URBAN SUSTAINABILITY AND THE EXTINCTION OF EXPERIENCE:
ACKNOWLEDGING DRIVERS OF BIOCULTURAL LOSS
FOR SOCIO-ECOLOGICAL WELL-BEING


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In this dissertation I address urban sustainability with a focus on loss of cultural heritage and ecological knowledge by expanding the concept “extinction of experience” (EoE). Conceptualized by conservationist Robert Michael Pyle, EoE is the loss of nature experiences leading to apathy towards biodiversity and degradation of the common habitat. I expand upon Pyle’s formulation of the concept by considering the EoE cycle as an indirect driver that amplifies biodiversity losses. Additionally, I introduce the analysis of interrelated losses of biological and cultural diversity in relation to EoE. With a biocultural approach I discuss that EoE is tied to the infrastructural inertia within the global urban economy. I propose that addressing the EoE cycle is critical in that as a complex and multi-faceted process, it cements threats to biological and cultural diversity as permanent fixtures within society by obscuring their significance in light of economic development. This cycle remains a hidden problematic in that it perpetuates the environmental crisis while making such losses invisible within day-to-day lifestyle habits, constructing an emerging urban culture within the global economy that is ignorant of ecological processes and sustainability requirements. I frame the implications of EoE with an analysis of the newly proposed revisions of the UN Sustainable Development Goals voted on in September 2015 to prioritize local ecological knowledge and biocultural heritage.
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CHAPTER 1

URBAN SUSTAINABILITY AND THE EXTINCTION OF EXPERIENCE

Only 600 urban centers, with a fifth of the world’s population, generate 60 percent of global GDP.

--- Urban World Report, *McKinsey Global Institute*¹

Over the past 50 years, humans have changed ecosystems more rapidly and extensively than in any comparable period of time in human history, largely to meet rapidly growing demands for food, fresh water, timber, fiber and fuel. This has resulted in a substantial and largely irreversible loss in the diversity of life on Earth.

--- *The Millennium Ecosystem Assessment*²

As cities and metastasizing suburbs forsake their natural diversity, and their citizens grow more removed from personal contact with nature, awareness and appreciation retreat. This breeds apathy toward environmental concerns and, inevitably, further degradation of the common habitat. So it goes, on and on, the extinction of experience sucking the life from the land, the intimacy of our connections.

--- Robert Michael Pyle, *The Thunder Tree*³

1.1 Introduction: The Environmental Crisis and the Inertia of Biological and Cultural Diversity Loss

We live in an age of hidden problematics, where the actions taken by consumer society are mediated through the global political economy, making it difficult, if not impossible, to trace the sources and consequences of the urban ecosystem upon biodiversity and human well-being. Mediating technologies create conditions in which urban consumers experience nature indirectly, and the resources it provides such as food and water become biased ideas as opposed to

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immediate experiences. Additionally, information regarding the origin of these products is often vague or incorrect, obscuring the illegal, inhumane, and unethical practices that often take place in sweatshops, logging operations, and within industrial crop and animal agricultures. Children growing up in cities often have no direct experience with nature, leaving them without fundamental ecological knowledge regarding the origin of foodstuff such as milk or seasonal availability of fruits. Water in a brook—or from the tap for that matter—is often seen as dirtier to drink than that purchased in a plastic bottle. Urban sustainability is difficult to implement when such fundamental ecological knowledge and environmental sensitivity is threatened.

Such misconceptions dominate the urban sphere, skewing the perception of the human relationship to the environment where the natural appears to be foreign or threatening. This dehumanization of the ‘other’ correspondingly erodes the sense of moral responsibility for these social and environmental injustices. Furthermore, as urban centers are linked through their global reach and production systems, communities that live beyond the edge of the city often face displacement and impoverishment from encroaching economic growth. Articulating moral responsibility for environmental degradation in this context is a complicated and obscured

4 While Bruno Latour is known for popularizing the idea of technological mediation and its influence on human culture, ways of life, and values—there are many variations on this theme. For an overview, see: Steven Dorrestijn, “Theories and figures of technical mediation,” in Design and Anthropology, ed. Jared Donovan and Wendy Gunn (Surrey, UK; Burlington, USA: Ashgate Publishing, 2013), pp. 219-230. See also the discussion of FN10 regarding technological agency and infrastructural inertia.


6 For more on alienation from nature, see Henri Lefèbvre’s discussion on second nature in his book Urban Revolution. He argues that an ecological conception of ‘nature’ is displaced by a new conceptual ‘space of reality’—the urban sphere—which encompasses distinct processes of its own. For the isolated denizen within the city, the urban is seen as natural, and what was once ‘natural’ becomes alien, artificial and beyond the human world. When nature is encountered within these urban spaces, Lefèbvre argues this ‘alienated nature’ appears now either as an ornament or is perceived as an oddity because it is only a fragmented partial aspect of ecological nature. (Henri Lefèbvre, Urban Revolution, trans. Robert Bonnono, [University of Minnesota Press: 2003, Originally published 1970], p. 28.) The treatment of nature as artificial and separate from urban communities is a sentiment considered throughout contemporary environmental philosophy and eco-literacy movements as well. For an overview reflection on this theme see Andrew Biro, “On Nature and Alienation,” in Critical Ecologies: The Frankfurt School and Contemporary Environmental Crises, particularly (University of Toronto Press, 2011), particularly pp. 201-203. It is important to note that Lefèbvre is critiquing the processes in which this alienated nature comes about, as a move towards recovering or engaging a non-alienated form of nature within the bounds of the post-industrial city.
process, with the fundamental causes often distanced and remote from the ultimate outcomes of those processes.

Environmental degradation, social injustices, and power asymmetries are pervasive and ever-present aspects of today’s global economy. The impact of this economy reaches worldwide, albeit often distanced from the direct experiences of those living deep in urban centers. For instance, the losses of life, language, landscapes, and culture that occur often go unrecognized by the industrial machine-culture that continues to produce its electronics, cars, food, clothing, and other commodities that make up the life of the urbanite. Comprehending the true ramifications of today’s consumer society is difficult when so much of it is mediated, separate and “elsewhere.”

As expressed so eloquently by conservationist Robert Michael Pyle in the initial quote of this chapter, the extinction of experience (EoE) is a complex phenomenon occurring alongside these material losses. Indeed, “[a]s cities and metastasizing suburbs forsake their natural diversity, and their citizens grow more removed from personal contact with nature,” an EoE occurs. The process noted by Pyle emerges as the EoE cycle, an iterative, self-replicating process that must be addressed in order to confront the consequent lack of knowledge about ecosystem processes and biodiversity losses. As Pyle stated, the lack of contact “breeds apathy toward environmental concerns and, inevitably, further degradation of the common habitat.”

In this dissertation, I expand upon Pyle’s formulation of the concept by considering the EoE cycle as a driver that amplifies and continues biodiversity and cultural diversity losses as it is tied to the infrastructural inertia within the global urban economy. I propose that addressing

\[\text{\footnotesize\[\text{\footnotesize7 Pyle’s use of “natural diversity” refers to the local biodiversity of a particular region.} \text{\footnotesize8 Robert Michael Pyle, “Eden in a Vacant Lot: Special Places, Species, and Kids in the Neighborhood,” in Children and Nature: Psychological, Sociocultural, and Evolutionary Investigations, ed. Peter H. Kahn and Stephen R. Kellert (MIT Press, 2002), 305-327.} \text{\footnotesize9 Pyle, Thunder Tree, 146.} \text{\footnotesize10 The inertia of infrastructure and institutions is discussed further in Chapter 3 as a driver of extinction of experience. For a discussion on urban inertias (social, institutional, and infrastructural) see: Childers, Daniel L. et} \]}

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EoE is vital in that as a process, it cements threats to biological and cultural diversity through permanent fixtures within society by obscuring their significance in light of economic development. This cycle remains a hidden problematic in that it perpetuates the environmental crisis while making such losses invisible in day-to-day lifestyle habits, constructing an emerging urban culture within the global economy that is ignorant of ecological processes and sustainability requirements. As such, this dissertation explores the following questions:

- What culture and values are embedded in the EoE cycle?
- What cultures and values emerge as part of the EoE cycle, and how does this phenomenon influence biocultural diversity?
- How can the detrimental consequences of the EoE processes be articulated and implemented as a critique for losses of biological and cultural diversity?
- How does a biocultural approach to EoE contribute to better incorporating sustainable ways of life of diverse cultures into global society?
- How does acknowledging EoE contribute to shifting the prevailing market economy and its global structures to better incorporate sustainable and equitable priorities?

In this dissertation I address these questions by analyzing the needs of urban sustainability with a focus on the loss of cultural heritage and ecological knowledge. To do so, I broaden the EoE concept by embedding it within a biocultural framework that captures the co-constitutive interrelationship of cultural and biological diversity. Further, I consider this complex biocultural interrelationship across the rural-urban gradient to include perspectives throughout the today’s

al., “Advancing Urban Sustainability Theory and Action: Challenges and Opportunities,” Landscape and Urban Planning 125 (2014): 320-328. Of ‘embedded’ inertia the authors write, “We suggest that all of these theories interact through inertia in urban systems, and that this multi-faceted inertia—e.g. institutional inertia, infrastructural inertia, and social inertia—imparts degrees of rigidity that make urban systems less flexible and nimble when facing transitional triggers and change. Given this, solutions to urban sustainability challenges may be categorized as those: (1) that “tweak” the current systems and work with or even take advantage of the inertia in those systems, versus; (2) that are more “transformative,” that confront systemic inertia, and that may require new systems” (321). While I am not doing the comparison here, it is worth noting Andrew Feenberg’s critique of technological agency develops a similar vein of reasoning. Andrew Feenberg, Critical Theory of Technology (New York: Oxford University Press, 1992). I am ultimately arguing that the discussion of embedded inertia within structural elements of society is applicable to indirect drivers generally, and in particular, in the case of food culture, standardized education, and market economy within the United States. My proposal is that if urban drivers carry an inertial force that produces EoE, this process will remain particularly insidious as knowledge is lost and the capacity to recognize this biocultural loss is diminished. This view challenges a technological determinism and instead proposes that technological forces can be re-aligned to match societal goals and vice versa, creating a powerful hermeneutic for change.
globalized society that are impacted by EoE in distinct ways. I argue that EoE is a contributing factor to dominant development practices by overlooking the losses of biocultural diversity. According to this biocultural framework, it is necessary to affirm the interrelationship of cultural, linguistic, and biological diversity (biocultural diversity). I present EoE as a process that can be used to identify potential and actual threats to biocultural diversity for urban and traditional communities.

Presented as the first significant finding of the Millennium Ecosystem Assessment (MEA),\(^\text{11}\) anthropogenic drivers have rendered irreversible damage to the world’s ecosystems, undermining ecological processes. This is a result of human behavior largely a result of economic growth and wanton consumption. Yet it remains true that this consumption is driven by the urban centers of the globe, and the profits reach an even smaller fraction of the global population.\(^\text{12}\) On the one hand, biocultural ethics affirms that there is a great need to distinguish differential responsibility among different individuals, social groups, and institutions that cause global environmental change. On the other hand, it affirms the need to support sustainable ways of life exhibited by diverse traditional societies and local communities throughout the rural-urban gradient.

In this chapter I propose that the EoE critique reveals important elements necessary for sustainability policy that are currently overlooked. This discussion is particularly relevant with the revision of the Millennium Development Goals (MDG) in Fall 2015 for the newly proposed “Sustainable Development Goals” (SDG). These SDGs have been developed to address the shortcomings identified in the implementation of the MDGs, and yet continue to follow the same

\(^{11}\) Throughout the literature the Millennium Ecosystem Assessment has been abbreviated both as MA and MEA, I am adopting the latter here to emphasize all three aspects of the assessment.

trends discounting the importance of traditional and local ways of life. My goal is to develop a biocultural approach to EoE in order to provide a novel lens to discuss the deterioration of local ecological knowledge (LEK), traditional ecological knowledge (TEK), and cultural heritage, and the consequences this has on sustainable development policy and practices across the rural-urban gradient. I will present the concept of biocultural heritage to affirm the LEK, TEK, and cultural heritages that are often lost through the EoE process.

1.2 Research Problem: The Emerging Unsustainable Urban Society and the Extinction of Experience

With projections of urban society reaching three-quarters of the human population by 2050, all those lives will be connected through a shared hydrological, communicative, economic, educational, and food infrastructure that comprises the urban sphere. Urban centers dominate the world economy and, consequently, the manipulation of the world’s natural resources (its biodiversity and ecological processes as utilized by commerce). The implications of the Urban World Report are looming, with the proportion of the “consuming class” increasing. The consuming class is projected to move from 2.4 billion people in 2010 to 3.7 billion by 2025. This net increase means over one billion new consumers in market cities by 2025, and across larger cities, an increase in annual household consumption by the equivalent of 20 trillion US dollars in that same period of time.

The McKinsey Global Institute has dubbed the group of cities that comprise this urban center of economic influence ‘the City 600’. The City 600 refers to those cities that contribute approximately 65% of the world’s gross domestic product (GDP). The Institute further estimates

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14 Ibid. p 23.
that by 2025, the ‘Emerging 440’—those cities that are ‘emerging economies’ located predominantly in China, South and Southeast Asia, and Latin America—will comprise almost half of that GDP by 2025.\textsuperscript{15} The underlying structures that link the rapidly growing urban societies around the globe create a unique problematic in that the standardized structure of these novel cities imposes, in general, a narrow relationship to the contrasting particular ecological and cultural diversities in which they are placed around the world. These emerging urban settings and their economies are following the unsustainable paths set out by today’s dominant commerce, replete with its environmental and social impacts.\textsuperscript{16}

The rapid and recent change of today’s global economy follows a period of great change in the twentieth century.\textsuperscript{17} When the United Nations were formed after the two world wars, a spirit of a peaceful and unified planet was taken up in global political discourse. However, the world in the twenty-first century is vastly different than what was envisioned when a league of world-nations was first proposed. The loss of biodiversity, the degradation of ecosystems, the displacement of peoples from their lands, the rise in poverty, and the great asymmetries in wealth make this society far from peaceful, just, or equitable in the distribution of benefits and harms. An increasing number of studies demonstrate that it is the consumption patterns of the global economy that are correlated with the accelerated rate of global environmental change, and not simply the rapidly increasing global population.\textsuperscript{18} Technical solutions do not address the

\begin{flushleft}
\textsuperscript{15} Ibid., vi-vii.
\textsuperscript{17} Initiated in 1950, the so-called “Great Acceleration” launched a separate stage in the anthropocene, with unprecedented rates of economic growth and ecological footprints. Steffen et al., 2011, see also the analysis in Rozzi 2015, Implications of Biocultural Ethics.
\end{flushleft}
underlying causes of social and environmental inequities without also considering values and cultural heritages.

The tension of managing this so-called “ordered”

global society highlights the controversies that lie at the heart of the environmental crisis: they reveal the potency of policy choices between diversity and homogeneity, monocultures and polycultures, economic and ecological efficiency, as well as between market and subsistence economies. In terms of justice, they reveal the need to consider distribution of wealth, goods, and services; procedural justice, which ensures all peoples are given a fair opportunity for redressing harms; and restorative justice, which attempts to recover what has been lost. These principles—reconciliation and restitution, recognition and affirmation—fall within the politics of the environmental crisis in that particular economic forces are causing the majority of these biodiversity, linguistic, and cultural losses. Nonetheless, these economic forces are anthropogenically driven, and thereby remain forces that can be altered by political and ethical will.

In this dissertation, I propose that to reorient the indirect drivers of the environmental crisis, it is indispensible to recover the experience of both biological and cultural diversity, including the diversity of human values, languages, ecological practices, and ways of being.

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19 John Rawls explored the idea of the ‘well-ordered’ society and the role institutions play in creating the basic structure on the lives of citizens in his work *A Theory of Justice*. A perfectly just or ‘well-ordered society’ for Rawls is one in which all peoples desire and act upon the requirements of justice. He wrote, “…for the most part I examine the principles of justice that would regulate a well-ordered society. Everyone is presumed to act justly and to do his part in upholding just institutions” (n.p.). While Rawls’s original position attempts to protect cultural differences save for the most extreme human rights violations, his theory of justice has been criticized for lacking inclusion of ecological and non-human ethical considerations, and further for remaining untenable in as much as it focuses on concepts of justice based upon the identity through citizenship, as opposed to personhood. For more on this view see: Charles R. Beitz. “Rawls’s Law of People”, in *John Rawls: Critical Assessments of Leading Political Philosophers*, ed. Chandran Kukathas (London: Routledge, 2003), p. 221.
Sustainable solutions to the environment crisis must incorporate diverse socio-political dimensions. While various groups throughout the sustainability discourse have articulated this view, more attention needs to be given to the factors that undermine cultural diversity, cultural heritage, and the maintenance of lifestyle practices and traditions in tandem with ecological concerns within policy. This includes a consideration of not only the importance of developing an environmental ethic within global society, but also protecting the interest and concerns of cultures that do live sustainably with the environment. These biocultural heritage communities share value systems and traditions that are distinct from, yet oppressed by, those found in global society dominated by market economy even as these communities persist throughout the rural-urban gradient. Additionally, sustainability requires accounting for the gap that is currently present between the physical drivers creating social change, which correspondingly limit the development of local ecological knowledge, an ethic of care for nonhuman entities, and the practice of living with sustainable alternatives.

In order to address the structures that transmit knowledge and structure daily lives, I focus a theoretical critique on the relationship of local ecological knowledge and the structures that influence values and lifestyles in relation to their sustainability. As local and applied knowledge fades in the urban sphere, certain key experiences are absent from day-to-day engagements, emerging as a culture of ‘extinction of experience.’ Language articulating the nature of this process needs to be better developed for its application in policy change.

The loss of key experiences, engagement, and ways of life in the world are part of globalized urban culture that has emerged in the past fifty years. I argue that the comprehension

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21 I analyze Pyle’s inception of EoE and the EoE cycle in Chapter 2 and expand upon its use in relation to biocultural heritage in Chapter 3.
of the inertial force underlying urbanized spaces and its consequential influence on cultural and emotional experiences is one of the most significant ethical problems of our time. In this human-dominated period of our planet, landscapes and biodiversity are not the only entities severely impacted. This is also a time when ecological knowledge, cultural heritage, and connectivity between lifestyle habits and impacts upon the world are often hidden, mediated, and invisible. The work must be done to make the EoE cycle visible, explicit, and at the center of the sustainability conversation, so that we might address, target, and prevent it from perpetuating into the future.

EoE as a concept points to a fundamental loss in relation to local biodiversity, cultural heritage, and local relationships that are driven by structural forces within society. Introducing a biocultural approach, my dissertation focuses on understanding EoE as a process across the rural-urban gradient, through a critical discussion of the societal structures that are threatening diversity of the planet in its biological, linguistic, and cultural expressions, and through the rich and dynamic changes that form this diversity. I propose that we should consider EoE as both a cause and a product of certain forces within urban structures, with ramifications for life within and beyond the city. As such, my goal is double: first to better understand the causes of the EoE cycle and the way this cycle is tied to the infrastructural inertia of the urban itself, and second, to develop a language to critique and prevent EoE so that its cycle can be halted.

Certain technologies that have come to dominate consumer culture and agriculture have changed the way of life for the average citizen by fundamentally altering the environment that constitutes our daily lives and habits. Just as we cannot always see the stars at night in our well-lit cities, technology has affected human life on planet Earth in unexpected ways. With 50% of the world population living in these conditions, the impact that this infrastructure has on
community and culture needs to be understood, in particular, in terms the unsustainable cultures that are developing through the EoE.

1.3 Significance of This Research: The Extinction of Experience Cycle Within the Environmental Crisis

The significance of this research lies in drawing attention to the extinction of experience cycle as a major force driving the environmental crisis and which self-replicates as a result of this environmental degradation. Globally, there has been a concerted effort to address human well-being while responding to the environmental crisis. However, these efforts are typically centered on economic prosperity and growth, and measured through economic vitality. For instance, the United Nations originally set eight major priorities for its Millennium Development Goals (MDGs) in 2000 for managing a sustainable global society. A fifteen-year target was set for addressing these goals as a response to the environmental crisis and the perceived threats to human well-being. These eight goals include eradicating extreme poverty and hunger, achieving universal primary education, ensuring environmental sustainability, and furthering a global partnership for development.  

Reports have shown some improvement in these areas, according to the indicators used by the assessment. The UN MDG Report 2012 showed that

… the proportion of people living on less than $1.25 has decreased from 47% in 1990 to 24% in 2008 (from 2 to 1.4 billion). This indicates that Target 1 – Halve the proportion of people living on less than one dollar a day – will be reached by 2015 (UN, 2012). Child mortality… has been steadily decreasing globally, and immunization rates are over 90% in almost two-thirds of all countries (Overseas Development Institute [ODI], 2010). Enrollment rates of primary schools increased from 58 to 76% in sub-Saharan Africa between 1999 and 2010, professional assistance during childbirth has improved from

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22 The complete MDG goals include: Eradicate Extreme Poverty and Hunger; Achieve Universal Primary Education; Promote Gender Equality and Empower Women; Reduce Child Mortality; Improve Maternal Health; Combat HIV/AIDS, Malaria, and Other Diseases; Ensure Environmental Sustainability; Global Partnership for Development.
55% in 1990 to 65% in 2010 (Indicator 5.2) and the aimed reduction of slum dwellers by 100 million (Target 7.D) is already achieved. (UN, 2012).23

Following Rio+20, an open working group was put together to develop new Sustainable Development Goals, to update and adapt the MDGs for a post-2015 development agenda. In September, a global vote will be made to approve these new sustainable goals building upon the Millennium Goals.24

While the proposed expansion of the original development goals include more explicit considerations of social and economic justice as well as an emphasis on building sustainable practices and societies, the analysis of the forces that create unsustainability as a culture is little developed. Further, the factors that threaten local ecological knowledge, traditional lifestyles, and alternative economic practices still remain absent and are not explicitly listed in the seventeen new goals (Table 1.1). The proposed sustainability goals listed below are intended to be revisions of the MDGs to account for the shortfalls found in the past fifteen years.25 Note that no single goal emphasizes the need to protect local ecological knowledge, cultural heritage, nor its interrelation with biodiversity as a pathway to sustainability.

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25 Ibid.
Table 1.1: 2015 Sustainable Development Goals (emphasis added)

1. End poverty in all its forms everywhere  
2. End hunger, achieve food security and improved nutrition and promote sustainable agriculture  
3. Ensure healthy lives and promote well-being for all at all ages  
4. Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all  
5. Achieve gender equality and empower all women and girls  
6. Ensure availability and sustainable management of water and sanitation for all  
7. Ensure access to affordable, reliable, sustainable and modern energy for all  
8. Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all  
9. Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation  
10. Reduce inequality within and among countries  
11. Make cities and human settlements inclusive, safe, resilient and sustainable  
12. Ensure sustainable consumption and production patterns  
13. Take urgent action to combat climate change and its impacts  
14. Conserve and sustainably use the oceans, seas and marine resources for sustainable development  
15. Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss  
16. Promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels  
17. Strengthen the means of implementation and revitalize the global partnership for sustainable development

One aspect of development discourse that has gained particular traction in recent years is the need to address the socio-political injustices that result from these development practices as an ethical priority. I concur with MDG critics, who emphasize that in many ways these

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26 I will be using the phrase “development discourse” following Arturo Escobar’s analysis of post-World War framing of the first and third worlds. For a discussion on the origin of this idea and its historical context see Farzana Naz’s. “Arturo Escobar and the Development Discourse: An Overview,” Asian Affairs 28, no. 3 (2006): 64-84. Franz writes, “[A] central feature of development discourse…is the narration of underdevelopment as a series of absences. The third world is defined primarily by what it is not, rather than by what it is. Its central characteristics become what it lacks, not what it possesses. The essence of the third world is accordingly its lack of development, the absence of ‘technical knowledge’, ‘scientific advances’, prosperity, progress and so on. As development discourse has changed and adapted to the changing circumstances of both donor and recipient countries, the specific nature of these absences has varied. Underdevelopment has been variously described as the absence of ‘growth’,
development goals did not manage to stem the impact of large-scale economies on local communities as these goals did not address the underlying causes of displacement, overexploitation, and poverty. For instance, “development aid has fallen for the first time in more than a decade” despite Goal 8 to create a better ‘global partnership for development.’

Even if this decrease in aid had not occurred, global partnership requires more than aid for the impoverished, it requires addressing the conditions that create poverty.

The creation of poverty is caused by many factors, and the disregard for these causes and its relation to the dominant economy ignores its significance for cultural sovereignty and its implications for earth stewardship. Local peoples are often displaced from their land by industry, leading to mass rural migrations to urban cities. These displaced communities then go on to form shantytowns at the outskirts of large urban centers, unsupported by the larger infrastructure of the city and disconnected from their traditional livelihoods. This pattern is taking place at unprecedented rates today in regions of Africa, Asia, Central and South America. Large-scale development degrades local ecosystems and displaces local peoples, leading to an EoE of that is both environmental and cultural.

Alleviating poverty requires avoiding the original displacement and impoverishment of these peoples, rather than simply addressing their needs once they have been displaced from their homelands and traditional ways of life. A landmark decision protecting the right of ancestral peoples to maintain their lands occurred with 1993 Law of Colombia, “In Recognition of the Right of Black Colombians to Collectivity Own and Occupy their Ancestral Lands.”

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28 Ibid.
29 Rozzi, Latin American Perspectives, 87-111.
case, Afro-Colombians of the South-Pacific were facing displacement due to growing economic pressures. To protect their way of life and livelihoods, Law 70 of Colombia put forth the following principles:

- Recognition and protection of ethnic and cultural diversity, and equal rights for all cultures that compose the Colombian nationality.
- Respect for the integrity and dignity of the Black Communities’ cultural life.
- Participation of the Black Communities and their organizations, without detriment to their autonomy, in decisions that affect them and in those that affect the entire nation in conformity with the law.
- The protection of the environment, emphasizing the relationships established by the Black Communities and nature.\(^\text{31}\)

It seems reasonable to expect similar language within the MDG and SDG. Yet MDG #1 and its SDG adaptation do not explicitly acknowledge the underlying causes of poverty. Indeed, if policy were to “eradicate extreme poverty and hunger” we should equally expect to see a goal that read ‘preserve the sovereignty of local peoples to their land, heritage, and property,’ as stated in Law 70 of Colombia. Instead, the SDG perpetuates the same theme underscoring development discourse—if not exacerbating this trend—by setting the new goal which only generalizes these principles more by reframing the goal to “end poverty in all forms everywhere” without addressing its ultimate causes.

While the “Consequences of Responses on Human Well-Being and Poverty Reduction” chapter within Volume 3 of the MEA. “Ecosystems and Human Well-Being: Policy Responses” acknowledges this tension by calling for decentralization and the need to “respect…the use of ecosystem services by different communities,” the language still obscures the uneven distribution of wealth and its direct correlation with asymmetrical consumption patterns. Even within the conceptual definitions of poverty provided by the MEA, the definitions do not include

\(^{31}\)Ibid.

Translation available online: www.benedict.edu/exec_admin/intnl_programs/other_files/be-intnl_programs-law_70_of_colombia-english.pdf
displacement from ancestral lands as a type of poverty and instead provide indicators as to the
degree and quality of the nature of the poverty as it is now expressed.\textsuperscript{32} Protecting heritage and
sustainable lifestyles is as important as developing new strategies for adapting current
development practices towards sustainability. In sharp contrast to partnership, the two are linked
in that large-scale development often displaces or undermines local ways of life that are already
self-sustaining.

Another example is present in the use of “inclusivity” throughout the language of the SDG
regarding subsistence economies and education. The educational model underlying SDG Goal
#3, “Ensure inclusive and quality education for all and improve lifelong learning,” expands on
MDG’s goal to “achieve universal primary education.” Yet it does not explicitly recognize other
educational methods within traditional and indigenous communities. This educational model
does not account for the nuanced and complex traditional knowledge of communities, thereby
discounting local ways of life and further separating knowledge relevant to local landscapes.\textsuperscript{33}
The lack of recognition for local forms of knowledge and transmission perpetuates the
displacement of local ways of life and knowing, ultimately continuing the trend to undermine
subsistence ways of life. This reveals the significant urgency that policy address local ecological
knowledge, knowledge transmission, and traditional lifestyle practices more explicitly within the
SDGs, especially in its post-Rio iteration.

\textsuperscript{32}Anantha Kumar Duraiappah et al. “Chapter 17: Consequences of Responses on Human Well-being and
Poverty Reduction,” in \textit{Millennium Ecosystem Assessment, Ecosystems and Human Well-being: Policy Responses,
vol. 3} (Island Press: 2005), pp. 487-526. Note that not a single concept or measure of poverty provided within the
chapter refers to dispossession in terms of loss of land or sovereignty, emphasis is instead placed upon lack of access
to food, shelter, and income. Concepts listed are: Absolute poverty, relative poverty, incidence of poverty, depth of
poverty, temporary poverty, chronic poverty, monetary poverty, and multidimensional poverty. See Box 17.5, p. 512.

