaces that house a collection of floral and faunal diversity with corridors connecting them to other spaces. Attention must also be placed on the animals' adaptation strategies, and gaining political support for such a project. Ecological analysis should consider the permeability for urban animals to be properly included in the urban fabric. Better decisions need to be made regarding land-use, landscaping designs, and animal corridors so that they can mitigate stress, mortality rates, and exposure to predators. Synurbic spaces acclimate species to the topography, social composition and climate that are similar to their environments of origin. They have a 'let nature run its course' type of

management. Instead of constantly dictating the resources and interactions that the animals can enjoy, both flora and fauna are left to their own devices. The only responsibility we have is to ensure that the quality of resources surrounding space. Here, the death of animals is considered a natural phenomenon and their survival a system success. Synurbic space aims at creating viable urban animal populations. This is an interdisciplinary effort that will require the collaboration of experts in the different animal science disciplines. The main aim of the structural aspect of this space is to ensure adequate cover, adequate and accessible food resources, breeding habitats, proper waste management, technologies, and other conveniences that improve the animals' quality of life. Synurbic space shall, ideally, go against the grain of decreasing animal populations across the globe. It shall be the mirror through which we observe and evaluate our relationships with and knowledge of animals. It will help us evaluate our prowess in designing and building animal shelters that can accommodate the growing animal populations and their welfare by gauging the feedback given by observing animal behavior. This experimental space will work to improve the lives of animals through the introduction of technologies that believe that "nature and city are no longer opposites."⁸⁰⁶

Greener on the other side?

Both human and animal worlds are in a state of chaos. We lack inspiration of what the ideal ecologically sound and sustainable future should look like. To create such a vision, we need to see past the 'ifs and buts' and focus on the ideal scenario that we hope to achieve. Fred Polak, one of the founding fathers of Futures Studies, through his work,

⁸⁰⁶ Julian Schubert, Elena Schütz, and Leonard Streich, *Something Fantastic : A Manifesto by Three Young Architects on Worlds, People, Cities, and Houses*, 1st ed. (Berlin, Germany: Ruby Press, 2010): iii.

points out that to create an ideal vision of the future we need to first understand how our projections of the future ideals affect the overall outcome of our community.⁸⁰⁷ Positive projections result in positive outcomes, with the reverse holding true. With this in mind, he brings forth the argument that for us to achieve positive projections of the future, we need to first identify what is wrong with our present world.

“We need to understand our ailing visions in order to know what to reject and what to accept in them, but all our study is only a preliminary clearing of the decks for the great act of purposeful, responsible recreation of images of a still glorious future which beckons if we have but the wisdom, courage and strength to break through the present and lift the veil of the future.”⁸⁰⁸



Figure 30. Poster for the movie “Dawn of the Planet of the Apes”⁸⁰⁹

⁸⁰⁷ Fred L Polak, *The Image of the Future: Enlightening the Past, Orientating the Present, Forecasting the Future*, 1 (AW Sythoff, 1961).

⁸⁰⁸ Ibid: 367

⁸⁰⁹ Matt Reeves, *Dawn of the Planet of the Apes*, Drama/Thriller, 2014.

Currently, our perception of the future world is largely a construct of Hollywood.⁸¹⁰ In the majority of films, the future is presented to us as being in a state of ecological disarray with citizens of the earth on either side of the wealth extremes. Some films are thought to be warnings of what may come to pass. One common message, however, is the looming destruction of the natural aspects on the earth thanks to the doings of the human race. However well-intended these works are, could pushing the illusion that the future is only for anthropogenically engineered environments, be doing more harm than good? Could this display of a primarily human engineered future be as a result of our inability to overcome our need to dominate our surroundings?⁸¹¹ What is clear, is the narrow scope of these futuristic films that seem to be concentrated on “western hightech, white, heterosexual, patriarchal, militaristic, dark blandness where a small number of the rich and powerful men are in control. It is a view that misses out on the lushness of human and biological diversity and the joyful messiness of plurality and truly democratic systems of shared power.”⁸¹²

Our ability to see a future brighter than our current scenarios is dampened by constantly being presented with a grim future that is dominated by western technologies.⁸¹³ Projections of the future have thus far been centered on the perceived American world dominance.⁸¹⁴ We stand a chance at changing this narrative by identifying fault in the current

⁸¹⁰ Karen Hurley, “Daring to Envision Ecologically Sound and Socially Just Futures: An Interdisciplinary Exploration of Contemporary Film.” (PhD Thesis, University of Victoria, 2009).

⁸¹¹ Elise Boulding, *Cultures of Peace: The Hidden Side of History* (New York: Syracuse University Press, 2000).

⁸¹² Ibid: 3.

⁸¹³ Wheeler W Dixon, *Visions of the Apocalypse: Spectacles of Destruction in American Cinema* (New York: Wallflower Press, 2003).

⁸¹⁴ Ziauddin Sardar and Merryl Wyn Davies, *American Terminator: Myths, Movies, and Global Power* (Newburyport, Massachusetts: Red Wheel Weiser, 2004).

projections of future times.⁸¹⁵ We need to create a vision within which the health and well-being of all that we share in the earth's resources is at the fore front, before any selfish or capitalistic intentions. Such a blue print does not necessarily mean the end of conflicts and the creation of a homogenous space. It simply provides for alternative, peaceful ways to deal with and accommodate such conflicts and diversities. To achieve this, we need to break free of the assumptions presented to us, a task made rather difficult due the constant perpetuation of a hegemonic future.⁸¹⁶

Future scenarios take the form of both literal and visual narratives, and are further exacerbated by the various scientific findings pointing out the loss of biodiversity. The detrimental changes that are witnessed today had in fact been predicted by scientists; predictions that fell on deaf ears. We, therefore, need to rebuild our visions for the future we hope to attain by working from a positive perspective and employing the empirical evidence gathered to support them. In order to envision a different, more sustainable future, we must wander past the boundaries of the current world as described by the different forms of media and experts.⁸¹⁷ We need to look beyond the doom and gloom painted for us in the form of a future devoid of nature and the diversity that comes with it. While the current projections of the future are meant to serve as warnings, they also portray a hopeless future.⁸¹⁸ There is an apparent need to change the narrative of the world's future from that

⁸¹⁵ Fred L Polak, *The Image of the Future: Enlightening the Past, Orientating the Present, Forecasting the Future*, 1 (AW Sythoff, 1961).

⁸¹⁶ Ivana Milojevic, *Educational Futures: Dominant and Contesting Visions* (London: Routledge, 2005).

⁸¹⁷ Elise Boulding, *Building a Global Civic Culture: Education for an Interdependent World* (New York: Syracuse University Press, 1990): 90.

⁸¹⁸ Anthony Reading, *Hope and Despair: How Perceptions of the Future Shape Human Behavior* (London: JHU Press, 2004).

of a damned world to one of hope and promise.⁸¹⁹



Figure 31. Still image of the metropolis from the animated film “Zootopia”⁸²⁰

Urban planning is taking over, often overshadowing the importance of rural development and ecological planning. This is a major contributor to the hyper-urban future that we have come to accept.⁸²¹ The perpetuation of this imagery is such that we tend to seek the built world for answers to present day problems before looking anywhere else; case in point the idea of taking advantage of vertical space for agricultural and zoo keeping purposes.⁸²² The looming result of such built solutions will be the reduction in biodiversity, the restriction of animals to indoor spaces and the transformation of agriculture from a pleasure driven activity to one that is profit driven. The dominant image of the perceived

⁸¹⁹ Krishan Kumar, “Aspects of the Western Utopian Tradition,” *History of the Human Sciences* 16, no. 1 (2003): 74.

⁸²⁰ Byron Howard and Rich Moore, *Zootopia*, Mystery/Crime, 2016.

⁸²¹ Kamin, Blair, “At Aqua and Other Projects, Jeanne Gang Offers Material Evidence for Her ‘rising Star’ Status,” *Chicago Tribune*, 2008.

⁸²² Stan Cox and David Van Tassel, “Vertical Farming’ doesn’t Stack up,” *Synthesis/Regeneration* 52, no. 4 (2010).

future is also one where the natural habitats of different animals, their ecosystems, and the resultant processes that sustain them are peculiarly absent giving the illusion that this is the desired outcome.⁸²³

Architectural representations have also seen the future perpetuated as one devoid of agricultural spaces, unaccommodating of diversity of any form, and dominated by technology.⁸²⁴ The repetition of this definition of the future leaves little room for envisioning an alternate, more encompassing world that is more tolerant of biodiversity. There is a need for more positive descriptions of our future world if we are indeed to achieve a sustainable future.⁸²⁵ Perhaps the difficulty we face in expressing an ecologically healthy future is because it necessitates us to articulate our wants and desires.⁸²⁶ Such expressions call for us to be more creative in our thinking, rather than hide behind empirical evidences. This is, however, a particularly difficult task for those in data dependent fields as well as those who are just simply cynical. This is where the architects come in. Such designers can light the way when it comes to creating an alternative future for the rest of us to probe and understand. They have the ability to look beyond the numbers and cynicism, to highlight that which seems to be working to create a peaceful, sustainable, and cohesive future. However, in our quest for positive images of the future, we need not bury our heads in the sand with regards to the destruction of our natural environments that is evidently going on around us. In the previous

⁸²³ Ivana Milojevic, *Educational Futures: Dominant and Contesting Visions* (London: Routledge, 2005): 5.

⁸²⁴ Karen Hurley, "Daring to Envision Ecologically Sound and Socially Just Futures: An Interdisciplinary Exploration of Contemporary Film." (PhD Thesis, University of Victoria, 2009).

⁸²⁵ Judith Nies, "The Black Mesa Syndrome," in *The Future of Nature: Writing on a Human Ecology from Orion Magazine*, ed. Barry Holstun Lopez (Minneapolis: Milkweed Editions, 2007).

⁸²⁶ Chris Maser, *Vision and Leadership in Sustainable Development*, vol. 6 (Boca Raton, FL: CRC Press, 1998).

chapters, we have been introduced to winged serpents, celebrity rhinos, mechanical beasts, sleepless predators, stuffed elephants, and a brown bear in the city. All of these possibilities here on earth, the question is who do we want to meet?

REFERENCES

- A. McNeely, Jeffrey. "Foreword." In *Wildlife Tourism: Impacts, Management and Planning*, by Karen Higginbottom. Champaign, IL: Common Ground Publishing, 2004.
- Aalders, Merel. "'There Is a Riddle Here': Uplift Fiction and the Question of the Animal," 2017.
- Abdel-Rahman, Nourhan H. "Alexandria's Cultural Landscapes: Historical Parks Between Originality and Deterioration." *WTT Transactions on The Built Environment* 170 (2017): 73–83.
- Acampora, Ralph. "Oikos and Domus: On Constructive Co-Habitation with Other Creatures." *Philosophy & Geography* 7, no. 2 (2004): 219–235.
- Acampora, Ralph R. *Metamorphoses of the Zoo: Animal Encounter after Noah*. Oxford, UK: Lexington Books, 2010.
- Ackerman, Diane. *The Human Age: The World Shaped by Us*. New York: WW Norton & Company, 2014.
- Agamben, Giorgio. *The Open: Man and Animal*. Palo Alto, CA: Stanford University Press, 2004.
- Aitken, R. J., E. Gordon, D. Harkiss, J. P. Twigg, P. Milne, Z. Jennings, and D. S. Irvine. "Relative Impact of Oxidative Stress on the Functional Competence and Genomic Integrity of Human Spermatozoa." *Biology of Reproduction* 59, no. 5 (November 1998): 1037–46.
- Akama, John S. "Western Environmental Values and Nature-Based Tourism in Kenya." *Tourism Management* 17, no. 8 (1996): 567–574.
- Alcamo, Joseph, Detlef Van Vuuren, Claudia Ringler, Jacqueline Alder, Elena Bennett, David Lodge, Toshihiko Masui, et al. "Methodology for Developing the MA Scenarios." *Carpenter, SR et Al.(2005), Ecosystems and Human Well-Being: Scenarios 2* (2005).
- Aldo, Leopold. *A Sand County Almanac: And Sketches Here and There*. Oxford, UK: Oxford University Press, 1949.
- Aldridge, Alan. *Consumption*. Cambridge, UK: Polity Press, 2003.
- Allan, John. *Berthold Lubetkin: Architecture and the Tradition of Progress*. London, UK: RIBA publications, 1992.
- Allen, Brandon. "Culturalistic Design: Design Approach to Create Products for Specific Cultural and Subcultural Groups." Auburn University, 2009.

- Allenby, Braden. *Reconstructing Earth: Technology and Environment in the Age of Humans*. Washington D.C.: Island Press, 2013.
- Allenby, Braden R, and Daniel Sarewitz. *The Techno-Human Condition*. Cambridge, MA: MIT press, 2011.
- Amsel-Arieli, Melody. "Cabinets of Curiosity (Wunderkammers)." *History Magazine* 13 (2012): 40–2.
- Andermann, Jens, and Arnold-de Simine, Silke. "Memory, Community and the New Museum." *Theory, Culture, & Society* 29, no. 1 (2012): 3–13.
- Anderson, Kay. "A Walk on the Wild Side: A Critical Geography of Domestication." *Progress in Human Geography* 21, no. 4 (1997): 463–485.
- . "Culture and Nature at the Adelaide Zoo: At the Frontiers of Human Geography." *Transactions of the Institute of British Geographers*, 1995, 275–294.
- Andrei, Mary Anne. "The Accidental Conservationist: William T. Hornaday, the Smithsonian Bison Expeditions and the US National Zoo." *Endeavour* 29, no. 3 (2005): 109–113.
- Andrzejewski, Roman, Joanna Babińska-Werka, Joanna Gliwicz, and J Goszczyński. "Synurbization Processes in Population of *Apodemus Agrarius*. I. Characteristics of Populations in an Urbanization Gradient." *Acta Theriologica* 23, no. 20 (1978): 341–358.
- Andy Martin. "For Whom the Bell Tolls: £20m 'Memo' Project Takes Shape on Dorset's Jurassic Coast." *Independent*, June 2012. <https://www.independent.co.uk/news/uk/this-britain/for-whom-the-bell-tolls-20m-memo-project-takes-shape-on-dorsets-jurassic-coast-7848566.html>.
- "Animal Attraction: Advertising at the Zoo," May 10, 2017. <http://adage.com/article/news/animal-attraction-advertising-zoo/112828/>.
- Argus, Cape. "When Game Parks Become Killing Fields." *Pressreader*, March 2017. <https://www.pressreader.com>.
- Arluke, Arnold. "Our Animals Ourselves." *Contexts* 9, no. 3 (2010): 34–39.
- Arnold, M. "Keine Angst Vor Wildnis." *Pro Natura Magazin* 1 (2005): 12–13.
- Ashley, M, M Wilson, O Pergams, D O'Dowd, S Gende, and J Brown. "Evolution Enlightened Management." *Biological Conservation* 11 (2003): 115–23.
- Ashley, Susan. "State Authority and the Public Sphere: Ideas on the Changing Role of the Museum as a Canadian Social Institution, 2005." *Museum and Society*, 2005, 5–17.

- Aspling, Fredrik, Oskar Juhlin, and Elisa Chiodo. "Smelling, Pulling, and Looking: Unpacking Similarities and Differences in Dog and Human City Life." In *Proceedings of the 12th International Conference on Advances in Computer Entertainment Technology*, 64. ACM, 2015.
- Atkins, Peter. *Animal Cities. Beastly Urban Cities*. Farnham, UK, & Burlington, VT: Ashgate Publishing, 2012.
- . *Animal Cities: Beastly Urban Histories*. London, UK: Routledge, 2016.
- Auerbach, Jeffrey. "Empire under Glass: The British Empire and the Crystal Palace, 1851–1911." In *Exhibiting the Empire*. Manchester, UK: Manchester University Press, 2017.
- Austin, April Louise. "Illustrating Animals for the Working Classes: The Penny Magazine (1832–1845)." *Anthrozoös* 23, no. 4 (2010): 365–382.
- Austin, Jeremy J, Julien Soubrier, Francisco J Prevosti, Luciano Prates, Valentina Trejo, Francisco Mena, and Alan Cooper. "The Origins of the Enigmatic Falkland Islands Wolf." *Nature Communications* 4 (2013): 1552.
- Autin, Whitney J, and John M Holbrook. "Is the Anthropocene an Issue of Stratigraphy or Pop Culture." *GSA Today* 22, no. 7 (2012): 60–61.
- Autio, Minna, Rebecca Collins, Stefan Wahlen, and Marika Anttila. "Consuming Nostalgia? The Appreciation of Authenticity in Local Food Production." *International Journal of Consumer Studies* 37, no. 5 (2013): 564–568.
- Avery, Mark. *A Message from Martha: The Extinction of the Passenger Pigeon and Its Relevance Today*. London, UK: A&C Black, 2014.
- B, G. *Theoretical Sensitivity*. Mill Valley, CA: Sociology Press, n.d.
- Bacon, Francis. *New Atlantis and the Great Instauration*. Hoboken, New Jersey: John Wiley & Sons, 2016.
- Bagstad, Kenneth J, and Ruscena Wiederholt. "Tourism Values for Mexican Free-Tailed Bat Viewing." *Human Dimensions of Wildlife* 18, no. 4 (2013): 307–311.
- Baker, Philip J, Claire V Dowding, Susie E Molony, Piran CL White, and Stephen Harris. "Activity Patterns of Urban Red Foxes (*Vulpes Vulpes*) Reduce the Risk of Traffic-Induced Mortality." *Behavioral Ecology* 18, no. 4 (2007): 716–724.
- Bakshi, Anita. "Responding to Emotional Aspects of Environmental Loss: Implications for Landscape Architecture Theory and Practice." *Landscape Research Record*, no. 7 (2018).

- Baldwin, Peter C. *Domesticating the Street: The Reform of Public Space in Hartford, 1850-1930*. Columbus, OH: Ohio State University Press, 1999.
- Banks, Peter B, and Dieter F Hochuli. "Extinction, de-Extinction and Conservation: A Dangerous Mix of Ideas." *Australian Zoologist* 38, no. 3 (2017): 390–394.
- Baratay, Eric, and Elisabeth Hardouin-Fugier. *Zoo: A History of Zoological Gardens in the West*. London, UK: Reaktion Books, 2004.
- "Bärengraben." Atlas Obscura. Accessed March 1, 2019.
<https://www.atlasobscura.com/places/barengaben>.
- Barnes, Trevor, and James Duncan. "Writing Worlds: Discourse." *Text and Metaphor in the Representation of Landscape*, 1992.
- Barone, M, M Roelke, J Howard, J Brown, A Anderson, and D Wildt. "Reproductive Characteristics of Male Florida Panthers: Comparative Studies from Florida, Texas, Colorado, Latin America and North American Zoos." *Journal of Mammology* 75 (1994): 150–62.
- Barrat, E, R Deaville, T Burland, M Bruford, G Jones, and P Racey. "DNA Answers the Call of Pipistrelle Bat Species." *Nature* 387 (n.d.): 138–39.
- Barron, Patrick. "Introduction: At the Edge of the Pale." In *Terrain Vague*, 15–37. London, UK: Routledge, 2013.
- Barua, Maan. "Bio-Geo-Graphy: Landscape, Dwelling, and the Political Ecology of Human-Elephant Relations." *Environment and Planning D: Society and Space* 32, no. 5 (January 1, 2014): 915–34.
- Bauer, Johannes, and Alexander Herr. "Hunting and Fishing Tourism." In *Wildlife Tourism: Impacts, Management and Planning*, 57–77. Altona: Common Ground Publishing, 2004.
- Bauer, Johannes J, and Jack Giles. "Recreational Hunting: An International Perspective." WILDLIFE TOURISM RESEARCH REPORT SERIES: Status Assessment of Wildlife Tourism in Australia Series. CRC for sustainable tourism Gold Coast, Queensland, Australia, 2002.
- Bauer, Nicole, Astrid Wallner, and Marcel Hunziker. "The Change of European Landscapes: Human-Nature Relationships, Public Attitudes towards Rewilding, and the Implications for Landscape Management in Switzerland." *Journal of Environmental Management* 90, no. 9 (July 2009): 2910–20.
- Bauers, Sandy. "Philadelphia Zoo's Big Cat Crossing Gets a Test Run." philly.com, 2014.
http://www.clrdesign.com/pr_pdfs/Philadelphia_Zoo_Big_Cat_Crossing.pdf.

- Baxter, Pamela, and Susan Jack. "Qualitative Case Study Methodology: Study Design and Implementation for Novice Researchers." *The Qualitative Report* 13, no. 4 (December 1, 2008): 544–59.
- Bayma, Todd. "Rational Myth Making and Environment Shaping: The Transformation of the Zoo." *The Sociological Quarterly* 53, no. 1 (2012): 116–141.
- Bear, Christopher, and Sally Eden. "Thinking like a Fish? Engaging with Nonhuman Difference through Recreational Angling." *Environment and Planning D: Society and Space* 29, no. 2 (January 1, 2011): 336–52.
- Beardsworth, Alan, and Alan Bryman. "The Wild Animal in Late Modernity: The Case of the Disneyization of Zoos." *Tourist Studies* 1, no. 1 (June 1, 2001): 83–104.
- Beatley, Timothy. "Biophilic Cities: What Are They?" In *Biophilic Cities*, 45–81. Berlin, Germany: Springer, 2011.
- Beatley, Timothy, and Marc Bekoff. "City Planning and Animals: Expanding Our Urban Compassion Footprint." In *Ethics, Design and Planning of the Built Environment*, 185–195. Berlin, Germany: Springer, 2013.
- Beatley, Timothy, and Peter Newman. *Green Urbanism down Under*. Washington D.C.: Island Press, 2009.
- Bekoff, Marc. *Ignoring Nature No More: The Case for Compassionate Conservation*. Chicago, IL: University of Chicago Press, 2013.
- . *Rewilding Our Hearts*. Novato, CA: New World Library, 2013.
- . *The Animal Manifesto: Six Reasons for Expanding Our Compassion Footprint*. Novato, CA: New World Library, 2010.
- Benbow, Mary P. "Death and Dying at the Zoo." *The Journal of Popular Culture* 37, no. 3 (2004): 379–398.
- Benford, G. "Saving the 'Library of Life.'" *Proceedings of the National Academy of Sciences* 89, no. 22 (November 15, 1992): 11098–101.
- Bennet, T. *The Birth of the Museum: History, Theory, Politics*. London, UK: Routledge, 1995.
- Bennett, Tony. "The Exhibitionary Complex." *New Formations* 4 (1988): 97.
- Berche, Patrick. "The Threat of Smallpox and Bioterrorism." *Trends in Microbiology* 9, no. 1 (2001): 15–18.
- Berger, Alan. "Drosscape." *The Landscape Urbanism Reader*, 2006, 197–217.

- Berger, John. *Why Look at Animals?* London, UK: Penguin, 2009.
- Beston, Henry. *The Outermost House: A Year of Life on the Great Beach of Cape Cod*. New York: Henry Holt and Company, 2003.
- Bils, Jeffrey, and Stacey Singer. "Gorilla Saves Tot in Brookfield Zoo Ape Pit." *Chicago Tribune* 17 (1996): 1.
- Bingham, Nick. "Object-Ions: From Technological Determinism towards Geographies of Relations." *Environment and Planning D: Society and Space* 14, no. 6 (1996): 635–657.
- Birch, Thomas H. "The Incarceration of Wildness: Wilderness Areas as Prisons." *Environmental Ethics* 12, no. 1 (1990): 3–26.
- Birke, Lynda. "Who—or What—Is the Laboratory Rat (and Mouse)." *Society and Animals* 11, no. 3 (2003): 207–24.
- Birke, Lynda, and Ruth Hubbard. *Reinventing Biology: Respect for Life and the Creation of Knowledge*. Washington D.C.: Georgetown University Press, 1995.
- Bitgood, Stephen, Donald Patterson, and Arlene Benefield. "Exhibit Design and Visitor Behavior: Empirical Relationships." *Environment and Behavior* 20, no. 4 (1988): 474–491.
- Blockstein, David E. "We Can't Bring Back the Passenger Pigeon: The Ethics of Deception around de-Extinction." *Ethics, Policy & Environment* 20, no. 1 (2017): 33–37.
- Boesch, Christophe. "What Makes Us Human (Homo Sapiens)? The Challenge of Cognitive Cross-Species Comparison." *Journal of Comparative Psychology* 121, no. 3 (2007): 227.
- Boonman-Berson, Susan, Esther Turnhout, and Michael Carolan. "Common Sensing: Human-Black Bear Cohabitation Practices in Colorado." *Geoforum* 74 (2016): 192–201.
- Booth, Eric G, Jiangxiao Qiu, Stephen R Carpenter, Jason Schatz, Xi Chen, Christopher J Kucharik, Steven P Loheide II, Melissa M Motew, Jenny M Seifert, and Monica G Turner. "From Qualitative to Quantitative Environmental Scenarios: Translating Storylines into Biophysical Modeling Inputs at the Watershed Scale." *Environmental Modelling & Software* 85 (2016): 80–97.
- Bottrill, Madeleine C, Liana N Joseph, Josie Carwardine, Michael Bode, Carly Cook, Edward T Game, Hedley Grantham, et al. "Finite Conservation Funds Mean Triage Is Unavoidable." *Trends in Ecology & Evolution* 24, no. 4 (2009): 183–184.
- Boulding, Elise. *Building a Global Civic Culture: Education for an Interdependent World*. New York: Syracuse University Press, 1990.

- . *Cultures of Peace: The Hidden Side of History*. New York: Syracuse University Press, 2000.
- Bousé, Derek. “False Intimacy: Close-Ups and Viewer Involvement in Wildlife Films.” *Visual Studies* 18, no. 2 (2003): 123–132.
- Bovenkerk, Bernice, and FWJ Keulartz. *Animal Ethics in the Age of Humans*. Vol. 23. Berlin, Germany: Springer, 2016.
- Bowker, Geoffrey C, and Susan Leigh Star. *Sorting Things out: Classification and Its Consequences*. Cambridge, MA: MIT press, 1999.
- Bowkett, Andrew E. “Recent Captive-Breeding Proposals and the Return of the Ark Concept to Global Species Conservation.” *Conservation Biology* 23, no. 3 (June 1, 2009): 773–76.
- Boyko, Christopher T, Mark R Gaterell, Austin RG Barber, Julie Brown, John R Bryson, David Butler, Silvio Caputo, et al. “Benchmarking Sustainability in Cities: The Role of Indicators and Future Scenarios.” *Global Environmental Change* 22, no. 1 (2012): 245–254.
- Brace, Catherine. “Landscape and Identity.” *Studying Cultural Landscapes*, 2003, 121–140.
- Bradbury, Roger. “A World Without Coral Reefs.” *The New York Times*, July 13, 2012. <http://www.nytimes.com/2012/07/14/opinion/a-world-without-coral-reefs.html>.
- Brand, Stewart. “The Case for de-Extinction: Why We Should Bring Back the Woolly Mammoth.” *Yale Environment* 360 (2014).
- Brandt, Patric, David J Abson, Dominick A DellaSala, Robert Feller, and Henrik von Wehrden. “Multifunctionality and Biodiversity: Ecosystem Services in Temperate Rainforests of the Pacific Northwest, USA.” *Biological Conservation* 169 (2014): 362–371.
- Braun, Bruce. “Environmental Issues: Writing a More-than-Human Urban Geography.” *Progress in Human Geography* 29, no. 5 (2005): 635–650.
- Brause, Caryn, and Carey Clouse. “The Ark: Grafting Productive Programs onto Contemporary Waste-Space,” 2014.
- Braverman, Irus. “Looking at Zoos.” *Cultural Studies* 25, no. 6 (November 1, 2011): 809–42.
- . *Zooland: The Institution of Captivity*. Palo Alto, CA: Stanford Law Books, 2013.
- . “Zootopia: Utopia and Dystopia in the Zoological Garden.” SSRN Scholarly Paper. Rochester, NY: Social Science Research Network, November 30, 2011.

- Brenneisen, Stephan. "Space for Urban Wildlife: Designing Green Roofs as Habitats in Switzerland." *Urban Habitats* 4 (2006).
- Briggs, John C. "Coral Reefs: Conserving the Evolutionary Sources." *Biological Conservation* 126, no. 3 (2005): 297–305.
- Brock, T. "Wildlife Tourism: A Visitor Attraction's Perspective. Presentation to 'It's Wild! People, Nature and Tourism in Scotland.'" 2002. www.greentourism.org.uk/prog.html.
- Brooks, David. "Journalists and Others for Saving the Planet." *Wall Street Journal*, 1989.
- Brown, Janine L., Frank Göritz, Nancy Pratt-Hawkes, Robert Hermes, Marie Galloway, Laura H. Graham, Charlie Gray, et al. "Successful Artificial Insemination of an Asian Elephant at the National Zoological Park." *Zoo Biology* 23, no. 1 (February 1, 2004): 45–63.
- Buller, Henry. "Animal Geographies." *Progress in Human Geography* 38, no. 2 (2013): 308–18.
- . "Reconfiguring Wild Spaces: The Porous Boundaries of Wild Animal Geographies." London, UK: Routledge, 2014.
- Bunderson, J. Stuart, and Jeffery A. Thompson. "The Call of the Wild: Zookeepers, Callings, and the Double-Edged Sword of Deeply Meaningful Work." *Administrative Science Quarterly* 54, no. 1 (March 1, 2009): 32–57.
- Burgess, Matt. "Where Are the Human Clones? 20 Years since Dolly Was Unveiled We Look at the Future of Cloning." *Wired*, March 2017.
<http://www.wired.co.uk/article/human-cloning-technology-dolly-sheep>.
- Burgin, Shelley, and Daniel Lunney. *Urban Wildlife: An Emerging Discipline*. Sydney, Australia: Royal Zoological Society of New South Wales, 2004.
- Burnam-Fink, Michael. "Creating Narrative Scenarios: Science Fiction Prototyping at Emerge." *Futures* 70 (2015): 48–55.
- Burney, D. "Madagascar's Prehistoric Ecosystems." In *The Natural History of Madagascar*. Chicago, IL: University of Chicago Press, n.d.
- Burney, D, D Steadman, and P Martin. "Evolution's Second Chance: Forward-Thinking Paleo-Ecologists Advocate Jump-Starting Diminishing Biodiversity." *Wild Earth* 12 (2009): 12–15.
- Burns, Georgette Leah. "Animals as Tourism Objects: Ethically Refocusing Relationships between Tourists and Wildlife." *Animals and Tourism: Understanding Diverse Relationships* 67 (2015): 44.

- Burt, Jonathan. *Rat*. London, UK: Reaktion Books, 2006.
- Burton, RS, CK Ellison, and JS Harrison. "The Sorry State of F2 Hybrids: Consequences of Rapid Mitochondrial DNA Evolution in Allopatric Populations." *The American Naturalist* 168, no. S6 (2006): S14–S24.
- Büscher, Bram E. "Conservation, Neoliberalism, and Social Science: A Critical Reflection on the SCB 2007 Annual Meeting in South Africa." *Conservation Biology* 22, no. 2 (April 1, 2008): 229–31.
- Butler, James, W Suadnya, K Puspadi, Y Sutaryono, RM Wise, TD Skewes, D Kirono, et al. "Framing the Application of Adaptation Pathways for Rural Livelihoods and Global Change in Eastern Indonesian Islands." *Global Environmental Change* 28 (2014): 368–382.
- Butler, Tom. *Overdevelopment, Overpopulation, Overshoot*. Novato, California: Goff Books, 2015.
- Byron Howard, and Rich Moore. *Zootopia*. Mystery/Crime, 2016.
- Cafaro, Philip. "Three Ways to Think about the Sixth Mass Extinction." *Biological Conservation* 192 (2015): 387–393.
- Cafaro, Philip, and Richard Primack. "Species Extinction Is a Great Moral Wrong." *Biological Conservation* 170 (2014): 1–2.
- Callaway, Ewen. "Dolly at 20: The inside Story on the World's Most Famous Sheep." *Nature News* 534, no. 7609 (2016): 604.
- Callenbach, E. *Ecotopia*. New York: Random House Publishing Group, 2009.
- Callicott, J Baird, and William Grove-Fanning. "Should Endangered Species Have Standing? Toward Legal Rights for Listed Species." *Social Philosophy and Policy* 26, no. 2 (2009): 317–352.
- Campbell, K. H., J. McWhir, W. A. Ritchie, and I. Wilmut. "Sheep Cloned by Nuclear Transfer from a Cultured Cell Line." *Nature* 380, no. 6569 (March 7, 1996): 64–66.
- Campbell, Michael O'Neal. "An Animal Geography of Avian Ecology in Glasgow." *Applied Geography* 27, no. 2 (2007): 78–88.
- Capecchi, Christina, and Katie Rogers. "Killer of Cecil the Lion Finds out That He Is a Target Now, of Internet Vigilantism." *New York Times*. [Http://Www. Nytimes. Com/2015/07/30/Us/Cecil-the-Lion-Walter-Palmer. Html](http://www.nytimes.com/2015/07/30/Us/Cecil-the-Lion-Walter-Palmer.html), 2015.
- Capps, Donald. "Melancholia, Utopia, and the Psychoanalysis of Dreams." *The Blackwell Companion to Sociology of Religion*, 2001, 96.

- Carlin, Norman F, Ilan Wurman, and Tamara Zakim. "How to Permit Your Mammoth: Some Legal Implications of de-Extinction." *Stan. Envtl. LJ* 33 (2013): 3.
- Carlstead, Kathy, and David Shepherdson. "Alleviating Stress in Zoo Animals with Environmental Enrichment." In *The Biology of Animal Stress: Basic Principles and Implications for Animal Welfare.*, edited by G. P. Moberg and J. A. Mench, 337–54. Wallingford, UK: CABI, 2000.
- Carpenter, Stephen, Eric Booth, Sean Gillon, Christopher Kucharik, Steven Loheide, Amber Mase, Melissa Motew, et al. "Plausible Futures of a Social-Ecological System: Yahara Watershed, Wisconsin, USA." *Ecology and Society* 20, no. 2 (2015).
- Carr, Neil. "An Analysis of Zoo Visitors' Favourite and Least Favourite Animals." *Tourism Management Perspectives Complete*, no. 20 (2016): 70–76.
- Castro, Freddy Winston. "Andrew Abbott: Chaos of Disciplines." *Acta Sociologica* 44, no. 3 (2001): 277–279.
- Cavaliere, Paola, and Peter Singer. *The Great Ape Project: Equality beyond Humanity*. London, UK: Macmillan, 1993.
- "Certify to Show Your Commitment to Wildlife." Non-profit organization. The National Wildlife Federation, September 14, 2018. <https://www.nwf.org/certify>.
- Chakrabarty, Dipesh. "The Climate of History: Four Theses." *Critical Inquiry* 35, no. 2 (2009): 197–222.
- Chapin Iii, F Stuart, Erika S Zavaleta, Valerie T Eviner, Rosamond L Naylor, Peter M Vitousek, Heather L Reynolds, David U Hooper, et al. "Consequences of Changing Biodiversity." *Nature* 405, no. 6783 (2000): 234.
- Charman, Isobel. *The Zoo: The Wild and Wonderful Tale of the Founding of London Zoo: 1826-1851*. New York: Pegasus Books, 2017.
- Chavatte-Palmera, Pascale, S Camousa, H Jammesa, N Le Cleac'ha, M Guillomota, and RSF Leed. "Placental Perturbations Induce the Developmental Abnormalities Often Observed in Bovine Somatic Cell Nuclear Transfer." *Placenta* 33 (2012): 599.
- Cheney, Jim. "Postmodern Environmental Ethics: Ethics of Bioregional Narrative." In *Postmodern Environmental Ethics*, edited by Max Oelschlaeger, 11:23–42. Albany, NY: State University of New York Press, 1995.
- Cherfas, Jeremy. "A Look beyond the Bars." London: British Broadcasting Corporation, n.d.

———. *Zoo 2000: A Look beyond the Bars*. London, UK: British Broadcasting Corporation, 1984.

Chiszar, D. “For Zoos.” *The Psychological Record* 40, no. 1 (1990): 3–13.

Chiutsi, Simon, Memory Mukoroverwa, Pauline Karigambe, and Boycen Kumira Mudzengi. “The Theory and Practice of Ecotourism in Southern Africa.” *Journal of Hospitality Management and Tourism* 2, no. 2 (2011): 14–21.

Christoffersen, Martin Lindsey, Joaquim Olinto Branco, and Maria Heloisa Beatriz Cardoso. “Regional Zoos in Brazil and Their Specific Role for Environmental Education.” *Herald Journal of Education and General Studies* 2, no. 3 (2013): 97–106.

Chrulew, Mathew. “Animals as Biopolitical Subjects.” *Foucault and Animals*, 2016, 222–239.

Churchman, David. “The Educational Impact of Zoos and Museums: A Review of the Literature.” American Psychological Association, Los Angeles, CA, August 1985.

Cignini, B., and R. Zapparoli. “Rome.” In *Birds in European Cities*, by John G Kelcey and Goetz Rheinwald, 243–278. Ginsterhahn, Germany: Ginster Verlag, 2005.

Cimon-Morin, Jérôme, Marcel Darveau, and Monique Poulin. “Fostering Synergies between Ecosystem Services and Biodiversity in Conservation Planning: A Review.” *Biological Conservation* 166 (2013): 144–154.

Cincotta, Richard P, and Larry J Gorenflo. *Human Population: Its Influences on Biological Diversity*. Vol. 214. Berlin, Germany: Springer Science & Business Media, 2011.

“City of Bears,” February 17, 2019. <https://www.bern.com/en/detail/city-of-bears>.

Clark, N. “Wildlife: Fertility and the Frontier with Chaos.” In *Quicksands: Foundational Histories in Australia & Aotearoa New Zealand*, by Klaus Neumann and Hilary Ericksen, 133–52. Sydney, Australia: UNSW Press, 1999.

Clarke, A. G. “The Frozen Ark Project: The Role of Zoos and Aquariums in Preserving the Genetic Material of Threatened Animals.” *International Zoo Yearbook* 43, no. 1 (January 1, 2009): 222–30.

Cloke, Paul, and Owain Jones. “‘Unclaimed Territory’: Childhood and Disordered Space (S).” *Social & Cultural Geography* 6, no. 3 (2005): 311–333.

Cockell, Charles S. “The Rights of Microbes.” *Interdisciplinary Science Reviews* 29, no. 2 (2004): 141–150.