\textsuperscript{33}Stanford Zent, "Traditional ecological knowledge (TEK) and biocultural diversity: a close-up look at
linkages, delearning trends, and changing patterns of transmission," \textit{Learning and knowing in indigenous societies
be explored further in Chapter 3.
These and other examples show that the SDGs appear to be continuing the trend of the MDGs in overlooking the important role of community action, local ecological knowledge, and heritage in managing socio-ecosystems. The listed SDG goals do not specify the importance of linguistic losses, disruption of the oral tradition, fragmentation of communities, or other forms of displacement and general disregard for local ways of life as a top-level priority for sustainability policy. Addressing the EoE is a significant step in addressing the drivers building cultures of unsustainability that have been created in the post-industrial society. It is also a political issue facing urban communities who face pressing economic and political pressures driving unsustainable ways of life.

As is well-exhibited with the first finding of the MEA, the “human dimension” and the “human actor” is now being recognized for what it is on the planet Earth - a formative ‘engineer’ of the structures, lives, and entities that survive and persist, or, those that are wiped out or oppressed. The socio-political dimensions of conservation are far-reaching, and efforts to address the impacts of conservation on indigenous and local communities are increasingly recognized in tandem with new sustainable priorities. Yet this discourse must still develop methods to fairly incorporate urban and rural perspectives, and the diversity of cultural views of the human–nature relationship in order to ensure a sustainable and truly inclusive dialogue is maintained, as opposed to assimilation of minority views based upon development priorities. The “inclusivity” that is stated by the SDGs contributes to a culture of sustainability through assimilation, thereby threatening cultural sovereignty and rights to self-governance. In this sense sustainable development makes no mention of ecological knowledge and values, a conspicuous absence
which threatens to perpetuate the EoE cycle even as the UN strives to make “globalization a positive force for all.”

1.4 Theory and Analysis: A Biocultural Adaptation of the Millennium Ecosystem Assessment to Address the Extinction of Experience Cycle

In 2000, UN Secretary General Kofi Annan called for the scientific evaluation of the world ecosystems and the services they provide for humanity in response to the recognized need for research on human well-being in relation to ecosystem health. The Millennium Ecosystem Assessment Framework (MEA) was presented in 2003, identifying direct and indirect drivers that impact ecological functioning and their consequent ability to provide ecosystems services for human well-being to meet the MDGs. The MEA uses the concepts of direct and indirect drivers to identify causal agents of change in the human-development of the environment. Direct drivers are those agents of change that are physical or mechanical processes, whereas indirect drivers are those agents of change that are intentional and socially related. Indirect drivers, ranging from patterns of consumption and production within the global economy, sociopolitical context, cultural and religious values, and technoscientific innovations are much less explicitly

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36 Ibid.
37 “The MA definition of a driver is any natural or human-induced factor that directly or indirectly causes a change in an ecosystem. A direct driver unequivocally influences ecosystem processes. An indirect driver operates more diffusely by altering one or more direct drivers. The categories of global driving forces are demographic, economic, sociopolitical, cultural and religious, scientific and technological, and physical and biological. Drivers in all categories other than physical and biological are considered indirect. Important direct, i.e., physical and biological, drivers include changes in climate, plant nutrient use, land conversion, and diseases and invasive species.” Gerald C. Nelson et al., “Anthropogenic Drivers of Ecosystem Change: An Overview,” Ecology and Society 11, no. 2 (2006). [Available online] http://www.ecologyandsociety.org/vol11/iss2/art29/
acknowledged than their direct or biophysical counterparts driving global environmental change.\textsuperscript{38}

Scientific research largely focuses on the direct drivers of change providing a descriptive account of what ecological and urban processes impact the environment and the complex interactive relationships between humans and the environment. Carpenter et al. have argued that focusing on indirect drivers is a particular strategy for development of ecological resilience in response to global environmental change, and that it remains a neglected area of research.\textsuperscript{39} For this reason, I aim to contribute advancing this discussion for sustainability by focusing on indirect drivers. I specifically provide a biocultural approach to address the EoE as one of the threats driving biological and cultural diversity losses, with detrimental consequences for sustainability. Complementarily, I develop an analysis of the factors that drive EoE in order to develop strategies to prevent EoE from remaining a force tied to the infrastructural inertia of development practices. Unless recognized in policy, the deterioration of ecological knowledge and cultural heritage will continue to impact future generations through infrastructural and policy inertia which create EoE conditions.\textsuperscript{40}

I call attention to the high relevance of the indirect drivers of global environmental change because, whether explicitly acknowledged or not, they represent influential structures linking life habits and the habitats of the urban habitat.\textsuperscript{41} These indirect drivers in turn shape communication, policies, and administration priorities, comprising the environmental context in which an individual participates, engages, senses, and perceives the world. And in the case of the EoE

\textsuperscript{38} Ibid.
cycle, the fundamental experiences that shape values, priorities, and knowledge of the world. The EoE cycle is a interlinking, self-perpetuating cycle that ripples through many other drivers, remaining a complex multi-faceted cultural phenomenon that shapes physical factors which in turn shape experiential reality. The habits constructed by these indirect drivers reflect a fundamental structure created by the urban habitat. This structure is representative of a global scale that maintains certain priorities, standards, and lifestyle practices. Drivers have the potential to shape human activities and steer society towards certain goals, if we are willing to acknowledge the vital force underlying these structures. Therefore, developing understanding of the infrastructural forces at work underlying sustainable societies must be at the forefront in the development of new structures for sustainable living in the twenty-first century. As stated above, I propose that EoE is one of these indirect drivers, and there remain many more such forces at work within the space between ethical and cultural values and the structures that shape human society and action.

The urban habitat shapes life habits, often created by monoculture based economies, which drive the EoE of biological and cultural diversity, disrupting the reciprocal link of life habits—habitats. This disconnection is an ongoing cultural phenomenon embedded within the global economy. Taken as an extinction of experience, it represents the obfuscation of the sustainable relationship human communities often do and can share with the natural world. I propose therefore, that EoE is considered as an indirect driver to address in sustainability policy. In order to address EoE, it is necessary to recognize the co-constitutive relationship among the factors

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that create culture and the way culture shapes these factors, that is its biocultural interrelation. As argued for in the MEA’s chapter on cultural values, “it is important to recognize models of decision-making that do not always fit formal economic models of ‘rational choice.’” Yet a further step must be taken to address a biocultural mode of thinking within the larger SDGs, and the forces which threaten or undermine these other ways of being, such as articulation of EoE in its physical and conceptual formulations.

1.5 Key Concepts and Method: Moving Towards Sustainable Development Goals by Addressing Biocultural Loss with the Extinction of Experience

The first major finding of the Millennium Ecosystem Assessment is to acknowledge that “over the past 50 years, humans have changed ecosystems more rapidly and extensively than in any comparable period of time in human history, largely to meet rapidly growing demands for food, fresh water, timber, fiber, and fuel.” The framing by the MEA is problematic in that this presentation implies that all humans are equally responsible for this unsustainable consumption of foodstuffs, energy, and materials. This view overlooks the importance of local and traditional ecological knowledge for developing sustainable life-practices, and further, for maintaining sustainable cultures. This view also overlooks the uneven distribution of wealth within the global economy, and that it is the high demand of consumption culture that is pushing demands past sustainable limits—not necessarily population.

While the MDG and newly updated SDGs do not explicitly prescribe cultural heritage conservation as a Millennium goal, the MEA affirms the important role human culture plays in

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45 Ogden et al. Uneven Anthropocene, p. 140-142, and “As the United Nation’s last Human Development report makes clear, climate change driven by fossil fuel consumption in the world’s wealthiest nations possess the greatest challenge to achieving environmental and society equity in the world,” p. 145.
influencing ecosystems and management practices in the chapter.\textsuperscript{46} In particular, the MEA recommends that in order “to achieve conservation and avoid unsustainable use of ecosystems, ‘traditional’ and ‘formal’ knowledge systems need to be linked.”\textsuperscript{47} Further, MEA emphasizes that current scientific understanding of “the linkages between ecological processes and social processes, and their tangible and intangible benefits (such as spiritual and religion values), and of the influence on sustainable natural resource management levels needs to be strengthened.”\textsuperscript{48}

The main cultural and amenity services the MEA recognizes are:

- a) cultural identity (as defined as the current cultural linkage between humans and their environment),
- b) heritage values (“memories” in the landscape from past cultural ties),
- c) spiritual services,
- d) inspiration,
- e) aesthetic appreciation of natural and cultivated landscapes,
- f) recreation and tourism.

In contrast, little of this MEA language is present in the new SDGs affirming alternative sustainable ways of life in relation to the culture of local communities, nor does it acknowledge the need for restorative and environmental justice surrounding industrial pollution and the transboundary politics of resource use. To take these recommendations seriously, these priorities should be made explicit in the SDGs, and could easily be articulated as a focused 18\textsuperscript{th} goal that emphasizes the importance of promoting sustainable values and biocultural heritage.

In a global society where extinction of species and the loss of wildlife populations are occurring at such a rapid rate, is the loss of biodiversity an experience? While an experience with a butterfly, a wren, or a condor is considered a valuable nature experience, is the disappearance of particular members of an ecological community an experience? Should this not also be considered in sustainability strategies? That the very knowledge, care, and heritage with

\textsuperscript{46} Bhattacharya et al, \textit{Cultural Services}, p. 457.
\textsuperscript{47} Ibid., p. 457
\textsuperscript{48} Ibid.
ecological systems are in some cases lost or distanced from standardized ways of life influences
the overall experience an individual has of the world.

The EoE is somewhat deictic in the meaning it carries, relative to the standpoint of those
experiencing different forms of loss, rooted as it is in their specific awareness and distinct life
histories, relationality, and engagement with human and non-human beings. Speaking a common
language, or struggling to learn the common language in a new region, shifts one’s personal
experience and ability to communicate and relate with others. It can create a sense of alienation,
disengagement, or disinterest, even as through such experiences one can create identity,
relationality, and familiarity. Due to this contextual quality of EoE, readers must keep in mind to
reflect at all times that this concept captures what experiences are being lost in relation to the
sphere of awareness, and that even the discussion about this phenomenon is embedded in our
own epistemological vantage of the human–nature relationship (as similar or different as they
may be).

Throughout the MDGs and SDGs, the language does not emphasize the need to protect
local ecological knowledge and local ways of life as a fundamental heritage of the local human
actor even as it acknowledges this importance. Fifteen years after the proposed MDGs, even
following the Rio Summit and many other international forums discussing solutions to the
environmental crisis, an explicit articulation of the need to maintain the ethical relationship
urging protection of biodiversity, the environment, and local ecological knowledge is still
missing within the revision of the goals. Since these policy recommendations are not capturing
the real-time socio-ecological dynamics between infrastructure and culture, and ethics and
heritage, a framework that intentionally and explicitly captures this co-constitutive quality in
addition to these other attributes is needed. Further, the very language used to express global
assessment priorities and scope requires analysis to uncover blindspots where heritage views of development are excluded.

I call attention to the fact that the EoE cycle is not only an outcome of biodiversity and cultural losses; at the same time, it is an indirect driver of these losses. Yet in order to address these co-constitutive losses, EoE requires a model that integrates the cultural experience and the valuing of the natural world synchronically with its ecological context, or in the least, in consideration of the interrelationship of biodiversity and culture. While biotic homogenization and cultural loss is often treated as isolated concepts of study within the sciences, biological diversity and cultural diversity are also being treated as an interlocked unit in the scholarship and activism bridging these two sectors, and can be found clearly within the biocultural framework.49

The biocultural framework is one socio-ecological approach that explicitly acknowledges the co-evolutionary interrelationship between human communities and their environments. Cultural values, priorities, and knowledge are shaped by the environments in which they live, and in time this is expressed in unique stories, narratives, and languages. Rather than treating language or culture as isolated from the environment, language and culture are better understood as ‘ecologically embedded.’50 The co-evolutionary interrelationship of biological, linguistic, and cultural diversity is emphasized as an integral part of a complex socio-ecological system, and the roles communities have in ecosystem management.

In 2010 the Declaration on Bio-Cultural Diversity of the International Conference on Cultural and Biological Diversity for Development affirmed the importance of local actors in


preserving their autonomy, self-reliance, and cultural heritage as a way of maintaining their sustainable role within their own ecosystems, calling upon the “1972 World Heritage Convention, 1992 Convention on Biological Diversity, the 2003 Convention for the Safeguarding of the Intangible Cultural Heritage and the 2005 Convention on the Protection and Promotion of the Diversity of Cultural Expressions.” Yet this interrelation nonetheless requires further integration into the SDGs and within the MEA itself in order to be implemented as a methodology within analysis.

The biocultural approach itself has emerged through fifty-plus years of research seeking to expose the deep co-evolutionary interconnection between humans and their environments. Embedded within the tradition of ethnoecology, biocultural diversity as a frame of analysis has helped bridged scientific and non-scientific perspectives within development discourse. I argue that a biocultural adaptation of the MEA can capture this co-evolutionary quality, and that further, EoE as phenomenon provides the justification for this adaptation.

For the purpose of this dissertation I refer to biocultural loss to capture the experiential diminishing of the interrelationship between biological, linguistic, and cultural diversity. Within this diminishing is the degradation of ecological systems and biodiversity, and the decline in nature encounters and opportunities for nature experience. Further, biocultural loss refers to the discounting of the innate value of biodiversity and alternative cultural forms and expression of nature values. Additionally, just as environmental sensitivity refers to awareness of ecological processes and the integrity of ecological functioning, I use the term biocultural sensitivity to

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refer to the awareness of the co-constitutive relationship between humans and their environments, and the inter-ethical consideration of cultural diversity as a driver of landscape change. The EoE cycle captures mechanisms that diminish the sensitivity to comprehend biocultural loss, and the complexity heritage, livelihood, and biodiversity share at the intersection of biological, linguistic, and cultural diversity and within the complex mosaic of cultural landscapes comprising the rural–urban gradient. To foster socio-ecological sustainability across the rural–urban gradient it is necessary to focus on protecting indigenous biocultural knowledge where it persists, as much as developing a biocultural ethic and rationale within technoscientific communities that lack sensitivity to this deep interrelation.

1.6 Background Problematic Assumptions: Three Development Myths Masking the Structural Inertia Driving Biocultural Loss

Environments shape cultures, just as cultures in turn shape the habitats around them through their values, life-style habits, and management practices. This co-evolution is an ongoing cycle, with cultural habits and habitats co-constitutively forming each other. Urban cultures are strongly influenced by the automated processes of surrounding technological infrastructure, such as the transportation, industrial agribusiness, and educational systems, as well as by the intangible values underlying the policies of these systems. Within this urban sphere, socio-cultural groups living within urban ecosystems are developing forms of ecological

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53 See Rozzi and Poole, Cultures of Sustainability.
knowledge that are not necessarily tied to regional ecosystems as is reflected by the conception of EoE.

The emerging physical and cultural isolation of communities from regional ecosystems has been identified as one of the major causes for the lack of awareness and ethical concern for the unprecedented loss of biological, linguistic, and cultural diversity that is occurring globally.\textsuperscript{54} As communities lose day-to-day relations with the vast diversity of animals, plants, and environs, and pressures increase on rural and indigenous communities that co-inhabit other cultural landscapes to adopt this distanced way of life, the culture of living ecological knowledge embedded in practice recedes. Ethnoecological studies have demonstrated that indigenous and traditional cultural habits and worldviews are a vital component of sustainability and conservation of biodiversity.\textsuperscript{55} Today, a major conservation challenge is creating ways in which rural and indigenous ways of thinking and acting are propelled by the properties of the urban infrastructure itself. The EoE of biological and cultural diversity is a part of this disconnection cycle, reiterated between structure and culture, and it is also expressing itself in the policies and new strategies that are being proposed in response to the environmental crisis.

Before I examine the causes and outcomes of the EoE cycle within this dissertation, I present three hidden assumptions that skew the discussion of the role of cultural diversity and cultural heritage in creating sustainable solutions to development. Presented here as ‘development myths,’ these assumptions appear constantly throughout development discourse and skew views on sustainable policy. It is important to make explicit and critically analyze these


hidden assumptions in order to deconstruct the conceptual hurdles that must be crossed in order to address plural cultures of sustainability.\textsuperscript{56} Deconstruction of these assumptions will help to identify more precisely the drivers and agents that are responsible for environmental and social harms, and further, the distinct structures that create these losses. As such, I present these assumptions as development myths that are pervasive throughout sustainability discourse. Refining categorization of the complex urban global network will allow policy to more ably articulate the sources of environmental harms and the barriers between global society and sustainable management of the global commons.\textsuperscript{57}

While this is not a complete analysis of the MEA, I point to instances where these assumptions are expressing themselves to highlight language and framing that contributes to the EoE within policy. Admittedly, even the MEA is not consistent throughout the assessment because it is a large body of work representing research from multiple social and ecological sciences. For instance, the chapter on social values runs in tension with the chapter on poverty, the former emphasizing cultural sovereignty and the latter overlooking the role that large-scale development plays in displacing peoples and violating that local sovereignty. This unevenness in emphasis should be corrected in order to address the EoE, or in the least, noted as ongoing tensions within discourse surrounding the environmental crisis and urban sustainability.

1.6.1 Myth #1: The Myth of Cultural Homogeneity

As stated in the beginning of this chapter, the first finding of the MEA is that “over the past 50 years, humans have changed ecosystems more rapidly and extensively than in any

\textsuperscript{56} Rozzi, \textit{Implications of Biocultural Ethics}, p. 132.

comparable period of time in human history.” While acknowledging the significant influence anthropogenic drivers have in causing global environmental change, the lack of differentiation among the distinct groups actually responsible for these social and environmental harms reveals the hidden assumption of cultural homogeneity, that is, *all cultures essentially share the same human–nature relationship with biodiversity and the ecosystems*. This assumption is particularly deceptive in that it simultaneously obscures the existence of communities that are living sustainably, while concealing the source of these harms. Though it is an important step for the ecological sciences and policy to acknowledge human drivers as the major cause of global environmental change occurring today, it is necessary to take this analysis one step further and speak more precisely to avoid presenting the human species as essentially or generally harmful to the environment. In order to halt unsustainable practices, policy language needs to better articulate and pinpoint the source of these harms. As Ricardo Rozzi wrote of the biocultural ethic, sanctioning responsible parties is a necessary step towards addressing unsustainability. He writes,

> Unsustainable practices and agents that are detrimental to sustaining life need to be sanctioned and/or remedied; complementarily, more sustainable worldviews, forms of knowledge, values, economic, and ecological practices should be respected and eventually adapted as we develop new modes of Earth stewardship.  

Within the biocultural ethic, Ricardo Rozzi has described the accounting for the differential responsibilities of distinct social groups as a major need within policy to confront plutonomy within global power dynamics. “While ‘developing’ countries account for most of the population growth during the twentieth century and today contribute 5.9 billion to the 7 billion of the world population, ‘developed’ countries… are most responsible for the growth in GDP and

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58 MEA, p. 1.  
59 Rozzi, *Latin American Perspectives*, p. 88
today account for more than 75% of the world’s GDP.” As such it is the “consumption in the OEDP [Organization for Economic Cooperation and Development] countries, rather than population growth in the rest of the world, [that] has been the most important driver of change.” While overpopulation is often treated as the major driver of the global environmental crisis, the emissions of OEDP consumption practices is the larger driver of anthropogenic change. Rozzi’s analysis shows this uneven distribution. North America has a 4.6 ratio of GDP to world population, with Europe and Oceania following with 2.4 and 1.7, respectively. Latin America, Asia, and Africa, the regions often identified as overwhelming ecosystems due to climbing populations, by comparison, show a GPD to world population ratio of 1.0, 0.6 and 0.2 respectively. The extent of this disparity is made even clearer when it is shown that 85 individuals posses 1% of the world’s total wealth, which would equal 1,630,588 individuals to own the equivalent amount. This differential impact is often obscured in language that treats all humans as equally culpable.

Second, this presentation also overlooks the cultural diversity present throughout humanity. The biocultural ethic also argues that it is important to ‘pluralize human natures’ which “fosters intercultural forms of Earth Stewardship” so that policy analysis not only makes note of these differences for comparison but also creates opportunities for dialogue among these differences by affirming their reality.

As such, it is clear that not all human communities equally experience global environmental change, nor are they equally responsible for its occurrence. Not all communities share the same human–nature relationship. Based upon their cultural heritage, different

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60 Rozzi, Implications of Biocultural Ethics, p. 120.
61 Steffen et al., 2011, p. 757, as quoted by Rozzi in Implications of Biocultural Ethics.
62 Rozzi, Implications of Biocultural Ethics, p. 119
63 Ibid., p. 135
communities share distinct environmental sensitivities in experiencing the loss of biodiversity and in response to the environmental crisis, and therefore perceive different responsibilities relative to their perception of these events. Nonetheless, these communities share lives connected through the formal structures of education, industry, transportation, and commerce within the global development discourse and differences must be acknowledged within policy language so as to avoid obscuring them and furthering the EoE cycle.

1.6.2 Myth #2: The Myth of the Human Cancer on the Planet Earth

Since the infamous 1993 article by Warren Hern entitled, “Has the Human Species Become a Cancer on the Planet?” the reoccurring analogy that humans are a tumor killing the Earth continually reemerges in face of the great biodiversity extinctions and impacts of climate change within the environmental crisis. Hern captured the human cancer as an idea and then presented the behavior of cancer as a possible explanation for the environmentally destructive actions of humans and captures the second myth I analyze, the belief that all humans are inherently harmful to biodiversity and ecosystems. He describes the ‘malignant characteristics of the human species’ as matching the four main characteristics of a malignant neoplasm: rapid, uncontrolled growth, invasion and destruction of adjacent tissue, de-differentiation and loss of individual components (or in the case of humans at the community level and metastasis to different sites). Further, his statement that “a chief tendency of the human species to simplify ecosystems everywhere” goes against significant anthropological and ethnoecological work that

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65 Interestingly, Hern also called for a biocultural approach to the ‘human problem’ to aid in the human ability to self-govern within ecological limits though he offers no explanation as to his meaning in the article, p. 9.
has demonstrated humans as complex ecosystem managers who actually increase the biological diversity within their habitats.  

Given that not all human cultures are equally responsible for global environmental change, it is technically misleading and ethically unfair, then, to label the entire human species as detrimental to the environment within global sustainability discourses, such as the SDGs. Nonetheless, it remains a striking trend that human beings as a whole species continue to be compared to a cancerous tumor on the Earth by cultural critics, with the species of humanity alluded to as a plague on all the beings that inhabit the world—as if we are harmful by nature. Consequently, the implication under such perspective is that the environmental crisis is unavoidable as long as this harmful species persists. This “cancerous” allusion (and sometimes accusation) is not unanimously applied, yet its continual reoccurrence reveals an underlying assumption that is the second myth I identify. Pyle uses a similar comparison as well, as he describes EoE emerging “as cities and metastasizing suburbs forsake their natural diversity, and their citizens grow more removed from personal contact with nature, awareness and [its] appreciation retreat.” While Pyle treats this cancerous comparison as an unnatural state for humanity, it nonetheless still frames unsustainable practices as the potential that humanity can become. While the implications of such framings may not be intentional, treating humans as a cancer perpetuates the first myth, that all human cultures are the same, and secondly, implies the cause of the environmental crisis is an inherent product of the human nature as a destructive presence for other life-forms.

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66 For plural cultural perspectives of the human–nature relationship, see my discussion on ethnoecology in section 3.4.
68 Hern captured the human cancer as an analogy and proposed it is a possible explanation for the environmentally destructive behavior of humans. Interestingly, he also called for a biocultural approach to the ‘human problem’ to aid in the human ability to self-govern within ecological limits, p. 1088.
69 Pyle, Thunder Tree, p. 146.
This myth, that the entire species is harmful by nature, simultaneously makes invisible the cultural diversity of ways of being with the planet, many of which are sustainable, while presenting the human species as a tumor that needs to be cut out of the its host—the planet Earth. This analogy of cancer to the Earth specifically creates the view that humans are antagonistic or destructive by nature to this planetary system at the species level. The analogy only allows the option of cutting out the tumor; there is no cure, only absence or cessation of human existence. Rather, this comparison disguises that the human–nature relationship is actually co-evolutionary, co-constitutive, and innate not only in the ecological relationship humans share with the rest of the world, but our cultural and intentional relationships as well.

A recent and popularly circulated Internet meme exhibits this pessimistic sentiment well. Originating with a New York Times cartoon, this image was replicated on an earth science department’s blackboard and then spread through the Internet, displaying a sympathetic yet lifeless Saturn acknowledging that the reason Earth is ill is its human “infection” (Box 1, below). Of course the imagery breaks down once we recall that Saturn harbors no life and that Earth is currently the only planet we know of that carries the rich diversity of life at all. This looming and misanthropic view of humankind is reaching mythic proportions, perpetuated in the face of global environmental change as urban society struggles to come to terms with the significant damage done to the planet and the hard facts that many of these changes are now inalterable. Instead of blaming the growing human population for environmental destruction, we should be targeting which human communities are actually harming the environment and sanction such activities and life-style habits.

As Rozzi urges, “to achieve Earth stewardship, omitting this specification in the diagnosis of global environmental change would be a mistake as serious as a physician that treats
this disease, instead of identifying the specific organism[s] that are actually responsible for the infection.” The view of the human cancer simplifies the analysis of anthropogenic drivers of the environmental crisis by emphasizing the population of humans on the planet as opposed to the overconsumption practices that undermine ecological processes and are maintain through global society.

The disproportionate consumption of resources by a small percentage of the population demonstrates that this is not simply a matter of population but one of consumption rates, driven by values underlying how societies choose to inhabit the Earth. As Rozzi suggests, a more helpful analogy, instead, would be to consider human degradation of the environment similar to that of an infection, where a cure can be provided. Using this analogy instead creates the possibility that humans are part of the planetary ecosystem, and as such, this relationship is co-evolutionary, co-constitutive, and innate not only in our biological relationship to the rest of the world, but through cultural and intentional relationships that are present as well. The biocultural framework allows policy to address harmful overgeneralizing such as the human cancer myth “to achieve a better diagnosis of specific threats and a better identification of opportunities that already exist in many communities for conserving the health of the land and the people.” This specification acknowledges the uneven impacts of development and the differential impacts distinct communities have upon the environment. In doing so, policy can emphasize the health and well-being of socio-ecological systems in all of their diversity, as opposed to essentializing humanity based on singular instances of sustainable or unsustainable activities.

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70 Rozzi, Implications of Biocultural Ethics, p. 133
71 Ibid. p. 134
1.6.3 Myth #3: The Myth of the Weightless Economy

Throughout the MDGs, development is treated as already placing equal prioritization for economic development and socio-ecological well-being. This takes us to the third myth I wish to identify, the view that economic growth supports profit and socio-ecological well-being equally. It is a misrepresentation to argue that large-scale development prioritizes equally the well-being of local communities with their profit margin. Infrastructure that is universalized does not take into account the local context, as it creates a mismatch between that standardized infrastructure and the local region and culture. Arguably, this mismatch causes much of the environmental destruction and social injustices witnessed today as large-scale corporations displace local communities for the resources found on their lands. Unsustainable development is complicated by the mirage of the “weightless economy” and attitudes which do not recognize the human reliance on these elements for life itself to persist, and further still, the tendency to dismiss the emotional complexity and importance that the relationship with the nonhuman world can have. The economy is considered weightless when it is presumed that our economy runs sufficiently without consideration of the quantity of resources available, as a “disembedded market whose rules are freed from any social responsibility or any recognition of our embedment in a constraining ecological order.”\(^7\) The importance of dispelling this myth lies in the recognition that economic priorities should not dispel socio-ecological considerations, as so frequently occurs on a daily basis such as in the case of local fracking operations appearing throughout the United States despite local resistance.

\(^7\) The neoliberal market and the logic of domination has been criticized heavily by Val Plumwood for being treated as if it were a “weightless economy.” Val Plumwood, *Environmental Culture: The Ecological Crisis of Reason*, (New York: Psychology Press, 2002), 24. For more on the epistemological blindspots created by such a view, see also her discussion in the same volume, “The Blindspots of Centrism and Human Self-Enclosure,” 97-122.
There is also a corollary often associated with this growth model of economic development, which believes that *economic growth is not limited by the availability of natural goods and services, but by technological innovation*. The common view is referred to as “technological progressivism,” or the belief that anything is possible through human ingenuity as a “technological fix” is just waiting to be discovered to solve the dilemma.\(^73\) Instead of limiting consumption or altering fundamental ethical priorities, the consumption of materials is justified by the rationale that it only requires a new technological innovation to address the ways which development practices have exceeded ecological limits or justice considerations. This view asserts that the Earth will continue to provide unlimited resources to sustain the unrestrained growth of the human population and that all it takes is some technological tweaking to find a way to attain these resources. Perhaps put best by one of the main proponents of this idea, Professor Julian Simon, “our growing ability to create new resources has more than made up from temporary setbacks due to local resource exhaustion, pollution, population growth, and so on.”\(^74\)

In the chapter on the “Consequences of Responses on Human Well-being and Poverty Reduction” within the MEA, the authors are critical of the limitations of the technological fixes to the development problem. Nonetheless, MEA’s language would need to be more specific to avoid blurring the differences of cultures and their respective benefits and harms experienced within the global economy.