- Coe, Jon. "Design and Architecture: Third Generation Conservation, Post." New York, 2012.
- . "Giving Laboratory Animals Choices." *Lab Animal* 2 (1995): 41–42.
- . "Immersion Design." Jon Coe Design, September 5, 2018. http://www.joncoedesign.com/trends/exhibit_trends.htm#immersion.
- . "Mixed Species Rotation Exhibits." NZ, 2004.
- . "Steering the Ark toward Eden: Design for Animal Well-Being." *Journal of the American Veterinary Medical Association* 223, no. 7 (2003): 977–80.
- Coe, Jon, and R Mendez. "The Unzoo Alternative," 2005.
- Cohen, Jon. *Almost Chimpanzee: Redrawing the Lines That Separate Us from Them*. London, UK: Macmillan, 2010.
- Cohen, Shlomo. "The Ethics of De-Extinction." *NanoEthics* 8, no. 2 (2014): 165–178.
- Cohn, J.P. "Decisions at the Zoo." *Bioscience* 42, no. 9 (1992): 654–59.
- Cohn, Neil. "Visual Narrative Structure." *Cognitive Science* 37, no. 3 (2013): 413–452.
- Colebrook, Claire. *Death of the PostHuman: Essays on Extinction, Vol. 1*. London, UK: Open Humanities Press, 2014.
- Collective, T.H. (Ed.). *Animals in the Anthropocene*. Sydney, Australia: Sydney University Press, n.d.
- Collective, University of Sydney Human Animal Research Network Editorial, F. Chiew, and Sydney University Press. *Animals in the Anthropocene: Critical Perspectives on Non-Human Futures*. Animal Publics. Sydney, Australia: Sydney University Press, 2015.
- Colléony, Agathe, Léo Martin, Nicolas Misdariis, Susan Clayton, Michel Saint Jalme, and Anne-Caroline Prévot. "Exoticism as a Mediator of Everyday Experiences of Nature: An Anthropological Exploration of Soundscape in Zoos." *Human Ecology* 45, no. 5 (2017): 673–682.
- Colley, Ann C. *Wild Animal Skins in Victorian Britain: Zoos, Collections, Portraits, and Maps*. London, UK: Routledge, 2016.
- Colodner, Debra, and Craig Ivanyi. "The Arizona-Sonora Desert Museum: A Model Regional Biopark." In *The Ark and Beyond: The Evolution of Zoo and Aquarium Conservation*, by George Rabb, 322–26. Chicago, IL: University of Chicago Press, 2018.

“Conservation in the Anthropocene - Beyond Solitude and Fragility,” May 10, 2017.
<https://thebreakthrough.org/index.php/journal/past-issues/issue-2/conservation-in-the-anthropocene>.

Conway, William. “The Species Survival Plan and the Conference on Reproductive Strategies for Endangered Wildlife.” *Zoo Biology* 4, no. 3 (January 1, 1985): 219–23.

Cooper, Margaret E, and others. *An Introduction to Animal Law*. Cambridge, MA: Academic Press Limited, 1987.

Copeland, Marion. *Cockroach*. London, UK: Reaktion Books, 2003.

Corlett, Richard T. “The Anthropocene Concept in Ecology and Conservation.” *Trends in Ecology & Evolution* 30, no. 1 (January 2015): 36–41.

Corner, James. *Terra Fluxus. The Landscape Urbanism Reader (Charles Waldheim Ed.)*. New York: Princeton Architectural Press, 2005.

Cosgrove, Denis, and Stephen Daniels. “The Iconography of Landscape: Essays on the Symbolic Representation, Design and Use of Past Environments.” *Cambridge Studies in Historical Geography* 9 (1988).

Cosgrove, Denis E. *Social Formation and Symbolic Landscape*. Madison, WI: University of Wisconsin Press, 1998.

Cosntanza, Robert, Lisa J. Graumlich, and Will Steffen. *Sustainability or Collapse? An Integrated History and Future of People on Earth*. Cambridge, MA: MIT Press, 2007.

Costello, Mark J., Robert M. May, and Nigel E. Stork. “Can We Name Earth’s Species Before They Go Extinct?” *Science* 339, no. 6118 (January 25, 2013): 413–16.

Cox, Stan, and David Van Tassel. “Vertical Farming’doesn’t Stack up.” *Synthesis/Regeneration* 52, no. 4 (2010).

Crandall, L.S. *Management of Wild Animals in Captivity*. Chicago, IL: University of Chicago Press, 1964.

Creed, Barbara. “Apes and Elephants: In Search of Sensation in the Tropical Imaginary.” *ETropic: Electronic Journal of Studies in the Tropics* 12, no. 2 (2016).

———. *Stray: Human-Animal Ethics in the Anthropocene*. Sydney, Australia: Power Publications, 2017.

Cressey, Daniel. “Ecotourism Rise Hits Whales.” *Nature* 512, no. 7515 (2014): 358.

“Critics Question China’s Worldwide Panda Profit.” *The Age*, April 5, 2003.

Croke, Vicki. *The Modern Ark: The Story of Zoos: Past, Present, and Future*. New York: Simon and Schuster, 2014.

Cronon, William. "The Trouble with Wilderness: Or, Getting Back to the Wrong Nature." In *Uncommon Ground: Rethinking the Human Place in Nature*. New York: Norton, 1996.

———. *Uncommon Ground: Rethinking the Human Place in Nature*. New York: WW Norton & Company, 1996.

Cronon, William, and others. *Uncommon Ground: Toward Reinventing Nature*. Vol. 95. New York: Norton, 1995.

Crutzen, Paul J. "Geology of Mankind." *Nature* 415, no. 6867 (January 3, 2002): 23.

Crutzen, Paul J., and Stoermer, E.F. "The Anthropocene." *Global Change Newsletter* 41 (2000): 17–18.

Crutzen, Paul, Jan Zalaseiwicz, Mark Williams, and Will Steffen. "The New World of the Anthropocene." *Environmental Science and Technology* 44, no. 7 (2010): 2228–31.

Csuti, Blair, Eva L Sargent, and Ursula S Bechert. *The Elephant's Foot: Prevention and Care of Foot Conditions in Captive Asian and African Elephants*. Hoboken, New Jersey: John Wiley & Sons, 2008.

Cunningham, A.A. "Disease Risks of Wildlife Translocations." *Conservation Biology* 10 (1996): 349–53.

"CURITIBA DECLARATION On Cities and Biodiversity." Curitiba, Brazil, March 26, 2007.

Dagg, Anne Innis. *Giraffe: Biology, Behaviour and Conservation*. Cambridge, UK: Cambridge University Press, 2014.

Daniels, Christopher Brian, and others. *A Guide to Urban Wildlife: 250 Creatures You Meet on Your Street*. Sydney, Australia: ABC Books, 2011.

Darnell, Eric, and Tom Mcgrath. *Madagascar*, 2005.

Darwin, Charles. *The Descent of Man and Selection in Relation to Sex*. Vol. 1. London, UK: Murray, 1888.

Daston, Lorraine, Gregg Mitman, and others. *Thinking with Animals: New Perspectives on Anthropomorphism*. New York: Columbia University Press, 2005.

Dator, Jim. "13 Assuming 'Responsibility for Our Rose.'" *Environmental Values in a Globalizing World: Nature, Justice and Governance*, 2004, 215.

- . *Advancing Futures: Futures Studies in Higher Education*. Westport, CT: Greenwood Publishing Group, 2002.
- . “Alternative Futures at the Manoa School.” *Journal of Futures Studies* 14, no. 2 (2009): 1–18.
- . “Alternative Futures in Architecture.” In *The Routledge Companion for Architecture Design and Practice: Established and Emerging Trends*, by Mitra Kanaani and Dak Kopec. London, UK: Routledge, 2015.
- . “Researching Futures of X,” March 2018.
- . “What Futures Studies Is, and Is Not.” In *The Knowledge Base of Futures Studies*, by Richard Slaughter, Foreword. 3 Vols. Hawthorn, Australia: DDM Media Group, 1996.
- David Brendan Hall. *Austin Bats at the South Congress Bridge*. 2018.
- Davidai, Noa, John K Westbrook, Jean-Philippe Lessard, Thomas G Hallam, and Gary F McCracken. “The Importance of Natural Habitats to Brazilian Free-Tailed Bats in Intensive Agricultural Landscapes in the Winter Garden Region of Texas, United States.” *Biological Conservation* 190 (2015): 107–114.
- Davies, Gail. “Networks of Nature: Stories of Natural History Film-Making at the BBC.” PhD Thesis, UCL, 1998.
- . “Science, Observation and Entertainment: Competing Visions of Postwar British Natural History Television, 1946-1967.” *Ecumene* 7, no. 4 (2000): 432–460.
- Davis, Susan G. *Spectacular Nature: Corporate Culture and the Sea World Experience*. Berkeley, CA: University of California Press, 1997.
- Davison, Aidan, and Ben Ridder. “Turbulent Times for Urban Nature: Conserving and Re-Inventing Nature in Australian Cities.” *Australian Zoologist* 33, no. 3 (2006): 306–314.
- Deffeyes, Kenneth. *Beyond Oil: The View from Hubbert’s Peak*. New York: Hill and Wang, 2005.
- Deleuze, Gilles, and Felix Guattari. *A Thousand Plateaus*. Translated by Brian Massumi. Minneapolis: University of Minnesota Press, 1987.
- Deliège, Glenn, and Stijn Neuteleers. “Ecosystem Services as an Argument for Biodiversity Preservation: Why Its Strength Is Its Problem-Reply to Cimon-Morin et Al.” *Biological Conservation* 172 (2014).

- Delord, Julien. "Can We Really Re-Create an Extinct Species by Cloning? A Metaphysical Analysis." In *The Ethics of Animal Re-Creation and Modification*, 22–39. Berlin, Germany: Springer, 2014.
- Dempsey, Jessica. "Tracking Grizzly Bears in British Columbia's Environmental Politics." *Environment and Planning A: Economy and Space* 42, no. 5 (May 1, 2010): 1138–56.
- Derrida, Jacques. *The Animal That Therefore I Am*. New York: Fordham University Press, 2008.
- Desmond, Morris. *The Human Zoo*. New York: Random House, 2009.
- Di Minin, Enrico, Nigel Leader-Williams, and Corey JA Bradshaw. "Banning Trophy Hunting Will Exacerbate Biodiversity Loss." *Trends in Ecology & Evolution* 31, no. 2 (2016): 99–102.
- Diamond, Jared. *Collapse: How Societies Choose to Fail or Succeed*. New York: Penguin, 2005.
- . "Overview of Recent Extinctions." In *Conservation for the Twenty First Century*, by David Western and M Coautor Pearl, 37–41. OXFORD UNIVERSITY PRESS, 1989.
- Dick, P.K. *Do Androids Dream of Electric Sheep?* SF Masterworks. London, UK: Gollancz, 2010.
- Dickson, Barney, Jonathan Hutton, and William A Adams. *Recreational Hunting, Conservation and Rural Livelihoods: Science and Practice*. Hoboken, New Jersey: John Wiley & Sons, 2009.
- Dilworth, Craig. *Too Smart for Our Own Good: The Ecological Predicament of Humankind*. Cambridge, UK: Cambridge University Press, 2010.
- Ditchkoff, Stephen S, Sarah T Saalfeld, and Charles J Gibson. "Animal Behavior in Urban Ecosystems: Modifications Due to Human-Induced Stress." *Urban Ecosystems* 9, no. 1 (2006): 5–12.
- Dixon, Wheeler W. *Visions of the Apocalypse: Spectacles of Destruction in American Cinema*. New York: Wallflower Press, 2003.
- Djoghlaif, Ahmed. "Convention on Biological Diversity." Curitiba, Brazil, 2007.
- Dmitry, Orlov. "Thriving in the Age of Collapse and Post-Soviet Lessons for a Post-American Century." <http://www.lifeafterpeakoil.com/BreakingNews.htm>, 2009.
- Dodington, Edward M. *How to Design with the Animal: Lessons in Cross-Species Architecture and Design*. Houston, TX: Animal Architecture Press, 2013.

———. “The Expanded Environment,” September 7, 2018.
<http://www.expandedenvironment.org>.

Donahue, J, and E Trump. *The Politics of Zoos Exotic Animals and Their Protectors*. DeKalb, IL: Northern Illinois University Press, 2006.

Donaldson, Sue, and Will Kymlicka. *Zoopolis: A Political Theory of Animal Rights: An Overview*. Oxford, UK: Oxford University Press, 2015.

Dooren, Thom van, Garry Marvin, and Susan McHugh. *Routledge Handbook of Human-Animal Studies*. London: Routledge, 2014.

Dooren, Thom van, and Deborah Bird Rose. “Keeping Faith with the Dead: Mourning and de-Extinction.” *Australian Zoologist* 38, no. 3 (2017): 375–378.

Dosch, Roland. “Next Generation Mothers: Maternal Control of Germline Development in Zebrafish.” *Critical Reviews in Biochemistry and Molecular Biology* 50, no. 1 (2015): 54–68.

Durant, John. “Wild Animals, Zoos, and You: The Influence of Habitat on Health.” August 8, 2011. <https://www.slideshare.net/ancestralhealth/ahs-slidesjohn-durant>.

Earth Island Institute. “Project Coyote,” September 3, 2018. www.projectcoyote.org.

“Ecological Effectiveness: Conservation Goals for Interactive Species.” ResearchGate, May 10, 2017.
https://www.researchgate.net/publication/227663274_Ecological_Effectiveness_Conservation_Goals_for_Interactive_Species.

Edwards, Jacob. “The Irony of Hannibal’s Elephants.” *Latomus* 60, no. Fasc. 4 (2001): 900–905.

Ehmke, Lee. Director, Minnesota Zoo and Former Director of Design at Bronx Zoo, July 21, 2009.

Ehrenfeld, David. “Foreword.” In *Ethics on the Ark*. Washington D.C.: Smithsonian Institution Press, 1995.

Ehrenfeld, John. *Sustainability by Design: A Subversive Strategy for Transforming Our Consumer Culture*. New Haven, CT: Yale University Press, 2008.

Ehrlich, Paul, and Anne Ehrlich. *One with Nineveh: Politics, Consumption, and the Human Future*. Washington D.C.: Island, 2004.

Ehrlich, PAUL R, and A Ehrlich. “The Case against De-Extinction: It’s a Fascinating but Dumb Idea.” *Yale Environment* 360 (2014).

Elmqvist, Thomas, Michail Fragkias, Julie Goodness, Burak Güneralp, Peter J Marcotullio, Robert I McDonald, Susan Parnell, et al. *Urbanization, Biodiversity and Ecosystem Services: Challenges and Opportunities: A Global Assessment*. Berlin, Germany: Springer, 2013.

Emel, Jody. "Are You Man Enough, Big and Bad Enough? Ecofeminism and Wolf Eradication in the USA." *Environment and Planning D: Society and Space* 13, no. 6 (1995): 707–734.

Erell, Evyatar, David Pearlmutter, and Terence Williamson. *Urban Microclimate: Designing the Spaces between Buildings*. London, UK: Routledge, 2012.

Erickson, Clark L. "Amazonia: The Historical Ecology of a Domesticated Landscape." In *The Handbook of South American Archaeology*, 157–183. Berlin, Germany: Springer, 2008.

Estes, R.D. *The Behavior Guide to African Mammals*. Berkeley, CA: University of California Press, 1991.

Etherington, Rose. "Animal Wall by Gitta Gschwendtner." *Dezeen*, August 28, 2009. <https://www.dezeen.com/2009/08/28/animal-wall-by-gitta-gschwendtner/>.

Evans Ogden, Lesley J. "Summary Report on the Bird Friendly Building Program: Effect of Light Reduction on Collision of Migratory Birds,," 2002.

Fagan, Garrett G. *The Lure of the Arena: Social Psychology and the Crowd at the Roman Games*. Cambridge, UK: Cambridge University Press, 2011.

Farber, Paul Lawrence. *Finding Order in Nature: The Naturalist Tradition from Linnaeus to EO Wilson*. Baltimore, MD: JHU Press, 2000.

Farhat-Holzman, Laina. "Charles C. Mann, 1491—New Revelations of the Americas before Columbus." *Comparative Civilizations Review* 59, no. 59 (2008): 13.

Farina, Almo, Carlo Brentari, Katharine Dow, Martin Drenthen, Annabelle Dufourcq, Peter Gaitsch, Gisela Kaplan, et al. *Thinking about Animals in the Age of the Anthropocene*. Lanham, MD: Rowman & Littlefield, 2016.

Feinberg, Rebecca, Patrick Nason, and Hamsini Sridharan. "Introduction." *Environment and Society* 4, no. 1 (2013).

Feldman, Mark. "Where the Wild Things Aren't: Animals in New York City." *The Minnesota Review* THE FERAL ISSUE (2009): 231–42.

Fields, Jen. "AZA and Microsoft's 'Zoo Tycoon' Collaboration Unites a Virtual Zoo Community with Real-World Conservation Initiatives," 2014.

- Findlen, Paula. "Inventing Nature: Commerce, Art, and Science in the Early Modern Cabinet of Curiosities." *Merchants and Marvels: Commerce, Science, and Art in Early Modern Europe*, 2002.
- Fine, Aubrey H. *Handbook on Animal-Assisted Therapy: Foundations and Guidelines for Animal-Assisted Interventions*. Cambridge, MA: Academic Press, 2015.
- Finn, Ed, and Kathryn Cramer. *Hieroglyph: Stories and Visions for a Better Future*. New York: Harper Collins, 2014.
- Fish, United States, and Wildlife Service. "2011 National Survey of Fishing, Hunting, and Wildlife-Associated Recreation: National Overview," 2012.
- Fisher, Nicholas, A Lee, J Cribb, and G Haynes. "Public Perceptions of Foxes and Fox Eradication in Tasmania." *Australian Zoologist* 35, no. 3 (2011): 576–589.
- Fitzsimmons, M., and D. Goodman. "Incorporating Nature: Environmental Narratives and the Reproduction of Food." In *Remaking Reality: Nature at the Millennium*, edited by B. Braun and N. Castree, 194. London, UK: Routledge, 1998.
- Flannery, Tim. *The Weather Makers: How Man Is Changing the Climate and What It Means for Life on Earth*. New York: Atlantic Monthly, 2006.
- Flanzraich, Annie. "Activists Protest Treatment of Elephants in Many Zoos." *Daily World, Associated Press*. July 21, 2007.
- Folch, Josep, MJ Cocero, P Chesné, JL Alabart, V Domínguez, Y Cognié, A Roche, et al. "First Birth of an Animal from an Extinct Subspecies (*Capra Pyrenaica Pyrenaica*) by Cloning." *Theriogenology* 71, no. 6 (2009): 1026–1034.
- Foster, Alan Dean. *Midworld*. New York: Open Road Media, 2012.
- Foster, John. *The Sustainability Mirage: Illusion and Reality in the Coming War on Climate Change*. London, UK: Earthscan, 2008.
- Foucault, Michel. *Discipline and Punish: The Birth of the Prison*. Harmondsworth, UK: Penguin, 1985.
- . *Power/Knowledge: Selected Interviews and Other Writings, 1972-1977*. New York: Pantheon, 1980.
- Foucault, Michel, and Jay Miskowic. "Of Other Spaces." *Diacritics* 16, no. 1 (1986): 22–27.
- Franck, Karen, and Quentin Stevens. *Loose Space: Possibility and Diversity in Urban Life*. London, UK: Routledge, 2006.