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\(^73\) Latour commented on the myth of the technological fix. French philosopher and sociologist Bruno Latour noted that “the myth of progress is based on a very rudimentary mechanism…a confusion, made in the past, between what objects really are in themselves and what subjectivity of humans believes them to be, projecting onto them passions, biases, and prejudices…. What could be called the front of modernization—like the Western Frontier—thus clearly distinguishes…even more clearly the efficiency and objectivity of the laws of nature from the values, rights, ethical requirements, subjectivity, and politics of the human realm. [Entities] are not objects and subjects at all, but humans and nonhumans,” Bruno Latour, “A Collective of Humans and Nonhumans” in *Pandora’s Hope: Essays on the Reality of Science Studies* (Cambridge, MA: Harvard University Press, 1999), p 199-200.

Many of the economic, legal and technological responses used today to manage ecosystems emphasize economic growth—aiming at aggregate welfare as measured by income—through the efficient allocation of the provisioning services of ecosystems. There is little uncertainty that economic, legal, and technological responses have improved the material wealth and livelihoods of many people. However, there is also high certainty that the regulating, supporting, and cultural services have deteriorated in many parts of the world and this has had dire consequences on the health, security, good social relations, and the freedoms and choices of many individuals and local communities, especially in developing countries. Equity has also been de-emphasized in the design of many of these responses. There have been losers and winners, with the vulnerable and the poor experiencing losses most of the time.75

This framing of “losers and winners, with the vulnerable and the poor experiencing losses most of the time” treats the poor and privileged as if these were permanent conditions, as if these peoples had always been poor. This language, even as it uses combative tones such as ‘losers and winners’ avoids saying explicitly that these ‘losers’ are most often impoverished peoples who have been oppressed and displaced from their homelands, or witnessed their homelands degraded first-hand. Yes, these ‘losers’ are vulnerable, as is anyone who receives harms and injustices. Social equity thereby must require social and environmental justice to redress these asymmetries and avoid treating impoverishment as a permanent quality but instead a condition created by contingencies within colonialism and current global economy.

While neoclassical profit margins and economic growth have acted as a ‘weightless economy,’ the weightlessness has allowed profits to increase without impediment gives the illusion that business actions are not weighed down by socio-ecological considerations. Yet in truth this weight has only become a burden on local peoples experiencing these social and ecological harms first-hand. Addressing these externalities has driven ecological economics and

sustainable economic models, which attempt to incorporate these factors into assessments. These new views of sustainability imply that we need to rethink what market economies are and what ‘growth means’ within the larger context of cultural and ecological diversity, and to better assess how unlimited growth models often obfuscate the democratic process and maintain unsustainable management economies.

1.6.4 Summary of Myths: Environmental Misanthropy and Unsustainable Cultures

These three myths I have identified perpetuate the impoverishment of sustainable policies by obscuring the important role of environmental experience and cultural diversity. Recognizing these hidden premises is an important aspect of addressing the invisible drivers of biocultural loss, as sustainable solutions require not only limiting current unsustainable practices, but the affirmation, acknowledgement, and support of lifestyles and cultures which are already living sustainably within ecological limits. By treating humans at the species level—or even generalizing urban development—as inherently unsustainable for the planet’s ecology, the very real diversity of cultures living on the planet is denied and oppressed. It is also a denial of the importance of experience, in that experience can change the human being and his or her approach to the world. These hidden assumptions within development discourse have muddied the sustainable waters in the form of an environmental misanthropy that domineers the views of the human actor. In order to address them, differential impact and responsibility must be accounted for within policy, and as such, language should reflect these important differentiations.

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Surrounded by environmental degradation and emotional indifference to these losses, one might conclude that humans are destructive beings who are incapable of compassion for the Earth, or that it is strange to have such care towards nonhuman beings. Taking into consideration the EoE, imagine having no first-hand experience of the natural world, and then being told by the media and popular culture that humans will cause or are causing the end of life on Earth. A misleading environmental misanthropy might emerge in which humans are essentialized and homogenized, obscuring the living communities that strive and do live within sustainable limits.

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1.7 Conclusion and Chapter Summaries: Overcoming the Extinction of Experience for a Sustainable Future

In this chapter I established that there is a need to consider local ecological knowledge, skill, and values within Sustainability Development Goals and policy more broadly. Additionally, not only does sustainability need to address factors that contribute to developing ecological knowledge and an environmental ethic, but policy should also consider those factors which prevent communities from acting in accordance with their ecological conscience or culture. By affirming cultural diversity in the face of the free-market economy requires to better acknowledge alternative forms of lifestyles and human–nature relationships not recognized by neoclassical economics. There is a prevailing environmental misanthropy underlying dominant global discourse regarding sustainable development. This misanthropy has three major pervasive assumptions: 1) all human cultures share in this same relationship to the environment, 2) humans are inherently harmful to the environment, 3) development prioritizes profit and socio-ecological well-being equally. A further expansion of this view is expressed in the belief that only technological solutions can address the full extent of the environmental crisis, discounting the contribution the local and traditional ecological knowledge plays in sustainable and adaptive responses to environmental changes. Dispelling environmental misanthropy and other negative characterizations of humanity and the human–nature relationship is a necessary step in addressing ongoing biocultural losses, which include human connection or heritage with natural spaces and ecological knowledge.

In the second chapter I review Pyle’s landmark concept, extinction of experience, and propose that it has significant policy implications if treated as an additional driver of global environmental change. I explore the urban context driving EoE for biodiversity conservation. The care and knowledge of biodiversity is a complicated relationship and requires more than
textbook understanding of the natural world, but personal experience reinforced through daily engagement with biodiversity. The discounting of heritage and local engagements for biodiversity conservation also makes invisible the displacement of heritage cultures, demonstrating that the biodiversity extinction crisis is not only a part of the environmental crisis but a socio-political crisis as well.

The third chapter complements the urban view of EoE by exploring indigenous and ethnoecological accounts of EoE as it impacts heritage communities. Complementing my discussion of conservation biology in the previous chapter, I review ethnoecological perspectives of EoE in order to address the marginalization of local peoples. Ethnoecology as a discipline specifically focuses on bridging scientific and non-scientific views of ecological knowledge. By following this history with consideration of heritage groups, I clarify a methodology that has been developed to navigate scientific and non-scientific worldviews in a manner that recognizes the mutual legitimacy of indigenous and non-indigenous worldviews, with particular focus on the conditions that lead to EoE. In particular, ethnoecology bridges scientific and non-scientific worldviews. The biocultural framework has been adapted to capture the co-evolutionary relationship between biological, cultural, and linguistic diversity and I argue that this interrelation is particularly vulnerable to EoE. As such, I present EoE as a driver of biocultural homogenization, characterized by its capacity to self-perpetuate and propel additional EoE cycles through biocultural diversity losses.⁷⁸

The final chapter summarizes the significance of EoE for sustainable policy and future research that is needed to address it as a major force underlying the environmental crisis. In order

⁷⁸ Situations where actors and institutions engage with ecological dynamics in a way that leads to vulnerable pathways that are unrecognized have been called ‘socio-ecological traps.’ See also Carpenter’s presentation of socio-ecological traps in relation to adaptive capacity in, S.R. Carpenter and W. A. Brock. *Adaptive capacity and traps.* Ecology and Society 13(2): 40 (2008). http://www.ecologyandsociety.org/vol13/iss2/art40/
to address the environmental crisis, I argue that policy must also consider the *experiential* crisis that threatens biological and cultural diversity. Just as the environment is facing greater losses through dominant development practices, communities are becoming more significantly disconnected, removed, and ignorant of the natural world and its ecological processes. In order to promote the care, management, and wisdom to live sustainably with the Earth and with the many cultures that thrive on this planet, it is necessary to halt and overcome the extinction of such experiences.

It needs to be noted that in certain cases the EoE and losses of biological and cultural diversity can be reverted. For example, in 2012, the largest dam removal in U.S. history was initiated, demolishing the Glines Canyon Dam on the Elwha River of Washington State. Within a year, Chinook salmon returned to spawn in the rivers. Mel Elofson, who lives and works with the watershed, said of the return:

> My grandmother lived on that homestead, and she walked down there as a young woman when the dams were being built and was devastated…. She used to talk about nearly being able to walk across the river on the backs of the salmon. There were tears of sadness back then, but if all the elders were alive, there would be tears of joy.79

When the habitats are degraded, wildlife displaced and absent, when even the memory of ecology that once was is gone, an extinction of experience emerges. This extinction disrupts not just the experience of what once was, but also of what could be. For these reasons, sustainable development must confront this hidden driver of biocultural loss, and overcome the drivers built into society perpetuating this extinction of experience.

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CHAPTER 2

EXTINCTION OF EXPERIENCE
AND THE BIODIVERSITY CRISIS

One of the penalties of an ecological education is that one lives alone in a world of wounds. Much of the damage inflicted on land is quite invisible to laymen. An ecologist must either harden his shell and make believe that the consequences of science are none of his business, or he must be the doctor who sees the marks of death in a community that believes itself well and does not want to be told otherwise.

--- Aldo Leopold

So it goes, on and on, the extinction of experience sucking the life from the land, the intimacy from our connections. This is how the passing of otherwise common species from our immediate vicinities can be as significant as the total loss of rarities. People who care conserve; people who don't know don't care. What is the extinction of the condor to a child who has never known a wren?

--- Robert Michael Pyle

2.1 Introduction: The Extinction of Experience in the Urban World

As of 2008, the technological environment dominated the lifestyles of the majority of humans, with 50% of the world population living in urban environments. Rural populations have decreased on every continent since the 19th century. Only 3% of the world’s population lived within urban areas in 1800. Today, more than 80% of the population lives in cities in North, Central, and South America, more than 70% lives in cities in Europe and Oceania, and

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83 Ibid., p. 8.
urban migration is growing rapidly in Africa and Asia.\textsuperscript{84} The rapidity of this rural–urban migration is influencing cultures and lifestyle in fundamental ways, with cultural, political, and ethical ramifications including a rise shift towards the “consuming class” in developed nations and emerging economies of the City 440.\textsuperscript{85} First and foremost there is a fundamental change in the form of lifestyle engagements of humans with the basic necessities of life that occur when living within the urban sphere. From food production to market economy, formal education, work, municipalities, and transportation, the ways human lives are experienced have shifted in response to and in part of the modern urbanization process. Built into the physical structures of urban change is an alteration of the knowledge, level of engagement, and experience that those living within urbanized spaces share with each other and nature. The lifestyle habits built into the urban structures changes the engagement denizens have with the world around them, including the local biodiversity and ecological processes that are part of regional ecosystems. Understanding the cultural and political dynamics underlying the disparity between the ecological limits of regional ecosystems and the urban ecological impact is paramount for developing sustainable solutions to the environmental crisis within urban systems, even as these dynamics express themselves uniquely for each city and urban space.

Even with the great diversity of urbanization processes, certain shifts in lifestyles structures can be similarly characterized. As populations migrate from rural to urban environments, the lifestyles and the types of interactions individuals have during their childhood, adulthood, and elder years have significantly changed as well. All too often, these changes are in


ways that reinforce the loss of local biodiversity and cultures tied to ecological place. Lifestyle habits have shifted to spending a greater proportion of time in environments that are either indoors, or, when outdoors, highly structured in form. When not in the classroom, for instance, children of the United States are spending on average ten hours a week on homework and as much as thirty hours a week watching television—the equivalent of a part-time job. When engaged in physical activities these children are more often engaged in structured sports, and not in free play or direct engagement with natural spaces. In the United States, these habits are carried into adulthood, with an average workweek spanning forty to sixty hours. In the context of the growing urban sphere, daily experiences such as listening to the song of a wren, or watching the flight of a condor become less and less frequent, leading to the extinction of key perceptions and emotions that structure the understating, valuing, and co-inhabiting with the diversity of living beings.

As nature writer, lepidopterist, and conservationist Robert Michael Pyle warned in the introductory quote, a way of life disconnected from nature can be considered an “extinction of experience” (EoE). EoE is a loss of the awareness of biodiversity and ecosystem processes; it is apathy towards the well-being of these nonhuman entities, and in some cases an ignorance that these biodiversity losses are even occurring. The life living in one’s backyard is a window into the value of life; blindness to the life in one’s own habitat is likely to lead to a myopic view of the value of biodiversity more generally. For Pyle, this formative process of either engaging or being distanced from nature begins in the neighborhood, in the space of one’s home and

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87 Thirty hours is the equivalent of a part-time job! It’s worth reflecting on how this type of life habit has been exacerbated during the last decade with the coming of the Internet and proportional time engaging with media through smartphones, computers and other electronic devices. To read more on the influence of the virtual age on child psychology see Louv’s more recent work, The Nature Principle: Reconnecting with Life in a Virtual Age (Chapel Hill, NC: Algonquin Books of Chapel Hill, 2012). In both texts Louv emphasized “nature deficit disorder” which is a developed theory built upon the foundation already set down by discussions regarding extinction of experience and environmental generational amnesia.
livelihood, which in turn shapes the view, meaning, and ethical relationships one shares with the world beginning at the earliest days of one’s childhood.

Normative arguments for the conservation of life have developed relying on reasoning that focuses on both the intrinsic value of life to exist for its own sake and its instrumental value for humanity. As stated in conservation biology’s code of ethics, not only does biodiversity have a right to exist for its own sake, but functioning ecosystems are necessary to produce the ‘services’ humanity needs in order to survive. Yet strategies such as those found in the Millennium Ecosystem Assessment\textsuperscript{88} and ecological economics disproportionally lean on utilitarian claims for biodiversity conservation justification as a rhetorical device, even though its intrinsic value is an equally valid argumentation. This seemingly never-ending debate as to whether biodiversity’s value is based upon intrinsic or instrumental justification for conservation values obscures the ways in which societal structures are undermining these value systems in society itself. Drawing out this connection is key to addressing EoE as a force undermining a sustainable human–nature relationship.

In addition to the need of developing the valuing of nature, I argue that the lack of environmental knowledge, appreciation, and engagement is indicative of another area in need of change: the structure of our post-industrial society. Extinction of environmental knowledge points to and opens up a much larger normative problem not only for the individual and the quality of his or her own life experience, but for the practices of society as a whole, and the way that structures within society propel these losses, disengagements, and disaffections. Consider for instance the “Plasti
\textsuperscript{88} See my discussion of the Millennium Ecosystem Assessment in Chapter 1.

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for these changes, yet remain largely unaware of the impact of plastic culture on the environment.

I contend that recognizing the drivers of EoE opens up the political and ethical ramifications of extinguishing biodiversity, the displacement of wildlife populations, and the fragmentation and degradation of habitat. These environmental degradations affect not only the biodiversity itself, but also human communities who live with the land (whether urban, remote, wild, or pristine) as rural populations are displaced and urban communities are diminished in their capacity for self-reliance, food security, and sustainable ways of life. Addressing the EoE cycle therefore requires a socio-political response that engages not only personal experience of nature but also the political forces that dominate different ways of life within the urban world.

While never presented by Pyle as a philosophically developed theory, EoE has remained a device used by environmental educators and conservationists to describe this social phenomenon of experiential loss. This concept has gained popularity in use by the general public as well, appearing in public lectures and inspiring Richard Louv’s “No Child Left Indoors” social movement in the United States and expressed in the 2015 House Bill “No Child Left Indoors.” What is particularly significant within this concept is that as a phenomenon it is occurring systematically within urban communities. Consequently, I propose that if left unaddressed, EoE may continue to self-perpetuate as a hidden phenomenon impacting societal values and cultures and underlying the loss of biodiversity.

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89 The “No Child Left Inside Act of 2015” was introduced to the House of Representative in February 2015 by Representative John P. Sarbanes and into the Senate by Senator Jack Reed before being referred to committee for review. The bill “amends the Elementary and Secondary Education Act of 1965 (ESEA) to direct the Secretary of Education to award grants to states and, through them, competitive subgrants to eligible partnerships to support the implementation of state environmental literacy plans that include environmental education standards and teacher training.” See summary available online for H.R.882—114th Congress (2015-2016), (http://www.congress.gov).
Due to the heavy implications of EoE as a driver of social and cultural values, I argue that discussions of EoE should go beyond treating it as a literary concept. It can also be considered as a systematic and predictable outcome of the very structures underlying current modes dominating the global market and its current expressions in urban systems. If left unchecked, the EoE cycle emerges as a product of these heritage losses that self-perpetuates the deterioration of environmental sensitivity. As a societal force, EoE can influence the very psychology of human experience, consequently driving increased indifference, disaffection, and disengagement in new generations even as ecological limits are exceeded and the rich biodiversity of the Earth is extinguished by those same development practices.

Human populations living within urban ecosystems are developing forms of ecological knowledge and a sense of place that are not necessarily tied to regional ecosystems, influenced as they are by an economy, formal education, and employment that emphasize urban life as opposed to rural livelihoods. This change has occurred for many populations in the last one to two generations, leading to what has been dubbed an “environmental generational amnesia” in which “children who know about pollution in general and live in a polluted city [are] unaware of their own city’s pollution.”90 The lack of local experiences with nature is also tied to a disregard for the innate importance of biodiversity and a tendency to emphasize conservation priorities based upon instrumental or ecological arguments, as opposed to arguments of intrinsic worth.91 It


91 One only needs to look at the array of justifications that prevail throughout biodiversity assessments such as the Millennium Ecosystem Assessment, the IUCN, or popular conservation outlets such as National Geographic to find such argumentation. In an online commentary on the extinction crisis, The Sixth Great Extinction was called a “Silent Extermination” of biodiversity because it remains invisible or auxiliary to the general experience of the urbanite. In the section entitled “Why Should I Care?” the authors make a special case that humanity cannot survive without biodiversity. This utilitarian argument for biodiversity’s ‘right to life’ overlooks its intrinsic and ecological values and is a typical example of this argumentation. “The Sixth Great Extinction: A Silent Extermination,” Voices
was for this ignorance that Aldo Leopold famously made the argument for the need of a land
ethic; the need for an explicit ecological conscience as a societal norm.92

In addition to the need to create an appreciation of nature to revert EoE, it is necessary to
consider the domain of policy within societies: the degree to which certain societal structures
may be creating conditions in which EoE is likely to occur. To revert the EoE process from
becoming entrenched within society, we need to address those societal drivers that make
invisible the loss of biodiversity, undermine direct engagement, or erode knowledge about
ecosystem function and what is necessary for sustainable practices. Efforts to counteract EoE and
develop an ecological conscience must go beyond formal and informal education. These efforts
must also inform the structures that shape, create, and constitute urban lives on a daily basis. The
economic and industrial structures that are typically sequestered to the realm of policy and
development therefore are also the realm of the cultural critic, the ethicist, the conservationist,
and ultimately the citizen.

The change of life habits that I highlight here are only some of the ways in which urban
denizens are losing key nature experiences. Additionally, urban families tend to spend less time
with unprocessed foods, and familial culinary and agricultural traditions are being replaced by a
culture of packaged foods from grocery stores and fast food restaurants.93 The urban sphere
sculpts even physical movement, as transportation largely emphasizes automobiles, creating
spaces that deprivitize pedestrian experience, fundamentally skewing the lifestyle choices

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for Biodiversity (blog), *The National Geographic*, March 28, 2012,
http://voices.nationalgeographic.com/2012/03/28/the-sixth-great-extinction-a-silent-extermination/
(Last Accessed July 09, 2015).

92 Leopold, *Sand County*.

for Research and Policy,” ESA Working Paper No. 04-17, FAO, Rome, Italy, as cited in J. R. Miller’s use of the
available for outdoor exploration or engaging biocomplexity while moving. Experiences with
nature are being lost and the traditions and stories about this nonhuman world are becoming
correspondingly remote.

Conservationists and ethicists have reasoned that to address this deficit of nature
experience, urban children must learn more of nature ecologically and personally. Ecologically,
children must have a scientific understanding of its ecological necessity for sustaining human
and nonhuman life. Personally, children should develop a care and ecological awareness of
nonhuman entities. The conclusion of environmental educators is often therefore that children
must engage biodiversity and ecological processes firsthand in order to understand its
complexities. They are then confronted with the need to change the many structures that shape
children’s fundamental experiences, such as by developing schoolyard gardens or outdoor field
trips. Yet inevitably, these changes are countered by the larger societal dependence upon
industrial agriculture, processed foods, commoditized labor, and the displacement of wild nature
away from urban development.

Environmental educators and conservationists have found themselves in the disparate
space of bridging this gap of biodiversity loss and ethical valuing, of creating opportunities and
spaces for nature appreciation, even while the fundamental structures around them disregard,
discourage, and undermine such forms of engagement. It is necessary to make explicit the
underlying mechanisms that are shifting lifestyles away from awareness of ecological processes

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94 20th century French philosopher Henri Lefèbvre discusses the ways pedestrian rhythms and movements
are shaped by the physical structures within the city throughout his writings. For Lefèbvre, certain patterns can lead
to ‘blind fields’ where certain experiences are invisible or unobservable as a result of mediation and urban habits.
Also called the “social production of space,” Lefèbvre’s critique of everyday (urban) life pursues consideration of
the construction of meaning in technological spaces, questions of alienation and the “right to the city,” that is, the
right to create and reshape our spaces in meaningful ways for a meaningful life. See Middleton’s discussion on the
“Walking City” for a general overview of the sense of time and movement in urban spaces. Henri Lefèbvre,
and away from this ecological conscience.

Considering the importance of understanding EoE as a product of certain structures within the urban environments and the dominant economy, I prepare a careful analysis of the phenomenon and the factors that both produce it and are products of it. To begin, I review Pyle’s inception of the concept *extinction of experience* as an expression of the absence of biodiversity engagements within day-to-day personal experience. I then discuss EoE within the context of personal experience and ecological knowledge and responses by environmental educators and conservation biologists who argue for conserving nature experiences as a way to biodiversity conservation and urban sustainability. Through this analysis, I propose EoE as a process or *driver* of global environmental change tied closely to biological and cultural homogenization. Developing our understanding of EoE as a force of change will aid in our ability to critique the social and ecological forces underlying the environmental crisis, and draw attention to the political ramifications of this internuanced cycle of cause and effect.

Urban structures can shape lives in ways that celebrate and engage nature experience. Indeed, many new development projects are centered on new visions of urban sustainability that emphasize the need for children and urban denizens to experience biodiversity and develop an understanding of ecological processes. While Pyle emphasizes that EoE takes place in the neighborhood, in the place and experience of one’s very personal life, I argue that EoE itself is driven by many of the structures within our urban society that shape human action, experience, and knowledge of the surrounding world. These are opportunities for engagement that have been

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95 Val Plumwood identifies this cultural space as the “illusion of disembeddedness.” Plumwood’s concept captures a quality similar to that of Pyle’s usage of EoE. Plumwood wrote, “[the illusion of disembeddedness] promotes various damaging forms of epistemic remoteness, for by walling ourselves off from nature in order to exploit it, we also lose certain abilities to situate ourselves as part of it.” Val Plumwood, *Environmental Culture: The Ecological Crisis of Reason* (Psychology Press, 2002), p. 98.
lost, and remain opportunities that structure our lives that can promote sustainable practices, and the knowledge, values, and cultures that create sustainable communities.

I ultimately propose in this dissertation that responding to the socio-environmental crisis with urban sustainability practices requires addressing extinction of experience as a complex biocultural phenomenon, which represents a major (though indirect) driver of global change. Moreover, EoE is an invisible, mediated, and far-reaching driver of the biological and cultural diversity losses we are encountering today which perpetuates these losses. However, to begin in this chapter, we must first embark to understand the extinction of experience that is ongoing now, today, in the living space of the urban fabric.

2.2 Extinction of Experience and the Search for the Urban Wildland

In 1978 Robert Michael Pyle coined the term ‘extinction of experience’ to capture the presence of a cultural and generation-wide loss of experience and appreciation of nature. This loss of experience is so pervasive that it even self-perpetuates as new generations mature within a world where physical and cultural exposure to nature is lessened. Local knowledge of that nature is either absent or not transmitted through formal educational channels, and this trend is exacerbated as urban lifestyles are structured so that overall experience of nature is narrower, shallower, and intermittent.

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96 See Gary Paul Nabhan and Sara St. Antoine, “The Loss of Floral and Faunal Story: The Extinction of Experience” in The Biophilia Hypothesis, ed. S. Kellert and E. Wilson (Island Press: 1993), 229-250. Nabhan erroneously cited Miller and Samways as the originators of the EoE concept. The first use of this term appears with Pyle’s short essay in Horticulture that he revisited almost 20 years later in his work The Thunder Tree. In the second iteration, Pyle tells the story of the moment when he discovers that a beloved woodland has been cut down for a parking lot. Elsewhere, Michael J. Samways, “Rescuing the Extinction of Experience,” Biodiversity and Conservation 16, no. 7 (2007): 1995-1997 cited Miller for EoE since urban society lies on the edge of the “real and virtual world” (1995). While Samways and Miller may be responsible for popularizing EoE within certain discourses, the concept originated with Pyle’s conceptualization. There is a surprisingly diverse use of this term across conservation, ethnoecology, environmental education, and even within popular culture. Considering the term’s deictic nature, one of my goals is to review different usages of EoE so as to better understand the significance the term carries for distinct perspectives.
Originally printed in popular magazine *Horticulture*. Pyle’s first usage of the term in the magazine is later adapted for the more well-known discussion of EoE found in *The Thunder Tree: Lessons from an Urban Wildland*, published almost twenty years later. Pyle’s inaugural introduction of the concept argued that loss of *opportunities* of experience can have irreversible consequences for knowledge and care of nature. Further, this lacking exacerbates trends to reduce local instances of biodiversity through management practices, continuing a cycle of biodiversity loss.

Pyle’s emphasis was that an extinction of experience can occur when opportunities for engagement are lost, whether it be a physical or conceptual barrier, or the physical disappearance of an endemic species, that is, the absence of its local presence.

The majority of extinctions involves not the eradication of species on a global scale, but the disappearance of portions of them wherever we look. A colony goes extinct here, a subspecies drops out there—two varieties of butterflies vanish from the High-line Cana. They add up, and the consequence is a drastically undermined flora and fauna. It seems to me that the impact of these partial extinctions upon our natural base and collective psyche, as well as our ability to withstand future assaults on the environment, are very grand indeed. In the long run they may affect more of that than will the disappearance of entire species. For what these local extinctions represent is the loss of opportunities—the extinction of experience.

The implications of EoE are double: it points to the physical removal of a species, and also to the loss of lifestyle and cultures engaging and aware of that biodiversity in the larger collective psyche. The cultural interrelation and meaning that arises from the co-evolutionary and dynamic relationship humans have with the land is impoverished when local species are eradicated, unnoticed by those urbanites who are carrying their daily habits separate from this biodiversity. These local extinctions represent the lost opportunities to engage, be aware of, and interact with biodiversity and ecological processes. Without such experience, the capacity to manage systems

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in relation to sustainability limits is diminished. So we can extend Pyle’s question to reveal its greater significance: What is the loss of a condor to a child who does not know a wren? Well, what is unsustainable use and destruction of biodiversity and ecosystems to a culture that is disengaged and blind to nature’s existence?

Pyle’s work in conservation and nature writing has been significant. Founder of the Xerxes Society for invertebrate conservation, he was awarded the 1987 John Burroughs Medal for Distinguished Nature Writing and remains a strong contemporary voice reflecting on the biodiversity conservation in the twenty-first century United States. One of Pyle’s more prominent efforts, The Monarch Project,\(^{100}\) has been integral in highlighting the threat facing Monarch butterflies despite their comparatively popular status in North American ethos. Throughout his writing, he takes particular effort to emphasize that not only is the presence of particular species threatened by development practices, but the possibility or opportunities for encounters with biodiversity as well. Local extirpations can occur which either displace particular species away from awareness of urban experience, such as remaining indoors or within automobile transportation, or displace a species from a locale through particular development, such as the destruction of habitats. Therefore, just as we recognize that there are endangered species, we must also recognize that local biotic communities can be displaced, fragmented, or degraded, and this leads to lost opportunities for nature experiences.

For Pyle, this is particularly clear in the case of the Monarch butterfly’s migration across the Americas. The migration’s scale spans nations, and yet, even so, here remains a phenomenon that may be disrupted as its habitat is fragmented by urbanization.

So it is not the [Monarch], a wonderfully adaptable generalist in its nonmigratory mode,

that is jeopardized. It is the grandest butterfly spectacle on the planet that stands at risk, and one of the most dramatic and elegantly evolved animal migrations of all.\textsuperscript{101}

Under threat is the way the Monarch persists in its environment. Its migration follows the milkweed southwards along the Americas as seasons change, trailing towards Mexico, creating a grand spectacle. This migration could easily disappear as an incident of urbanization, even as representations of the massive migration remain in the urban imaginary and memory, veiling the fact that this loss is even occurring.

To counteract the former trend, Pyle considers an \textit{urban wildland} as an urbanized space where meaningful nature can still occur; nature encounters in vacant lots or overgrown brooks are still possible. Space where children can play, imagine, and risk, spaces where these encounters could include the kind of massive spectacle as the Monarch migration or the minor display of a butterfly fluttering across a deserted lot.\textsuperscript{102} Pyle himself was inspired to study nature by an abandoned lot that formed a kind of sanctuary for wildlife within the urban space. As a child, it was a place where he could encounter, explore, and personally learn about the biodiversity on his walk to and from school. For Pyle, that he came across this urban wildland as a day-to-day encounter is a key aspect of meaningful nature experience. In particular, the loss of opportunities of engagement when local species are not present or natural landscapes are highly fragmented is an important loss for the child’s nature experience. The tendency for such disassociation is further exacerbated when urban lifestyles remove children from outdoors encounters with nature through their daily habits. So, not only should we conserve endangered species, but we should look out for endangered nature experiences.