- Franklin, Adrian. *Animals and Modern Cultures: A Sociology of Human-Animal Relations in Modernity*. Thousand Oaks, CA: Sage, 1999.
- Frederick William Bond. *The Penguin Pool at London Zoo*. 1934. ZSL.
- “French Picturesque Gardens of the 18th Century.” VIVIENNE MORRELL, October 10, 2015. <https://vivienmorrell.wordpress.com/2015/10/10/french-picturesque-gardens-of-the-18th-century/>.
- Friedman, Benjamin M. “The Moral Consequences of Economic Growth.” In *Markets, Morals, and Religion*, 29–42. London, UK: Routledge, 2017.
- Friese, C. *Cloning Wild Life: Zoos, Captivity, and the Future of Endangered Animals*. New York: New York University Press, n.d.
- Fryxell, John M, Anthony RE Sinclair, and Graeme Caughley. *Wildlife Ecology, Conservation, and Management*. Hoboken, New Jersey: John Wiley & Sons, 2014.
- Fuller, Richard A, Philip H Warren, Paul R Armsworth, Olga Barbosa, and Kevin J Gaston. “Garden Bird Feeding Predicts the Structure of Urban Avian Assemblages.” *Diversity and Distributions* 14, no. 1 (2008): 131–137.
- Funtowicz, Silvio O, and Jerome R Ravetz. “Science for the Post-Normal Age.” *Futures* 25, no. 7 (1993): 739–755.
- Gade, Daniel W. “Shifting Synanthropy of the Crow in Eastern North America.” *Geographical Review* 100, no. 2 (2010): 152–175.
- Galetti, M. “Parks of the Pleistocene: Recreating the Cerrado and the Pantanal with Megafauna.” *Natureza and Conservacao* 2 (2004): 93–100.
- Gamborg, C, and P Sandoe. “Beavers and Biodiversity: The Ethics of Ecological Restoration.” In *Philosophy and Biodiversity*, 217–36. Cambridge, MA: Cambridge University Press, 2004.
- Gandy, Matthew. *Concrete and Clay: Reworking Nature in New York City*. Cambridge, MA: MIT Press, 2003.
- Garland, P. “Artificial Insemination of Scimitar-Horned Oryx (Oryx Dammah).” *Bulletin of Zoo Management* 27 (1989): 29–30.
- Garreau, Joel. *Radical Evolution: The Promise and Peril of Enhancing Our Minds, Our Bodies – and What It Means to Be Human*. New York: Doubleday, 2005.
- . *The Nine Nations of North America*. Orlando, FL: Houghton Mifflin, 1981.

Gaynor, Andrea. "Animal Agendas: Conflict over Productive Animals in Twentieth-Century Australian Cities." *Society & Animals* 15, no. 1 (2007): 29–42.

———. "Regulation, Resistance and the Residential Area: The Keeping of Productive Animals in Twentieth-Century Perth, Western Australia." *Urban Policy and Research* 17, no. 1 (1999): 7–16.

"GeesePeace." Non-profit corporation, September 3, 2018. www.geesepeace.com.

Giaimo, Cara. "The Story Behind the Most Famous Photo from Hurricane Andrew." Atlas Obscura, September 6, 2016. <https://www.atlasobscura.com/articles/the-story-behind-the-most-famous-photo-from-hurricane-andrew>.

Gibson, Katherine, Deborah B Rose, and Ruth Fincher. *Manifesto for Living in the Anthropocene*. New York: Punctum Books, 2015.

Giesecke, Annette, and Naomi Jacobs. *Earth Perfect? Nature, Utopia, and the Garden*. London, UK: Black Dog Publishing, 2012.

Gieser, Thorsten. "Killing a Wounded Sow." *The Situationality of Human-Animal Relations: Perspectives from Anthropology and Philosophy* 15 (2018): 129.

Gill, Natasha. *Educational Philosophy in the French Enlightenment: From Nature to Second Nature*. London, UK: Routledge, 2016.

Gillespie, Kathryn, and Rosemary-Claire Collard. *Critical Animal Geographies: Politics, Intersections and Hierarchies in a Multispecies World*. London, UK: Routledge, 2015.

Gingrich, Newt. *Winning the Future: A 21st Century Contract with America*. Victoria, Canada: AbeBooks, 2017.

Gingrich, Newt, and Terry Maple. *A Contract with Earth*. Baltimore, MD: Johns Hopkins, n.d.

Ginn, Franklin. "Sticky Lives: Slugs, Detachment and More-than-Human Ethics in the Garden." *Transactions of the Institute of British Geographers* 39, no. 4 (2014): 532–544.

Godefroid, Sandrine. "Temporal Analysis of the Brussels Flora as Indicator for Changing Environmental Quality." *Landscape and Urban Planning* 52, no. 4 (2001): 203–224.

Goderie, Ronald. "The Tauros Programme: The Search for a New Icon for European Wilderness," February 17, 2019. <http://www.taurosproject.com>.

Gooch, Pernille. "Feet Following Hooves." In *Ways of Walking*, 79–92. London, UK: Routledge, 2016.

- Goode, Mathew, David Chiszar, Charles W. Radcliffe, Karen Estep, and Andrew Odum. "Field Observations on Strike-Induced Chemosensory Searching in the Aruba Island Rattlesnake." *Bulletin of the Psychonomic Society* 28, no. 4 (1990): 312–14.
- Goode, M.R. "Field Observations on Feeding Behavior in an Aruba Island Rattlesnake (*Crotalus Durissus Unicolor*): Strike-Induced Chemosensory Searching and Trail Following." *Bulletin of the Psychonomic Society* 4, no. 28 (1990): 312–14.
- Goodwin, Harold J. *Tourism, Conservation, and Sustainable Development: Case Studies from Asia and Africa*. 12. London, UK: International Institute for Environment and Development, 1998.
- Goonatilake, Susantha. *Merged Evolution: Long-Term Implications of Biotechnology and Information Technology*. London, UK: Gordon & Breach, 1999.
- Gore, Al. *An Inconvenient Truth: The Planetary Emergency of Global Warming and What We Can Do about It*. Emmaus, PA: Rodale, 2006.
- Grant, Rachel, V Montrose, and Alison Wills. "ExNOTic: Should We Be Keeping Exotic Pets?" *Animals* 7, no. 6 (2017): 47.
- Grazian, David. *American Zoo: A Sociological Safari*. Princeton, NJ: Princeton University Press, 2015.
- Green, Carin MC. "Free as a Bird: Varro de Re Rustica 3." *The American Journal of Philology* 118, no. 3 (1997): 427–448.
- Green-Armytage, AHN. *Bristol Zoo 1835-1965: A Short History of The Bristol, Clifton and West of England Zoological Society*. Bristol, UK: J. W. Arrowsmith, 1964.
- . *Story of Bristol Zoo*, 1964.
- Grieve, Symington. *The Great Auk, or Garefowl*. Cambridge, UK: Cambridge University Press, 2015.
- Griffiths, H, I Poulter, and D Sibley. "Feral Cats in the City." In *Animal Spaces, Beastly Places: New Geographies of Human–Animal Relations*, by Chris Philo and Chris Wilbert, 56–70. London and New York: Routledge, 2000.
- Gringrich, Newt. *Winning the Future. The 21st Century Contract with America*. Washington D.C.: Regnery, 2005.
- Gruffudd, Pyrs. "Biological Cultivation: Lubetkin's Modernism at London Zoo in the 1930s." In *Animal Places, Beastly Places: New Geographies of Human Animal Relations*, by Chris Philo and Chris Wilbert, 222–42. London, UK: Routledge, 2004.

- H., M. *Behavioural Enrichment in the Zoo*. New York: Van Nostrand Reinhold, n.d.
- Hacker, Randi. *Chinese Zoo Lion Fraud*. Recording, oral. Postcards from Asia. Center for East Asian Studies, University of Kansas, 2013.
- Haeg, Fritz. "Animal Estates," September 5, 2018. animalestates.org.
- Hagenbeck, Carl, Hugh Samuel Roger Elliot, and Arthur Gordon Thacker. *Beasts and Men, Being Carl Hagenbeck's Experiences for Half a Century Among Wild Animals*. Harlow, UK: Longmans, Green, 1911.
- Hall, Charles A. S., and John W. Day. "Revisiting the Limits to Growth After Peak Oil." *American Scientist* 97, no. 3 (2009): 230.
- Hallman, B.C. "Canadian Human Landscape Examples." *Canadian Geographer* 50, no. 2 (n.d.): 256–64.
- Halsey, Mark John. "Molar Ecology: What Can the (Full) Body of an Eco-Tourist Do?" London: Palgrave Macmillan, 2007.
- Hamilton, Clive. "Why We Resist the Truth about Climate Change." In *Climate Controversies: Science and Politics Conference, Museum of Natural Sciences*, 286. Brussels, Belgium, 2010.
- Hancocks, David. *A Different Nature: The Paradoxical World of Zoos and Their Uncertain Future*. Berkeley, CA: University of California Press, 2001.
- . "The Design and Use of Moats and Barriers." *Wild Mammals in Captivity Principles and Techniques* (1996): 191–203.
- . "The Future of Zoos," 2012.
- Hand, David. *Bambi*. Walt Disney, 1942.
- Hanson, Elizabeth. *Animal Attractions: Nature on Display in American Zoos*. Princeton, NJ: Princeton University Press, 2004.
- Hanspach, Jan, Tibor Hartel, Andra Milcu, Friederike Mikulcak, Ine Dorresteijn, Anikó Kovács-Hostyánszki, and András Báldi. "A Holistic Approach to Studying Social-Ecological Systems and Its Application to Southern Transylvania." *Ecology and Society*, 2014.
- Haraway, Donna. "Anthropocene, Capitalocene, Plantationocene, Chthulucene: Making Kin." *Environmental Humanities* 6, no. 1 (2015): 159–165.
- . "Awash with Urine: DES and Premarin© in Multi-Species Responseability." *WSQ: Women's Studies Quarterly* 4, no. 1–2 (2012): 301–316.

- . “Teddy Bear Patriarchy: Taxidermy in the Garden of Eden, New York City, 1908-1936.” *Social Text*, no. 11 (1984): 20–64.
- . “The Companion Species Manifesto: Dogs, People, and Significant Otherness Prickly Paradigm Press.” *Chicago IL*, 2003.
- . *When Species Meet*. Vol. 224. Minneapolis, MN: University of Minnesota Press, 2008.
- . “Zoōpolis, Becoming Worldly, and Trans-Species Urban Theory: For Old Cities yet to Come.” In *Playing Cat’s Cradle with Companion Species*. UC Irvine, 2011.
- Haraway, Donna, and others. *Simians, Cyborgs, and Women*. New York: Routledge, 1991.
- Hardin, Garrett. *Living within Limits: Ecology, Economics, and Population Taboos*. Oxford, UK: Oxford University Press, 1995.
- Harrison, Ariane Lourie. “Animal Interfaces for a Post-Human Territory.” In *ACSA Annual Meeting Proceedings, New Constellations, New Ecologies*, 2013.
- . *Architectural Theories of the Environment: Posthuman Territory*. London, UK: Routledge, 2013.
- Harrison, Brian. “Animals and the State in Nineteenth-Century England.” *The English Historical Review* 88, no. 349 (1973): 786–820.
- Harvey, David. *Justice, Nature and the Geography of Difference*. Vol. 468. Oxford, UK: Blackwell, n.d.
- Hatley, James. “Suffering Witness.” *New York: State University of New York*, 2000.
- Hawken, Paul, Amory Lovins, and Hunter Lovins. *Natural Capitalism: The next Industrial Revolution*. Boston, MA: Back Bay, 2000.
- Hawley, Alex Wilson Lewis. *Commercialization and Wildlife Management: Dancing with the Devil*. Malabar, FL: Krieger, 1993.
- Hayles, N Katherine. “Simulated Nature and Natural Simulations: Rethinking the Relation between the Beholder and the World.” *Uncommon Ground: Toward Reinventing Nature*, 1995, 409–425.
- Hediger, Heini. *Wild Animals in Captivity*. London, UK: Butterworth, 1950.
- Heinberg, Richard. *Peak Everything: Waking up to the Century of Declines*. Gabriola Island, Canada: New Societ, 2007.

- Henderson, Jason. "Wildlife Recreation: Rural America's Newest Billion Dollar Industry." *Ag Decision Maker Newsletter* 9, no. 2 (2015): 2.
- Herda-Rapp, Ann, and Karen G Marotz. "Contested Meanings: The Social Construction of the Mourning Dove in Wisconsin." *Mad About Wildlife*, 2005, 73–122.
- Hermes, R.G. "First Successful Artificial Insemination with Frozen-Thawed Semen in Rhinoceros." *Theriogenology* 71, no. 3 (2009): 393–99.
- Hess, Laurie. "Exotic Animals: Appropriately Owned Pets or Inappropriately Kept Problems?" *Journal of Avian Medicine and Surgery* 25, no. 1 (2011): 50–57.
- Hessels, Laurens K, Harro Van Lente, and Ruud Smits. "In Search of Relevance: The Changing Contract between Science and Society." *Science and Public Policy* 36, no. 5 (2009): 387–401.
- Higginbottom, K, CL Northrope, and RJ Green. "Wildlife Tourism Research Report No. 6, Status Assessment of Wildlife Tourism in Australia Series." *Positive Effects of Wildlife Tourism on Wildlife and Habitats*, 2001.
- Higginbottom, Karen. *Wildlife Tourism: Impacts, Management and Planning*. Champaign, IL: Common Ground Publishing, 2004.
- Hinchliffe, Steve. "Cities and Natures: Intimate Strangers." In *Unsettling Cities*, by J Allen, D Massey, and M Pryke, 138–76. London, UK: Routledge, 1999.
- . *Geographies of Nature: Societies, Environments, Ecologies*. Thousand Oaks, CA: Sage, 2007.
- Hinchliffe, Steve, Matthew B Kearnes, Monica Degen, and Sarah Whatmore. "Urban Wild Things: A Cosmopolitical Experiment." *Environment and Planning D: Society and Space* 23, no. 5 (October 1, 2005): 643–58.
- Hinchliffe, Steve, and Sarah Whatmore. "Living Cities: Towards a Politics of Conviviality." *Science as Culture* 15, no. 2 (2006): 123–138.
- Hird, Myra J. "Meeting with the Microcosmos." *Environment and Planning D: Society and Space* 28, no. 1 (2010): 36–39.
- Hobbs, Richard J, Salvatore Arico, James Aronson, Jill S Baron, Peter Bridgewater, Viki A Cramer, Paul R Epstein, et al. "Novel Ecosystems: Theoretical and Management Aspects of the New Ecological World Order." *Global Ecology and Biogeography* 15, no. 1 (2006): 1–7.
- Hobson, Kersty. "Political Animals? On Animals as Subjects in an Enlarged Political Geography." *Political Geography* 26, no. 3 (March 1, 2007): 250–67.

- Hochadel, Oliver. "Science in the 19th-Century Zoo." *Endeavour* 29, no. 1 (2005): 38–42.
- Hofer, Doris, and Juan Carlos Blanco. *The Lion's Share of the Hunt: Trophy Hunting and Conservation: A Review of the Legal Eurasian Tourist Hunting Market and Trophy Trade Under CITES: A TRAFFIC Europe Regional Report*. Brussels, Belgium: TRAFFIC Europe, 2002.
- Holmberg, Tora. "Trans-Species Urban Politics: Stories from a Beach." *Space and Culture* 16, no. 1 (2013): 28–42.
- . *Urban Animals: Crowding in Zoocities*. London, UK: Routledge, 2015.
- Holmberg, Tora, and Jacob Bull. "Introducing Animals, Places and Lively Cartographies." In *Animal Places*, 1–14. London, UK: Routledge, 2017.
- Holt, W. "Hormonal and Behavioural Detection of Oestrus in Blackbuck, Antelope Cervicapra, and Successful Artificial Insemination with Fresh and Frozen Semen." *Journal of Reproduction and Fertility* 82 (n.d.): 717–25.
- Holt, W. V., T. Abaigar, and H. N. Jabbour. "Oestrous Synchronization, Semen Preservation and Artificial Insemination in the Mohor Gazelle (*Gazella Dama Mhorr*) for the Establishment of a Genome Resource Bank Programme." *Reproduction Fertility and Development* 8, no. 8 (1996): 1215–22.
- Holt, W. V., T. Abaigar, David E. Wildt, and P. F. Watson. "Genetic Resource Banks for Species Conservation." In *Reproductive Sciences and Integrated Conservation*, 267–80. Cambridge, UK: Cambridge University Press, 2003.
- Holt, W. V., P. M. Bennett, V. Volobouev, and P. F. Watwon. "Genetic Resource Banks in Wildlife Conservation." *Journal of Zoology* 238, no. 3 (March 1, 1996): 531–44.
- Holt, W. V., and A. R. Pickard. "Role of Reproductive Technologies and Genetic Resource Banks in Animal Conservation." *Reviews of Reproduction* 4, no. 3 (September 1999): 143–50.
- Hovorka, Alice. "Transspecies Urban Theory: Chickens in an African City." *Cultural Geographies* 15, no. 1 (2008): 95–117.
- Howard, Brian Clark. "Can Lion Trophy Hunting Support Conservation." *National Geographic*. <http://www.news.nationalgeographic.com/2015/07/150729-Liontrophy-Hunting-Conservation-Animals-Cecil>, 2015.
- Howard, J. "Comparative Semen Cryopreservation in Ferrets (*Mustela Putorius Furo*) and Pregnancies after Laparoscopic Intrauterine Insemination with Frozen Thawed Spermatozoa." *Journal of Reproduction and Fertility* 92 (1991): 109–18.

Howell, Philip. "A Place for the Animal Dead: Pets, Pet Cemeteries and Animal Ethics in Late Victorian Britain." *Ethics, Place & Environment* 5, no. 1 (2002): 5–22.

———. "Flush and the Banditti: Dog-Stealing in Victorian London." In *Animal Spaces, Beastly Places: New Geographies of Human–Animal Relations*, by Chris Philo and Chris Wilbert, 35–55. London and New York: Routledge, 1998.

Huber, Peter. *Hard Green: Saving the Environment from the Environmentalists: A Conservative Manifesto*. New York: Basic, 2000.

Hughes, James. *Citizen Cyborg. Why Democratic Societies Must Respond to the Redesigned Human of the Future*. Boulder, CO: Westview, 2004.

Hullmandel, Charles. *The Bear Pit at the Zoological Gardens, Regents Park*. 1835. Engraved and pub.

"Hunters in Court over Cecil the Lion's Death." *CBS News*, 2015.

<https://www.cbsnews.com/news/cecil-the-lion-hunters-in-court-over-illegal-poaching-in-zimbabwe/>.

Hurley, Karen. "Daring to Envision Ecologically Sound and Socially Just Futures: An Interdisciplinary Exploration of Contemporary Film,," 2009.

Hutchins, Michael, Kevin Willis, and Robert J Wiese. "Strategic Collection Planning: Theory and Practice." *Zoo Biology* 14, no. 1 (1995): 5–25.

Hyers, Lauri L. "Myths Used to Legitimize the Exploitation of Animals: An Application of Social Dominance Theory." *Anthrozoös* 19, no. 3 (September 1, 2006): 194–210.

"Information About Animals In War." The Animals in War Memorial, September 3, 2018. http://www.animalsinwar.org.uk/index.cfm?asset_id=1375.

Ingham, Lucy. "Last to See: The Future Rise of Extinction Tourism." *Factor*, February 2015. <https://www.factor-tech.com/feature/last-see-future-rise-extinction-tourism/>.

Ingold, Tim. "Epilogue: Towards a Politics of Dwelling." *Conservation and Society*, 2005, 501–508.

———. "From Trust to Domination: An Alternative History of Human — Animal Relations." In *Animals and Human Society*. London, UK: Routledge, 1994.

"IPCC, 2013: Summary for Policymakers," in *Climate Change 2013: The Physical Science Basis. Contribution of Working Group 1 to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change*. Cambridge: Cambridge University Press, 2013.