We can and should try to head off the global extinction of an endangered species which we wish to retain as part of our world. But we must also save the endangered experience of precious contact with wildlife in our own communities. If a species which exists elsewhere becomes extinct within our own research, the result is the same, in one sense, as complete eradication. Since the young are the least mobile, their opportunities vanish first. And why are the ones whose sensibilities must be touched by the magic reaction with wildlife if biologists, conservationists, and concerned citizens are not to become endangered themselves? What is the extinction of a condor to a child who has never seen a wren?  

Deserted lots, parks, and natural spaces in the city remain important areas for urban encounters with biodiversity. As Pyle emphasized, this can be the only opportunity for urban denizens to experience these engagements at all. Further, when citizens must go beyond city limits to have nature experiences, nature can appear to have value only in terms of human recreation, leaving the ecological and practical importance of healthy ecosystems unclear and the importance of sustainable relationship between human and nonhuman invisible. So, not all spaces within the urban sphere lack encounters with biodiversity.

Recognizing that opportunities for nature engagement can be lost depending on the way in which we structure our landscapes raises many ethical and political issues related to biodiversity conservation. In addition to the importance of biodiversity loss in and of itself, what is the human experiential value of this extinction? What is its meaning in terms of personal experience? And for those who are witnesses and care about this loss of biodiversity, the depletion of wildlife populations, and the fragmentation of their migrations and habitats, what happens as they disappear?

And it opens further ethical priorities: How should our society respond to structures that drive systematic loss of ecological knowledge, lifestyle engagement, and nature experiences? Could it really be that even as the severity of the environmental crisis grows, urbanites continue

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with consumer culture oblivious of these degradations well embedded as many are living with the false security of a weightless economy?

2.3 Extinction of Experience, Did You Say?

And just how can experience go extinct? While an obvious refutation of this expression is that some type of experience is always being felt and that it is merely the nature of the experience that is changing, the concept has gained traction among certain communities to convey what is considered a precious aspect of the human existence: the quality of experience as shaped by the engagements we have day-to-day with biodiversity. The loss of opportunities for experience is no easy concept to convey. Any experience will naturally replace an experience of another kind; for all we can do is but experience. A person can enjoy learning about elephants or kangaroos on a nature program, just as she can enjoy the feel of soil on her hands when she plants her first seed. Yet these experiences require different skill sets and are integrated into day-to-day living distinctly. Engaging nature in ways that create knowledge and meaning in relation to it remains a potential as part of the human condition. One might question whether local ecological knowledge is a necessary component of the human experience, and if so, whether the form of this engagement matters.

In The Thunder Tree enunciation of EoE, Pyle contextualized the loss of opportunities for engagement that occurred during his childhood in the urban United States:

One central, unavoidable fact of my childhood was the public school system of Aurora, Colorado. My path to school for ten out of twelve years followed the same route: down Revere Street, left at the fire hall, along Hoffman Park to Dell Mar Circle, then around the Circle to Peoria Street, and on to whichever school was currently claiming my time. Detours occurred frequently.

The intersection of Hoffman Boulevard and Peoria Street was two corners sacred, two profane. On the southeast squatted the white brick Baptist church. Across Del Mar lay a vacant lot full of pigweed, where Tom and I cached brown bananas and other castoffs foraged from behind Busley’s Supermarket in case we needed provisions on
some future expedition…. On the northeast corner lay Saint Mark’s, the red brick lair of the Lutherans, marginally modern, with a stained glass cross in the wall. I spent quite a lot of time dawdling in the vacant lot among the pigweed and haunting the Kwik Shake after school, but I seldom loitered in the precincts of the churchgoers…. Behind the Lutheran Church lay another, a smaller vacant lot, where the congregation parked in the mud. The new community of Hoffman Heights had been built partly on a filled-in lake. The water poked up here and there, making marshy spots full of plants that grew nowhere else around, like cattails and curly dock. The fat corner of the Lutheran’s lot held one of the last of these.

One September day, coming home from school, I cut across the boggy corner, almost dried out with late summer and tall with weeds. Pink knotweed daubed the broken mud and scented the afternoon air. Then I noticed, fully spread on the knotweed bloom, a butterfly. It was more than an inch across, richly brown like last year’s pennies, with a purple sheet when the sun caught it just right. I knelt and watched it for a long time. There were others flitting around, some of them orange, some brown, but this one stayed put, basking. Then a car drove by, disturbing it. The last thing I noticed before it flew was a broad, bright zigzag of fiery orange across its hind wings.

Years later, Pyle returned to this space to discover “the Lutherans” had paved their lot. “They dumped loads of broken concrete and earthfill into the little march, then covered it with thick black asphalt.” His indignation so great, he vehemently declares in the opening line of the essay, “I became a nonbeliever and a conservationist in one fell swoop. All it took was the Lutherans paving their parking lot.” Yet Pyle overlooks that it is not a fundamental value of the Lutheran church to pave over lots, but that this is the inertia of the society the church is embedded in as a whole. It could have as likely been the Kwik Shake or another business that chose to finally encapsulate the once-lake with pavement. Indeed, the power in Pyle’s concept is revealed in this tension: the ecological value of the milkweed had been forgotten and disregarded for the inertia of ‘the way things are done’ in the city. It was practical and necessary to create a

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105 Ibid., p. 142
106 Ibid., p. 140.
107 This is a prime example of the way in which extinction of experience results from the infrastructural inertia or is a legacy effect of development practices. See footnote 9 in Chapter 1 for more discussion on the concept of infrastructural inertia.
permanent parking lot for the vehicles. Within urban systems parking spaces for cars take precedent over fragmented ecosystems, as it did in this case as well.

The High Line Canal community had filled in a lake, and the church had been built as part of this development. Filling in the lake in the first place, and then the paving over its remains, reflects blindness to the value of the space in its ecological sense while remaining a legacy of management decisions from the past.\(^\text{108}\) The obliteration of the then-vacant lot, which had become a secondary ecosystem, is no greater a disregard than had occurred in the first place to create the High Line community. Should this action be called a disregard of ecological value? Or is it only blindness, inertia, and acceptance of the ways things supposedly are? Perhaps, instead, it reflects the *deficit* of the nature experience or the absence of an environmental sensitivity. Pyle is trying to resist this deficit in the very telling of his story. Yet this deficit of experience has born a blindness; and in the blindness there remains a lack of sight that must be articulated, even as the yearning, mourning, and trauma of bearing witness to these losses inspire the conversation. EoE emerges as a cycle that grows as local instances of biodiversity and urban wildlands are lost as points of engagement.\(^\text{109}\)

In Pyle’s reflective essay introducing the concept, he engages the experience felt through the loss of nature. The loss of opportunities for nature experience took place in his life as valued places were destroyed and ‘developed.’ Yet EoE also refers to the ways such loss or absence had become a cultural phenomena, that is an “us” of collective experience shaped by the fabric of society. Pyle reasons that, “the loss of neighborhood species endangers our experience of nature.

\(^{108}\text{For a discussion on ‘subtle human effects’ see McDonnell and Pickett’s “Humans as Components of Ecosystems: The Ecology of Subtle Human Effects and Populated Areas,” p. 3. In the introduction, the authors detailed the need to account for the ‘subtle human effects’ within populated areas. In particular, they identified: indirect effects, historical effects, biological legacies, echo of the past, lagged effects, and unexpected action at a distance. While an interesting discussion remains to be had of EoE in relation to these terms, I note it here for the reader’s interest. Mark J. McDonnell and Steward T.A. Pickett, eds., *Humans as Components of Ecosystems: The Ecology of Subtle Human Effects and Populated Areas* (Springer Science and Business Media, 2012), p. 3.}\n
\(^{109}\text{Pyle, *Eden in a Vacant Lot*, p. 324.}\)
If a species becomes extinct within our own radius of reach, it might as well be gone altogether.”

Recalling the quote that began this chapter, the wren is a symbol of the day-to-day nonhuman visitors that comprise an ecological community, ranging from the commonplace mice, rats, raccoons, squirrels, pigeons, and grackles, to the cockroaches, snails, spiders, and less-familiar critters of the world. Even the ‘junk birds’—a colloquialism used by ornithologists to refer to invasives or ‘pest’ birds—are part of this community and opportunities of engagement with nature, though they can skew ecological understanding of the native habitat. When Pyle stumbled across the butterfly, he knew not its name, its natural history, nor its movements. But he wanted to learn more. For him, this was a nature experience, albeit a depreciated one. Years later, he had appreciated this ecological knowledge with a lifetime of careful observation and study of Lepidoptera. Environmental educators continue to argue for positive nature experiences and a depth of ecological understanding as well. Nature—defined not as a museum, decoration, or manicured park—but as a space in which life can be lived. Further, while often presented as homogenized systems without ecological complexity, urban systems often present unique ecosystems that provide habitats for biodiversity and opportunities for nature experiences, especially when managed with these priorities in mind. Pyle acknowledges this complexity in his treatment of city space as an “urban wildland,” nonetheless acknowledging that these are often survivors, or remnants of the natural complexity that has been displaced.

Pyle argues that EoE is caused by loss of individual experience biodiversity in one’s own neighborhood. The young, elderly, poor, or disabled are particularly vulnerable to local biodiversity losses as they do not have the capacity to move beyond their home range to seek out

110 Pyle, The Thunder Tree.
nature experiences. While the loss of local biodiversity has evolutionary and ecological consequences, it has experiential consequences for the human community, too: “a different type of depletion,” because “the loss of neighborhood species endangers our experience by nature.”

Pyle’s initial definition regarding the extinction of experience clarifies the difference between an i) actual extinction and disappearance of the thing itself, so that no experience of it is possible, and ii) the loss of certain lifestyle practices or habits or types of engagements which allow for the presence or absence of an experience with that thing. In the case of biodiversity extinction, our range of experiences with a species might change depending on its physical presence in a particular region, or, a change in our habits to such an extent that we do not engage that being. Yet this framing overlooks the justice issue that biodiversity is being exterminated and landscapes decimated, and further, that this becomes a cycle that self-perpetuates as experiences with nature diminish and understanding and emphasis on nature decrease, exacerbating the tendency to create conditions in which nature experiences are unlikely.

An interesting case to demonstrate the importance of this distinction is the ivory-billed woodpecker in the United States, thought to be extinct until the 1990s when two biologists observed the bird in its natural setting. For years, the bird was cited as an example of how we might claim an animal is extinct when really it is only moved beyond a region where we might normally encounter it. Another study was conducted in which the specimen in a photo was identified as an alternate species, and the story then shifted to a textbook case of how emotion or desire might influence our interpretation of results as researchers. Knowledge in this case is very different from personal experience of an entity, and certain forms of course can be based on

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113 Pyle, The Thunder Tree, p. 260
the “facts” alone—regardless of the veracity of such statements. We might pose another question yet: For instance, when I have asked my students whether or not the bald eagle is extinct, a look of doubt crosses their faces. “What would you say if I told you the bald eagle is extinct?” Student replies are varied, but among the most typical remain, “We know it is not extinct because it would be in the news if it was the case.” Yet the knowledge and experience of this animal remains in the virtual sphere, with all of the students swearing to the reality of the bird’s existence, yet none having personal experience with the being. When asked about their care for the bird, many said it was important because it was endangered, it was the mascot of the United States, and it was beautiful. Nonetheless, lacking primary encounters with the bald eagle, the student faces a moment of doubt when contemplating whether it has gone extinct or not.

Pyle emphasizes the need for engagement and intimacy with nature throughout his writings. “A face-to-face encounter with a banana slug means much more than a Komodo dragon seen on television. With rhinos mating in the living room, who will care about the creatures next door?” The lack of widespread intimacy with the living world, not the technological, mediated, or virtual, “few people organize their lives around nature, or even allow it to affect them profoundly.” ¹¹⁵ Indeed, a most prevailing concern for biodiversity may well be, what happens when “concerned citizens… become endangered themselves?” The endangerment of knowledgeable citizens who are familiar with the natural world and ecological processes, as well the culture that produces such knowledge, is part of the extinction of experience cycle. In order to dispel the EoE cycle, those threats to ecological culture within urban society must be targeted.

Akin to our knowledge of the wren, why do we care if a being dies, or if an entire species goes extinct, if we do not personally encounter and feel enriched by its existence? Is it possible to care for these entities abstractly, as concepts only? Or do we develop care based upon

analogy—I know I will suffer if injured, and so I care for the suffering of others by extension? In a sense, this question begs a more fundamental one that remains one of the fundamental questions of philosophy: Why do we care at all? Is it as simple as the ethical egoists would assert, that we care only for those things that benefit us, and that such benefits underlie our good? Alternative views of the origins of the ethical capacity have reframed the ethics of care by redefining the relationship between emotions and rationality by exploring its significance as an intellectual tool shaped by intentionality. Callicott points to the tradition within Western philosophy of David Hume and Adam Smith that emphasize the need for “sentiments” in order to relate to others, and the high prevalence of this quality throughout the animal kingdom. This reasoning demonstrates that evolutionarily, “we must become ethical before we become rational.”

Darwin developed this argument in his Descent of Man, as he specifically pointed to the presence of an evolutionary moral sense—that is, a moral sensibility is fundamental to the survival of social species and built upon sentimental and social instincts.

Objective knowledge of the ecological importance of biodiversity is not enough, nor is recreational use, for the individual may not be moved to care or have ethical awareness of that biodiversity. As Pyle asserted, “when the natural world becomes chiefly an entertainment or an obligation, it loses its ability to arouse our deeper instincts.” A certain type of engagement with nature is needed in which daily life practices engage ecological processes in a way that engages our deeper instincts, or as E. O. Wilson might say, engages our biophilia. Put in terms

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118 Pyle, The Thunder Tree, p. 146

119 Edward O. Wilson, Biophilia (Cambridge, MA: Harvard University Press, 1984); Kellert and Wilson, The Biophilia Hypothesis.
of our ethical valuing, developing an ecological conscience or ethical relationship with biodiversity requires more than playtime or fact-gathering, it requires key and formative personal experiences.

Similar to the themes found in conservation biology, Pyle argued that it is impossible to care for something without personal experience with it. This observation opens up the question as to what it is necessary to know in order to develop care for something, which has also become a focus for environmental educators. Is cerebral or metaphysical knowledge sufficient to develop concern, or must an individual engage with something personally in order to develop such emotions? The cognitive disassociation can be a kind of pathology—the obliteration of individual beings, and at times, entire species, are reported without so much as a flinch. Animal suffering within industrial agribusiness is communicated with a pessimism and indifference throughout much of U.S. culture, an ambivalence underlying cultural norms that pressures the population to look past suffering, loss, and extinction as a frivolous and weak concern. It is for this reason that many environmental ethicists and conservation biologists continue to identify with the concept of intrinsic value so that the innate value of an entity can be valued, separate from its utility or ecological function (though sometimes this is also recognized as part of the definition of this term).

For his part, Pyle developed this concept of experiential extinction to refer to the type of connection individuals share with nature. In particular, he said that the nature of this connection has changed such that a sustainable connection is less possible, as ecological knowledge of the limits of natural systems has been lost as the appreciation of the innate value of those systems. Alongside overpopulation and economic disparity, he identified the lack of direct experience

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with nature as the major force driving the environmental crisis.\textsuperscript{121} EoE is particularly insidious because it is self-perpetuating, as range of experience narrows and “as common elements of diversity disappear from our own nearby environs, we grow increasingly alienated, less caring, more apathetic. Such collective anomie allows further extinctions and deeper impoverishment of experience, round and round.”\textsuperscript{122} Appreciation or recognition of innate value in this sense requires an awareness or a reason to care. If people’s experience is narrowed, why would they look beyond those limits, and where would they know to look? We might dub this an urban blindness, but I think this is short-sighted and misrepresentative of the phenomenon at hand. The narrowing of this experience needs to be more precise so as to not needlessly vilify all urban and technological processes, but instead point to a more sophisticated and intentional revision of these systems with EoE taken into account as a phenomenon that can occur in any context.

A basic exercise can help demonstrate this point. You the reader, take a moment to pull out a sheet of paper and pen or pencil. Now, write out as many living plant species that you know grow in the area that you are currently. How long is your list? Analyze your responses—what level of detail were you able to identify for a species? Generally, by local or common name, by multiple common names, by scientific title, in another language? How does this naming by you of these species reflect your actual relationship to them? What about the ecological processes? Do you know their seasonal patterns, when they bloom? Are they resilient to drought?

I conducted this exercise over a course of four or five years with numerous groups of students, informally. The point of the exercise was not for me to so survey what knowledge they had of the local environment. The purpose was to demonstrate to each of them what walking

\textsuperscript{121} Pyle, \textit{Nature Matrix}, p. 206
knowledge they have of the world around them. Variations of the exercise are possible, with
students going outside to identify species in groups and to form a collective book of plants that
they work on during the course of the semester. Typical student responses included agricultural
or ornamental species, or very generalized descriptions such as “grass,” “trees,” or “white flower
on the corner of my street.” They will also argue that what is needed to live a good life in the city
requires knowledge of the municipal utilities used to manage a city, though many of them
admitted to lacking knowledge of key municipal services. This lack of familiarity with the
ecological particulars similarly extended to sources of water, food, and waste management.
While this ignorance of practical ecological knowledge has long remained a topic within
environmental education, it also provides a platform to discuss the causes for ‘loss of care’
towards local biodiversity.

As a result of this deficit of experience, environmental educators have documented and
continue to demonstrate that there is an steady decrease in environmental knowledge and
awareness of our dependence upon ecological processes in younger generations. Further, they
argue that children need to develop a personal relationship with biodiversity in order to care
about its well-being. 123 However, it is not as simple as exposing children to “nature” so that they
can worship at its foothills.

Pyle described EoE as an “inexorable cycle of disconnection, apathy and progressive
depletion” 124—this cycle is spiraling as opportunities for positive experiences with an intact
nature are lost, and its presence in urban life discounted. 125 Because of this, Pyle urged us to
remember that any natural experience can be life-changing, and that even the smallest and most

123 Louv, Last Child; David Orr, Ecological Literacy: Education and the Transition to a Postmodern World
125 Pyle does not discuss the harms that may come from nature, such as those following natural disasters.
His focus in these sections remains on possible formative experiences that create appreciation of nature.
“humble” habitats can fulfill the role of awakening a child’s care for the environment, that is, the sense of E.O. Wilson’s *biophilia*. Recalling Pyle’s emphasis that EoE self-perpetuates, “[t]he extinction of experience is not just about losing the personal benefits of the natural high. It also implies a cycle of disaffection that can have disastrous consequences.” If we accept with Pyle that nature conservation is not only about the beneficial and positive experience a child might experience with nature, but is key in the conservation of this biodiversity itself, how can we conserve these experiences? How do we protect the body of knowledge that reflects these fundamental experiences?

2.4 Drivers of Extinction of Experience and the Conservators of Experience

Pyle attributes three major developments for the loss of emphasis on local ecological knowledge within the United States. First he pointed out that the rise of specialized scholarship in the “hard sciences” somewhat disrepudiated the rather fuzzy nature of ecological knowledge. Second, the countryside was rapidly depopulated through suburbanization and urbanization. Third, the Second World War and Cold War created a climate focused on industrialization and productivity: the world of technological solutions as opposed to natural engagement. Within the emphasis of the hard sciences arose the emphasis of intellectual rigor and rationality through emotionless intellectualism. Logic was not considered emotional in nature, but a calculus, possible only through the separation of emotion and personal bias from “truth.” He went on to

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126 While biophilia remains a key concept for conservation biologists, I will not be exploring this concept in relation to extinction of experience. It was re-introduced into popular discourse by E.O. Wilson, who in turn was inspired by Eric Fromm’s usage in *The Heart of Man: Its Genius for Good and Evil*. Alternate definitions of this term have been in the past, most notably by Freud who used it to refer to a drive towards life in tension with the drive towards death. For a more general discussion on biophilia from this branch of thought see: Joan Braune, “Erich Fromm and Thomas Merton: Biophilia, Necrophilia, and Messianism,” Lecture presented at the Italian-English conference “Death and the Love for Life in Psychoanalysis. In Memoriam. Romano Biancoli” on June 5-6, 2010 in Ravenna. First published in: Fromm Forum (Tuebingen, Selbstverlag: 2011).

explore the role of the naturalist within society, and it seems that the naturalist’s role as carriers of this knowledge begins to crystallize. In our time, Pyle lamented, even with citizen science, fewer naturalists are present to pass on knowledge of the rich diversity of life in local systems.128 As a result, even as educational programs are implemented, the depth of the knowledge remains shallow in its ability to describe biodiversity richness, and instead focuses on general ecological processes, general and larger-scale categories that nonetheless reduce the meaningful and individual relationships with nature.

In addition to certain nature experiences being endangered as urban wildlands are increasingly absent, another component in the EoE cycle is the loss of carriers of local ecological knowledge, who are also threatened by these changes in priorities embedded in an economy that believes it is separate and flowing above ecological dynamics. What happens when those that care become endangered themselves? I reaffirm that not only does the capacity to care need to be preserved, but the physical processes that shape day-to-day life need to be reexamined in light of biodiversity experience and personal experiences, as well as the political forces at work that cause the displacement of local biodiversity and communities.

To gain some clarity on the experience of the extinction of experience, we can follow educators and conservationists who build upon Pyle’s concept. Peter Miller explored the relationship of biodiversity conservation in relation to the extinction of experience, bringing this concept to the attention of the biodiversity discourse once again.129 Miller similarly argued that one of the major problems for biodiversity conservation is that urban residents remain disconnected from nature as a result of living in urban areas where meaningful interactions with

the natural world are less typical. While we have accumulated potential strategies to address drivers of biodiversity loss, Miller said we seemingly lack the “wherewithal” to actually take actions to protect our natural heritage. In order to encourage conservation efforts, programs should be developed where people live and work so as to create meaningful interactions between these individuals and the natural world. The net result is an estrangement of urban populations from nature generally, and more specifically, an ignorance of local species. This can ultimately lead to an extinction of experience in the knowledge and valuing of nature, local landscapes, and lifestyle practices adapted to that locality.

Miller’s work emphasizes the importance of cultural experience of nature and the importance of identifying elements of urban infrastructure that undermine appreciation and understanding of the natural world and our role in it. Noting the cultural importance of experiencing nature and ecological processes emphasizes that EoE is not only a matter of personal experience, but a socio-political process as well. He emphasized the role that the cultural experience of nature plays in developing ecological values, and how its absence also plays a role when communities lose ecological values.

A further element important in Miller’s work is the emphasis that “education is not enough.” Building upon Pyle’s EoE, Miller argues that textbook or indoor academic familiarization with factual elements of the natural world is not the same as a personal experience with local flora and fauna. Miller writes, “collective ignorance ultimately leads to collective indifference.” He further discussed a growing body of research that has

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131 Further, urbanization itself has an accumulative effect on biodiversity as native habitats are reduced in size and fragmented into patches, and the concentration of native species tends to be away from urban “cores” of cities, where most residents spend their time.

132 Miller, *Biodiversity Conservation and EoE*, p. 430
demonstrated that children’s emotional and intellectual development, not to mention their ability to form values, are developed in relation to familiar settings. We can imagine that for children then, who are only exposed to concrete playgrounds or fixed sports settings for their free time, will have little imagination or compassion for biodiversity. Upon hearing these words, we might see the echo of Leopold’s own musings that we need education of a different kind in order to address the needs of biodiversity conservation; that addressing the wounds requires understanding of what life was before the wounds were made.

It is worth noting that adaptive management strategies are limited within urban environments because of the fixed nature of urban infrastructure. Communal property and gardening spaces are normally regulated through city policy and regulations. While this remains one of the pluses of “modern conveniences,” it can disrupt the local connectivity of communities with their environment, and biocultural diversity can be lost as communities lose their ability to adapt and change their environment in real time.

David Stokes did not hesitate to embrace the most literal interpretation of the term, claiming that we need to intentionally become “conservators of experience.” In response to EoE, Stokes writes in 2006,

We have the potential to act not only as conservators of biodiversity but as conservators of experience. That is, nearly all biological research—including fieldwork, museum and laboratory studies, and other endeavors—has the potential to provide young people with close and meaningful experience of living things.

In order to create appreciation of nature within urban communities, Stokes argues that traditional research objectives must include a concern for not only conserving biodiversity, and the scientific knowledge regarding those species, but the fundamental experiences of engagement with those species. “It is important to recognize that this is not the same as providing

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134 Ibid., p. 7.
information, although that is also useful. What is needed is the kind of direct experience that has the capacity to activate biophilia.\textsuperscript{135} The implications of this recognition are profound and reach further than Stokes might at first recognize—neutral information, neutral knowledge systems lose meaning because of their very neutrality. The relevance of biodiversity ceases to be evident to those who have not experienced those lifeforms, or certain forms of experience with \textit{that life}. As conservators of experience, we may find that conservationists are becoming stewards of not only the beings they strive to study, but of the bond, and of a culture that supports life practices to form that bond. The apparent neutrality of knowledge is called into question with the extinction of experience because it implies that knowledge begins to lose its validity without meaning, thereby pushing the assumption of the innate separation between epistemological, metaphysical, and ethical qualities of knowledge. Knowledge is, in this sense, comprised of a reflexive relation with the observer, the nature of the being itself, and how that being is studied, engaged, and described.

To empower this intention to create opportunities for experience by conserving spaces in which day-to-day and personal experiences can take place, I propose that we must consider the structures or \textit{drivers of EoE} and target them for change with the goal of ameliorating EoE in mind. Stokes’ proposal that a ‘conflict of interest’ remains within this discourse makes clear two aspects of the conservation dilemma: the innate appreciation and care for biodiversity and nature on the one hand, and the intentional conservation and preservation of biodiversity and nature on the other.\textsuperscript{136} When the larger question is asked, “What role should appreciation and valuation play in conservation?” it is nonetheless important not to oversimplify the scenario. The culture-wide appreciation, compassion, and care for non-human entities is distinct from targeted,

\textsuperscript{135} Ibid., p. 6.
scientific management strategies developed specifically to conserve species and within the field of restoration ecology. As such, Miller, Stokes, and other proponents of ecological literacy argue that appreciation of ecological knowledge of systems is part of a general conservation strategy that can be implemented by conservation biologists. Yet, the long-standing separation of scientific knowledge and local ecological knowledge begs many questions: Does society have a moral obligation to prioritize entities that ecology, the science, argues is more essential or vital for conservation than a particular community or culture? What is the nature of this knowledge as distinct from cultural value or knowledge? And can we separate out the metaphysical implications of appreciation from the epistemic or ecological value? The newly proposed Sustainable Development Goals reflect that this separation is still a continuing trend, even as conservation discourse acknowledges the importance of values for conservation policy.

I propose that what is missing in this discourse is the acknowledgement of the traditional or local ecological knowledge (TEK or LEK) that a community develops in time, whether living in an urban or rural space, and that LEK is equally legitimate to some scientific knowledge (and vice versa). That is to say, community care and the concern for the ‘recreational’ appreciation of nature is not the same as sophisticated bodies of traditional knowledge which incorporate ecological management strategies that have been developed by communities.

Miller agrees with Stoke in the need for recreational appreciation, explaining, “If there is to be broad based public support for biodiversity conservation, the places where people live and work should be designed so as to provide opportunities for meaningful interactions with the natural world. Doing so has the potential not only to engender support for protecting natural species, but also to enhance human well-being.” Miller is critical of the “education the public” approach for being one-directional and for tending to disregard the role of growing

137 Miller, *Biodiversity Conservation and EoE*, p. 430.
“estrangement of people from nature” in biodiversity losses. And as such, there are two levels which we should consider in conservation biology, 1) the estrangement of people from nature and 2) biological impoverishment, “shifting baseline syndrome,” and greater still, what has been called the “environmental generational amnesia.” In turn, Michael Samways argues for the need to address EoE by moving “beyond instrumental value” in valuation of nature, and this is particularly prominent within urban environments. He also emphasizes that urban/virtual societies are losing their appreciation of the reliance on nature, stressing further that not only do we need to acknowledge the extinction of experience, but that within urban environments we must take drastic steps to redress or rescue that extinction process.

While I agree with Samways that these two efforts are “highly complementary activities,” I am concerned that there remains an implicit assumption that regard for life and appreciating it is an act of ethical egoism. That is, there is appreciation of nature and its complexity that does benefit humanity, but the motivation for conservation should not necessarily arise from the instrumental benefits. Samways stressed the need to acknowledge the extinction of experience within urban environments, and that we must take drastic steps to redress or rescue that experience that has been lost in order to inform ecological knowledge. This will require intentional action within education, along with intentional landscapes that exhibit local species and create urban spaces in which the community can interact with nature.

We are on the threshold between a real world and a virtual world, which is disconnecting us and nature. The outcome is a loss of appreciation of our reliance on nature. As we are an intrinsic part of the world around us, there are some issues requiring close focus before we embark on a rescue of the extinction of experience.

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138 Ibid., p. 15.
139 Ibid., pp. 16-17.
141 Ibid., p. 1996.
Yet it is not only the nature of education experiences for children, but the extent to which they are experiencing formal structures in their lives which are shaping and mediating the types of experiences we are encountering every day. That is to say there remain drivers within infrastructure that mediate, disconnect, and disrupt cultural traditions and lifestyle practices, often invisibly, producing the illusion of separation and disconnection that are not accurate in terms of our material dependency on the world around us. If we wish to address the extinction of experience in urban environments, models that integrate the cultural experience and valuing of the natural world will be important in rescuing EoE.

Samways, while contemplating how we might redress the EoE, asks, “So how then do we encourage experience while practicing good science?” He first points out that urban nature experiences generally can be misleading because “they are effectively exposed just to common, widespread and generalist species, with the specialists relegated to the remnants of wilderness ultimately giving a “false sense, particularly of rare, irreplaceable biodiversity.” So here we know that there are two aspects of nature appreciation, the first being the appreciation of nature at all, and second a more sophisticated understanding of the role of species and the ecological integrity of a system as pertain to a local region. This latter might be called ecological knowledge and the former nature appreciation. This of course is complicated by the conception of ‘nature’ within the urban space, and further, what qualifies natural entities as integral representations of actual nature. Within the literature, there is a tendency to treat ‘nature’ as being opposed to the anthropogenically created ‘urban’ world. My intention is not to treat the two in opposition but to capture the tone of those discussing the experience of the natural world, whether or not it is a pristine or disturbed habitat. The general opinion of the conservation biologists that “if only they understood, they would care” does not seem to be enough to address

142 Samways citing Ferreira and Tidon 2005.
the apathy many urbanites feel towards nature. We may find that this critique would benefit from a finer analysis in which social forces are at play, and to what extent the “wherewithal” is lacking.

Similarly, Miller and other conservationists responded to Pyle, emphasizing the need to address EoE for conservation because they believe that with ‘more experience, comes more care.’ Such reasoning risks reducing the importance of recognizing EoE as a phenomenon to the personal experience of the child and the resources necessary for human life. This can lead to an overemphasis on the individual experience and needs, and distract from the larger social, political, and ecological dimensions of biodiversity issues and the ways in which human life is impoverished when such experience, engagement, and care are lacking.

This framing is also an idealization of the moral complexity of nature in that all of nature is not ideal or beautiful, but includes a world where wolves eat deer, where disease and death bring an end to life, and in which all the creepy crawlies found in nature that may not be quite as charismatic to all nature-appreciators. The emphasis upon ‘recreational care’ or ‘utilitarian care’ of nature are not the only values that are lost through EoE, nor are they the only tools that can be used to draw public attention to the ecological importance and innate value of nature. Indeed, these are values of nature and should be acknowledged, but other ways of relating, valuing, and engaging persist as well. These other ways of relating are becoming increasingly obscured by the urban structures that discount the innate worth of nonhuman entities and the human engagement with these entities. The emphasis on the need to develop an ethic of care in response to the loss of nature experience can undermine the significance of biodiversity loss and its causes to the concerns of the individual’s quality of life obscures our attention to the causes that produce systematic loss of biodiversity and alternative cultural ways of life.
To avoid simplifying EoE to a discussion of a developing novel ways to create care for biodiversity within particular social groups, I propose that the discussion must shift towards analysis of the structures that shape the lifestyles, care, and knowledge about biodiversity. What are the drivers of EoE? So now the question becomes, if we want to protect our conservationists from being extinguished: How can we address the structures to halt the extinguishing of ecological knowledge and care from perpetuating as a force tied to the very fabric of our society? What are the products or outcomes of EoE for biodiversity and communities? How can we mitigate these impacts? The discussion must be shifted beyond local care, recreational appreciation, or utilitarian preservation of biodiversity, but to a view that affirms that deep connection between the loss of biodiversity and losses within human culture and experience.

2.5 Conservation Biology and the Experiential Crisis

Building on the conservation tradition following Leopold, humanity is typically presented as being one in character, worldview, and orientation towards the natural world by conservationists and within sustainability discourse. A telling example is in Richard B. Primack’s third edition Essentials of Conservation Biology, in which he similarly overgeneralizes urban peoples while distinguishing them from indigenous communities:

In an ecological and cultural history of the Indian subcontinent, Gadgil and Guhu\textsuperscript{143} argue that the belief systems, religions, and myths of hunter-gatherer societies and stable agricultural societies tend to emphasize conservation themes and the wise use of natural resources because these groups have learned over time to live within the constraints of a fixed resource base. In contrast, the beliefs systems of communities that raise livestock and rapidly expanding agricultural and industrial societies emphasize the rapid consumption and destruction of natural resources as a way to maximize growth and assert control over other groups. These groups move to new localities when the resources to any one place are exhausted. Modern industrial states represent the extreme of such societies.

Their excessive and wasteful consumption involves the transportation of resources to urban centers in ever-widening circles and resource depletions.\textsuperscript{144}

While Primack pointed out that the “modern industrial states represent the extreme,” he nonetheless emphasized that “the belief systems of communities…expanding agricultural and industrial societies emphasize the rapid consumption and destruction of natural resources.” One of the many difficulties in studying cultures is the need to state accurately the core beliefs of that community, without essentializing or overgeneralizing a community at the same time. Not only is the origin of conservation biology a recent one, but these dramatic changes in life habits are associated with the rapid transformation of urban society or (in terms of Zev Naveh) the expansion of the techno-ecosystem worldwide.\textsuperscript{145} In most cases, these distinct values and loss of ecological knowledge are only taking root in the last one or two generations of urban society.\textsuperscript{146} Numerous studies continue to make the case that a new form of knowledge is emerging that is a virtual form, in which ecological dependence and being grounded in physical reality is perceived as less necessary for survival.\textsuperscript{147} This world structure that is shifting the type and frequency of nature experiences is fundamentally shifting daily habits of engagement and is in denial of the ecological contingency for human survival.

Plant physiologist and conservationist Carl Leopold further noted that:

Our sense of identity with nature has changed as our culture has changed. For example, people living in low-technology settings, such as the Inuits in the Arctic and hunter-gatherers in Africa and Australia, must maintain a high level of sensitivity to their environmental resources. Their survival depends upon it. Indeed, not only are people in those societies directly dependent on the natural world, but in many cases they maintain a sense of affection for its living components (López 1986)—a sort of environmental aesthetic. In an agrarian society such as the one that brought farming and ranching to the settlement of

\textsuperscript{146}Ibid.
\textsuperscript{147}Recall Kahn, \textit{Generational Environmental Amnesia}, 115-116; see also footnote 9.
North America, people must have retained some sensitivity to environmental issues as they derived their livelihood directly from the land. But with the advance to an urban or metropolitan society, there has been a major disconnect between humans and nature.\textsuperscript{148}

It is interesting to note that Carl Leopold, who wrote this essay half a century after Aldo Leopold, his father, had written the landmark essay the \textit{Land Ethic},\textsuperscript{149} did not explicitly address problems associated with the urban sphere. Aldo Leopold once wrote, “We fancy that industry supports us, forgetting what supports industry.”\textsuperscript{150} Even as Aldo Leopold called for an ecological conscience, a \textit{land} ethic (as opposed to an ethic separate from the land), Aldo’s discussion focuses on the need for such a sensitivity within human communities, and not the mechanisms which have caused depreciation of cultural nature-valuation and ecological knowledge within U.S. culture. Indeed, while the elder Leopold emphasized the biotic community and its inner workings, his son, Carl Leopold, carries on this tradition by further emphasizing the need to consider what the land ethic might become within the grand technosphere of the urban–industrial global complex—that is, how this cultural tradition of ecological desensitivity came to be present.\textsuperscript{151} In other words, after affirming the need for this ecological conscience, it is also necessary to look at the material and social conditions necessary for such a conscience to be part of common society. While it has often been asserted that this value has been absent from the very founding of the United States, this generalization overlooks the diversity of nature values present in any culture and how this is impacted by the power dynamics of any given society. Leopold the younger continued,

\textsuperscript{149} Aldo Leopold, \textit{A Sand County Almanac}.
Our urban society is provided with mowed parks, paved playgrounds, plush automobiles to move us around on asphalt roads, housing with automatically regulated heat and cooling, and supermarkets with wheely baskets in which we can gather our food supplies from orderly shelves. This human-built environment (the techno-ecosystem of Naveh\textsuperscript{152}) serves to buffer urban society from the untamed biological world. The buffering is evident in homes, in play, in recreation, in travel, and in the act of acquiring food and supplies. It is easy to see how families can become alienated from the system of nature that sustains us. And the contemporary expansion of affluence and consumer lifestyles can further promote alienation from nature.\textsuperscript{153}

And yet, even in Milwaukee, Wisconsin, where Leopold’s legacy and his work as a conservationist is honored annually in March, Governor Walker proposed a $300 million budgetary cut defunding educational institutions and transforming the Natural Resources Board for the acquisition of public lands making them advisory party only, deplete of actionable power. Leopold Scholar and historian Curt Meine noted this benchmark on a short opinion piece in the Milwaukee, Wisconsin \textit{Journal Sentinel}:

Walker’s proposed budget reflects a deeper, more profound failure to appreciate just how interwoven our economy and our land are and always will be. A healthy economy depends on healthy lands, waters and ecosystems, and on individuals, businesses and institutions that see, understand and honor these connections. Leopold had a visionary grasp of this basic fact. “We fancy that industry supports us,” he once wrote, “forgetting what supports industry.”\textsuperscript{154}

These changes have been noted not only by scientists but also by artists, such as nature writer Barry López, who critically examines the relationships between human culture and biophysical landscapes.\textsuperscript{155} The presence of such nature writers in the U.S. today also reflects that an alternate view of nature and the human relationship is possible, even while being embedded within this industrial urban society (and further, arguably, we can say have always been present).

Within these industrial–urban societies exist individuals and communities who are concerned for

\textsuperscript{152}Naveh, \textit{Landscape Ecology}.

\textsuperscript{153}Carl Leopold, \textit{Living with the Land Ethic}, p. 149.

\textsuperscript{154}Curt Meine, “This year, Wisconsin fails to honor Leopold,” \textit{Milwaukee (Wisconsin) Journal Sentinel}, Available online: \url{http://www.jsonline.com/news/opinion/this-year-wisconsin-fails-to-honor-aldo-leopold-b99455621z1-295421101.html}

the prioritization of profit and economic efficiency over sustainable practice oriented towards animal welfare, ecological integrity, and social equity (sometimes recognized under the designation “recognition” or “environmental” justice). The ecological conscience called for by Aldo Leopold has been present within the urban experience, though its expression is complicated by the inertia of the urban structures themselves.

Pyle’s EoE is important for conservation in that it explicitly acknowledges the process of the loss of this care, the loss of familiarity with local ecosystems, and the ecological knowledge to manage it practically. While the debate of such a heritage exists at all in the United States, the strong roots of American Transcendentalism bears witness that care and knowledge of nature is part of this cultural tradition even as it is obscured by the dominance of consumerism.

This tension between the industrial–urban complex and conservation is complicated further by the process that local ecological knowledge is getting lost in time as a result of particular ways of urban living, in which the habits undermine and deteriorate such knowledge and ultimately the capacity to care for such things. Within current educational practices and urban modes of conduct, intergenerational knowledge and cultural heritage as an inheritance are displaced by generalizable, technological habits and knowledge. And so the next step in this development of conservation biology, sustainability ethics, and socio-ecological well-being is connecting descriptions of the cultures within the city with the true diversity that lives within those spaces to capture that local heritage. If individuals who care and value nature intrinsically want to protect it, how do urban management practices assist in empowering such change? Forging a stronger connection between local communities and urban policy will mean taking on the entire industrial–urban complex and revamping it with an orientation towards sustainability. This is a move beyond recognizing economic logics alone and that this shift must take place all
while a deficit of experience and local knowledge pervades in younger generations of consumer societies. That is to say, there are social, institutional, and infrastructural inertias that are embedded within the urban system that constrain decisions and perpetuate extinction of experience as an ongoing process.\(^\text{156}\)

Pyle’s discussion of extinction of experience is an important articulation to address forces that lie at the heart of the tensions persisting between the values, beliefs, and ecological knowledge of a community and the socio-political forces that frame and shape their decisions. Conservation biology, and its prioritization of biodiversity conservation in particular, remains a tradition within the United States emphasizing the importance of biodiversity for its own sake: that is, its intrinsic and ecological value.\(^\text{157}\) Pyle, who is embedded in this same tradition, helps bridge the ethical and meaningful significance of biodiversity losses within the environmental history of rural–urban communities of the United States. Understanding EoE as a phenomenon driving biodiversity loss, that is as the summary loss of experience, knowledge, and care towards biodiversity, helps us address the larger concerns of conservation biology—which is of course the conservation of these species.

Further, this dissociation, considered here to be the *extinction of experience*, can become embedded in the institutional and physical infrastructure of society, formalizing this relationship in a permanent way. EoE is phenomenally obscure;\(^\text{158}\) it evokes consideration of not only fundamental experience and existence, but the potentials we create with the substantive worlds

\(^{156}\) Recall the discussion in footnote nine on infrastructural inertia in Chapter 1.
\(^{157}\) For an expanded discussion the diversity of nature-values, see Holmes Rolston’s distinct set of nature-values: economic value, life support value, recreational value, scientific value, aesthetic value, life value, diversity and unity values, stability and spontaneity values, dialectical value, and sacramental value in Holmes Rolston III, “Values in Nature,” *Environmental Ethics* 3, no. 2 (1981): 113-128. Stephen R. Kellert agrees with Rolston, though he adapted some of these categories in *The Value of Life: Biological Diversity and Human Society* (Island Press, 1997). Kellert’s taxonomy of values include utilitarian, naturalistic, curiosity, ecological, scientific, aesthetic, symbolic, humanistic, moralistic, dominionistic, negativistic.
\(^{158}\) I would like to thank environmental philosopher Joseph Tuminello for suggesting the phrase “phenomenally obscure” to capture this aspect of EoE.
we enforce with our decisions. Yet this is a process of loss, and as E. O. Wilson wrote, “The one process now going on that will take millions of years to correct is the loss of genetic and species diversity by the destruction of natural habitats. This is the folly our descendants are least likely to forgive.”

This view is reflected in the central ethical principles of Conservation Biology emphasizes the intrinsic value of biological diversity over its instrumentality:

- The diversity of species and biological communities should be preserved
- The untimely extinction of populations and species should be prevented
- Ecological complexity should be maintained
- Evolution should continue
- Biological diversity has intrinsic value

Conservation biology, as a discipline, emerged in the 1980s, in recognition of the rapid extinction of biodiversity on the planet. In the seminal paper, “What Is Conservation Biology?” written in 1985, Michael E. Soulé identified conservation biology as a crisis discipline and in this, its focus is distinct from biology and that it “is analogous to that of surgery to physiology and war to political science.” One of the difficulties for anyone acting in a crisis discipline, Soulé pointed out, is that one is always acting in a state of incomplete knowledge when actions must take place nonetheless. Further, conservation biology is distinguished from other natural resource fields because of its emphasis on conservation over “financial resources and management.” Soulé also argued that “for humans, the emphasis is on our natural resources.” While his observation regarding the focus on instrumental over intrinsic priorities

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159 Wilson, *Biophilia*.
160 Ethical principles taken from Primack’s *Essentials of Conservation Biology*, 3rd ed.
162 Soulé, *What Is Conservation Biology?*, 278
163 Ibid.
in management strategies, he simultaneously overgeneralized that it is *all humans* that commit this error.\textsuperscript{164}

Note that experience of nature is not mentioned, appreciation of nature is not mentioned, and lifestyle habits or ecological knowledge is not mentioned in the principles of conservation biology, yet these elements have all been recognized as necessary for developing conservation strategies. To address EoE as a causal force contributing to biodiversity loss, we really need to get at cultural formation of nature experience. The principles outlined by conservation biology are important, but they need better integrating with the complex socio-ecological relationship cultures share with their local environments.

Indeed, comprehending the true ramifications of this deficit of experience *today*—before the impacts on future generations (future generations of not just humanity but future generations of biological *and* cultural diversity and of ecological integrity) are fully realized—remains difficult for those who are removed from the consequences that are visible in our time. For urban technocrats, so many of these impacts are mediated, separate, and occurring “elsewhere,” and as they lack personal knowledge of local and endemic species, they are unaware of their passing, and unaware of signs of a stable or unstable ecological community. This emerging phenomenon of a cultural-wide disaffection, disengagement, and estrangement from nature has far reaching consequences that go beyond the simple need for recreational appreciation of nature. Indeed,

\begin{quote}
\textsuperscript{164} Ricardo Rozzi made a similar criticism of Leopold’s overgeneralization of humanity, writing, “In contrast to the land ethic of Aldo Leopold who refers to the human species as a whole, by asserting that ‘a land ethics change the role of Homo sapiens from conquer of the land-community to plain member and citizen of it,’ biocultural ethics shows us that many cultures—including Amerindian, Buddhist, and some Western philosophical traditions—have ecological worldviews that recognize humans, plants, waters, and other beings as co-inhabitants.” (Rozzi, *Biocultural Ethics: From Biocultural Homogenization Toward Biocultural Conservation*, p. 10.) The debate regarding the underlying values of U.S. culture in relation to wildlife has been ongoing since the beginning of the field of environmental ethics. My point is only to recognize the diversity of nature-culture values that have persisted in the history of the United States and its peoples, whether it is of colonial or ancestral origin. For further discussion on the U.S. environmental ethic, see: J. Baird Callicott, “The Conceptual Foundations of the Land Ethic,” and Chapter 4, “Wildlife Protection Values,” in *Foundations of Environmental Ethics*, ed. Eugene C. Hargrove, (Environmental Ethics Books, 1989).
\end{quote}
disaffection and lack of knowledge shape lifestyle practices, management choices, and ethical priorities that in turn shape the very structure of institutions and policies perpetuating the cycle. This conversation is not only about the ethical justifications for conserving biological diversity, though this is an essential component to this debate, but it is also about the deep ways in which such losses shape the very conversation about biodiversity, and in this sense, it is a conversation about ourselves, our meaning, and our existence.

2.6 Conclusion: Applying EoE to Reveal Normative and Socio-Political Dimensions of the Experiential Crisis

Conservation biology must address the loss of ecological knowledge as a driver of biodiversity loss in order to account for the role culture and society play in shaping cultural landscapes. One of the reasons many scientists argue for scientific knowledge in addressing environmental management is that the public is perceived as having appreciation of nature (if they have it all) without the understanding of the subtleties of a complex ecosystem. Therefore, the approach has been two-pronged: developing positive nature experiences, and second, applying scientific knowledge. While well intended, this approach can often have the unfortunate side-effect of displacing or undervaluing local ecological knowledge and local lifestyle habits that have been adapted in the long-term for human life in relation to the environment. However this is not necessarily a function of scientific knowledge, but the way knowledge is treated more generally within the formal education of the United States.

Discounting of naturalist knowledge in formal education, and local ecological knowledge by dominant education and development more generally, dismisses the cultural component of nature engagement. Evaluating the sustainability of these practices requires consideration of the
ecological integrity of the system, but nonetheless the assumption that local knowledge lacks awareness of the limitations of the system is unfounded and requires exploring case by case.

In order to develop the conceptualization of EoE as a driver and to capture the causes that lead to experiential loss as a phenomenon, it is necessary to identify the systematic ways in which standardized mechanisms within urban institutions and infrastructure are creating a production of biodiversity loss, degradation of ecological systems, disregard of harm done to other sentient beings, and in general the emerging apathy at reacting to tragedy produced by the global system. In particular, it is necessary to understand how EoE works within cultural traditions and the transmission of local ecological knowledge. While Pyle’s analysis began by identifying three trends that have led to EoE post-WW2, further analysis is required regarding the forces that produce the EoE cycle. This phenomenon is complex in that it contributes both to the loss of biodiversity and the depreciation of quality of life even while the perception of the priorities of life for a good life changes depending upon the standpoint and values of particular cultures. For this reason, I review perspectives from ethnoecological and indigenous critiques of EoE and the influence of the experience of loss within today’s society in the next chapter. The concept also needs to be integrated with conservation strategies so as to better reflect distinct cultural viewpoints of how extinction of experience occurs as a phenomenon.

Ultimately, I will propose in this dissertation that responding to the socio-environmental crisis with urban sustainability practices requires addressing extinction of experience as a complex biocultural phenomenon, which represents a major (though indirect) driver of global change. Moreover, that EoE is an invisible, mediated, and far-reaching driver of the biological and cultural diversity losses we are encountering today. While Pyle emphasizes that EoE takes place in the neighborhood, in the place and experience of one’s very personal life, I argue EoE
itself is driven by structures within our society that shape human action, experience, and knowledge of the world around them. These drivers are embedded in structures worldwide and in this sense EoE is present in urban structure itself.

For Pyle, even as we recognize these distinct types of valuation, and the epistemic, emotional, and social character of this valuation, we must also reflect upon the nature of the experiences that drive the type of engagement we have with nature. The valuation of nature is implicitly part of a larger system of our local ecological knowledge. While Pyle does not go so far as to discuss the nature of cultural heritage or the co-evolutionary role that culture can play in appreciation and understanding of ecosystems, he laments the absence of knowledge, experience with nature, and the care that comes with it (what he, Wilson, and others have called “biophilia”). I do this work of considering cultural heritage in addressing nature experience, knowledge, and appreciation in the next chapter, exploring the conceptualization of EoE within the context of the co-evolutionary relationship between culture and environment in the next chapter, by following Gary Nabhan and Luisa Maffi’s use of this term within this context.

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CHAPTER 3
EXTINCTION OF EXPERIENCE AND THREATS TO BIOCULTURAL HERITAGE

As local peoples are removed from their lands, or subsist in severely degraded ecosystems, and are absorbed into a market economy in which normally there is little room for traditional subsistence practices and resource use, local ecological knowledge and beliefs and the accumulated wisdom about human-environment relationships begin to lose their relevance to their lives. This phenomenon has been called the “extinction of experience”: the radical loss of the direct contact and hands-on interaction with the surrounding environment that traditionally comes through subsistence and other daily life activities.

--- Luisa Maffi

3.1 Introduction: Experiencing the Threats and Outcomes of Extinction to Biocultural Diversity

By the end of the twenty-first century, it is estimated that 20% of the world’s species will have gone extinct, though we have lost almost 50% of wildlife populations in the past forty years. Even more striking, possibly as much as 80% of the world’s almost 7,000 languages will be lost in that same period of time. Worldwide, over 50% of the global population is speaking ten languages, and in formal education less than 500 languages are used. These losses of biodiversity, ecological knowledge, and the degradation of ecological processes are not isolated instances but linked by the larger web of drivers embedded within the practices of the

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global market economy. Therefore, addressing the loss of biological diversity and ecological degradation requires understanding the cultural and political processes innately tied to these physical processes within that economy.

Throughout this dissertation, I have been emphasizing the role of experience and knowledge in comprehending the environmental crisis and the environmental literacy on the capacity to be aware and respond to the environmental crisis. In this chapter, I focus on the skill and traditions that have been developed in relation to biodiversity, and the societal structures that support or undermine the practice of utilizing this local ecological knowledge. There is an entire world of experience and engagement between social and ecological systems that may not be perceptible depending upon one’s experiences and heritage. I propose that the creation of blinders to sustainable forms of engagements is a very real consequence of EoE, and one that must be redressed for a sustainable future. Affirming this is not only necessary for the continued existence of biodiversity and human well-being, but it is also part of integral heritages and traditions that are often disregarded by the dominant market economy.

Anthropogenic global drivers shape not only environmental processes and biodiversity, but additionally, they shape knowledge, experiences, values, and lifestyles. Yet not all anthropogenic drivers are equally influential within the global system. Environmental impact of urban ecosystems and populations have a far greater influence on the world’s ecosystems than rural communities, with urban areas covering only 2% of the world’s surface, yet consuming over 75% of the world’s natural resources.\(^{170}\) Therefore, in order for urban communities to take responsibility for their environmental impact, it is of great importance that these groups have

comprehension of the severity of environmental degradation, and that the political and social displacement processes that are a concurrent part of this phenomenon are accounted.

In the previous chapter, I described ways in which awareness of environmental degradation occurred through my discussion of the concept of extinction of experience (EoE). Within urban environments, EoE is an often-invisible extinction because the deficit of nature experience and ecological knowledge means a shallowness of comprehending even the reality of these losses. While some communities remain blind to biodiversity loss, environmental degradation, and acculturation pressures, or discount these changes as unimportant, many communities are experiencing these changes first-hand.\textsuperscript{171}

The gap between those who are concerned with such losses and those who are not, and to what extent, is often reflected by the ecological knowledge of a community along with its cultural heritage and daily practices of engagement with the surrounding world.\textsuperscript{172} For instance, urban populations are often experientially isolated from ecosystems with the least first-hand knowledge of natural limits to resources, while remaining the most significant contributors to environmental degradation. By comparison, rural, indigenous, and traditional communities are often integrated into ecosystems through subsistence economies and farming practices, with first-hand knowledge of natural limits to resources and the partaking in generations-old cultures of management strategies about these systems.\textsuperscript{173}

\textsuperscript{171} Ricardo Rozzi, \textit{Latin American Biocultural Ethic}. This is particularly evident in Latin America, where local communities are resisting and also ecological diversity patterns are quite distinct from those found in North America.

\textsuperscript{172} This gap is also evident within ‘climate change denial’ prominent in the United States. Various studies have shown that groups are more likely to deny climate change if it requires significant change in their lifestyle and is dependent on their access to resources in case of emergency conditions. From this view, concern for environmental change is reflected in a willingness to assume risk, and therefore, the vulnerability to risk. Dan M. Kahan et al., “The Polarizing Impact of Science Literacy and Numeracy on Perceived Climate Change Risks,” \textit{Nature Climate Change} 2, no. 10 (2012): 732-735.

\textsuperscript{173} The apparent blindness to loss is complicated further by the heterogeneous mosaic of perspectives across the intersection of biological, cultural, and linguistic diversity, and therefore should be seen as a range of
In affirmation of the importance of ecological knowledge for biodiversity conservation, Pyle and others argue that addressing EoE within urban communities requires creating spaces of engagement in which knowledge of nature can be developed through personal experience as opposed to textbook, virtual, or mediated experiences alone. Whereas EoE originates for Pyle in the recognition that urban schoolchildren in the United States have become completely unaware of local biodiversity, in contrast, this same phenomenon is particularly poignant for communities that share in daily interactions with biological diversity, the community more generally, and other nonhuman beings sharing the same habitat. Consequently, within this chapter I follow accounts that criticize drivers that undermine cultural heritage and ecological knowledge. These critics argue that the loss of local engagements and the mechanisms that drive this disconnect within culture, in turn, often leads to the loss of cultural heritages and impoverishment of ecological knowledge and overall community self-reliance. Further, heritage knowledge is often discounted by the global economy and techno-scientific viewpoints, relegating this knowledge as less reliable than that embedded in dominant development and techno-scientific discourse.

Recall that I argued in the previous chapter that EoE can be better understood as a process that simultaneously erodes biodiversity and ecological integrity and through this erosion, it desensitizes one’s ability to be aware and conceptualize such losses. EoE is not an abstract concept alone, but gains meaning when defined in reference to concrete experiences that are being lost, or certain opportunities for engagement that have disappeared. What extinction of experience emphasizes is that relationship that is extinguished is made invisible and obscured, and that what is lost through EoE process is unique for each culture and community.

viewpoints, each with its own particular standpoint. However, in order to address the material causes of these changes, the mechanisms which veil or mask ongoing biodiversity loss, environmental degradation, and cultural loss must be better understood, in particular consideration that these impacts themselves may be unapparent or difficult to recognize for particular social groups.
Just as any experience can never go ‘extinct’—for all we can do is but experience—Maffi’s use of “local peoples” may seem an unnecessary redundancy in that all people are local, relative to the space they inhabit. What she is differentiating is key to understanding EoE in that those peoples and communities have co-evolved and inhabit with local knowledge and meaning that inextricably linked with local biodiversity. These local engagements shape ways of life of traditional peoples and are expressed in generations-old knowledge and traditions that form a cultural heritage co-evolved with biodiversity and the local ecosystem. This form of culture is distinct from those peoples inhabiting technological environments that have had insufficient time for co-evolutionary learning to exist within these urban habitats. Yet, the distinction of ‘local’ peoples captures an important aspect of what is being lost through EoE, and what is challenged by dominant technologies or monocultures that do not account for local ecological context or affirm the value of local cultures.

Even as populations move to urban environments, cultural heritages tied to place often are displaced or become invisible in the face of development. Within urban cultures, the predominance of the consumer lifestyle disguises how recent these changes truly are. In this chapter, I examine the discounting of local and traditional ecological knowledge as a key driver of biological, linguistic, and cultural losses. I also propose that, if unexamined, discounting of local ecological knowledge will perpetuate itself as an iterative process promulgated as EoE cycle. This cycle is an interactive process in that it erodes both local biodiversity and traditional knowledges, reducing the capacity for self-sustaining management as reliance on the industrial market increases and reducing the ecological knowledge communities need in order to recognize these losses.
In particular, the view of ethnoecology emphasizes the need for a unified history to encapsulate the interrelationship between the histories of humanity and biodiversity; that is, these biocultural links contain the cultural memory, genetic history, and cultural landscapes that are interwoven in time. This biocultural relationship exists across time, as witness to the past in the present, with bearing upon the potentiality of the future even as is expressed through the biodiversity and cultural landscapes created by human hands in the present. This is true even more so as anthropogenic urban environments grow in dominance of cultural landscapes. In this context, the purpose of this project examines EoE at the intersection of biological, cultural, and linguistic diversity losses and the underlying forces driving these losses to halt irreversible losses of cultural knowledge and biodiversity extinctions. This requires a critical analysis of dominant structures in global society with the interwoven, deep nature of these rich cultural and biological histories in mind. I argue that in order to affirm the rights for indigenous citizens, the equal legitimization of plural worldviews is necessary within the greater context of scientific and development discourse to manage for ecological functioning and sustainable management practices that are otherwise overlooked by these dominant Western techno-scientific worldviews.