- Irvine, Leslie. *Filling the Ark*. Philadelphia, PA: Temple University Press, 2009.
- Isenberg, Andrew C. *The Destruction of the Bison: An Environmental History, 1750-1920*. 18. Cambridge, UK: Cambridge University Press, 2001.
- “IUCN Red List of Threatened Species,” February 17, 2019. <https://www.iucnredlist.org>.
- Jabado, Rima W, Saif M Al Ghais, Waleed Hamza, Aaron C Henderson, Julia LY Spaet, Mahmood S Shivji, and Robert H Hanner. “The Trade in Sharks and Their Products in the United Arab Emirates.” *Biological Conservation* 181 (2015): 190–198.
- Jachowski, David S, and Dylan C Kesler. “Allowing Extinction: Should We Let Species Go?” *Proc. Natl. Acad. Sci. USA* 105 (2009): 2919–2922.
- Jacques, Servière. “Science and Animal Welfare in France and European Union: Rules, Constraints, Achievements.” *Meat Science* 98, no. 3 (2014): 484–489.
- “James J. Breheny - Executive Vice President & General Director, Zoos & Aquarium & Director of the Bronx Zoo at Wildlife Conservation Society.” Relationship Science, May 10, 2017. <http://relationshipscience.com/james-j-breheny-p25869210>.
- Jamieson, D. “Against Zoos.” In *In Defense of Animals*. Oxford, UK: Basil Blackwell, 1985.
- Jan, Edmund, Edmund Jan Osmańczyk, Rupert Lee, and others. *Encyclopedia of the United Nations and International Agreements: T to Z*. Vol. 4. New York: Taylor & Francis, 2003.
- Jeff Pinkner, Josh Appelbaum, André Nemeč, Scott Rosenberg, Michael Katleman, James Mangold, Cathy Konrad, et al. “Zoo.” CBS, 2017 2015.
- Jeffrey, E. “9. Cultural Diversity on Saturday Morning Television.” *Children and Television*, 1993, 132.
- Jepson, Paul, Maan Barua, and Kathleen Buckingham. “What Is a Conservation Actor?” *Conservation and Society* 9, no. 3 (2011): 229–235.
- Jerolmack, Colin. “Animal Archeology: Domestic Pigeons and the Nature-Culture Dialectic.” *Qualitative Sociology Review* 3, no. 1 (2007).
- . “How Pigeons Became Rats: The Cultural-Spatial Logic of Problem Animals.” *Social Problems* 55, no. 1 (2009): 72–94.
- . *The Global Pigeon*. Chicago, IL: University of Chicago Press, 2013.
- Johnson, Chris. *Australia’s Mammal Extinctions: A 50,000-Year History*. Cambridge, MA: Cambridge University Press, 2006.

Johnson, Elizabeth A, and Michael W Klemens. *Nature in Fragments: The Legacy of Sprawl*. New York: Columbia University Press, 2005.

Johnston, Catherine. "Beyond the Clearing: Towards a Dwelt Animal Geography." *Progress in Human Geography* 32, no. 5 (October 1, 2008): 633–49.

Johnston, L. A., and R. C. Lacy. "Genome Resource Banking for Species Conservation: Selection of Sperm Donors." *Cryobiology* 32, no. 1 (February 1995): 68–77.

Joklik, Wolfgang K, Bernard Moss, Bernard N Fields, David L Bishop, and Lev S Sandakhchiev. "Why the Smallpox Virus Stocks Should Not Be Destroyed." *Science* 262, no. 5137 (1993): 1225–1227.

Jones, Brian TB. "Community Benefits from Safari Hunting and Related Activities in Southern Africa." *Recreational Hunting, Conservation and Rural Livelihoods: Science and Practice*, 2009, 158–177.

Jones, Karen. "The Rhinoceros and the Chatham Railway: Taxidermy and the Production of Animal Presence in the 'Great Indoors.'" *History* 101, no. 348 (2016): 710–735.

Jones, R. C. "Collection, Motility and Storage of Spermatozoa from the African Elephant *Loxodonta Africana*." *Nature* 243, no. 5401 (May 4, 1973): 38–39.

Jongh, Tom de, Neil Spooner, Jan Vermeer, and Istvan Vidakovits. "2.1. Accommodation: Gorilla Accommodation." *EAZA Best Practice Guidelines*, 2017, 32.

Joon-ho, Bong. *Okja*. Netflix, 2017.

Jorgensen, Anna, and Richard Keenan. *Urban Wildscapes*. London, UK: Routledge, 2012.

Josh Donlan, C., Joel Berger, Carl E. Bock, Jane H. Bock, David A. Burney, James A. Estes, Dave Foreman, et al. "Pleistocene Rewilding: An Optimistic Agenda for Twenty-First Century Conservation." *The American Naturalist* 168, no. 5 (November 1, 2006): 660–81.

Joy, Bill. "Why the Future Doesn't Need Us." WIRED, May 10, 2017.
<https://www.wired.com/2000/04/joy-2/>.

Kahn, Herman, and Anthony J. Wiener. *Year 2000; a Framework for Speculation on the next Thirty-Three Years*. New York: Macmillan, 1967.

Kaika, Maria. *City of Flows: Modernity, Nature, and the City*. London, UK: Psychology Press, 2005.

Kalof, Linda. *Looking at Animals in Human History*. London, UK: Reaktion Books, 2007.

———. *The Oxford Handbook of Animal Studies*. Oxford, UK: Oxford University Press, 2017.

Kamin, Blair. "At Aqua and Other Projects, Jeanne Gang Offers Material Evidence for Her 'rising Star' Status." *Chicago Tribune*, 2008.

Kathleen Krull. *What's New? The Zoo!: A Zippy History of Zoos*. New York: Arthur A. Levine Books, 2014.

Kean, Hilda. "Traces and Representations: Animal Pasts in London's Present." *The London Journal* 36, no. 1 (2011): 54–71.

Kellert, Stephen R. *The Value of Life: Biodiversity and Human Society*. Washington D.C.: Island Press, 1996.

———. "Urban American Perceptions of Animals and the Natural Environment." *Urban Ecology* 8, no. 3 (1984): 209–228.

Kenneth F. Hyde. "Recognising Deductive Processes in Qualitative Research." *Qualitative Market Research: An International Journal* 3, no. 2 (June 1, 2000): 82–90.

Keulartz, Jozef. "Captivity for Conservation? Zoos at a Crossroads." *Journal of Agricultural and Environmental Ethics* 28, no. 2 (2015): 335–351.

———. *Struggle for Nature: A Critique of Radical Ecology*. London, UK: Psychology Press, 1998.

Kiley-Worthington, Marthe, and others. *Animals in Circuses and Zoos: Chiron's World*. Basildon, UK: Little Eco-Farms Publishing, 1990.

Kinzig, Ann P, Paige Warren, Chris Martin, Diane Hope, and Madhusudan Katti. "The Effects of Human Socioeconomic Status and Cultural Characteristics on Urban Patterns of Biodiversity." *Ecology and Society* 10, no. 1 (2005).

Klein, Roger D. "Patents and Proprietary Assays." In *Genomic Applications in Pathology*, 159–169. Berlin, Germany: Springer, 2019.

Knight, John. *Natural Enemies: People-Wildlife Conflicts in Anthropological Perspective*. London, UK: Routledge, 2013.

Koenig, Walk. "Hope Is the Thing with Feathers." *The Condor* 102, no. 4 (2000): 963.

Kolbert, Elizabeth. *The Sixth Extinction: An Unnatural History*. New York: Henry Holt and Co, 2014.

Koplow, David A. "Deliberate Extinction: Whether to Destroy the Last Smallpox Virus." *Suffolk UL Rev.* 37 (2004): 1.

Kreger, Michael D., and Joy A. Mench. "Visitor—Animal Interactions at the Zoo." *Anthrozoois* 8, no. 3 (September 1, 1995): 143–58.

- Kumar, Krishan. "Aspects of the Western Utopian Tradition." *History of the Human Sciences* 16, no. 1 (2003): 63–77.
- . *Utopianism*. Minneapolis, MN: University of Minnesota Press, 1991.
- Kumar, Subrat. "Extinction Need Not Be Forever." *Nature News* 492, no. 7427 (2012): 9.
- Kunstler, James Howard. *The Long Emergency: Surviving the Converging Catastrophes of the 21st Century*. New York: Atlantic Monthly, 2005.
- Kurzweil, Ray. *The Singularity Is near: When Humans Transcend Biology*. New York: Viking, 2005.
- Larson, Greger, and Dorian Q Fuller. "The Evolution of Animal Domestication." *Annual Review of Ecology, Evolution, and Systematics* 45 (2014): 115–136.
- Last Tasmanian Tiger, Thylacine, 1933*, 2019.
<https://www.youtube.com/watch?v=6vqCCI1ZF7o>.
- Latour, Bruno. "10 "Where Are the Missing Masses? The Sociology of a Few Mundane Artifacts,"" 1992, 199, 201.
- . "Politics of Nature: How to Bring the Sciences into Democracy Harvard University Press." *Cambridge, Massachusetts*, 2004.
- . *Science in Action: How to Follow Scientists and Engineers through Society*. Cambridge, MA: Harvard University Press, 1987.
- Lawrence, Michael. *The Zoo and Screen Media: Images of Exhibition and Encounter*. Berlin, Germany: Springer, 2016.
- Leahy, H.R. *The Value of Life: Biodiversity and Human Society*. Abingdon, UK: Routledge, 2012.
- Lee, C. "Curator of Fishes, Toronto Zoo Interview." In *Zooland: The Institution of Captivity*, 36. Stanford, California: Stanford, 2013.
- Lemelin, Harvey. "The Gawk, the Glance, and the Gaze: Ocular Consumption and Polar Bear Tourism in Churchill, Manitoba, Canada." *Current Issues in Tourism* 9, no. 6 (2006): 516–534.
- Leo Burnett. *Black Cats*. 2009. Print advert.
- Leopold, Aldo. "Conservation Esthetic." *Bird Lore* 40, no. 2 (1938): 101–109.
- Lesser, William H. *Animal Patents*. Berlin, Germany: Springer, 2016.

- Lestel, Dominique. "The Question of the Animal Subject: Thoughts on the Fourth Wound to Human Narcissism." *Angelaki* 19, no. 3 (2014): 113–125.
- Lethem, Jonathan. *Chronic City*. Vol. 46. Milano, Italy: Il saggiatore, 2010.
- Leutemann, Heinrich. *Hannibals Übergang Über Die Alpen*. 1866. Colored engraving.
- Lewis-William, JD. *The Mind in the Cave*. London, UK: Thames and Hudson, 2002.
- Lindgren, Mats. *Scenario Planning*. Basingstoke, UK: Palgrave, 2003.
- "Living with Wildlife in Anchorage: A Cooperative Planning Effort." Alaska Department of Fish and Game, April 2000.
<http://www.adfg.alaska.gov/index.cfm?adfg=anchoragewildlifeplanning.main>.
- Lomborg, Bjorn. *Cool It: The Skeptical Environmentalist's Guide to Global Warming*. New York: Alfred A. Knopf, 2007.
- . *Global Crises, Global Solutions*. Cambridge, UK: Cambridge University Press, 2004.
- Lord, Gail Dexter, and Kate Markert. *The Manual of Strategic Planning for Cultural Organizations: A Guide for Museums, Performing Arts, Science Centers, Public Gardens, Heritage Sites, Libraries, Archives and Zoos*. Lanham, MD: Rowman & Littlefield, 2017.
- Lorimer, Hayden. "Herding Memories of Humans and Animals." *Environment and Planning D: Society and Space* 24, no. 4 (August 1, 2006): 497–518.
- Lorimer, Jamie. "Elephants as Companion Species: The Lively Biogeographies of Asian Elephant Conservation in Sri Lanka." *Transactions of the Institute of British Geographers* 35, no. 4 (June 22, 2010): 491–506.
- . "Living Roofs and Brownfield Wildlife: Towards a Fluid Biogeography of UK Nature Conservation." *Environment and Planning A* 40, no. 9 (2008): 2042–2060.
- . "Moving Image Methodologies for More-than-Human Geographies." *Cultural Geographies* 17, no. 2 (April 1, 2010): 237–58.
- . *Wildlife in the Anthropocene*. Minneapolis, MN: University of Minnesota Press, 2015.
- Louv, Richard. *Last Child in the Woods: Saving Our Children from Nature-Deficit Disorder*. Chapel Hill, NC: Algonquin Books, 2008.
- Ludlum, Stacey M. "The Next Zoo Design Revolution?" *Designing Zoos*, July 15, 2008.
<https://designingzoos.com/2008/07/15/the-next-zoo-design-revolution/>.
- Ludwig, Edward. "People at Zoos: A Sociological Approach." *ZOO*, January 1, 1981, 316.

- Luisi, Pier Luigi. *The Emergence of Life: From Chemical Origins to Synthetic Biology*. Cambridge, UK: Cambridge University Press, 2016.
- Lulka, David. "Boring a Wormhole in the Zoological Ark." In *Metamorphoses of the Zoo: Animal Encounter after Noah*, by Ralph R Acampora, 123. Oxford, UK: Lexington Books, 2010.
- . "The Posthuman City: San Diego's Dead Animal Removal Program." *Urban Geography* 34, no. 8 (2013): 1119–1143.
- . "The Residual Humanism of Hybridity: Retaining a Sense of the Earth." *Transactions of the Institute of British Geographers* 34, no. 3 (June 1, 2009): 378–93.
- Luniak, Maciej. "Synurbization—Adaptation of Animal Wildlife to Urban Development." In *Proceedings of the 4th International Urban Wildlife Symposium*, 50–55, 2004.
- Lunney, Daniel. "Is a Grumpy Ecologist an Oxymoron?" In *Grumpy Scientists: The Ecological Conscience of a Nation*, by Daniel Lunney, Patricia Hutchings, and Harry F Recher, 95–105. Mosman, Australia: Royal Zoological Society of New South Wales, 2013.
- Lynas, Mark. *The God Species: Saving the Planet in the Age of Humans*. Boone, IA: National Geographic Books, 2011.
- Lynch, Michael. "Alfred Schutz and the Sociology of Science." *Worldly Phenomenology: The Continuing Influence of Alfred Schütz on North American Human Science*. Washington, DC: Center for Advanced Research in Phenomenology and University Press of America, 1988.
- . "Sacrifice and the Transformation of the Animal Body into a Scientific Object: Laboratory Culture and Ritual Practice in the Neurosciences." *Social Studies of Science* 18, no. 2 (1988): 265–289.
- Lynch, Michael, Eric Livingston, and Harold Garfinkel. "Temporal Order in Laboratory Work." *Science Observed: Perspectives on the Social Study of Science*, 1983, 205–238.
- Lynn, William S. "Animals, Ethics and Geography." In *Animal Geographies: Place, Politics and Identity in the Nature-Culture Borderlands*, by Jennifer Wolch and Jody Emel, 280–98. London: Verso, 1998.
- Lynn, W.S., and E Sheppard. "Cities." In *Patterned Ground: Entanglements of Nature and Culture*, by Stephan Harrison, Steve Pile, and Nigel J Thrift. London, UK: Reaktion Books, 2004.
- Mabey, Richard, and Iain Sinclair. *The Unofficial Countryside*. London, UK: Collins, 1973.
- MacKenzie, John M. *The Empire of Nature: Hunting, Conservation and British Imperialism*. Manchester, UK: Manchester University Press, 1997.

- Madden, Dave. *The Authentic Animal: Inside the Odd and Obsessive World of Taxidermy*. New York: St. Martin's Press, 2011.
- Maier, Holger R, Joseph HA Guillaume, Hedwig van Delden, Graeme A Riddell, Marjolijn Haasnoot, and Jan H Kwakkel. "An Uncertain Future, Deep Uncertainty, Scenarios, Robustness and Adaptation: How Do They Fit Together?" *Environmental Modelling & Software* 81 (2016): 154–164.
- Malamud, Randy. *Reading Zoos: Representations of Animals and Captivity*. New York: New York University Press, 1998.
- Mallarach, Josep Maria, John Morrison, Ashish Kothari, Fausto Sarmiento, José-Antonio Atauri, and B Wishitemi. "In Defence of Protected Landscapes: A Reply to Some Criticisms of Category V Protected Areas and Suggestions for Improvement." In *Defining Protected Areas: An International Conference in Almeria, Spain*, 31–37. International Union for Conservation of Nature (IUCN): Gland, Switzerland, 2008.
- Maple, Terry. "Toward a Responsible Zoo Agenda. In M.H.B. Norton, *Ethics on the Ark*," 20–30. Washington D.C.: Smithsonian Institution Press, 1995.
- Maple, Terry L, and Bonnie M Perdue. "Launching Ethical Arks." In *Zoo Animal Welfare*, 167–183. Berlin, Germany: Springer, 2013.
- Markowitz, Hal. *Behavioral Enrichment in the Zoo*. New York: Van Nostrand Reinhold, 1982. <http://trove.nla.gov.au/version/30279392>.
- Martin, Angus, and others. "Zoo Ethics: The Challenges of Compassionate Conservation [Book Review]." *Australian Humanist, The*, no. 128 (2017): 18.
- Martin, Janaea, and Joseph O'Reilly. "The Emergence of Environment-Behavior Research in Zoological Parks." *Public Places and Spaces* 10 (2012): 173.
- Maser, Chris. *Vision and Leadership in Sustainable Development*. Vol. 6. Boca Raton, FL: CRC Press, 1998.
- Masini, Eleonora. "Rethinking Futures Studies." *Futures* 38, no. 10 (2006): 1158–1168.
- Matt Reeves. *Dawn of the Planet of the Apes*. Drama/Thriller, 2014.
- Matt Socum. *Big Cat Crossing*. 2014. Photograph. Associated Press.
- Maturana, Humberto R, and Francisco J Varela. *Autopoiesis and Cognition—The Realization of the Living, Ser. Boston Studies on the Philosophy of Science*. Dordrecht, Holland: D. Dordrecht, Netherlands: Reidel Publishing Company, 1980.

Maxeiner, Dirk, and Michael Miersch. "The Urban Jungle." *Living for the City—A New Agenda for Green Cities, Policy Exchange, London*, 2006, 52–67.

Mazur, Nicole A. *After the Ark?* Melbourne, Australia: Melbourne University Press, 2001.

McCarthy, John. "Progress and Its Sustainability," n.d.
<http://www.formal.stanford.edu/jmc/progress/index.html>.

McCauley, Douglas J. "Selling out on Nature." *Nature* 443, no. 7107 (September 7, 2006): 27–28.

McDonough, William, and Michael Braungart. *Cradle to Cradle: Remaking the Way We Make Things*. San Francisco, CA: North Point, 2002.

McGibben, Bill. *Deep Economy: The Wealth of Communities and the Durable Future*. New York: Holt and Company, 2007.

McGreal, Shirley, and Sharon E Strong. "International Primate Protection League." *The International Encyclopedia of Primatology*, 2016, 1–2.

McHarg, Ian L, and Lewis Mumford. *Design with Nature*. New York: American Museum of Natural History New York, 1969.

McKibben, Bill. *Deep Economy: The Wealth of Communities and the Durable Future*. London, UK: Macmillan, 2007.

———. *The End of Nature*. New York: Random House Incorporated, 2006.

McKibben, Bill, and Schumann McKibben. *Eaarth: Making a Life on a Tough New Planet*. Toronto, Canada: Vintage Books Canada, 2011.

McLellan, Richard, Leena Iyengar, Barney Jeffries, and Nastasja Oerlemans. *Living Planet Report 2014: Species and Spaces, People and Places*. World Wide Fund for Nature, 2014.

McMarlin, Shirley. "Zoos of the Future May Be Animals' Last, Best Hope." TribLIVE.com, August 27, 2016. <http://triblive.com/lifestyles/morelifestyles/10781768-74/zoo-zoos-conservation>.

McNeill, John Robert. *Something New under the Sun: An Environmental History of the Twentieth-Century World (the Global Century Series)*. New York: WW Norton & Company, 2001.

Meadows, Dennis, and Jorgan Randers. *The Limits to Growth: The 30-Year Update*. London, UK: Routledge, 2012.

Michael, Mike. *Technoscience and Everyday Life: The Complex Simplicities of the Mundane*. Maidenhead, UK: McGraw-Hill Education (UK), 2006.

- Michaels, Patrick. *Meltdown: The Predictable Distortion of Global Warming by Scientists, Politicians and the Media*. Washington D.C.: Cato, 2004.
- Mies, Maria, Vandana Shiva, and others. *Ecofeminism*. London, UK: Zed Books, 1993.
- Milfont, T.L. "Preservation and Utilization: Understanding the Structure of Environmental Attitudes." *Medio Ambiente y Comportamiento Humano* 7, no. 1 (2006): 29–50.
- Milius, Susan. "Life & Environment: Windows Are Major Bird Killers: Small Buildings Do Much More Damage than Skyscrapers." *Science News* 185, no. 6 (2014): 8–9.
- Miller, Brian. "New Conservation' or Surrender to Development?" *Animal Conservation* 17, no. 6 (n.d.): 509–15.
- Miller, Marc L, and Berit C Kaae. "Coastal and Marine Ecotourism: A Formula for Sustainable Development." *Trends* 30, no. 2 (1993): 35–41.
- Milojevic, Ivana. *Educational Futures: Dominant and Contesting Visions*. London: Routledge, 2005.
- Minden, Michael, and Holger Bachmann. *Fritz Lang's Metropolis: Cinematic Visions of Technology and Fear*. Rochester, NY: Camden House, 2002.
- Minteer, Ben. "Is It Right to Reverse Extinction?" *Nature News* 509, no. 7500 (2014): 261.
- Minteer, Ben A. *After Preservation: Saving American Nature in the Age of Humans*. Chicago, IL: University of Chicago Press, n.d.
- . "Can Zoos Save the World?" *The Conversation*, May 10, 2017. <http://theconversation.com/can-zoos-save-the-world-32356>.
- Minteer, Ben A., and James P. Collins. "Ecological Ethics in Captivity: Balancing Values and Responsibilities in Zoo and Aquarium Research under Rapid Global Change." *ILAR Journal* 54, no. 1 (2013): 41–51.
- Mockford, Emily J, and Rupert C Marshall. "Effects of Urban Noise on Song and Response Behaviour in Great Tits." *Proceedings of the Royal Society of London B: Biological Sciences*, 2009.
- Montag, Jessica M., Michael E. Patterson, and Wayne A. Freimund. "The Wolf Viewing Experience in the Lamar Valley of Yellowstone National Park." *Human Dimensions of Wildlife* 10, no. 4 (November 5, 2005): 273–84.
- Montgomery, Scott. "The Zoo: Theatre of the Animals." *Science as Culture* 4, no. 4 (1995): 565–600.

- Moore, H. “Artificial Insemination in the Giant Panda (*Ailuropoda Melanoleuca*).” *Journal of Zoology* 203, no. 269–278 (n.d.): 1984.
- Moore, H, R Bonney, and D Jones. “Successful Induced Ovulation and Artificial Insemination in the Puma (*Felis Concolor*).” *Veterinary Record* 108 (1981): 282–83.
- Mora, Camilo, and Peter F Sale. “Ongoing Global Biodiversity Loss and the Need to Move beyond Protected Areas: A Review of the Technical and Practical Shortcomings of Protected Areas on Land and Sea.” *Marine Ecology Progress Series* 434 (2011): 251–266.
- Mora, Camilo, Derek P. Tittensor, Sina Adl, Alastair G. B. Simpson, and Boris Worm. “How Many Species Are There on Earth and in the Ocean?” *PLOS Biology* 9, no. 8 (August 23, 2011): e1001127.
- Morris, Brian. *The Power of Animals: An Ethnography*. Oxford, UK: Berg Publishers, 1998.
- Morrison, G., and F. Quitely. *We3*. We3 (2004). New York: Vertigo, 2005.
- Moss, Andrew, and Maggie Esson. “Visitor Interest in Zoo Animals and the Implications for Collection Planning and Zoo Education Programmes.” *Zoo Biology* 29, no. 6 (2010): 715–731.
- Moss, Andrew, Maggie Esson, and Sarah Bazley. “Applied Research and Zoo Education: The Evolution and Evaluation of a Public Talks Program Using Unobtrusive Video Recording of Visitor Behavior.” *Visitor Studies* 13, no. 1 (March 31, 2010): 23–40.
- Moss, Andrew, Eric Jensen, and Markus Gusset. “Evaluating the Contribution of Zoos and Aquariums to Aichi Biodiversity Target 1.” *Conservation Biology: The Journal of the Society for Conservation Biology* 29, no. 2 (April 2015): 537–44.
- Mostafavi, Mohsen, and Ciro Najle. *Landscape Urbanism: A Manual for the Machinic Landscape*. London, UK: AA Publications, 2003.
- Mouffe, Chantal. “Deliberative Democracy or Agonistic Pluralism.” *Social Research* 66, no. 3 (1999): 745–758.
- Mowbray, Sean. “How the Bear Became the Symbol of Bern.” Culture Trip, February 13, 2018. <https://theculturetrip.com/europe/switzerland/articles/how-the-bear-became-the-symbol-of-bern/>.
- Mulhall, Douglas. *Our Molecular Future: How Nanotechnology, Robotics, Genetics, and Artificial Intelligence Will Transform the World*. Amherst, New York: Prometheus, 2002.
- Mullan, Bob. *Zoo Culture*. Champaign, IL: University of Illinois Press, 1999.

- Müller, Anna-Lisa, and Werner Reichmann. *Architecture, Materiality and Society: Connecting Sociology of Architecture with Science and Technology Studies*. Berlin, Germany: Springer, 2015.
- Müller, Norbert, and Peter Werner. “Urban Biodiversity and the Case for Implementing the Convention on Biological Diversity in Towns and Cities.” *Urban Biodiversity and Design*, no. 7 (2010).
- Murphy, Mark, and Cristina Costa. *Theory as Method in Research: On Bourdieu, Social Theory and Education*. London, UK: Routledge, 2015.
- Mushet, David M, Jordan L Neau, and Ned H Euliss Jr. “Modeling Effects of Conservation Grassland Losses on Amphibian Habitat.” *Biological Conservation* 174 (2014): 93–100.
- Myers, Norman. “Conservation of Biodiversity: How Are We Doing?” *Environmentalist* 23, no. 1 (March 1, 2003): 9–15.
- Myers, Norman, and Andrew H. Knoll. “The Biotic Crisis and the Future of Evolution.” *Proceedings of the National Academy of Sciences* 98, no. 10 (May 8, 2001): 5389–92.
- Nagy, Kelsi, and Phillip David Johnson II. *Trash Animals: How We Live with Nature’s Filthy, Feral, Invasive, and Unwanted Species*. Minneapolis, MN: University of Minnesota Press, 2013.
- Naidoo, Robin, L Chris Weaver, Richard W Diggle, Greenwell Matongo, Greg Stuart-Hill, and Chris Thouless. “Complementary Benefits of Tourism and Hunting to Communal Conservancies in Namibia.” *Conservation Biology* 30, no. 3 (2016): 628–638.
- Nance, Susan. *Animal Modernity: Jumbo the Elephant and the Human Dilemma*. Berlin, Germany: Springer, 2015.
- National Park Service. “National Park Service Statistical Abstract,” 2000.
- Navarro, Laetitia M., and Henrique M. Pereira. “Rewilding Abandoned Landscapes in Europe.” *Ecosystems* 15, no. 6 (September 1, 2012): 900–912.
- Nelson, Erik J, Peter Kareiva, Mary Ruckelshaus, Katie Arkema, Gary Geller, Evan Girvetz, Dave Goodrich, et al. “Climate Change’s Impact on Key Ecosystem Services and the Human Well-Being They Support in the US.” *Frontiers in Ecology and the Environment* 11, no. 9 (2013): 483–893.
- Nelson, Michael Paul, Jeremy T Bruskotter, John A Vucetich, and Guillaume Chapron. “Emotions and the Ethics of Consequence in Conservation Decisions: Lessons from Cecil the Lion.” *Conservation Letters* 9, no. 4 (2016): 302–306.
- Newmark, W.D. “Extinction of Mammal Populations in Western North American National Parks.” *Conservation Biology* 9 (n.d.): 512–26.

- Newsome, David, Ross Kingston Dowling, and Susan A Moore. *Wildlife Tourism*. Vol. 24. Bristol, UK: Channel View Publications, 2005.
- Ng, Sandra J, Jim W Dole, Raymond M Sauvajot, Seth PD Riley, and Thomas J Valone. "Use of Highway Undercrossings by Wildlife in Southern California." *Biological Conservation* 115, no. 3 (2004): 499–507.
- Nicholls, Henry. "Restoring Nature's Backbone." *PLOS Biology* 4, no. 6 (June 13, 2006): e202.
- Nielsen, Hannah, and Anna Spenceley. "The Success of Tourism in Rwanda: Gorillas and More." *Yes, African Can: Success Stories from a Dynamic Continent*, 2011, 231–249.
- Nies, Judith. "The Black Mesa Syndrome." In *The Future of Nature: Writing on a Human Ecology from Orion Magazine*, edited by Barry Holstun Lopez. Minneapolis: Milkweed Editions, 2007.
- Nohl, Werner. "Gedankenskizze Einer Naturästhetik Der Stadt." *Landschaft+ Stadt* 22, no. 2 (1990): 57–67.
- Norton, Bryan G, Michael Hutchins, Terry Maple, and Elizabeth Stevens. *Ethics on the Ark: Zoos, Animal Welfare, and Wildlife Conservation*. Washington D.C.: Smithsonian Institution, 2012.
- Noss, Reed F, Andrew P Dobson, Robert Baldwin, Paul Beier, Cory R Davis, Dominick A Dellasala, John Francis, et al. "Bolder Thinking for Conservation." *Conservation Biology* 26, no. 1 (2012): 1–4.
- Nowicki, C.L. "The Animal Welfare Act: All Bark and No Bite." *Seton Hall Legic, J.*, no. 23 (n.d.): 443.
- Nussbaum, Martha. "Animal Rights: The Need for a Theoretical Basis (Reviewing Steven M. Wise, *Rattling the Cage: Toward Legal Rights for Animals* (2000))." *Harvard Law Review*, January 1, 2001, 1506.
- . "The Moral Status of Animals." *Chronicle of Higher Education* 52, no. 22 (2006).
- Nuttall, D.B. "An Animal-as-Client (AAC) Theory for Zoo Exhibit Design." *Landscape Research* 29, no. 1 (2004): 75–96.
- Odling-Smee, F John, Kevin N Laland, and Marcus W Feldman. *Niche Construction: The Neglected Process in Evolution*. 37. Princeton, NJ: Princeton University Press, 2003.
- Oelschlaeger, Max. "Deep Ecology and the Future of the Wild in the Anthropocene." *Trumpeter* 30, no. 2 (2014): 231–246.

- Ogden, J.A. "Why Focus on Zoo and Aquarium Education?" *Zoo Biology* 28, no. 5 (2009): 357–60.
- Ogden, Lesley Evans. "Extinction Is Forever... or Is It?" *BioScience* 64 (2014): 469–75.
- Oldfield, Frank, Anthony D Barnosky, John Dearing, Marina Fischer-Kowalski, John McNeill, Will Steffen, and Jan Zalasiewicz. "The Anthropocene Review: Its Significance, Implications and the Rationale for a New Transdisciplinary Journal." *The Anthropocene Review* 1, no. 1 (December 3, 2013): 3–7.
- Oldfield, M. *The Value of Conserving Genetic Resources*. Sunderland, MA: Sinauer Associates Inc., 1989.
- . *The Value of Conserving Genetic Resources Singuer Associates Inc.* MA: Sunderland, 1989.
- Olena Shmahalo. *The Five Big Cats of the Panthera Genus*. 2017. Quanta Magazine.
- "Ooz: Zoo Backwards," October 23, 2018. www.nyu.edu/projects/xdesign/ooz/.
- Opel, Andy, and Jason Smith. "ZooTycoon: Capitalism, Nature, and the Pursuit of Happiness." *Ethics and the Environment*, 2004, 103–120.
- Oteros-Rozas, Elisa, F Ravera, and I Palomo. "Participatory Scenario Planning in Place-Based Social-Ecological Research: Insights and Experiences from 23 Case Studies." *Ecology and Society*, 2015.
- Pacini, Giulia. "Environmental Concerns in Bernardin de Saint Pierre's Paul et Virginie." *Interdisciplinary Studies in Literature and Environment* 18, no. 1 (2011): 87–103.
- Packer, Craig, Dennis Ikanda, Bernard Kissui, and Hadas Kushnir. "Conservation Biology: Lion Attacks on Humans in Tanzania." *Nature* 436, no. 7053 (August 18, 2005): 927–28.
- Padilla, Elisabeth, and Gary Kofinas. "'Letting the Leaders Pass': Barriers to Using Traditional Ecological Knowledge in Comanagement as the Basis of Formal Hunting Regulations." *Ecology and Society* 19, no. 2 (2014).
- Palazy, Lucille, C Bonenfant, JM Gaillard, and F Courchamp. "Rarity, Trophy Hunting and Ungulates." *Animal Conservation* 15, no. 1 (2012): 4–11.
- Palmer, Clare. "Colonization, Urbanization, and Animals." *Philosophy & Geography* 6, no. 1 (2003): 47–58.
- . "Harm to Species-Species, Ethics, and Climate Change: The Case of the Polar Bear." *Notre Dame JL Ethics & Pub. Pol'y* 23 (2009): 587.

- Palmer, Lisa. "Indigenous Interests in Safari Hunting and Fishing Tourism in the Northern Territory." Wildlife Tourism Research Report Series. Goldcoast, Australia: Sustainable Tourism, 2002.
- Pangau-Adam, Margaretha, Richard Noske, and Michael Muehlenberg. "Wildmeat or Bushmeat? Subsistence Hunting and Commercial Harvesting in Papua (West New Guinea), Indonesia." *Human Ecology* 40, no. 4 (2012): 611–621.
- Parker, Tommy S, and Charles H Nilon. "Urban Landscape Characteristics Correlated with the Synurbization of Wildlife." *Landscape and Urban Planning* 106, no. 4 (2012): 316–325.
- Parson, Edward A, Virginia Burkett, Karen Fisher-Vanden, David Keith, Linda Mearns, Hugh Pitcher, Cynthia Rosenzweig, and Mort Webster. "Global-Change Scenarios: Their Development and Use," 2007.
- Patchett, Merle Marshall. "Putting Animals on Display: Geographies of Taxidermy Practice." PhD Thesis, University of Glasgow, 2010.
- Patrick, P.G. "Conservation and Education: Prominent Themes in Zoo Mission Statements." *The Journal of Environmental Education* 38, no. 5 (n.d.): 53–60.
- Peacock, D, and A Peacock. *The Essential Grizzly: The Mingled Fates of Men and Bears*. Lyons, New York: Lyons Press, 2006.
- Peattie, Lisa. "Convivial Cities." In *Cities for Citizens: Planning and the Rise of Civil Society in a Global Age*, by Mike Douglass and John Friedmann, 247–53. Hoboken, New Jersey: John Wiley & Son Ltd, 1998.
- Pedde, Simona, Kasper Kok, Janina Onigkeit, Calum Brown, Ian Holman, and Paula A Harrison. "Bridging Uncertainty Concepts across Narratives and Simulations in Environmental Scenarios." *Regional Environmental Change*, 2018, 1–12.
- Pedersen, Helena. "Animals on Display: The Zoocurriculum of Museum Exhibits." *Critical Education* 1, no. 8 (2010).
- Pedersen, Helena, and Natalie Dian. "Earth Trusts : A Quality Vision for Animals?" In *Metamorphoses of the Zoo: Animal Encounter after Noah*, by Ralph R Acampora, 171–92. Oxford, UK: Lexington Books, 2010.
- Péquignot, Amandine. "The Rhinoceros (Fl. 1770–1793) of King Louis XV and Its Horns." *Archives of Natural History* 40, no. 2 (2013): 213–227.
- Pergams, O. "Linkages of Conservation Activity to Trends in the U.S. Economy." *Conservation Biology* 18 (2004): 1617–25.

Perrings, Charles, Shahid Naeem, F Ahrestani, Daniel E Bunker, P Burkill, G Canziani, T Elmqvist, et al. "Ecosystem Services for 2020." *Science* 330, no. 6002 (2010): 323–324.

Perrot, Jean. "The French Avant-Garde Revisited: Or, Why We Shouldn't Burn Mickey Mouse." *Critical Perspectives on Postcolonial African Children's and Young Adult Literature*, 1998, 79–85.

Peterson, Matthew. "The Production of Narrative through Static Imagery: Examples from a Peculiar Medieval Illustration." *Visual Communication*, 2018, 1470357217749998.

Philo, Chris. "Animals, Geography, and the City: Notes on Inclusions and Exclusions." *Environment and Planning D: Society and Space* 13, no. 6 (1995): 655–681.

Philo, Chris, and Chris Wilbert. *Animal Spaces, Beastly Places*. London, UK: Routledge, 2004.

Phippen, J. Weston. "'Kill Every Buffalo You Can! Every Buffalo Dead Is an Indian Gone.'" *The Atlantic*, May 13, 2016.
<https://www.theatlantic.com/national/archive/2016/05/the-buffalo-killers/482349/>.

Photograph of a Pile of American Bison Skulls Waiting to Be Ground for Fertilizer. 1892. Burton Historical Collection. https://commons.wikimedia.org/wiki/File:Bison_skull_pile-restored.jpg.

Pidgeon, Anna M, Curtis H Flather, Volker C Radeloff, Christopher A Lepczyk, Nicholas S Keuler, Eric M Wood, Susan I Stewart, and Roger B Hammer. "Systematic Temporal Patterns in the Relationship between Housing Development and Forest Bird Biodiversity." *Conservation Biology* 28, no. 5 (2014): 1291–1301.

Pimm, S.L. "How Many Plant Species Are There, Where Are They, and at What Rate Are They Going Extinct?" *Annals of the Missouri Botanical Garden* 100, no. 3 (2015): 170–76.

Pimm, Stuart L., Gareth J. Russell, John L. Gittleman, and Thomas M. Brooks. "The Future of Biodiversity." *Science* 269, no. 5222 (July 21, 1995): 347–50.

Pink, Daniel H. *A Whole New Mind: Moving from the Information Age to the Conceptual Age*. New York: Riverhead, 2005.

Planhol, Xavier de. *Le Paysage Animal: L'homme et La Grande Faune: Une Zoogéographie Historique*. Paris, France: Fayard, 2004.

Pleasants, Nigel. "The Question of the Holocaust's Uniqueness: Was It Something More Than or Different From Genocide?" *Journal of Applied Philosophy* 33, no. 3 (2016): 297–310.

"Pleistocene Park: Restoration of the Mammoth Steppe Ecosystem," February 17, 2019.
<http://www.pleistocenepark.ru/en/background/>.