In order to develop socio-ecosystemic perspectives on EoE, I complement my previous chapter on the urban discussion begun by Pyle with the analysis of indigenous and non-Western views to account for EoE, most notably through the work of ethnoecologists Luisa Maffi and Gary Nabhan. I introduce the concept of biocultural heritage as a product of the co-evolutionary relationship between biological and cultural diversity. Even as biodiversity loss, ecological degradation, and acculturation are painfully ongoing processes for many, they are often made invisible to many through the political and power processes present within dominant discourse.
Discussion regarding extinction of experience remains incomplete if we focus on only urban communities, whose ways of life, daily habits, and habitat are greatly different than rural environments, or for those communities living in remote or less urbanized areas. Therefore, this chapter locates EoE as it is influencing indigenous, traditional, and local communities at the intersection of biological and cultural diversity to provide a foundation for my discussion regarding the drivers of this phenomenon.

3.2 Global Market Economy, Industrial Agriculture and Formal Education: Major Drivers of EoE

As the initial quote by Luisa Maffi emphasizes, EoE is an effect driven by the dominant market economy system and other indirect drivers that characteristically displace local ways of life and knowing. When opportunities for engaging nature are lost and as species are extirpated and ecosystems fragments or degraded, the local ecological knowledge that is dependent upon that biodiversity also disappears. As I show in this chapter, the dominant practices within development, such as the biotechnologies of industrial agriculture and the monolingual educational model, are often tied to loss of linguistic and cultural heritage. In such scenarios, traditional practices are displaced, discounted, and often treated as subordinate to industrial practices. Further, these traditional practices decrease as active practices, as communities are forced to change their way of life to exist within the capitalist economy system. Consequently, cultural memory and local management practices are disrupted within rural communities through displacement, loss of land, and discounting of intellectual resources. I propose that explicating the ways in which formative social policies and structures can disrupt the cultural link between management practices and biological diversity should be an ethical priority for our ‘sustainable century.’ Acknowledging the ways in which dominant structures are disrupting the deep interlink
between biocultural heritage and sustainable management of systems affirms a belief that human communities can live sustainably within the limits of their ecosystems. If one accepts this ethical responsibility to do so—both individual and societally—then it is possible to target those structures where the inextricable link between biological, linguistic, and cultural diversity are disconnected.\textsuperscript{174}

The direct and indirect drivers of socio-ecological disconnection come in many forms. For instance, biotechnology influences communities to replace subsistence farming practices with those of industrial agriculture, substituting polycultural systems with “monocultures of genetically uniform cultivars.”\textsuperscript{175} This consequent decoupling of cultural heritage from management practices diminishes the self-reliance of communities. Through generations, this can lead to the cumulative loss of certain components or traditions of that heritage even as new ones emerge within a single generation. In terms of industrial agriculture, this often results in new knowledge about the uniform cultivars and the specific knowledge needed to maintain them, not the specific knowledge of local varieties and their care for this inextricable link between biological and cultural diversity. This has led many to argue that “both the loss of knowledge and the loss of biodiversity are irreversible: once the information is lost, it cannot be retrieved.”\textsuperscript{176} EoE further reveals that there is an inextricable link also shared between the institutional and physical structures that shape the lifestyle practices of communities, and thereby their ultimate capacity to manage their ecosystems sustainably.

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\textsuperscript{176} Susette Biber-Klemm, Thomas Cottier, and Danuta Szymura Berglas, “Rights to Plant Genetic Resources and Traditional Knowledge,” Basic Issues and Perspectives. (Cabi, Wallingford UK, and Cambridge, USA: 2006), p. 26
\end{flushleft}
The cut of the inextricable links between humans and nature (biodiversity–cultural diversity/management priorities–sustainable use) is illustrated clearly in the discussion of heirloom seed conservation. *In vitro* seed banks have been criticized for isolating seed strains in space and time, as they often do not survive reintroduction after being stored because they are no longer adapted to new environmental conditions. The isolation of genetic stocks from the cultural knowledge of the care of those species and the ecological isolation of those same stocks from the dynamic environment can equally lead to their extinction as these genetic lines are no longer adapting in real time to environmental changes, nor being managed to changing environmental conditions as the knowledge about these species has not been maintained or relayed. *Ex situ* seed banks are criticized ultimately because they are not dynamic and the reintroduction of seeds after environmental isolation can make seed strains vulnerable to disease. Further, the local and traditional practices of rotating crops and managing them may not be implemented when the seeds are ‘withdrawn’ from the bank, perhaps containing key management information and strategies. The evolutionary link between genetic diversity and environmental changes is disrupted, and the biocultural link between biodiversity and management traditions and practices is also disrupted.

The irreversibility of the loss of this link, in addition to biological and cultural diversity in and of itself, makes the process of EoE particularly insidious because it removes these entities (in the case of biocultural heritage, the native language and biodiversity) from the experiential sphere of the individual and community culture. For this reason, EoE becomes an invisible driver of ecological degradation and species extirpations. Consequently, EoE represents a puzzling aspect in the creation of unsustainable cultures in that the process effaces its presence by

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removing sustainable examples of human-nature coexistence from the sphere of lived experience,\textsuperscript{178} even as its seemingly intangible presence causes physical environmental degradation, displacement of biodiversity, and disruption of local cultures. Further, within a given culture, the local biodiversity, the traditional agro-cultures and ways of life can be forgotten and lost to memory, as elders and other knowledge holders in the oral tradition are unable to pass on their knowledge to the younger generations and this information is not retained in formal societal modes.\textsuperscript{179}

Formal education can be considered a major driver of EoE. Formal education, and its pedagogical methodologies, has been criticized for assimilating linguistic groups through the use of monolingual systems in which schoolchildren must learn in a dominant language, different from their own. The monolingual model displaces bi- or multi-lingualism, creating a culture in which native languages are looked down upon or become secondary in importance to learning the dominant language. For instance, within the early days of U.S. education of Native Americans, core values of native peoples were dismissed with little respect to the internal logic of their cultural heritage.\textsuperscript{180} The marginalization of non-capitalistic values is evident in the U.S.

\textsuperscript{178} Lefèbvre, \textit{Urban Revolution}.

\textsuperscript{179} Similar criticisms have been raised regarding restoration more generally, as the act of restoring a devastated ecosystem can be considered artificial. While the endeavor to restore a system remains an important goal for maintaining ecological processes, whether it is possible to recover what is lost seems clear: certain losses remain permanent, though life itself goes on. Eric Katz, “The Big Lie: Human Restoration of Nature,” \textit{Readings in the Philosophy of Technology} 443 (2009). Katz is critical of the assumption that nature can be restored to an earlier ideal state is equivalent to the “technological fix” view of nature, whereas if humans apply enough technology to a given problem, an ideal resolution will occur. He argued it is both impossible to conduct such restoration, and that further, it can anthropocentric and work against natural processes. See also Eric Katz, “The Problem of Ecological Restoration,” \textit{Environmental Ethics} 18, no. 2 (1996): 222-224.

\textsuperscript{180} A book that catalogues this process within the U.S. education system, David Wallace Adams, \textit{Education for Extinction: American Indians and the Boarding School Experience, 1875-1928}, (Lawrence: University Press of Kansas, 1995). The depreciation of non-capitalistic values is evident in the U.S. treatment of Native Americans with the boarding schools of the late 1880s–1920s. “In the end, [Native Americans] must internalize the ideal of self-reliance, and they must come to realize that the accumulation of personal wealth is a moral obligation,” p. 22. See specifically Adams’s discussion on education policy as summarized in the Merriam Report, which he quotes “The problem of Indian Administration” (January 1928), “An overwhelming majority of the Indians are poor, even extremely poor, and they are not adjusted to the economic and social system of the dominant white civilization,” p. 331. The report recommended that a change in point of view was needed in the goal to prepare Indians for...
treatment of native Americans with the boarding schools of the late 1880s–1920s as native
schoolchildren were considered ‘uncivilized’ for lacking any appreciation of the need to earn
wages through employment and instead were content with traditional ways of life.

Formal education leads to an EoE that becomes a destructive driver of environmental
change. Today, this EoE process is far reaching within the global economy that these
disappearances of biodiversity, language, and tradition are occurring even as communities are
desensitized to the importance of these losses, obscuring the significance of such loss. The loss
of ecological knowledge and cultural heritage takes place in varying degrees in cultures and
communities throughout the world, driven by vast monocultures that displace and discount the
value of such local knowledge. Critics of globalization, such as Vandana Shiva, decry the
impact of biotechnology upon the third and fourth worlds (developing nations and indigenous
communities) because of the monocultural mindset that overrides the vital interrelations among
cultural, biological and ecological diversity. This monoculture is driven by the dominant
economy and the underlying values of biotechnology as utilized within the global industrial
agricultural system, and is expressed in the form of monocultural agricultural practices as well as
development and education practices. Ultimately, EoE is an iterative process tied deeply to local
knowledge (or its absence), nature-engagement, and heritage.

Through such analysis we see that the dominant structures of global society, including
market economy, industrial agriculture, and formal education, shape this culture–nature
interrelation in significant ways. Hence, EoE is an underlying force embedded within many of

“adjusting” to the “dominant white civilization,” moving from a system that believed “to remove the child as far as
possible from his home environment… to the necessity of connecting children’s education to family and
community… [abandoning] uniform curriculum… “and the teacher allowed to ‘gather material from the life of the
Indians about her, so that the little children may proceed from the known to the unknown and not be plunged at once
into a world where all is unknown and unfamiliar,” p. 332.

181 Vandana Shiva, Monocultures of the Mind: Perspectives on Biodiversity and Biotechnology.
the unsustainable practices in today’s global society. A first step towards preventing EoE is understanding this phenomenon, from urban, local, indigenous, and traditional viewpoints. By the end of this chapter, I will have synthesized a larger perspective on the phenomenon as a whole and the drivers that contribute to its occurrence. In the next section, I explore the role of cultural memory in relation to extinction of experience from the perspective of local, indigenous and traditional communities.

3.3 Transmission of Biocultural Heritage and the Extinction of Experience

In this section, I discuss the role of biocultural heritage in relation to EoE. The interrelation of human and ecological history is manifest in the modification and presence (or absence) of biodiversity, ecological community structures, cultural landscapes, and genetic lines. In this chapter I further develop my thesis that EoE is driven by structures (e.g. commercial resource use, privatization of land rights, urbanization, monolingual education) within our society that shape human action, experience, and knowledge of the world. In general, these structures either support lifestyle practices and livelihoods that work within the ecological limits of ecosystems, or they push for extended use beyond sustainable levels. Further, fundamental institutions, such as foodways, education, and economy can support local knowledge and lifestyle practices or disrupt these interconnections. In order to halt the continual erosion of cultural identity and local knowledge systems, I argue that it is an ethical obligation of global economy and dominant urban institutional policies and structures to implement awareness and sensitivity to the mechanisms which create EoE. Instead of these institutions as serving as pathways which reduce diversity and local ecological knowledge, they can be redirect to support the complex dynamic that exists between biodiversity, cultural diversity as the structures that shape lives.
EoE has been alluded to, described, and analyzed by thinkers in various intellectual camps, from indigenous rights and linguistic diversity conservationists, to urban educators and biodiversity conservationists. These thinkers share a core concern that is the loss of cultural memory and relation to place. These losses of cultural memory and sense of place deeply affect the quality of life and the root experiences that form meaningful lives. Further the loss of cultural memory about local ecosystems and the loss of a sense of place can lead to a desensitization or disregard for the loss of biodiversity and ecological integrity. These interdisciplinary and, also intercultural, camps have interpreted EoE in unique, yet overlapping ways.

Whereas Pyle emphasized the lack of key nature experiences within the urban and suburban United States, linguistic and heritage conservationists tend to emphasize the narrowing or loss of the possibility of biocultural experiences that were previously an essential part of everyday life and a rich cultural and linguistic heritage. The loss of these biocultural everyday experiences is a drastic and lasting loss because when a particular language is no longer spoken or certain ecological practices no longer taught, their absence is irrevocable or requires significant reconstruction to recover.\textsuperscript{182} Conservation efforts therefore, need to focus on not only the loss of biodiversity and ecological health (a.k.a. “nature”), but the loss of cultural heritage and ecological knowledge about those systems. Cultural heritage includes not only the knowledge of a particular community, but the modes of education through which it is passed on across the generation, and its cultural memory.

There are two main instances where EoE has been used in association with cultural memory, or the intergenerational transmission of traditional and local knowledge, by ethnoecologists. First, in 1993, Gary Nabhan introduced the term with his graduate student, Sara

Antoine, as related to intergenerational retention of traditional ecological knowledge (TEK) through oral traditions of language, story, and culture.\textsuperscript{183} They noted TEK’s displacement as a result of the rapid and extensive prevalence of virtual media and formal educational models that discount knowledge learned through direct experience, folk practices, and traditional ways of life. Second, in 2001, Luisa Maffi adopted Nabhan’s use of the term and applied it to the loss of medicinal and practical applications of cultural heritage of rural and indigenous communities in Southern Mexico and other regions.\textsuperscript{184} Maffi also treats EoE as a signifier as what is lost when practices common to Western development push out indigenous and traditional ways of life leading to language decay or “language death.”\textsuperscript{185} Her concern regarding language death in particular is tied to conditions “when the intergenerational transmission and the contexts of use of knowledge in the native languages begin to erode,” in time leading to a general decline in “‘cultural support’ for nature knowledge.”\textsuperscript{186} This discussion of cultural support for biodiversity knowledge complements Pyle’s concerns regarding the loss of biodiversity experience and knowledge, as it informs a better understanding of the mechanisms in which local knowledge is garnered and maintained.

While these two instances by Nabhan and Maffi remain the predominant instances applying EoE within ethnoecology and related literatures, their use of the term also captures the sense of the body of research that is highly concerned with loss of local knowledge construction, meaningful engagement with one’s surroundings, and expression through one’s cultural heritage and language for indigenous, local, and traditional (ILT) communities.

\textsuperscript{183} Gary Paul Nabhan and Sara St. Antoine, \textit{The Loss of Floral and Faunal Story}, p. 326.
\textsuperscript{186} Maffi, introduction to \textit{On Biocultural Diversity}, p. 7.
3.3.1 Gary Nabhan: From Indigenous and Rural to Urban Extinctions of Experience

Local ecological knowledge comes in many forms (e.g. traditional, folk, urban, indigenous), and these terms have been developed to signify distinct socio-ecological domains by ethnoecologists to reflect the diversity of cultural landscapes and relationships between humans and nature. This body of knowledge has been acknowledged as unique and deserving of its own intellectual and resource rights, due to these unique qualities. Darrel Posey and Graham Dutfield, two founders of ethnobiology, describe the unique qualities of traditional peoples and their respective practices, beliefs, and cultural heritage. The unique qualities of this heritage merit specific inalienable rights to maintain the ‘dignity and well-being’ for the traditional peoples, their lands, agroecosystems, and heritage:

… the term ‘traditional’ refers to the cherished practices, beliefs, customs, knowledge and cultural heritage of indigenous and local communities who live in close association with the Earth; ‘resource’ is used in its broadest sense to mean all knowledge and technology, esthetic and spiritual qualities, tangible and intangible sources that together, are deemed by local communities to be necessary to ensure healthy and fulfilling lifestyles for present and future generations; and ‘rights’ refers to the basic inalienable guarantee to all human beings and the collective entities in which they choose to participate of the necessities to achieve and maintain the dignity and well-being of themselves, their predecessors, and their descendants.187

Posey and Dutfield emphasize not only the uniqueness of traditional communities from non-traditional communities but that these peoples should be given a “basic inalienable guarantee” to participate in their lives according to the cultural heritage and lifestyle habits as related to the environment. Understanding the forces that would threaten these fundamental rights is key to conserve and protect this link between culture and place.

The theoretical understanding and practical argument for the need to conserve biological and cultural diversity in terms of EoE was articulated in the field of ethnoecology by Gary

Nabhan. In the 1980s, he started as a pollination biologist and advocated the importance for communities to have understanding about pollinators and the role they serve in agriculture and ecological communities. Nabhan became a lead researcher on the role of ecological knowledge in agricultural diversity and sustainable practices who was also concerned with forgotten or lost knowledge about that biodiversity. It is worth noting that in the early literature on conservation of biocultural diversity and ethnoscience literature, Nabhan’s interpretation of the term is often cited as the original source of the concept, though he adopted it from Pyle.

Nabhan wrote of EoE,

… local extirpations cause “the extinction of experience”—the loss of direct, personal contact with wildlife. Any conditions which reduce such intimate experience, Pyle claims, create a cycle of disaffection, apathy and irresponsibility toward natural habitats.

If we recall from Pyle, EoE involves not only the loss of certain experiences, but it also involves a ‘cycle of disaffection, apathy and disregard’ that can spread as opportunities for nature experiences disappear. Gary Nabhan and Sara Antoine presented EoE as a concept that included both the ignorance and disaffection driving peoples (mostly younger generations) away from biophilia and the fundamental relationship humans share with nature. In their study, they set out to conduct a survey of schoolchildren from a range of cultural background to determine

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189 While ethnobotony and ethnobiology were precursors to the larger subfield of ethnobotany, throughout my paper I refer to this cluster of studies as “ethnoscience” or “ethnoecology,” depending on the scale and context. Further, biocultural conservation emerged as a subfield only after literature first developed the need for the conservation of biocultural diversity throughout the ethnoscience.


191 Nabhan and St. Antoine, The Loss of Floral and Faunal Story, p. 239.

192 Pyle, Eden in a Vacant Lot.

193 This chapter is part of the larger compendium, E. O. Wilson’s The Biophilia Hypothesis. Wilson’s collected volume proposes the “biophilia hypothesis” that there is an instinctive attraction between humans and biodiversity, reflective of the co-evolutionary relationship of the two.
the extent to which EoE was taking place. Nabhan and Antoine observed in the essay, “[n]ow that global electronic media dominate knowledge of nature, these children are losing the kind of local awareness that television documentaries cannot supply.”194 Local awareness is being displaced in the children by information received from the media, including television programs, documentaries and other media sources. The concept of local awareness is distinct from the type of knowledge that is synthesized from electronic or media technologies. It is worth noting that this concern is echoed by child ecopsychologists who found that overly structured or controlled experiences can inhibit mental development.195

Nabhan and Antoine’s analysis demonstrated that children were losing local knowledge of their desert surroundings. Their study found that children did not know that birds sang more frequently in the morning than at dusk, that it was possible to eat the fruit from the prickly pear cactus, or that the creosote bush was the fragrance that carried in the wind so strongly.196 Further, it found that children were unaware of the prickly pear cactus despite its popularity as a major food source in the region for over 8,000 years, and that it continues to have a strong presence in markets in the area.

Nabhan also emphasizes that one of the major distinctions in the types of learning children are undergoing is that television or passive learning does not require the child to interact or engage their surroundings; they just ‘sit and absorb.’197 He wrote, “[b]oth television and certain formal education approaches run counter to the ways of indigenous education—for example, apprenticeships with elders—that have been more successful in previous

195 In Richard Louv’s U.S. campaign that ‘no child be left indoors,’ he made a case that the impatience and inability to focus may well come from the students’ lack of complex environments during their formative years.
196 Nabhan and St. Antoine, The Loss of Floral and Faunal Story, p. 240.
197 Ibid., p. 241.
generations. Nabhan calls this trend the “demise of the oral tradition.” Inspired by sentiments expressed by journalist and creative writer Italo Calvino in the work, *Mr. Palamor*, Nabhan wrote, “new knowledge… does not compensate for the knowledge spread only by direct oral transmission, which once lost, cannot be regained or transmitted.” Calvino wrote *Mr. Palamor* in the late 1970s to reflect on “the problem of non-linguistic phenomena. . . . That is, how can one read something that is not written.” Nabhan’s reflection inspires me to ask here: How can we recall what has been forgotten, or never known in the biocultural experience or in a lived lifetime? Here again we are confronted with the irreversibility of EoE as a process constructing human experience, and worse still, a process that is disengaging the sense of human proprietorship with land, biodiversity and even community. This disengagement disrupts even the cultural memory that such a thing even existed.

Stanford Zent, a United States-Venezuelan ethnobiologist employs the social dimension of biocultural experience and transmission of knowledge. In a 2009 UNESCO report on “delearning trends and changing patterns of [knowledge] transmission,” Zent argued the importance of local participation and engagement within learning patterns. Synthesizing many studies, Zent focused his report on the knowledge transmission of learning (or delearning patterns) within indigenous communities, as influenced by Western pedagogical practices, by reviewing case studies in multiple countries. From this synthesis, Zent concluded that traditional patterns of knowledge transmission are usually “informal, context-dependent, activity-situated and participatory in nature.” For instance, in Venezuela, when a mission institutionalized

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198 Ibid.
201 Stanford Zent, *Traditional Ecological Knowledge and Biocultural Diversity*.
202 Ibid., p. 51.
formalized education structures, such as indoor classroom environments or structured recess, children were less likely to participate in more traditional, local-based activities with the environment. These students demonstrated less local ecological knowledge and less interest in their traditional community practices.

Zent reported that:

According to our experience of Jotí daily life, most talk about plants occurs in contexts in which there is direct contact and interaction with them. These include: walking through the forest, harvesting plant products, processing or eating the catch, painting the body with vegetable dyes, performing rites with magical plants to enhance hunting success, curing the sick, etc. We did not witness formal or consciously planned teacher-led instruction about plants, with the exception of one of the schoolteachers at Kayamá who decided to teach his pupils about plants after we completed our study and then informed the community of the gap between children’s and adult’s knowledge on the subject. Only when children asked questions first to parents, older siblings or other caregivers, usually in the course of subsistence activities, was specific and directed verbal instruction provided. In that sense, we would characterize ethnobotanical knowledge transmission among Jotí as learner initiated or motivated: information is verbally transmitted from expert to apprentice upon the latter’s request.

The importance of knowledge transmission being “learner initiated or motivated” and taking place during day-to-day activities within the community emphasizes two aspects often missing within formal educational structures. First the local contact with biodiversity and emotional engagement is missing, and further, the absence of connectivity with the community’s day-to-day priorities also remains a gap between the student and the world in which they find themselves as subsistence ways of life are replaced by neoliberal economies. These two dimensions are not only missed in formal education; they are missed also within informal education and the prevalence of mediated experiences today.

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204 Zent, Traditional Ecological Knowledge and Biocultural Diversity, p. 51; my emphasis.

Nabhan deplores the tendency in the ‘media age’ to replace direct knowledge with mediated knowledge and physical recreation with virtual play because these mediated forms of knowledge do not replace actual experience in the world. While the tendency to displace physical activities is very much part of modern ways of life, this lacking helps to crystalize the question of what knowledge, experience, and engagements matter as the extinction of bioculturalheritages and ways of life increases.²⁰⁶

Not only do oral traditions become lost, but the informal educational praxis of learning from family, participating in community events, and discounting of home-economic activities occurs. I contribute to this analysis initiated by Nabhan by calling attention to the fact that these trends are present not only in aspects of formal and informal education, but are exacerbated by standardized institutions within urban systems as well, such as industrial agricultural systems and market economy practices. Not only does daily engagement with biodiversity decrease, but the knowledge about these systems is disregarded in practice as well. This standardized urban experience implies a deprecation of the quality of thinking and engagement with local biodiversity and local knowledge around the global economy, driven as it is by educational, cultural and physical structures within our lives that drive passivity and disengagement, ultimately creating spheres of mediated experience. Nabhan also observed that a prevailing approach in the West is the attempt “to gain insights about the natural world from indigenous peoples, treating them as ‘native ecologists’ whose traditional ecological knowledge is worthy of respect.”²⁰⁷ And so, dominant educational systems are disregarding and abandoning local ecological knowledge, even as this knowledge is often considered important in conservation and sustainable management.

²⁰⁷ Nabhan, Cultural Perceptions, p. 145
To capture Nabhan’s concern for the demise of oral tradition(s), I am examining EoE in the urban context as a driver of the loss of indigenous, local, and traditional heritages as well as the drivers that lead to EoE. Further, native rights to indigenous lands and ways of life are lost in the absence of the knowledge that would justify access to certain lands and genetic strains of crops. Indigenous and traditional knowledge systems have been treated as less relevant specifically because they do not participate in the global economy, and yet, they have an equal right to their way of life. As such, in order to understand the larger context of recognizing the importance of cultural memory, intergenerational transmission of knowledge for a biocultural heritage, I next look at Luisa Maffi’s discussion of biocultural diversity loss in relation to marginalizing forces within development practices.

3.3.2 Luisa Maffi: Intersections of Language, Culture, and Ecological Knowledge

One of the key critics of the drivers embedded in Western development practices that dissolve the cultural connection with nature is Luisa Maffi. Maffi is a linguist, anthropologist, and co-founder of the international NGO Terra Lingua—a non-profit organization dedicated to promoting biocultural diversity worldwide. Maffi argues that it is the phenomenon of modernization as driven by development that displaces local ecological knowledge because it disregards the place-specific and subsistence-related nature of local, indigenous, and traditional communities. Maffi defends and articulates the rights of indigenous peoples in relation to their ecological knowledge and values that are often concealed amid the dominance of global development discourse.

Maffi described marginalization and displacement for traditional communities by the external forces of the market economy and dominant development discourse resulting in the
emergent EoE phenomenon:

It is this inextricable link between language and the environment that is lost when external forces begin to undermine traditional cultures, pushing them into the “mainstream.” Whether this process is propelled by dispossessing local peoples of their sovereignty over land and resources, trampling their cultural traditions, or promoting linguistic assimilation (generally, all three phenomena occur at once and are mutually reinforcing), the end result is the same. Local peoples lose control over, and contact with, their natural and cultural environments.\textsuperscript{208} Here, Maffi implies that this inextricable link between language (and its values and particular meanings) and the environment is broken when ‘external forces push’ less dominant cultures into the mainstream—away from traditional way of life. This process can be driven through many forces, including displacing people from their native lands, taking resources or removing access to them, disregarding traditions or assimilating communities through linguistic homogenization. For Maffi, these forces weaken traditional communities’ attachment to their native lands, and this expresses itself as a cultural-wide “extinction of experience.”

Maffi further argues that a key component for maintaining cultural heritage is the control and contact local peoples share with their natural and cultural environments. This control and contact is similar to my earlier discussion on the efficacy or capacity an individual or community has for living in accordance with their ecological conscience. There are times when the societal structures limit ‘living with a land ethic’ and this limitation obscures the possibility of doing so. Global market economies, industrial agriculture, and formal education are drivers that disrupt this type of local control and contact. Control can be considered the capacity for a community to adapt to changing environmental dynamics, such as season temporality, drought, or other

conditions. Contact can be considered the frequency and degree of engagement with ecological processes, community, and knowledge.

In a 2012 interview with the online Berlin-based magazine The European, Luisa Maffi emphasized the obscurity of minority views and cultures in the global age by posing a poignant question to her interviewer:

*Maffi:* When your culture carries prestige and is widespread, it is easy to assume that others would want to join it. So we have to turn things on their head and look at cultural diversity from the perspective of minorities: What does it mean for them to lose their culture and their language? And what does it mean for us globally?²⁰⁹

Posing this question from the perspective of the dominant culture or from a marginalized one carries very different meaning and weight as the freedom to act in line with one’s values varies depending on the structures that shapes one’s life. One step towards addressing EoE is in validating the distinct views of dominant/nondominant discourse, and the respective (and unique) epistemological, ethical, and ontological conceptions of nature–human values that result.

Exploring the meaning of EoE from the standpoint of marginalized groups reveals distinct aspects of their heritage and lifestyle habits that are similarly obscured by the dominant system. As such, we can surmise that there will be unique elements of EoE for dominant and nondominant groups, distinct from the need or processes of EoE at work for urban communities. Conceptualizing this phenomenon in general terms poses the risk of creating equally useless stereotypes that mislead or misrepresent particular groups involved; at the same time, it is important to conceptualize the process of heritage loss, and the ways in which EoE materially contributes to the loss of biological diversity and sustainable management practices to develop tools to recognize processes that undermine heritage.

One concept that aids in the articulation of the distinct expressions of EoE is cultural

diversity, or rather the principle of affirmation that distinct communities share their own systems of heritage, language, practices, ecological and local knowledge, and values. Enunciated in the Convention of Cultural Diversity, affirming cultural diversity is not necessarily a discussion about which culture is dominant or hidden, but a recognition that all cultures are alive and part of being, continually linked to the world around them, and in this sense are equally legitimate cosmologies.\(^{210}\) These cultures have needs of self-determination, and they may be fundamentally different in their ontological conception of the world. The discussion regarding cultural diversity is not only a discussion about the right for unique communities to exist, but the very humanism that defines freedom of speech, the rights to think and to feel, and the spirit that supposedly fuels the cosmopolitanism of global law.\(^{211}\)

As the interview in the *European* continues, Maffi clarified the difficulties in maintaining traditional ways of life in the face of development further:

*The European*: If faced with the possibility of learning English and moving to a city, few people decline. The history of globalization is a history of exploitation, but it can also be seen as a history of expanding choices and human empowerment. Don’t you think that we should expand rather than restrict access to that history?