- Pluhar, Evelyn B. *Beyond Prejudice: The Moral Significance of Human and Nonhuman Animals*. Durham, NC: Duke University Press, 1995.
- Plumwood, Val. *Feminism and the Mastery of Nature*. London, UK: Routledge, 2002.
- Polak, Fred L. *The Image of the Future: Enlightening the Past, Orientating the Present, Forecasting the Future*. 1. AW Sythoff, 1961.
- Polasky, Stephen, Stephen R Carpenter, Carl Folke, and Bonnie Keeler. "Decision-Making under Great Uncertainty: Environmental Management in an Era of Global Change." *Trends in Ecology & Evolution* 26, no. 8 (2011): 398–404.
- Polaszek, Andrew. *Systema Naturae 250-The Linnaean Ark*. Boca Raton, FL: CRC Press, 2010.
- Poliquin, Rachel. *The Breathless Zoo: Taxidermy and the Cultures of Longing*. Vol. 1. University Park, PA: Penn State University Press, 2012.
- . "The Matter and Meaning of Museum Taxidermy." *Museum and Society* 6, no. 2 (2008): 123–134.
- Popper, Karl. *The Open Society and Its Enemies*. London, UK: Routledge, 2012.
- Power, Emma R. "Border-Processes and Homemaking: Encounters with Possums in Suburban Australian Homes." *Cultural Geographies* 16, no. 1 (2009): 29–54.
- Price, Jennifer. "Flight Maps Adventures with Nature in Modern America," 1999.
- . "Looking for Nature at the Mall: A Field Guide to the Nature Company." *Uncommon Ground: Toward Reinventing Nature*, 1995, 186–203.
- Price, Jenny. "Thirteen Ways of Seeing Nature in LA." *The Believer* 4, no. 3 (2006).
- "Publication: Good Zoo/Bad Zoo: Visitor Experiences in Captive Settings." ResearchGate, May 10, 2017.
https://www.researchgate.net/publication/233503953_Good_zoobad_zoo_Visitor_experiences_in_captive_settings.
- Putz, Oliver. "Moral Apes, Human Uniqueness, and the Image of God." *Zygon*® 44, no. 3 (2009): 613–624.
- Pyle, Robert M. *The Thunder Tree: Lessons from an Urban Wildland*. Lyons, New York: Lyons Press, 1998.
- Quinn, Daniel. *Beyond Civilization: Humanity's next Great Adventure*. New York: Three Rivers, 2000.

Rabinow, Paul. *Essays on the Anthropology of Reason*. Princeton, NJ: Princeton University Press, 1996.

Rachel Carson. *Silent Spring*. Boston, MA: Houghton Mifflin Harcourt, 1962.

Ralls, K. “Why Is Behaviour so Rarely Incorporated into Conservation Planning?” In *Proceedings of the Twenty-Fourth International Ethological Conference Abstracts*, 1995.

Ramirez, Rafael, Malobi Mukherjee, Simona Vezzoli, and Arnaldo Matus Kramer. “Scenarios as a Scholarly Methodology to Produce ‘Interesting Research.’” *Futures* 71 (2015): 70–87.

Ray, Justina. *Large Carnivores and the Conservation of Biodiversity*. Washington D.C.: Island Press, n.d.

Rayner, Steve. “Jack Beale Memorial Lecture on the Global Environment.” *Wicked Problems: Clumsy Solutions: Diagnoses and Prescriptions for Environmental Ills*, 2006.

Read, Rupert. “Culture, Nature, Ecosystem (or Why Nature Can’t Be Naturalized).” *Feminist Interpretations of Ludwig Wittgenstein*, 2002, 408–31.

Reading, Anthony. *Hope and Despair: How Perceptions of the Future Shape Human Behavior*. London: JHU Press, 2004.

Redford, Kent, and M. A. Sanjayan. “Retiring Cassandra.” *Conservation Biology* 17, no. 6 (December 1, 2003): 1473–74.

Reed, Chris. “Public Works Practice.” Edited by Charles Waldheim. *The Landscape Urbanism Reader* 282 (2008).

Regan, Tom. “Animal Rights, Human Wrongs.” In *Ethics and Animals*, 19–43. Berlin, Germany: Springer, 1983.

———. *Empty Cages: Facing the Challenge of Animal Rights*. Lanham, MD: Rowman & Littlefield, 2004.

“Regional Conference Proceedings.” *American Association of Zoological Parks and Aquariums*, n.d., 42–52.

Reichholf, Josef. *The Demise of Diversity: Loss and Extinction*. London, UK: Haus Publishing, 2009.

Rich, Nathaniel. “The Mammoth Cometh.” *New York Times* 27 (2014).

Rittel, Horst WJ, and Melvin M Webber. “Dilemmas in a General Theory of Planning.” *Policy Sciences* 4, no. 2 (1973): 155–169.

Ritvo, H. "London Zoo and the Victorians, 1828-1859." *Journal of Victorian Culture* 20, no. 2 (May 10, 2017): 255–57.

Robbins, Paul, and Sarah A Moore. "Ecological Anxiety Disorder: Diagnosing the Politics of the Anthropocene." *Cultural Geographies* 20, no. 1 (2013): 3–19.

"Robert Nickas : Live Free or Die – Les Presses Du Réel (Book)," May 10, 2017.
<http://www.lespressesdureel.com/EN/ouvrage.php?id=48>.

Robertson, George, Melinda Mash, Jon Bird, Lisa Tickner, Barry Curtis, and Tim Putnam. *FutureNatural: Nature, Science, Culture*. London, UK: Psychology Press, 1996.

Robinson, Kim Stanley. *2312*. London, UK: Hachette UK, 2012.

———. *Aurora*. London, UK: Orbit, 2015.

Rodney Start. *The Animals on Display in Wild: Amazing Animals in a Changing World*. n.d. Museum Victoria.

Roe, Dilys. *Making a Killing or Making a Living: Wildlife Trade, Trade Controls, and Rural Livelihoods*. 6. London, UK: IIED, 2002.

———. *Take Only Photographs, Leave Only Footprints: The Environmental Impacts of Wildlife Tourism*. 10. London, UK: International Institute for Environment and Development, 1997.

Roemer, Gary W., C. Josh Donlan, and Franck Courchamp. "Golden Eagles, Feral Pigs, and Insular Carnivores: How Exotic Species Turn Native Predators into Prey." *Proceedings of the National Academy of Sciences* 99, no. 2 (January 22, 2002): 791–96.

Rohter, Ira. *A Green Hawaii*. Los Altos, CA: Na Kane O Ka Malo, 1992.

Rollin, Bernard E. *Animal Rights and Human Morality*. Amherst, NY: Prometheus Books, 1981.

Rolston, Holmes. *Conserving Natural Value*. Columbia University Press, 1994.

Rondeau, Daniel, and Jon M Conrad. "Managing Urban Deer." *American Journal of Agricultural Economics* 85, no. 1 (2003): 266–281.

Rose, Martin. *Our Final Hour: A Scientist's Warning: How Terror, Error, and Environmental Disaster Threaten Humankind's Future in This Century – on Earth and Beyond*. New York: Basic, 2003.

Rosenzweig, Roy, and Elizabeth Blackmar. *The Park and the People: A History of Central Park*. Ithaca, NY: Cornell University Press, 1992.

- Rott, N. “The Organisation of Genetic Cryobanks and the Use of Developmental Biology Methods for the Conservation of Rare Animals II. Obtaining and Cryoconservation of Embryos of Wild Animals.” *Russian Journal of Developmental Biology* 27, no. 245–255 (n.d.): 1996.
- Rotter, Julian. *Social Learning and Clinical Psychology*. New York: Johnson Reprint Corporation, 1954.
- Rowcliffe, Marcus, and Chris Carbone. “Surveys Using Camera Traps: Are We Looking to a Brighter Future?” *Animal Conservation* 11, no. 3 (2008): 185–186.
- Rua Alshaheen. *Zoo?! Embracing Environmental Degradation*. 2015. Architecture Graduation Project. Kuwait University.
- Rupprecht, CDD, and JA Byrne. “Informal Urban Greenspace Perception and Use: Survey Instrument,” 2016.
https://www.researchgate.net/publication/303941485_Informal_urban_greenspace_perception_and_use_Survey_instrument.
- Rupprecht, Christoph DD, and Jason A Byrne. “Informal Urban Green-Space: Comparison of Quantity and Characteristics in Brisbane, Australia and Sapporo, Japan.” *PLoS One* 9, no. 6 (2014): e99784.
- Rupprecht, Christoph DD, Jason A Byrne, Jenni G Garden, and Jean-Marc Hero. “Informal Urban Green Space: A Trilingual Systematic Review of Its Role for Biodiversity and Trends in the Literature.” *Urban Forestry & Urban Greening* 14, no. 4 (2015): 883–908.
- Rupprecht, Christoph DD, Jason A Byrne, Hirofumi Ueda, and Alex Y Lo. “‘It’s Real, Not Fake like a Park’: Residents’ Perception and Use of Informal Urban Green-Space in Brisbane, Australia and Sapporo, Japan.” *Landscape and Urban Planning* 143 (2015): 205–218.
- Rust, Niki, and Diogo Verissimo. “Why Killing Lions like Cecil May Actually Be Good for Conservation.” *The Conversation*, 2015.
- Rutz, Christian. “The Establishment of an Urban Bird Population.” *Journal of Animal Ecology* 77, no. 5 (2008): 1008–1019.
- Sabloff, Annabelle. *Reordering the Natural World: Humans and Animals in the City*. Toronto, Canada: University of Toronto Press, 2001.
- Said, Edward. “Imaginative Geography and Its Representations: Orientalizing the Oriental.” In *The Cultural Geography Reader*, 369–376. New York: Routledge, 2008.
- . *Orientalism*. London, UK: Routledge and Kegan Paul, 1978.

- Salih, Sara. "The Animal You See: Why Look at Animals in Gaza?" *Interventions* 16, no. 3 (2014): 299–324.
- Samuelsson, Anna. "Zoo/Mbie Spaces: Museums as Humanimal Places." In *Animal Places*, 154–179. London, UK: Routledge, 2017.
- Sandbrook, Chris, William M Adams, and Bruno Monteferri. "Digital Games and Biodiversity Conservation." *Conservation Letters* 8, no. 2 (2015): 118–124.
- Sandler, Ronald. "The Ethics of Reviving Long Extinct Species." *Conservation Biology* 28, no. 2 (2014): 354–360.
- Sandler, Ronald L. *The Ethics of Species: An Introduction*. Cambridge, UK: Cambridge University Press, 2012.
- Sanera, Michael, and Jane S. Shaw. *Facts, Not Fear: Teaching Children about the Environment*. Vancouver, Canada: The Fraser Institute, 1999.
- Sardar, Ziauddin, and Merryl Wyn Davies. *American Terminator: Myths, Movies, and Global Power*. Newburyport, Massachusetts: Red Wheel Weiser, 2004.
- Sargent, Lyman Tower. "The Three Faces of Utopianism Revisited." *Utopian Studies* 5, no. 1 (1994): 28.
- Schlaepfer, Martin A. "Re-Wilding: A Bold Plan That Needs Native Megafauna." *Nature* 437, no. 7061 (October 13, 2005): 951.
- Schubert, Julian, Elena Schütz, and Leonard Streich. *Something Fantastic: A Manifesto by Three Young Architects on Worlds, People, Cities, and Houses*. 1st ed. Berlin, Germany: Ruby Press, 2010.
- Schutz, Alfred. "Collected Papers I: The Problem of Social Reality . The Hague: Martinus Nijhoff." *Schutz Collected Papers, I, The Problem of Social Reality* 1962, 1962.
- Schwartz, Peter. *The Long Boom: Forging a Better Future for Our Families, Communities, and Business in the New Global Economy*. New York: Perseus, 1999.
- Scott, Karen D. "Popularizing Science and Nature Programming: The Role of 'Spectacle' in Contemporary Wildlife Documentary." *Journal of Popular Film and Television* 31, no. 1 (2003): 29–35.
- Scott, Shirley V. *International Law and Politics: Key Documents*. Boulder, CO: Lynne Rienner Publishers, 2006.
- Scranton, Roy. *Learning to Die in the Anthropocene: Reflections on the End of a Civilization*. San Francisco, CA: City Lights Publishers, 2015.

Sebald, Winfried Georg. "Against the Irreversible: On Jean Améry." *On the Natural History of Destruction*, 2004, 143–67.

Segerdahl, Pär. *Undisciplined Animals: Invitations to Animal Studies*. Newcastle upon Tyne, UK: Cambridge Scholars Publishing, 2011.

Sergio, Fabrizio, IAN Newton, Luigi Marchesi, and Paolo Pedrini. "Ecologically Justified Charisma: Preservation of Top Predators Delivers Biodiversity Conservation." *Journal of Applied Ecology* 43, no. 6 (2006): 1049–1055.

Seymour, Mona. "'Support Your Local Invasive Species': Animal Protection Rhetoric and Nonnative Species." *Society & Animals* 21, no. 1 (2013): 54–73.

Seymour, Mona, and Jennifer Wolch. "Toward Zoöpolis? Innovation and Contradiction in a Conservation Community." *Journal of Urbanism* 2, no. 3 (2009): 215–236.

Shaffer, Mark L. "Minimum Population Sizes for Species Conservation." *BioScience* 31, no. 2 (February 1, 1981): 131–34.

Shapiro, Beth. "Pathways to De-Extinction: How Close Can We Get to Resurrection of an Extinct Species?" *Functional Ecology* 31, no. 5 (2017): 996–1002.

Sharp, Robin, and Kai-Uwe Wollscheid. "An Overview of Recreational Hunting in North America, Europe and Australia." *Recreational Hunting, Conservation and Rural Livelihoods*, 2009, 25–38.

Shea, SR, I Abbott, JA Armstrong, and KJ McNamara. "Sustainable Conservation: A New Integrated Approach to Nature Conservation in Australia." *Hale, P. and Lamb, D. (Eds)*, 1997, 39–48.

Shell, Marc. "The Family Pet." *Representations* 15, no. 1 (1986): 121–153.

Shepard, Paul. "On Animal Friends." *The Biophilia Hypothesis*, 1993, 275–300.

Shephard, P. *Thinking Animals: Animals and the Development of Human Intelligence*. Athens, GA: University of Georgia Press, 1998.

Sherkow, Jacob S, and Henry T Greely. "What If Extinction Is Not Forever?" *Science* 340, no. 6128 (2013): 32–33.

Shigeru Komatsuzaki. *The Ark of Space*. 1968.

Shoreman-Ouimet, Eleanor, and Helen Kopnina. *Culture and Conservation: Beyond Anthropocentrism*. Routledge, 2015.

Short, Damien. "Genocide." *The Wiley-Blackwell Encyclopedia of Social Theory*, 2017, 1–4.

- Shrock, Ellen, and Marc Güell. "CRISPR in Animals and Animal Models." In *Progress in Molecular Biology and Translational Science*, 152:95–114. Amsterdam, Netherlands: Elsevier, 2017.
- Sijtsma, Frans J, Michiel Daams, and Samantha van der Sluis. "Nature on TV: Deep Interests on Flat Screens." *Recreation, Tourism and Nature in a Changing World*, 2010, 258.
- Simmel, Georg, and Donald Nathan Levine. *On Individuality and Social Forms. Selected Writings. Edited and with an Introduction by Donald N. Levine*. Chicago, IL: University of Chicago Press, 1971.
- Simon, Julian. *The Ultimate Resource 2*. Princeton, NJ: Princeton University Press, 1998.
- Singer, Peter. *Animal Liberation: A New Ethic for Our Treatment of Animals*. New York: Harper Collins, 1975.
- Slaper, Timothy F, and Tanya J Hall. "The Triple Bottom Line: What Is It and How Does It Work." *Indiana Business Review* 86, no. 1 (2011): 4–8.
- Sleightholme, Stephen R., and Cameron R. Campbell. "A Retrospective Assessment of 20th Century Thylacine Populations." *Australian Zoologist*, 2015.
- Smith, Mick. *An Ethics of Place: Radical Ecology, Postmodernity, and Social Theory*. Albany, NY: Suny Press, 2001.
- Smith, N. *Uneven Development: Nature, Capital and the Production of Space*. Oxford, UK: Blackwell, 1984.
- Sontakke, Sadanand D., Manoj S. Patil, Govindhaswamy Umopathy, K. Ramachandra Rao, and Sisinthy Shivaji. "Ejaculate Characteristics, Short-Term Semen Storage and Successful Artificial Insemination Following Synchronisation of Oestrus in the Indian Blackbuck Antelope (*Antilope Cervicapra*)." *Reproduction, Fertility and Development* 21, no. 6 (July 22, 2009): 749–56.
- Sontakke, S.D. "Conservation of Genetic Material from Endangered and Economically Important Ungulate Species in Establishment of Cryobanks." *Theriogenology* 62, no. 1 (n.d.): 139–53.
- Soper, K. *What Is Nature? Culture, Politics and the Non-Human*. Oxford, UK: Blackwell, 1995.
- Sorkin, Michael. *Variations on a Theme Park: The New American City and the End of Public Space*. London, UK: Macmillan, 1992.
- Soule, M.E. "The New Conservation." *Conservation Biology* 27 (2013): 897–99.

Spenceley, Anna. "Impacts of Wildlife Tourism on Rural Livelihoods in Southern Africa." In *Responsible Tourism*, 187–214. London, UK: Routledge, 2012.

Speth, James. *Red Sky at Morning: America and the Crisis of the Global Environment*. New Haven, CT: Yale University Press, 2004.

Speth, James. *The Bridge at the Edge of the World: Capitalism, the Environment and Crossing from Crisis to Sustainability*. New Haven, CT: Yale University Press, 2009.

Sprigarelli, Jack. *Crisis Preparedness Handbook*. Alpine, UT: Cross-current, n.d.

Srinivasan, Krithika. "The Biopolitics of Animal Being and Welfare: Dog Control and Care in the UK and India." *Transactions of the Institute of British Geographers* 38, no. 1 (2013): 106–119.

Stanford, Craig B. *Planet without Apes*. Cambridge, MA: Harvard University Press, 2012.

Staples, Winthrop, and Philip Cafaro. "For a Species Right to Exist." *Life on the Brink: Environmentalists Confront Overpopulation*, 2012, 283–300.

Steadman, D, and P Martin. "The Late Quaternary Extinction and Future," 2003.

Steffen, Will, Wendy Broadgate, Lisa Deutsch, Owen Gaffney, and Cornelia Ludwig. "The Trajectory of the Anthropocene: The Great Acceleration." *The Anthropocene Review* 2, no. 1 (2015): 81–98.

Steffen, Will, Jacques Grinevald, Paul Crutzen, and John McNeill. "The Anthropocene: Conceptual and Historical Perspectives." *Philosophical Transactions of the Royal Society A: Mathematical, Physical and Engineering Sciences* 369, no. 1938 (2011): 842–867.

Stein, Matthew. "When Technology Fails: A Manual for Self-Reliance and Planetary Survival." Santa Fe, NM: Clear Light, 2000.

Stevenson, M., and D. Turner. "Zoos The Debate." *Ecologist* 34, no. 1 (2004): 20.

Stewart, C. "An Overview of Hand-Rearing Techniques for Long-Legged Birds at the Denver Zoo." In *Regional Conference Proceedings*, 42–52. American Association of Zoological Parks and Aquariums, 1986.

———. "An Overview of Hand-Rearing Techniques for Long-Legged Birds at the Denver Zoo." In *Regional Conference Proceedings*. American Association of Zoological Parks and Aquariums, 2003.

Stillman, Todd, George Ritzer. "The Postmodern Ballpark as a Leisure Setting: Enchantment and Simulated de-McDonaldization." *Leisure Sciences* 23, no. 2 (2001): 99–113.