*Maffi*: Yes, choice is always important. But it cuts both ways: We also should not deny the right to remain within traditional culture. Cultures are not museum specimens that can be frozen in time, they are always alive and evolving. In many cases, the shift from traditional cultures to Western culture cannot be understood as a free choice if we apply the standards of freedom and human rights. Assimilation is often forced, sometimes in subtle ways. For example, if we force someone to make a choice without providing the necessary information about consequences, that choice cannot be understood as an informed and free choice. Or someone might be driven by desperation and poverty when processes of globalization undermine their traditional way of life. That, too, is not a free choice.\(^{212}\)


\(^{211}\) “These reactions on solidarity can be connected to a sense that the human sciences have become complacent, if they have not been actually undone by their reluctance to be made over as critical science of inhumanity. It is also linked to the limitations of philosophical anthropology as a vehicle for ethical and political reflection and to the wider constraints of a difficult moment in which, as I have said, the desire to dwell convivially with difference can appear naïve, trifling, or misplaced in the face of deepening global inequalities and conflicts over resources, on one side, and a routine, almost banal multiculture on the other,” Paul Gilroy, *Postcolonial Melancholia* (Columbia University Press, 2005), p. 5.

\(^{212}\) *The European.*
Implicit in Maffi’s words remains the difficulty that, as an individual outside of a community (or even as a member within it), it may not be possible to determine whether the adoption of certain customs or practices have been forced following the legacy of degraded ecosystems and following the fragmentation of cultures through colonization and development. Further, just as living seeds cannot be sequestered in a seed bank without becoming vulnerable to new disease or change in environmental conditions, cultures change in time and response to the dynamics of the world in which they live. So, what options remain for biodiversity and culture conservation? Is paternalism inevitable as the culture wars continue—a war between those who articulate what is being lost, and those who are allowed to resist their own cultural extirpation?

For Maffi, and others who recognize the innate connection between biological, cultural, and linguistic diversity, a framework must be used that makes explicit this interconnection. The importance of preserving this interrelation lies not only in the conservation and protection of indigenous intellectual property, practices and livelihoods, but the recognition of knowledges and values that are made invisible or subordinated and which are key to biodiversity conservation and the maintenance of sustainability practices.

The biocultural framework serves as a focused subfield emphasizing the ethical engagement of human rights with consideration of biodiversity conservation priorities, in its biological and cultural expressions. This has ramifications for the formal structures within society, such as formal education policy and foodways. Additionally, the biocultural framing also provides a mechanism to articulate ways the transmission of knowledge and meaningful engagement takes place and the ways that humans modify landscapes. Maffi commented on the purpose of the biocultural framing of biological, cultural, and linguistic diversity:
… the field of biocultural diversity has not adopted the conventional academic “neutrality.” From its inception, it has embraced a strong ethics and human rights component, and has promoted a vision in which the protection of human rights (both individual and collective) is intimately connected to the affirmation of human responsibilities toward and stewardship over humanity’s heritage in nature and culture. In this view, the biocultural diversity of life has intrinsic value, as diversity is the expression of life’s evolutionary potential, and it ought to be protected and maintained. Any damage to it ought to be remedied, and any further damage ought to be prevented. This requires a complex but necessary, and ultimately winning, balance between nature conservation and human development, and between the rights of nature and the rights of humans.213

Maffi and other biocultural conservationists argue that traditional ecological knowledge, heritage stories, and place-specific names capture a relationship and way of relating that serves to instruct morally, perpetuating the values particular to that language and culture. When these local practices and language are lost, the meaning and ways of relating between humans and nature is similarly disrupted—as Maffi says, ‘losing the link.’ The process of ‘breaking the link’ between culture and place is driven by external forces which displace peoples from their native lands, disregard cultural traditions, or cause linguistic assimilation. These forces are often mutually reinforcing, and ultimately lead to local communities losing control over their environments and culture. This disconnect or displacement process is further exacerbated as ecosystems are degraded and communities must leave their native lands or move to the market economy, away from subsistence agricultural practices.

“The market economy,” Maffi wrote, leaves “little room for traditional subsistence practices and resource use, local ecological knowledge and beliefs, and the wisdom about human-environment relationships begins to lose their relevance to people’s lives.”214 The contrast of communities that are able to live within their ecological limits and those that are not also reveals that, while it is possible for humans to be destructive towards the environment, they

214 Ibid.
can also serve as successful environmental stewards who add to the biocomplexity and richness of a given space.

Ultimately, what is at stake here is that the habits which perpetuate these cultural losses are ingrained in specific elements of the urban, global system. This means that all local peoples, whether they live within an explicit urban environment or in the contours of the urban world within the edges of the city are experiencing losses of local language, local knowledge, and local practices which would otherwise tie them to their local habitat. These losses are captured well by EoE in that this is a phenomenon that has certain characteristics and can be identified and predicted based upon particular drivers of change embedded within policy and infrastructure. My goal is to deepen our understanding of this phenomenon and its causal relation with structures within dominant societal practices.

Returning to Maffi’s concern regarding traditional ecological knowledge, she identifies heritage stories and place-specific names as mechanisms that capture the relationship and way of relating between humans and environment. This heritage, she argues, also serves to instruct morally, perpetuating the values particular to that language and culture. When local practices and language are lost, the meaning and ways of relating between humans and nature is similarly disrupted, as Maffi says, “losing the link.”215 On the one hand, Maffi critiques the underlying values of the global economy inherited from Western colonial practices. On the other, Nabhan emphasizes the role of virtual and general knowledge in displacing actual experience and locally derived knowledge. This is further complicated for Nabhan in that the dominance of virtual media within urban practices is part of the larger Western hegemony of development, even while counter movements and social structure persist within the global economy and nation-state system active today. Framing the drivers which shape these losses is not exclusively a discussion

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215 Ibid.
of societal priorities and values, but also the expression of these priorities as they shape the physical systems that in turn guide and shape lives. The choice to institute policies that either reinforce the interconnection of biological, cultural, and linguistic diversity, or undermine this connection has implications for communities embedded within urban environments and those that live beyond in the fringes of the exurban.

Recognizing the positive feedback loop that this constructs between cultural knowledge and design reveals the grave potential for the irrevocable loss of certain knowledge traditions and practices. Environmental educators have linked this kind of disconnect to the concurrent dismissal of critical thinking and engagement more generally, that is, the philosophical traditions.\(^{216}\) To summarize the discussion thus far, the complexity of acknowledging the inextricable link between culture and biodiversity requires an affirmation of values at a few levels. First, there is the loss of this interrelation itself, and secondly, there is the fact that some cultures care about the loss of this connection more than others—what Gary Nabhan referred to as a culture’s ‘environmental sensitivity’ to the ecological limits of the local system. As a third dimension, the forces that disrupt this connection are often pushed upon societal forces or communities that are oblivious or indifferent to this connection. Rather than focus the argument on which cultures are more deserving of these rights, the discussion should be had in terms of the ecological and cultural integrity of human–nature systems, and the mechanisms which threaten or support this integrity. This approach simultaneously protects those that are most vulnerable to these losses, while creating a space for the right for access to this type of relation and the maintenance of biocultural diversity as a fundamental aspect of ecological and social health.


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The experience of losing such environmental sensitivity is also significant to comprehend, and is distinct for each community. As heritage is lost, the place that such meaning once held can be transformed into a yearning for a bygone time and a community that was once shared; this yearning can also be used as an impetus to protect and reinforce the aspects of reality that matter to society and that are often missing today. This yearning sometimes leads to the essentializing or pedestaling of cultures as apotheotic for holding on to their traditions and heritage. However, this apotheosis could be interpreted as a longing for something missing in one’s culture and life practices. So, following the development of ethnoecology, as indigenous heritage has been legitimized in the face of science, this represents an actual affirmation of the concept of heritage, or a biocultural heritage, and the innate importance this has for humanity generally, even as it expresses itself quite distinctly and uniquely for communities. For this reason, the legitimization of the unique view that ILT communities hold, in terms of their environmental sensitivities and cultural memory, affirming the internal logic, ethics, and priorities of these communities has increasingly been argued for by ethnoecologists as opposed to completing studies or reports of these knowledge systems as a standalone process.

The casting of indigenous and local groups and their knowledge systems in the role of repositories of valuable ecological information and as human resources for biotechnological development and biodiversity protection has been instrumental in garnering support for indigenous causes but this viewpoint is not without controversy and criticism. It has been severely questioned as exploitative and discriminatory and failing to take into account the interests, rights, priorities and worldviews of the local communities themselves. For this reason more attention has recently been placed on the significance of TEK from an insider’s perspective.


218 Stanford Zent, “Final Report on Indicator No. 2: Methodology for Developing a Vitality Index of Traditional Environmental Knowledge (VITEK) for the Project ‘Global Indicators of the Status and Trends of
I am arguing that the ‘insider perspective’ of TEK must be affirmed by non-TEK in order to prevent the ongoing perpetuation of exploitative and discriminatory practices embedded in the global infrastructure. The impacts of these structures can be overlooked by non-TEK communities who do not share the same cultural memory or environmental sensitivities. I next detail the discourse across scientific and indigenous views, through the discourse of ethnoecology.

3.4 Ethnoecology and Knowledge “Legitimacy”

While conservation biology might be called a crisis discipline of conservation, ethnoecology recognizes the crisis facing linguistic diversity and cultural heritage. In the previous section, I establish that key drivers within global practices threaten local knowledge and cultural heritage for urban and nonurban communities. These losses are particularly conspicuous to indigenous, local, and traditional communities because they have a biocultural heritage to lose.

Linguistic Diversity and Traditional Knowledge,” 2009, www.terralingua.org/projects/vitek/ch5.htm [Last accessed March 15, 2015], 4; Stanford Zent, “Traditional Ecological Knowledge (TEK) and Biocultural Diversity: A Close-Up Look at Linkages, Delearning Trends, and Changing Patterns of Transmission,” Learning and Knowing in Indigenous Societies Today (Paris: UNESCO, 2009), 39-58. “The hypothesis of biocultural diversity draws support mainly from macro-geographical studies showing a strong spatial correlation between species richness and number of endemic languages when tabulated by country or when plotted on a world map. Despite this intriguing evidence, the nature and extent of the linkage between diversity in the natural and the cultural realms at smaller spatial scales are still not well understood. Correlation does not necessarily indicate causation and we do not know whether the observed overlaps really reflect mutual determination (e.g. coevolution of ecological communities and human societies over time), asymmetrical causation from one side to the other (e.g. unique cultural adaptations to biogeographical characteristics versus anthropogenically modified landscapes), analogous but independent phenomena caused by third factors (e.g. fragmentation of habitat types and socioethnic territories caused by mountains, islands or climatic conditions), or some combination of these…,” p. 40.

219 Paulo Freire argues this asymmetry places the “the great humanist and historical task of the oppressed: to liberate themselves and their oppressors as well.” Paulo Freire, Pedagogy of the Oppressed. Bloomsbury Publishing, 2000, p. 44. I propose that this shift has already begun to take place, and in many places around the world we are seeing spaces in which the oppressed have “liberated themselves and their oppressors”—spaces in which dialogue and engagement have begun, and need continuance. These dialogues however, will not be able to persist indefinitely without some support from the larger global infrastructure in which they are embedded. As such, I argue that the oppressors, and those who have inherited the wealth and power of the oppressors, now need to look to this concept of liberation of their humanity, and to reflect on the ways in which the current global system impinges on the humanity of others. Addressing what is missing or made invisible through the “extinction of experience” may help address blindspots that have developed, overlooking biological, linguistic, and cultural diversity and their interconnections.
This process of loss, I am arguing, is present and ongoing in urban society as well. Biocultural conservationists and indigenous movements have articulated this concern. In contrast, scientific knowledge systems and the European intellectual tradition often emphasize generalizable knowledge that is decontextualized to place. This has led to a clear tension regarding which of these forms of knowledge are more legitimate and whether particular kinds can be considered objective, “more true” or universalizable.

The development of the field of ethnoecology and its current ethical principles as an academic discipline emerge at the heart of this tense intersection of diverse cultural worldviews regarding the fundamental (essential) relationship between humans and the environment. These ethical principles not only serve to affirm and protect indigenous intellectual property, but to present these worldviews as equally legitimate as scientific perspectives. The cross-dialogue between these worldviews requires delicate maneuvering as knowledge and management priorities can change depending on the particular framing.

The First International Congress of Ethnobiology met in 1988 in Belém, Brazil, to discuss the major concerns shared by indigenous and traditional peoples. The congress included world scientists and environmentalists with the goal of developing a common strategy to halt the rapid decline in biological, linguistic, and cultural diversity. Groups were also concerned about protecting the intellectual and genetic property of traditional peoples. From this meeting, the Declaration of Belém was written, detailing the ethical duties of scientists and activists in addressing indigenous, local, and traditional communities. The declaration detailed not only the goals of preserving biological and cultural diversity, but the professional duties scientists and policymakers have towards indigenous and local communities regarding intellectual property and indigenous rights to traditional lands and traditional ways of life.
Ethnoecology is a unique discipline in that it explicitly acknowledges that the framing of nature (or ecological processes) is very much dependent upon one’s cultural standpoint. Distinct cultures comprise unique epistemic communities, each with its innate logic, allowing for the plurality of nature–cultures and framings of the human–nature relationship. The ‘meta-awareness’ of ethnoecology allows for considering the plurality of nature–cultures as equally legitimate perspectives of the world and ways of being. As such, I am reviewing the field’s development here to gain insight into interactions across indigenous and scientific perspectives of one another, their collaborations, and the persistent tensions between these groups. Under my larger project of understanding EoE from the perspective of indigenous views, it is the necessity to consider the larger history of the persistent dialogue between ‘the West’ and local, traditional, and indigenous communities.

In the seminal paper “Ethnobiology in Four Phases,” ethnoecologist Eugene Hunn recognized four distinct phases in the interaction and development of technoscientific and local ecological knowledge (LEK) discourse “in terms of the legitimization of knowledge systems from the perspective of western epistemology.”220 Hunn details the history of ethnobiology as a discipline arising from anthropology, at the intersection of the Western colonial pioneers and the indigenous peoples who were being ‘discovered’ by the Europeans. These encounters were often problematic in that these ‘discovered’ peoples were often viewed as inferior to European civilization; so much so that Darwin and others had doubted their legitimacy as part of the human species.221 This presumptive hierarchy remained a legacy of the original colonial

encounters with non-European peoples, and has since been heavily critiqued, changing the ethical codes of anthropologists to adjust for these fundamental differences in cultures and indigenous rights. For instance, Walter Mignolo and others argue that it was not possible to discover certain peoples, as they had been living well before their European encounters. An introduction to a new culture in this sense is not a fundamental discovery, but a new encounter and opportunity for dialogue. Even this distinction requires the deprioritizing of Western perspectives of knowledge through the lens of their own history, to a broader view which acknowledges the existence of other, external knowledges and histories.

The tradition of discounting local or traditional ecological knowledge was carried on in the early days of ethnoecology, as scientists would interview locals to help identify unique or rare species, which they would then incorporate into the scientific taxonomy which was assumed to be a more rigorous classification system. Instead of pursing comparisons between Western science and traditional knowledge systems to determine which view is the most objective or accurate, new comparative goals have emerged within ethnoecology such as identifying the underlying values, and lifestyles practices embedded within those knowledge systems.

Hunn reflected on his own experience as an anthropologist regarding the ethical relationship of indigenous peoples with anthropology:

I have been a practicing ethnobiologist for 35 years and trust I will continue to pursue the many remaining ethnobiological mysteries for some years yet. I have witnessed the field evolve through several significant transitions. As a green graduate student, I saw ethnobiology emerge in the early 1970s as a favorite, if esoteric, domain of ethnoscientific theoretical analysis. I joined colleagues in the early 1980s in defense of indigenous knowledge and rights in land under the rubric of Traditional Ecological Knowledge.

222 Walter Mignolo wrote, “‘America,’ then, was never a continent waiting to be discovered. Rather, ‘America’ as we know it as an invention forged in the process of European colonial history and the consolidation and expansion of the Western worldview and institutions. The narratives that described the events as “discovery” were told not by the inhabitants of Anáhuac or Tawantinsuyu, but by Europeans themselves. It would be four hundred and fifty years until a shift in the geography of knowledge would turn around what Europeans saw as a “discovery” and see it as an “invention.” Walter D. Mignolo, The Idea of Latin America (John Wiley & Sons, 2009), p. 2.
Knowledge. I watched bemused as ethnobiology captured the public imagination in the 1990s as a heroic search for miracle cures amongst the vanishing cultures of the tropical rain forests. Finally, at the close of the 20th century, I shuddered as firebrand preachers of a postmodern morality castigated ethnobiology as bordering on biopiracy.\textsuperscript{223}

The realization that indigenous knowledge was a property that could be pirated by consuming or utilizing as a resource, took ethnoecologists by storm. It was necessary for the Western scientists to learn that, even though these communities existed in very different ways, it was still possible to damage or alter the indigenous ‘property’ even as they would not describe their own knowledge in these terms. Even as Western science was engaging non-Western communities, they were ‘discovering’ new languages and framings for knowledge, property, and the human–nature relationship. This type of translation is problematic in that it further obscures the indigenous or nonscientific worldviews, because “traditional knowledge is generally expressed in the terms and protocols of technoscience.”\textsuperscript{224}

The initial tension that Hunn recognized within the science of ethnobiology is the “utilitarian bias in which ethnobiology was dedicated to the discovery of useful plant and animal products…against an abstract intellectual emphasis of ethnobiological knowledge valued for its own sake.”\textsuperscript{225} While controversial, Hunn argued there is a case to be made that distinguishes ethnobiology and the related ethnosciences from the sister discipline economic botany as a result of the latter’s focus on not only the knowledge or utility of the plant studied, but the culture and lifestyle of communities which shared knowledge of particular plants. In this way, Hunn argues that ethnobiology started from its roots as a science that was engaged in the pluralistic and distinct ways in which cultures were constructing and engaging nature, and not only the utility of

\textsuperscript{223} Hunn, \textit{Ethnobiology in Four Phases}, p. 2.
\textsuperscript{224} Ishizawa, \textit{Cosmovisions and Environmental Governance}.
\textsuperscript{225} Hunn, \textit{Ethnobiology and Four Phases}, p. 2.
the knowledge obtained. He ultimately frames this distinction between the etic and emic perspectival approaches. The etic approach is fundamentally dominated by the interest of the scholar per se, while the emic approach is seen as “a means to understand how humans make sense of the living environment.”

Within the tension between Western scientists and indigenous peoples, Hunn recognized four stages. The first he described as pre-modern or pre-classical Ethnobiology I, where subjects of study were selected who might be considered profitable to the Western scientist. This was distinct from Ethnobiology II, or ‘Cognitive Ethnobiology’ where the emic or indigenous perspective was captured through “careful attention to local linguistic usage.” Cultures were viewed in their own terms with attempts to understand the fundamental structures of their own languages, values, and relation to their own ecological context.

In Ethnobiology III, Hunn described a new branch that emerged as a result of the work conducted by Victor Toledo. Toledo and others affirmed the innate integrity of traditional ecological knowledge, indigenous knowledge, and local ecological knowledge as legitimate knowledge systems distinct from the body of Western science. This expansion in recognizing distinct knowledge systems broadened the view of the culture–nature relationship, ultimately affirming the pluralistic reality of the human–nature relationship and culture at the heart of this intersection.

As the ethical dilemmas complicit in using the knowledge of other communities for profit became more explicit, the Declaration of Belém was formulated, emphasizing the moral responsibility of ethnoecologists to groups under study, and the awareness of their status as “often marginalized indigenous communities struggling to hold on to their ancestral lands and

226 Ibid., pp. 2-3.
227 Ibid., p. 3.
228 Ibid.
identities.”\textsuperscript{229} The ethics of ethnobiology as a discipline is extremely important as the principles guiding research ethics across the etic and emic domains. Engagement with communities and their knowledge systems become sensitive issues paralleling questions of assimilation, commodification, and, in some cases, colonization. In a way, the history of this field is also a discussion of the ethics underlying dialogue across unique cultural perspectives when larger questions of utility, health, and economic well-being are also at play.

The code of ethics for the International Society of Ethnobiology emphasizes the rights of indigenous peoples to maintain control of their “lands, territories, and traditional resources [which] are key to the perpetuation of all forms of diversity on Earth.”\textsuperscript{230} The main ethical codes of the society lie at the intersection of cultural tradition and biological diversity, focusing on principles that should be used to inform ‘international law and customary practice’ that protect the capacity of indigenous peoples, traditional societies, and local communities to engage with their territories according to their own intellectual property, practices, and ways of life:

- \textit{Principle of Prior Rights}: indigenous peoples, traditional societies, and local communities (ITL) have priority, proprietary rights, and interests over all air, land, and waterways, and the natural resources within them…together with all knowledge and intellectual property

- \textit{Principle of Self-Determination}: ITL communities have a right to local determination for traditional and local communities

- \textit{Principle of Inalienability}: inalienable rights of ITL in relation to traditional territories, both collectively and individually.

- \textit{Principle of Traditional Guardianship}: recognizes “holistic interconnectedness with the ecosystems of our Sacred Earth and the obligation and responsibility…to maintain their role as traditional guardians”

- \textit{Principle of Active Participation}: recognizes the crucial importance of ITL to actively participate in all phases of the project from inception to completion, as well as

\textsuperscript{229} Maffi, \textit{On Biocultural Diversity}, p. 547.
\textsuperscript{230} Ibid.
application of results

Additionally, there are many ethical principles protecting the intellectual property, autonomy, and freedom of indigenous peoples. I group them below thematically:


- **Regarding innate respect and autonomy**: Principle of Respect, Principle of Active Protection, Principle of Precaution


These codes emphasize that even as indigenous peoples, traditional societies, and local communities have shown themselves to be able to live sustainably, whether or not they maintain this capacity is not the justification for respecting their intrinsic rights. This ethical priority parallels that found in conservation biology in that biodiversity is considered of intrinsic worth for its own sake, even as it provides the means for life. In other words, the services an entity provides does not justify its existence, but instead reflects its role in the larger whole. The justification comes from innate worth, not of utility, though this certainly adds dimensions when discussing management priorities.

The fourth stage of ethnobiology’s development, according to Hunn, took place as indigenous activists became prominent in academia as well, becoming lead-authors on ethnoecological research, and creating spaces in which their intellectual property was affirmed on its own terms within academic discourse and policy. The professional code of ethnoecology is distinct from conservation biology’s code of ethics in that it emphasizes the ownership implicit

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in local knowledge of not only the knowledge itself, but the rights this implies regarding control of genetic diversity and management of these species and landscapes as part of that same heritage.

International policies focused on biodiversity conservation in particular have increasingly recognized the human role in driving biodiversity loss, including habitat fragmentation and land-use practices. These major drivers, in turn, are shaped by the cultures and values of the people inhabiting those lands. Originally framed as the “great wilderness debate,” or the “people vs. parks” problem, the controversy innate to whether humans are a ‘natural part’ of the environment concluded that naturalized language limited the critique which instead could be focused on the sustainability of these practices and lifestyles. Now more commonly termed the “pristine myth,” the misconception that humans are not an active driver of environmental change has been discredited in recognition of the “Anthropocene” – the age when human technologies are the greatest influence on global environmental changes on the planet.\textsuperscript{232}

Within the history of ethnoecology, there remains a tension between indigenous and scientific worldviews. On the one hand, there was the lack of clarity that even though indigenous peoples did not participate in the scientific community of the West, they still maintained integral rights to their knowledge and deserved compensation when this knowledge was used. On the other hand, there is a lingering assumption by the West that humans \textit{are} innately destructive for the environment. These assumptions led to the displacement of native peoples who then become conservation refugees, whereas the lands that were now deserted often became overrun by poachers and large-scale business which then consumed the land once its stewards or residential inhabitants vacated. For this reason, the need to integrate human stewards into management policies is increasingly emphasized by UN policy and conservationists.

\textsuperscript{232} Ogden et al., \textit{Uneven Anthropocene}.\textsuperscript{232}
This ‘pristine model’ erroneously assumes that humans have a negative impact upon the environment, and therefore should be removed from any nature areas where wildlife is preserved. In turn, it has also left land ranges vulnerable to poachers in the absence of their environmental stewards. Indeed, multiple cases have catalogued an increase in poaching once the native community has been displaced, and in the meantime, these communities are left without a home, and detached from their own ecological heritage. Even once these communities are restored access to their land, generational knowledge has often been lost after this displacement has taken place. Because traditional practices are not utilized in the new location, they can fall into disuse. Recovering these traditions and maintaining them in light of these displacements has consequently remained one of the most active areas of conservation for indigenous and local peoples. This tension between the rights of nature and human rights has led to unfortunate consequences for indigenous peoples as a conceptual human–nature dichotomy that is then reinforced by management policies and practices. The co-evolutionary nature of the biocultural approach explicitly recognizes the need for human actors to remain stewards of their ecosystems, and that identity, cultural heritage and lifestyle habits are shapes by the manner in which this occurs.

234 Arun Agrawal and Kent Redford, “Conservation and Displacement: An Overview,” Conservation and Society 7, no. 1 (2009): 1. The creation of “protected conservation areas” has been a widespread strategy for biodiversity conservationists, but often requires the displacement of the human populations living in the selected areas. Consequently, the conservation movement has received “damning accusations” for its formulaic approach that leads to conservation-induced displacements of human communities. In turn, major developers and organizations such as the World Bank, Inter-American Development Bank, and Organization for Economic Cooperation have formulated guidelines for industry that have also led to development-induced displacement of human communities. The authors discussed the nature of community displacements that occurred as a result of conservation groups (IUCN, public parks) and mega-development projects (e.g. dams, public works), concluding ultimately that “the most important critique against displacement is the injustice involved in the involuntary removal of disadvantaged peoples from their homes and lands.” Article available: http://www.conservationandsociety.org/text.asp?2009/7/1/1/54790
235 Ricardo Rozzi emphasizes the co-evolutionary nature of biological and cultural diversity, and the need to support biocultural ethics as a way of promoting this reciprocal link. See Rozzi, Earth Stewardship and the
The role of ethnoecology in the protection of indigenous peoples has only grown, and geographer Steve Wolverton has argued that we can now consider ourselves in Ethnobiology V: a period in which indigenous communities are fighting for their rights and are considered on equal footing with the positivistic epistemology of Western science. Due to the nature of the research across plural cultural views of nature, Wolverton argues that ethnobiologists are uniquely situated to bridge across western science and indigenous worldviews while affirming these differences. Likewise, we might similarly recognize cultural heritage as vital when informing management practices, and often key to the sustainability of a particular community.

Given these points, the field of ethnobiology in particular emerged at the heart of this unique tension between scientific knowledge and the legitimacy of nonscientific forms of knowledge. Supposedly an innocuous discipline that did not intervene with local ways of life, anthropology found itself criticized for the commodification and use of indigenous knowledge, often without proper permissions or compensation. The ethnobotanical enterprise in many ways reflects the ethical and political relationship between Western scientific tradition and indigenous non-Western peoples. For this reason, I have reviewed the losses articulated from the perspective of indigenous and local communities within the context of Western globalization pressures. It is illustrative to view the interaction and engagement of these two spheres through the funnel of the sciences—what was considered a value-free, neutral system of knowledge is now increasingly recognized as yet another worldview replete with its own unique ethics and ontology.

3.5 Biocultural Engagements with the Extinction of Experience


Following the discussion led by Nabhan and Maffi, I conclude a few things regarding a biocultural approach to addressing the extinction of experience. First, multiple dimensions must be addressed in order to acknowledge the complexity of looking at loss of biodiversity and loss of cultural diversity from the viewpoint of both the dominant and marginalized groups. Not only does the legacy of colonialism and imperialism need to be better understood as an agent of change in the present, but the diversity of relationships human communities share with nature must also be affirmed so as to avoid creating the illusion that there is only one essential relationship between human cultures and their environs. The emergence of diverse responses to the environment, or polycultures, often runs in conflict with the monocultures maintained by global economic and development models. One way of addressing this complexity is the recognition of the innate co-evolutionary link shared by humans and the environment and the multiple expressions this complexity may take.

From this, it seems that that extinction of experience is a predictable phenomenon in that it impacts the cohesiveness of cultural heritage for local peoples as result from these displacing forces. As such, EoE can be targeted to prevent further ‘extinction’ processes. The extinction process is reiterative as local communities are displaced and are no longer physically in place to...
steward the land, and further still, as the knowledge is lost in time after the people have been displaced.\textsuperscript{239}

The loss or preservation of heritage and local knowledge can occur in myriad ways, many of which are intentionally directed by a group (certain practices cease to be practiced for a new ethical view, for instance). Since these losses are often obscured and made invisible, they are discounted even as their physical experience is threatened, perpetuating the slow erosion of the capacity to recognize this loss. The loss of such sensitivity unravels thousands of years of a deep co-evolutionary adaptation of humans to their surrounding world, in its living, thriving culture. Examples of acculturation practices include the reduction of the number of languages spoken and the standardization of textbooks and content to represent one cultural worldview.\textsuperscript{240} These breakages between experience and knowledge have far-reaching implications for policy and institutional practices. These structures serve as a process that also influences cultural memory, sense of place, imagination and appreciation.\textsuperscript{241} Therefore, I propose that we must develop our understanding of the drivers or underlying causes of such experiential disconnect from knowledge, and comprehend this loss within the complex interrelation that culture shares with biological diversity and the environment as a co-evolutionary aspect of this dynamic.