- Stock, Gregory. *Redesigning Humans: Our Inevitable Genetic Future*. Boston, MA: Houghton Mifflin, 2002.
- Stokstad, Erik. *Bringing Back the Aurochs*. Washington, D.C.: American Association for the Advancement of Science, 2015.
- Stork, Nigel E. “Re-Assessing Current Extinction Rates.” *Biodiversity and Conservation* 19, no. 2 (2010): 357–371.
- Strauss A, C. J. *Basics of Qualitative Research: Grounded Theory Procedures and Techniques*. Thousand Oaks, CA: Sage Publications, 1990.
- . “Grounded Theory Methodology: An Overview.” In *Handbook of Qualitative Research*, 1–18. London, UK: Sage Publications, 1994.
- Sztybel, David. “Can the Treatment of Animals Be Compared to the Holocaust?” *Ethics and the Environment*, 2006, 97–132.
- Tam, Aaron. *Lyuba the Baby Woolly Mammoth*. April 10, 2012. AFP/Getty Images.
- Tapper, Richard. “Animality, Humanity, Morality, Society [in] What Is an Animal?” In *What Is an Animal?*, edited by Tim Ingold, *One World archaeology*:56. London, UK: Routledge, 1994.
- Tarsitano, Elvira. “Interaction between the Environment and Animals in Urban Settings: Integrated and Participatory Planning.” *Environmental Management* 38, no. 5 (2006): 799–809.
- Taylor, Russell. “Community Based Natural Resource Management in Zimbabwe: The Experience of CAMPFIRE.” *Biodiversity and Conservation* 18, no. 10 (2009): 2563–2583.
- Taylor-Leduc, Susan. “The Pleasures of Surprise: The Picturesque Garden in France.” *The Senses and Society* 10, no. 3 (2015): 361–380.
- Terborgh, J. “The Green World Hypothesis Revisited.” In *Large Carnivores and the Conservation of Biodiversity*, 82–99. Washington D.C.: Island, 2005.
- . “Vegetation Dynamics of Predator-Free Land-Bridge Islands.” *Journal of Ecology* 94 (2006): 253–63.
- “The Art of Nature: Artisan Crafted Steel Art Trees™.” NatureMaker Steel Art Trees, September 18, 2018. naturemaker.com.
- “The Bear Park.” Bern. Accessed March 1, 2019. <https://www.bern.com/en/detail/the-bearpark>.

“The Captivity Industry: The Reality of Zoos and Aquariums: An All Creatures Animal Rights Article,” May 10, 2017. <http://www.all-creatures.org/articles/ar-captivity-industry.html>.

“The Five Stages of Collapse.” Resilience, February 26, 2008. <http://www.resilience.org/stories/2008-02-26/five-stages-collapse/>.

“The Human Epoch.” *Nature* 473 (2011): 254.

The Vanishing Face of Gaia: A Final Warning. New York: Basic, 2009.

“The Zoo of the Future.” European Tourism Futures Institute, 2012. <http://www.etfi.nl/en/projects/zoo-future>.

Thomas, Edmund. “Urban Geographies of Human-Animal Relations in Classical Antiquity.” *Interactions between Animals and Humans in Graeco-Roman Antiquity*, 2017, 339.

Thomas, Frank, Ollie Johnston, and Frank Thomas. *The Illusion of Life: Disney Animation*. New York: Hyperion Press, 1995.

Thompson, D’Arcy Wentworth, trans. *The History of Animals—Aristotle*. London: John Bell, 1907.

Thoreau, Henry David. *Walden*. JL Shanley, Ed. Princeton, NJ: Princeton University Press, 1989.

Tidball, Alex. “Human Perceptions of Animals in the St. Louis Region: Prospects for a Transspecies City.” PhD Thesis, Southern Illinois University at Edwardsville, 2016.

Timothy, Jackson. *Prosperity without Growth*. London, UK: Sustainable Development Commission, UK, 2009.

Tobias, Michael Charles, and Jane Gray Morrison. *Anthrozooology: Embracing Co-Existence in the Anthropocene*. Berlin, Germany: Springer, 2016.

Tomkins, Richard. “Let’s Bring Back Rationing.” *Financial Times*, July 1, 2006.

Treves, Adrian. “Hunting for Large Carnivore Conservation.” *Journal of Applied Ecology* 46, no. 6 (2009): 1350–1356.

Treves, Adrian, and K. Ullas Karanth. “Human-Carnivore Conflict and Perspectives on Carnivore Management Worldwide.” *Conservation Biology* 17, no. 6 (December 1, 2003): 1491–99.

Tschumi, Bernard. *Architecture Zoo: Parc Zoologique De Paris. The Architectural Project*. Paris, France: Somogy Editions d’Art, 2014.

Tseronis, Assimakis, and Charles Forceville. "The Argumentative Relevance of Visual and Multimodal Antithesis in Frederick Wiseman's Documentaries." *Multimodal Argumentation and Rhetoric in Media Genres*, 2017, 165–188.

Tuan, YF. *Dominance and Affection: The Making of Pets*. New Haven, CT: Yale University Press, 1984.

Tudge, C. *The Variety of Life: A Survey and a Celebration of All the Creatures That Have Ever Lived*. Oxford, UK: Oxford University Press, n.d.

Turkle, Sherry. *The Second Self: Computers and the Human Spirit*. Cambridge, MA: MIT Press, 2005.

Turley, Sophie K, and others. "Conservation and Tourism in the Traditional UK Zoo." *Journal of Tourism Studies* 10, no. 2 (1999): 2.

Turner, Graham M. "A Comparison of the Limits to Growth with Thirty Years of Reality." Socio-Economics and the Environment in Discussion (SEED) Working Paper Series. CSIRO Sustainable Ecosystems, 2008. <https://ideas.repec.org/p/cse/wpaper/2008-09.html>.

Turner, Jack. *The Abstract Wild*. Tucson, AZ: University of Arizona Press, 1996.

Turner, Kj, and Rm Sharpe. "Environmental Oestrogens--Present Understanding." *Reviews of Reproduction* 2, no. 2 (May 1, 1997): 69–73.

Uddin, Farhad. "History of Zoo, Comparison of Different Zoo and Success of Captive Breeding in Bangladesh." *IOSR Journal of Agriculture and Veterinary Science* 10, no. 2 (February 2017): 13–16.

Uddin, Lisa. *Zoo Renewal: White Flight and the Animal Ghetto*. Minneapolis, MN: University of Minnesota Press, 2015.

Unmü\sig, Barbara. "Monetizing Nature: Taking Precaution on a Slippery Slope." *Great Transition Network*, 2014.

Urban, Florian. "Recovering Essence through Demolition: The "Organic" City in Postwar West Berlin." *Journal of the Society of Architectural Historians* 63, no. 3 (2004): 354–369.

Urbanik, Julie. *Placing Animals: An Introduction to the Geography of Human-Animal Relations*. Lanham, MD: Rowman & Littlefield, 2012.

Urbanik, Julie, and Mary Morgan. "A Tale of Tails: The Place of Dog Parks in the Urban Imaginary." *Geoforum* 44 (2013): 292–302.

- Urry, John. *The Tourist Gaze: Leisure and Travel in Contemporaries Societies*. London, UK: Sage, 1990.
- Van Dooren, Thom. *Flight Ways: Life and Loss at the Edge of Extinction*. New York: Columbia University Press New York, 2014.
- Van Dooren, Thom, Deborah Bird Rose, and others. “Storied-Places in a Multispecies City.” *Humanimalia* 3, no. 2 (2012): 1–27.
- Van Tuyl, Christine. *Zoos and Animal Welfare*. Farmington Hills, MI: Greenhaven Publishing LLC, 2009.
- Van Vuuren, Detlef P, Marcel TJ Kok, Bastien Girod, Paul L Lucas, and Bert de Vries. “Scenarios in Global Environmental Assessments: Key Characteristics and Lessons for Future Use.” *Global Environmental Change* 22, no. 4 (2012): 884–895.
- Vanderheiden, Steve. “Rethinking Environmentalism: Beyond Doom and Gloom.” *Global Environmental Politics* 11, no. 1 (2011): 108–113.
- Vannevkirk, Gus. “Artificial Cloning: Essential for Saving Endangered Species?” *EarthTalk.Org* (blog), September 9, 2016. <http://earthtalk.org/artificial-cloning-endangered-species/>.
- Veblen, Thorstein. *The Theory of the Leisure Class*. London, UK: Routledge, 2017.
- Veltre, Thomas. “Menageries, Metaphors, and Meanings.” *New Worlds, New Animals: From Menagerie to Zoological Park in the Nineteenth Century*, 1996, 22.
- Vernon, N., and J Kisling. “The Origin and Development of American Zoological Parks to 1899.” In *New Worlds, New Animals: From Menagerie to Zoological Park in the Nineteenth Century*, by Robert J Hoage and William A Deiss. Baltimore, MD: JHU Press, 1996.
- Vitousek, Peter M., Harold A. Mooney, Jane Lubchenco, and Jerry M. Melillo. “Human Domination of Earth’s Ecosystems.” In *Urban Ecology*, edited by John M. Marzluff, Eric Shulenberger, Wilfried Endlicher, Marina Alberti, Gordon Bradley, Clare Ryan, Ute Simon, and Craig ZumBrunnen, 3–13. New York: Springer US, 2008.
- Vucetich, John A, Jeremy T Bruskotter, and Michael Paul Nelson. “Evaluating Whether Nature’s Intrinsic Value Is an Axiom of or Anathema to Conservation.” *Conservation Biology* 29, no. 2 (2015): 321–332.
- Vue de Hambourg Au Début Du XXe Siècle*. December 14, 1909. Postcard. Vintage postcards private collection.

- Vuorisalo, Timo. "Environmental History and Urban Colonizations from an Avian Perspective." *Urban Biodiversity and Design*, no. 7 (2010): 191.
- Wall, John Edward. "Spaces of Co-Existence: The Processes and Prospects of Living with Endangered Species." PhD Thesis, Carleton University, 2011.
- Walsh, Froma. "Human-Animal Bonds I: The Relational Significance of Companion Animals." *Family Process* 48, no. 4 (2009): 462–480.
- Wang, Harris H, Hwangbeom Kim, Le Cong, Jaehwan Jeong, Duhee Bang, and George M Church. "Genome-Scale Promoter Engineering by Coselection MAGE." *Nature Methods* 9, no. 6 (2012): 591.
- Warkentin, Traci, and Leesa Fawcett. "Whale and Human Agency in World-Making: Decolonizing Whale-Human Encounters." In *Metamorphoses of the Zoo: Animal Encounter after Noah*. Lanham, MD: Lexington Books, 2010.
- Wehnelt, Stephanie, Steven Bird, and A Lenihan. "Chimpanzee Forest Exhibit at Chester Zoo." *International Zoo Yearbook* 40, no. 1 (2006): 313–322.
- Weig, Doerte. "Chapter Eight Resonating with Different Worlds: How Baka Musical Practices Generate Sociality, Identities, and Connection to Ritual Spirits." In *Making Music, Making Society*, by Sara Revilla, 191. Cambridge, UK: Cambridge Scholars Publishing, 2018.
- Weigl, Richard. "Longevity of Mammals in Captivity; from the Living Collections of the World," December 19, 2005.
<https://www.schweizerbart.de/publications/detail/isbn/9783510613793/Longevity-of-mammals-in-captivity-from-the-Living-Collections-of-the-world>.
- Weiland, Ulrike, and Matthias Richter. "Lines of Tradition and Recent Approaches to Urban Ecology, Focussing on Germany and the USA." *GALA-Ecological Perspectives for Science and Society* 18, no. 1 (2009): 49–57.
- Weinstein, Raymond S. "Should Remaining Stockpiles of Smallpox Virus (Variola) Be Destroyed?" *Emerging Infectious Diseases* 17, no. 4 (2011): 681.
- Weisman, Alan. *The World without Us*. New York: St. Martins, 2007.
- Wels, Harry. "'Animals like Us': Revisiting Organizational Ethnography and Research." *Journal of Organizational Ethnography* 4, no. 3 (2015): 242–259.
- Western, David. "Human-Modified Ecosystems and Future Evolution." *Proceedings of the National Academy of Sciences* 98, no. 10 (May 8, 2001): 5458–65.

“What Is an Immersion Exhibit?” Saint Louis Zoo, September 5, 2018.
<https://www.stlzoo.org/visit/thingstoseeanddo/riversedge/immersion>.

Whatmore, Sarah. “Dissecting the Autonomous Self: Hybrid Cartographies for a Relational Ethics.” *Environment and Planning D: Society and Space* 15, no. 1 (1997): 37–53.

———. *Hybrid Geographies: Natures Cultures Spaces*. Thousand Oaks, CA: Sage, 2002.

———. “Materialist Returns: Practising Cultural Geography in and for a More-than-Human World.” *Cultural Geographies* 13, no. 4 (2006): 600–609.

Whatmore, Sarah, and Lorraine Thorne. “Wild (Er) Ness: Reconfiguring the Geographies of Wildlife.” *Transactions of the Institute of British Geographers* 23, no. 4 (1998): 435–454.

“When You Walk Into a Zoo, Are You Helping Animals or Hurting Them?” TakePart, May 10, 2017. <http://www.takepart.com/feature/2014/05/02/do-zoos-matter>.

Whiston Spirn, Anne. “Constructing Nature: The Legacy of Frederick Law Olmstead.” *Uncommon Ground: Toward Reinventing Nature*, 1995, 91–113.

Whitfort, Amanda. “Evaluating China’s Draft Animal Protection Law.” *Sydney L. Rev.* 34 (2012): 347.

Whitham, Jessica C., and Nadja Wielebnowski. “New Directions for Zoo Animal Welfare Science.” *Applied Animal Behaviour Science* 147, no. 3 (2013): 247–60.

Whiting, A. “What’s Wrong with Zoos?” *Animal Liberation Victoria*, n.d.

“Who, What and, Why: Are Urban Fox Numbers Rising.” BBC News, 2013.
www.bbc.com/news/magazine-21409631.

“Why Zoos & Aquariums Matter: Assessing the Impact of a Visit to a Zoo or Aquarium.” ResearchGate, May 10, 2017.
https://www.researchgate.net/publication/253004933_Why_Zoos_Aquariums_Matter_Assessing_the_Impact_of_a_Visit_to_a_Zoo_or_Aquarium.

Wickins-Dražilová, Dita. “Zoo Animal Welfare.” *Journal of Agricultural and Environmental Ethics* 19, no. 1 (February 2006): 27–36.

Wilbert, Chris. “Animal Geographies.” *International Encyclopedia of Human Geography*, 2009, 122–26.

“Wildscreen Arkive.” Online Encyclopedia, September 7, 2018. www.arkive.org.

Wildt, D. *Tiger Genome Resource Banking (GRB) Action Plan. Global Need and a Plan for the North American Region* CBSG. MA: Apple Valley, 1993.

- Wildt, D., B. Pukazhenth, J. Brown, S. Monfort, J. Howard, and T. Roth. "Spermatology for Understanding, Managing and Conserving Rare Species." *Reproduction, Fertility, and Development* 7, no. 4 (1995): 811–24.
- Wilkin, Christa L, Paul Fairlie, and Souha R Ezzedeen. "Who Let the Dogs in? A Look at Pet-Friendly Workplaces." *International Journal of Workplace Health Management* 9, no. 1 (2016): 96–109.
- Wilkinson, Angela, and Esther Eidinow. "Evolving Practices in Environmental Scenarios: A New Scenario Typology." *Environmental Research Letters* 3, no. 4 (2008): 045017.
- William Ruddiman. *Plows, Plagues, and Petroleum*. Princeton, New Jersey: Princeton University Press, 2005.
- Williams, Jerry. "Knowledge, Consequences, and Experience: The Social Construction of Environmental Problems." *Sociological Inquiry* 68, no. 4 (1998): 476–497.
- Wilson, Alexander. *The Culture of Nature: North American Landscapes from Disneyland to the Exxon Valdez*. Cambridge, MA: Blackwell Books, 1992.
- Wilson, Edward O. *The Meaning of Human Existence*. New York: WW Norton & Company, 2014.
- Win, Hamish. "12 Companion Species and a Multisensory Urbanism." *Senses in Cities: Experiences of Urban Settings*, 2017.
- Wiseman, Michael, and Bogner, Franz. "A Higher-Order Model of Ecological Values and Its Relationship to Personality." *Personality and Individual Differences* 34 (2003): 783–94.
- Wohl, Ellen. *A World of Rivers: Environmental Change on Ten of the World's Great Rivers*. Chicago, IL: University of Chicago Press, 2011.
- Woinarski, John CZ, Sarah Legge, James A Fitzsimons, Barry J Traill, Andrew A Burbidge, Alaric Fisher, Ron SC Firth, et al. "The Disappearing Mammal Fauna of Northern Australia: Context, Cause, and Response." *Conservation Letters* 4, no. 3 (2011): 192–201.
- Wolch, J, A Brownlow, and U Lassiter. "Constructing the Animal Worlds of Inncercity Los Angeles." In *Animal Spaces, Beastly Places: New Geographies of Human–Animal Relations*, by Chris Philo and Chris Wilbert, 71–97. London and New York: Routledge, 2000.
- Wolch, Jennifer. "Anima Urbis." *Progress in Human Geography* 26, no. 6 (2002): 721–742.
- . "Zoopolis." *Capitalism Nature Socialism* 7, no. 2 (1996): 21–47.

Wolch, Jennifer, and Jacque Emel. "Bringing the Animals Back In." *Environment and Planning D Abstract* 13, no. 6 (1995): 632–636.

Wolch, Jennifer R, and Jody Emel. *Animal Geographies: Place, Politics, and Identity in the Nature-Culture Borderlands*. New York: Verso, 1998.

Wolch, Jennifer R, Kathleen West, and Thomas E Gaines. "Transspecies Urban Theory." *Environment and Planning D: Society and Space* 13, no. 6 (1995): 735–760.

Woods, Barbara. "Good Zoo/Bad Zoo: Visitor Experiences in Captive Settings." *Anthrozoös* 15, no. 4 (2002): 343–360.

Woolfson, Esther. *Field Notes from a Hidden City: An Urban Nature Diary*. Berkeley, CA: Counterpoint, 2014.

Worcester, Robyn E, and Robert Boelens. "The Co-Existing with Coyotes Program in Vancouver, BC," 2007.

Worm, Boris, and Robert T Paine. "Humans as a Hyperkeystone Species." *Trends in Ecology & Evolution* 31, no. 8 (2016): 600–607.

Wright, Daniel William Mackenzie. "Cloning Animals for Tourism in the Year 2070." *Futures* 95 (2018): 58–75.

Wu, Jianguo. "Urban Ecology and Sustainability: The State-of-the-Science and Future Directions." *Landscape and Urban Planning* 125 (2014): 209–221.

Yoon, Carol Kaesuk. "Naming Nature: The Clash between Instinct and Science." *The Chautauqua Journal* 1, no. 1 (2016): 19.

Zeitlin, Steve. "The Bell Tolls for Ringling." *Voices* 43, no. 3/4 (2016): 13–15.

Zimmer, Carl. "Bringing Them Back to Life The Revival of an Extinct Species Is No Longer a Fantasy. But Is It a Good Idea?" National Geographic, February 17, 2019. <https://www.nationalgeographic.com/magazine/2013/04/species-revival-bringing-back-extinct-animals/>.

Zimov, Sergey A. "Pleistocene Park: Return of the Mammoth's Ecosystem." *Science* 308, no. 5723 (May 6, 2005): 796–98.

"Zoo Animals Killed in Prague Floods." *BBC News World Edition*, August 14, 2002. <http://news.bbc.co.uk/2/hi/europe/2193483.stm>.

"Zoos: Pitiful Prisons." *PETA* (blog), May 10, 2017. <http://www.peta.org/issues/animals-in-entertainment/animals-used-entertainment-factsheets/zoos-pitiful-prisons/>.

Zurkow, Marina, and Una CHaudhuri. "Animalizing Interlude: Zoöpolis." In *The Stage Lives of Animals*, 115–130. London, UK: Routledge, 2016.