The disregard for local heritage and knowledge systems is evident in many lifestyle practices engaged by development originating from the colonial West and now embodied in neoclassical economic policy. Further, the opportunity for local ecological experiences is disappearing as automation and urban practices remove the need for urban and suburban residents to have knowledge or experiences with food and materials production in the world.

\textsuperscript{239} Shiva, \textit{Monocultures of Mind}.  
\textsuperscript{240} This tension has also been identified by conservationists as the difference between monoculture and polyculture systems.  
system of the global economy. For instance, schoolchildren in the U.S. are unable to recognize basic plants of their region, though they have a high incidence of product recognition. In rural communities, rural migrations have been taking place as younger generations move to cities. For many living in urban environments, local extinction of species or environmental degradation remains unknown or unobserved. These discussions are not generally part of city management concerns, and are not present in day-to-day life in urban environments. For those living outside the urban landscape, they are nonetheless embedded within the institutions, policies, and mindsets that are woven into this urban fabric. Nonetheless, the multitude of urban, rural, and pristine cultural landscapes express much diversity in values, practices, and local biodiversity. However, all of these landscapes are impacted by the global forces that shape and guide society, largely mediated by technology, agribusiness, international law, economy, and standardized education as part of the global economy.

Fikret Berkes and others have argued that some of the most common erroneous assumptions about culture is that it is fixed and that urban communities lack any significant heritage. Berkes et al. argued that “[some] traditional systems had certain similarities to adaptive management with its emphasis on feedback learning, and its treatment of uncertainty and unpredictability intrinsic to all ecosystems.” Describing traditional knowledge as a “knowledge-practice-belief complex,” Berkes highlights an important interconnection between knowledge of the world and the management practices we have with it—and that is the role that long-term memory, culture, and practiced knowledge(s) have in our engagement with the environment. This concept may point us in the direction of sustainability, but more importantly, it may also highlight the relationship to the environment that is missing for those who experience an “extinction of experience” either culturally, environmentally, or even from the absence of an

awareness of the interrelation. The working definition Berkes provides for traditional ecological knowledge, which also highlights the interrelation or awareness of day-to-day life with environment, is “a cumulative body of knowledge, practice, and belief, evolving by adaptive processes and handed down through generations by cultural transmission, about the relationship of living beings (including humans) with one another and with their environment.”

Similarly, Michelle Cocks argues that local ecological knowledge is actually a fundamental aspect of all cultures; however, this is harder to see explicitly in industrialized cultures that are more isolated from nature and that do not explicitly acknowledge the human–nature relationship within their fundamental values. For this reason, Cocks states that the concept of biocultural diversity should more explicitly be applied to urban and rural groups that do not fit into the categories of indigenous peoples to emphasize that the biocultural link is a very real part of the human–nature relationship, and that it is present in communities that may not even recognize this co-evolutionary relationship. If we are to take these ethnoecologists seriously, the implication, then, is that any educational or formal institution that discounts the importance of local ecological knowledge is undermining cultural integrity and heritage. The implication opens wide the need to analyze dominant global practices to see the ways that they undermine or affirm local cultural heritage, as well as ways to redress this trend. And so, we can acknowledge that communities share in a local culture, regardless of the degree to which the intergenerational transmission of knowledge and cultural memory has been degraded.

The tendency to overgeneralize all of human society as essentially the same in its valuing of nature, its relationship to it, and humanity’s ultimate role in ecosystems’ management is misleading and obscures this kind of analysis. While embedded in the roots of a universal truth

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243 Ibid., p. 1252.
as conceived by the Western philosophical tradition, this overgeneralization obscures important differences in cultures and communities. In the case of the environmental crisis, it obscures the existence of communities who are able to maintain sustainable relationships with their environment by conflating their actions with the most detrimental and destructive practices of particular societies within humanity. Such overgeneralizations also obscure the process of EoE as it is expressed in communities that share in deep ecological knowledge with local place and those that do not, making it difficult to identify what is being lost culturally to distinct groups. This further obscures the importance of local knowledge and traditions for sustainable management practices.

The urban infrastructure carries a particular inertia that will continue to perpetuate these alienating and homogenizing patterns until we have the tools to locate consistent elements of this infrastructure (drivers) that tend to perpetuate these unwanted processes. Similar to ecological functioning, drivers of biocultural homogenization can be seen as drivers which perpetuate or most likely lead to the loss of biological and cultural diversity, and their co-constitutive relationship. The consequence in terms of human meaning needs to be evaluated, comprehended, and understood, and then, these drivers need to be altered in ways that will drive the conservation, support, and meaning found in the interrelationship between biological, cultural diversity, and ecological health.

Ricardo Rozzi emphasized this need to interweave these aspects through his proposed biocultural ethics as part of a larger dynamic among Amerindian, contemporary ecological–evolutionary sciences, and pre-Socratic and other nonmainstream Western philosophies. Presented as a biocultural interface, Rozzi calls for considering the nested relation across

biocultural diversities, multiple worldviews within this triad of habits–inhabitants–habitats as a strategy for addressing the complexity of biocultural relations. Rozzi and Poole developed the argument that this approach is necessary in order to affirm sustainable cultures, that is to say, to assert the need for a pluralism of sustainability solutions, as opposed to the oft-cited need for an ultimate culture of sustainability that applies in all instances. My argument here is that EoE must be accounted for in order to target policy and institutions that undermine this interrelationship as it is a process that captures the deterioration of this biocultural interlink.

The structural component shaping human lives express livelihoods and the range of actions that can be taken by the individual. When the individual comes up against the limits of society, he or she must either make a change from those dominating structures or conform. The grey area between the ethical ideal for society and the reality that is actually lived is often the space for political action and change. In the context of the environmental crisis and human rights, the knowledge, values, and languages of the peoples are not only expressions of this world-vision but also changing cultures that reflect the world in which the people live. Extinction of experience is particularly important for sustainability and justice discourse because it pinpoints ideals, ways of living, and values that are being extinguished, in addition to the

247 Rozzi and Poole, Cultures of Sustainability.
248 Rozzi wrote, “The perspective of a biocultural ethic that interrelate(s) the Habits and Habitats with the identities and well-being of the co-in-Habitants to assess and reorient the ecological and social consequences of globalization. The interrelationships among the ‘3Hs’…involve biophysical, symbolic-linguistic, and institutional-socio-political-technological domains, and have foundations in three families of worldviews: (i) pre-Socratic and other non-mainstream Western philosophies, (ii) Amerindian and other non-Western ecological worldviews, and (iii) contemporary ecological-evolutionary sciences.” Ricardo Rozzi, “Introduction to Integrating Philosophy and Ecology: Biocultural Interfaces,” pp. 3-7. The interrelation of the biophysical, symbolic-linguistic and institutional-socio-politico-technological domain create a powerful problematic when it produces the extinction of experience of biocultural heritage particularly when perpetuated by infrastructural inertia.
biodiversity, languages, and philosophical critiques that are being lost.

As Rozzi writes of the biocultural ethic,

Applied biocultural ethics fosters a greater investigation and valuation of biological and cultural diversity, and their interrelationships, in education programs, policy making, and everyday culture, to counterbalance the linguicide, biocide, and increasing poverty derived from biocultural homogenization.²⁴⁹

This is further discussed by the editors of the volume “Linking Ecology and Ethics for a Changing World,” who emphasize the need to address geographic gaps in the scientific accounting of the planet, and the philosophic conceptual gaps that persist which do not consider particular epistemological, political, or ethical dimensions from nondominant worldviews (a form of marginalization).²⁵⁰ The editors are particularly concerned in that these gaps express themselves within the scientific cataloguing of the material state of the world and can provide the illusion that it is a complete account of cultural views of the world and its rich ecological and biodiversity expressly within the international Long-Term Ecological Research Network. The purpose of this dissertation is to extend this argument to incorporate the internuanced physical–cultural phenomenon of loss expressed in the idea of extinction of experience, so that it might be targeted as a fundamental mechanism driving socio-ecological systems. Linking the ethical articulation of this need to the research priorities of scientific communities will help incorporate this view into the United Nations’ new Sustainable Development Goals.

3.6 Conclusion: A Biocultural Conception of Heritage to Address EoE

Since the identification of the concept of extinction of experience by Pyle as an ongoing process, the term communicated first a sense of disconnection and alienation from nature. This

²⁴⁹ Rozzi, Biocultural Ethics: From Biocultural Homogenization Toward,” p. 11.
loss results from the absence of not only the knowledge about the natural world, but additionally, of fundamental opportunities for experience. Further, this alienation can be expressed in forms of discomfort, or disgust, as illustrated by urban schoolchildren who have disdain for rural ways of life or consider packaged foods more palatable than unprocessed ones. These experiences provide the foundation for that knowledge to be useful for everyday life and to take hold as a fundamental aspect of the individual’s life experience. For this reason, I have been discussing both the experience that is lost and the drivers or conditions which create the extinction of experience.

Under these circumstances, efforts to enunciate, recognize, and protect the interconnection between biological, cultural, and linguistic diversity emerged within academic discourse under the name of biocultural conservation to address this interlinked relationship between what was often framed as isolated components. Biocultural diversity explicitly recognizes the innate and co-evolutionary relationship between human culture, biodiversity and the environment. The emphasis on the local, co-evolutionary dynamic of biological and cultural components of the environment, as well as humans beings present within this dynamic, provides a methodology that articulates sustainable principles meant to be specific to particular localities. The biocultural approach provides a tool to evaluate the shared threats to biological and cultural diversity that can also be evaluated as mechanisms or drivers of EoE.

More often framed as the human–nature dichotomy, the way that the relationship between humans and nature is framed has many implications for actions, values, and the response we might give for sustainable solutions to address the environmental crisis. It has been

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251 One example of a biocultural adaptation of the MEA is present in the Indigenous Peoples’ Biocultural Climate Change Assessment Initiative (IPCCA) framework, http://ipcca.info/. Last accessed July 5, 2015. The IPCCA has taken extensive measures to incorporate biocultural principles into the MEA including cultural sovereignty and buen vivir.

252 Pretty et al, Intersections of Biological and Cultural Diversity.
argued that the distinct ways that the human–nature relationship can be framed represent distinct epistemological views of the human relationship with reality. These views are not necessarily commensurable, but are defined by fundamental differences in ontological definitions of human nature and existence. While the Western scientific view often bifurcates the categories of “human” and “nature,” biocultural framings treat the two as co-evolutionary or co-constitutive. This co-constitutive view of human-nature can be obscured by the assumption that they are fundamentally distinct entities, thereby further obscuring the importance of cultural heritages that developed through this lens.

The perceived conflict between nature conservation and human interest is also present in the tensions found within the global and local knowledge systems and practices. Biocultural conservation in particular focuses on preserving the techniques adapted by individual communities to particular landscapes to prevent such disconnection. The biocultural critique is often expressed in terms of proposed alternative management practices and institutionalized policies that alter the human–nature relationship and the capacity for local communities to express and utilize their traditional knowledge.

As I argue in the previous section, the deep connection of culture with ecological place is often obscured by the dominance of cultural views that do not recognize this co-constitutive connection. I propose that extinction of experience can also be understood as the absence of the knowledge of interconnection between culture and nature, and that in the absence of a cultural heritage that is able to articulate such losses, the sensitivity to this interrelation can become lost, and by generations, never known. That is, for communities that lack a strong intellectual tradition related to the land, it can be difficult to conceive of what this knowledge might be to a people who have such a tradition. Further, this knowledge is often treated within formal
education in global society as less valuable than techno-scientific knowledge and placed lower on the ‘hierarchy of knowledges’ about the world. A biocultural framing of EoE will aid in understanding the ongoing drivers and impacts of heritage, language, and biodiversity losses in the long-term by affirming a view of reality that is invisible to many.
CHAPTER FOUR
ADDRESSING THE EXTINCTION OF EXPERIENCE CYCLE
FOR A SUSTAINABLE FUTURE

4.1 Dissertation Summary

Imagine that if as part of the environmental impact assessment that any government or business conducted a biocultural assessment was also be integrally considered, and that new technologies and economies that were introduced were considered in terms of the way in which they may lead to the extinction of experience (EoE) of biocultural diversity and heritage. Imagine, if within urban environments, current educational, food, and economic practices were evaluated in terms of EoE, seeking out areas in which biocultural sensitivity, heritage, and connectivity were being eroded and undermined by current systems. Imagine if we critiqued sustainability in terms of EoE and the ways in which this interconnection between biological and cultural diversity was influenced by the infrastructures we design around us. And then imagine the result: communities and corporations are required to consider a fuller understanding of the environment and the impact that the developments would cause on these biocultural interrelations.

The challenges facing traditional and indigenous communities reveal aspects of urban heritage and culture that have been made invisible by EoE. These blindspots, in turn, often become forces within urban systems that deprioritize or discount the importance of local heritage and traditional practices, undermining the capacity for local communities to act according to their ecological conscience. Without critical analysis, EoE will remain only an adumbration for the experience of loss. Therefore, in this dissertation, I argue that the concept should be implemented as more than a literary device to capture loss, but as a theoretical and practical
approach to reform formal education and policies to better understand the nuances of biocultural loss, and move biocultural losses towards affirming biocultural diversity. These challenges are relevant for the urban and they need to target more explicitly within the Sustainable Development Goals.

Pyle’s writing follows in the tradition of “naturalist-authors” such as Gary Snyder, Barry López, Aldo Leopold, and Wendell Berry, capturing in prose, the beauty, depth, and knowledge of the natural world and living life as one engaged with that world based upon experience and personal meaning. As I argue in this dissertation, the consequences of the EoE process are far-reaching, and include the loss of cultural transmission of values of nature appreciation, lifestyle, and management practices. These losses, in turn, occur as a result of the loss of languages and local/folk practices. Conservation biologists and environmental educators have reflected on this process of loss as they seek to bridge the worlds of local ecological and scientific knowledge. EoE has also been used in the subfield of biocultural conservation to emphasize the disruption or loss of knowledge transmission between generations and across languages.

While the homogenizing forces of technology and industry are often emphasized in urban critiques of today’s global economy, I propose that within infrastructure and global policy which undermine the individual and societal capacity, there lie fundamental structures that are prone to disengage culture from the awareness biological diversity and ecological processes,

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thereby creating the conditions that catalyze biocultural homogenization. If transformed, these fundamental structures could in contrast promote a cultural awareness of individual and societal interactions in ecological processes. As such, the fundamental structures of global society can and should be targeted for analysis in terms of the feedback dynamics of experiential loss.

We need to integrate ecological and biocultural logics into our fundamental structures and institutional practices so that urban structures allow for humans’ habits to be more sustainable. With such intentionality, we can redress these homogenizing forces to recreate opportunities for cultures of dialogue, a recovery of nature experiences, and affirmation of the plurality of biocultural complexity as a response to the local extinction of both language and biodiversity to redirect these industrial and economic forces in more sustainable directions.

The term EoE is embedded in a sense of loss and disengagement that has been alluded to by cultural critics of modernity since the rise of the industrial revolution of the 1800s and the globalized society that emerged following the Second World War. Concerns for aspects of this loss have been articulated within different commentaries on the culture-wide absence of an active ecological awareness. Pyle is not alone in his reflections about loss of fundamental experiences resulting from changes in the technological human habitat. I propose that Pyle’s conceptualization of EoE captures the process by which fundamental experiences and structures in human life are disappearing. This articulation also recognizes cultural values and priorities that are often depreciated in globalized biophysically and linguistically monocultural systems which if left unrecognized, create the conditions for the perpetuation of biological and cultural diversity losses. By following this critique from the perspective of both urban and indigenous


\[257\] Ibid.
groups, it is then possible to clearly identify aspects of the experiential loss that is taking place and its incipient presence in today’s management practices and policies. For example, Nabhan and Maffi have argued that EoE is a product of acculturation practices, such as the reduction of the number of languages spoken. Further, the standardization of textbooks have led content to represent one cultural worldview as opposed to the diversity of perspectives that might be engaged by that education.  

My approach to developing urban sustainability for socio-ecological well-being is to focus on the process of knowledge transmission, lifestyle engagement, and meaning as shaped by the physical and structural elements embedded in urban, global society, and the ways in which these processes of transmission are threatened. I complement Pyle’s urban analysis with indigenous and ethnoecological views, moving from Pyle’s discussion of this experiential loss in urban environments to its overarching presence in linguistic and cultural extinctions. These dynamics are notoriously difficult to evaluate, often evading empirical measurement. My goal is to further the understanding of EoE, and the body of loss that is incorporated by this phenomenon, so that we might tighten our strategies for addressing the mechanisms of loss which are embedded within the urban system moving global society.

4.2 Contributions and Applications of EoE Research: Overcoming EoE Within Sustainability Discourse

While this study considers the theoretical aspect of EoE, it has the potential to be translated for policy and practice in different rural–urban scenarios. In doing so, it captures the complexity

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258 This tension has also been identified as the difference between monoculture and polyculture systems. See Vandana Shiva’s critique of the influence of monocultural structures that influence cultural diversity and perception through the physical presence of industrial monocultures in *Monocultures of the Mind*, 1993. For the monoculture in formal education, even at remote places, see Ricardo Rozzi and collaborators (2008), “Field Environmental Philosophy and Biocultural Conservation: The Omora Ethnobotanical Park Educational Program,” *Environmental Ethics* 30, 325-336.
of ethical priorities for conservation and the protection of traditional ways of life. Incorporating consideration of EoE into policy analysis also enhances urban discourse regarding the importance of cultural values and relationality to the environment, and the importance of cultural heritage for developing sustainable practices.

There are four ways in which this discussion has contributed to environmental philosophy’s critique of the environmental crisis with the emerging unsustainable urban society for development discourse. First, I call attention to EoE as a fundamental process that undermines ecological knowledge, valuing, and lifestyles adapted to local ecosystems as a reiterative cycle tied to formal economic, educational, and agricultural structures within urban society.

Second, by going beyond the urban discussion and contextualizing it with consideration from rural and indigenous viewpoints, I extend the relevance of the urban EoE critique and show commonalities that threaten biological and cultural diversity in terms of the causes and outcomes of the EoE process cycle. Typically the urban and rural roles within development discourse are treated separately, and I propose that EoE provides an additional bridge that can help address the disparate cause and outcomes within the rural–urban gradient.

Third, I provide some conceptual clarification of the EoE cycle’s utility in both its scientific and philosophical aspects. The scientific aspects are the ways in which it can be integrated into policy. Philosophically, EoE points to new ethical priorities that should be considered in sustainability priorities. I am extending the ongoing and recent conversation and debate about the role of EoE in undermining our experiential and conceptual framing of sustainable development.
Fourth, I propose that the extinction of experience cycle as a literary concept, which also captures a socio-ecological phenomenon, alters how we frame sustainability. As a phenomenon, EoE can be understood in terms of the cultural heritage and ecological context in which a culture is embedded. A biocultural approach to EoE affirms the innate interlink between biological and cultural diversity. This interlink is often disregarded by formal structures within dominant global economy. By affirming the harms of EoE, the argument for affirming the co-evolutionary and dynamic relationship implicit in the biocultural framing of socio-ecological relationships is strengthened, as EoE is difficult to detect without an affirmation of this deep interrelation. For sustainability, the implications are large in that policy goals should shift to protecting this biocultural heritage and conditions that support such ways of life. In order to accomplish this, the language capturing threats to biodiversity and cultural losses needs to be deconstructed to capture the underlying causes and incorporate cultural and ethical considerations and biocultural heritage.

While EoE points to the negative space or the psychology of loss as a driver of global environmental change, it is not only an abstraction of a cycle perpetuating loss. Even as this concept originated from the analysis of a scientist, one could, perhaps, say that discussion of EoE should be relegated to the realm of the ethicist or social critic. However, I do not believe this is the correct analysis. I contend that EoE opens up discussion at the intersection of scientific, political, biological, cultural, economic, and ethical concerns or considerations, because of its inherently interdisciplinary nature as a biocultural phenomenon that occurs at the nexus of the socio-ecological interrelationship. This means that as a factor that influences the capacity for society to develop sustainable solutions, it must be considered in terms of economic policy, socio-political context, and ecological integrity. This is a potential area of intense
interdisciplinary work amongst various experts that would lead to policy changes, and is particularly significant as revisions of the original Millennium Development Goals are proposed.

EoE contains scientific value because it requires interdisciplinary discourse between scientific and ethical experts, resulting in policy changes that consider the ever-evolving dynamics that persist between human communities, ecological processes, and the physical structures and policies that we create. The philosopher alone cannot complete a full biocultural assessment; it needs consideration by multiple disciplines, such as anthropologists, biologists, cultural experts, and philosophers in one forum to discuss new sustainable policy.

By linking the discounting of local ecological knowledge, biocultural heritage, and the importance of transmission of these values and practices within communities to the structures which erode this local way of life, I have expanded the way drivers of global environmental change can be targeted as socio-ecological phenomenon. Instead of treating these drivers as isolated, they can positively or negatively develop the nuanced understanding of the human role of shaping biodiversity.

The dominance of urban policies has led to the exacerbation of this EoE process that creates the conditions to self-perpetuate EoE ad infinitum, ever narrowing ethical and cultural awareness of biodiversity losses, even as they continue to drive the loss of the rich biodiversity on our planet. EoE reveals many knowledge gaps in the approach we take to developing sustainable solutions. Even as the MDGs prioritize reducing poverty and implementing universal education, EoE reveals the ways in which these top-down strategies can undermine or discount the important role of a community’s agency and capacity for self-reliance, whether they live within the urban sphere or at its rural and remote edges.
Addressing extinction of experience within policy points to a brighter future; one in which the forces shaping development policies incorporate the richness of cultural heritages and the benefits that could accrue from a more complete analysis and interaction with biocultural engagement: preservation of the rich biodiversity on the planet, the cultural diversity of its peoples, and the deep interrelation of culture with place as part of our developing, sustainable future.

4.3 Future Research: The Interrelated Cycle of Biocultural Homogenization and Extinction of Experience

There has been a significant response within Sustainable Policy for the need to protect distinct ways of life, including cultural diversity of humankind, the distinctiveness of biodiversity and ecosystems throughout the world, and the ongoing health and robust metabolism of these systems. Various proponents of minority perspectives have agreed with UNESCO and other global parties, arguing that we must “build solid bridges, based on solidarity between all cultures so as to create a new universal ethics of living together,”\(^{259}\) but with an important exception—these bridges must enable the diversity to persist and difference to appear through the common language of the conversation.\(^{260}\) In sum, rapprochement of cultures is vital, yet, the process must be nuanced enough so that it is conducted in a way that does not undermine, dismiss, or overwhelm the local ways of life.\(^{261}\) As I demonstrate in my analysis of the MDGs and SDGs in the first chapter of this dissertation, such as in the language framing poverty, this subtlety is often lacking in the current SDGs, which require refining in order to address EoE and


the biocultural interrelationship. Acknowledging the disenfranchised within the dominant
discourse remains a delicate process that the inertia of economic growth and urgency of social
and environmental problems often do not allow.

Translating difference across epistemologies, worldviews, value systems, infrastructures,
ecological knowledge, and language is no easy task, and it is typical for these processes to focus
on commonalities instead of difference. However, critics of the MDGs and conservation argue for
emphasizing these difference as opposed to commonalities that become overgeneralizations. This
perspective emphasizes the importance of translating these differences in perspective,
responsibility and impact into the political discourse surrounding the dominant global economy.
Luisa Maffi and others have made a call for “epistemological bridges,” refining the call for
bridging between communities for world peace to include the actual mechanism that would
enable the peaceful communication between peoples with distinct capacities, worldviews and
lifestyles: an assurance that distinct and differing ways of life would be acknowledged before
they are negotiated or compromised. Such negotiations can only occur after diverse biocultural
perspectives have been articulated, and allowed to persist, without compromising for the
dominant way of life. Only then can they be considered to proceed with any sort of parity.

The difficulty in addressing the differential asymmetries for the environment crises
remains an ongoing problem, and is an integral part of the postcolonial inheritance underlying
the social dynamics of our environmental crisis. Identified as the universal/local dichotomy by
Vandana Shiva, “power is also built into the perspective which views the dominant system not as
a globalized local tradition, but as a universalized tradition, inherently superior to local
systems.”262 The implications of this ‘inheritance’ is two-fold—for those whose local cultural
and knowledge tradition follows that of the dominant discourse, they are told that no local

262 Shiva, Monocultures of Mind, p. 10.
ecological knowledge that exists in their traditions and that only general knowledge exists. Those whose history does not share in the same cultural heritage as the dominant worldview are treated as inferior often times because these knowledge systems are particular, and in some cases non-universalizable.

This two-fold dismissal of local knowledge has a terrible impact on the sense of empowerment of the individual—the sense that one has knowledge about the surrounding world (including its community, the work and arts of that community, and the living and nonliving entities of that world), and replaces it with a looming concern that default to the expertise of general truths is necessary. The great irony of course (as we all know in the crumbling world of the environmental crisis) is that these same general principles still need refinement and application once they have been articulated.

However, after this moment of alienation, when global society has marginalized—even omitted—the very significance of local knowledge, the value production, the reconstitution and application of particularities to general rules means that often the personal meaning, richness, and cultural connectivity has been lost in the process. In a sense, globalized culture has externalized the very precious connection between our life and meaning because it has been stated as having little actual worth. Articulating this loss as a driver is significant in the sustainability discourse because it is driven by the very same drivers of biological and cultural loss.

Further still, ongoing efforts to integrate the academic disciplines and distinct social actors around this urgent need continue, and calls for this integration are increasing. Responses include new sub-disciplines that mix social and natural sciences and the development of interdisciplinary teams that work together to solve problems. In 2007, in response to the
Millennium Ecosystem Assessment’s apparent stagnation in addressing global environmental change, Carpenter and collaborators stated that we already know enough about the environmental crisis, but what we need to understand now is the indirect drivers, that is the social components, that drive environmental change.

In a 2010 article of Conservation and Society, Jules Pretty and fourteen leading researchers in a diversity of fields identified the most significant threats to both cultural and biological diversity, and the distinct ways these threats or drivers impact both biological and cultural diversity. These “common drivers or threats and outcomes for biological and cultural diversity” include: i) resource use by new commercial sectors such as biofuels or timber industries, ii) extended commodification of natural resources, iii) in-migration of new economic actors into long-standing community structures, iv) pollution of waterways, including the damming of rivers and depletion or contamination of aquifers, v) the aspirations of consumer lifestyles worldwide, vi) the continuing globalization of food systems, vii) urbanization and rural to urban migration trends (though there are notable reversals of these patterns), viii) modernization of healthcare, ix) homogenization of formal education and the expansion of dominant belief systems, x) language erosion and loss, xi) formalization and privatization of land rights, xi) state territorialization and ‘nation building,’ xii) expansion of transport network, particularly roadways, and xiii) assimilation. Elsewhere Pretty described the need to maintain socio-ecological resilience through the biocultural relationship, calling the environmental crisis also a “crisis of disconnection.”

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264 Pretty et al., 2010, p. 105

265 In a follow-up review, Pretty wrote on “Interdisciplinary Progress in Approaches to Address Social-Ecological and Ecocultural Systems,” for Environmental Conservation (2011). Here, Pretty details the “Crisis of Disconnection” (Pretty 2010, 128).
What is extremely important within the synthesis work of Pretty and colleagues is not only the identification of the shared drivers or threats to biocultural diversity, but the respective and interrelated outcomes for biological and cultural diversity as well. Understanding the ways in which these outcomes narrow the sphere of experience and the physical presence of biological and cultural diversity will certainly help clarify the threats to sustainable cultures and can help to articulate ways in which solutions can vanish from general consciousness.

Redressing EoE will require complicated responses that look at aspects of alienation, the trauma of disconnection, displacement, and other human right violations related to bicultural heritage. EoE is a placeholder for these losses that might be incomprehensible to those who have never shared in certain nature-experiences or ways of life, and who have difficulty conceiving or imaging the ways of life that are being lost, while also acknowledging mechanisms which undermine local culture for those who are part of a biocultural heritage.

4.4 Concluding Remarks: Addressing the Structural Forces Driving EoE for Biocultural Conservation and Sustainable Development

Urban environmental philosophy promotes a conversation extending biological and cultural conservation, making it progress by adapting EoE within that discourse. While my analysis is a theoretical and analytical study, I have extended the discussion of EoE through a synthesis of urban and rural perspectives on biocultural loss. I point to ways in which policy needs to break down barriers between heritage and urban communities, making it adaptable across diverse biocultural heritages.

Since EoE’s conceptualization by Pyle, environmental educators, ethnoecologists, and the biocultural conservation movement have taken up the budding concept to refer to the loss of oral or local knowledge that is tied to a sense of place and key nature experiences as part of everyday
life. Pyle’s relatively short chapter on EoE has been featured in online nature blogs in the United States. This concept also influenced the national movement led by environmental educator Richard Louv, “No Child Left Indoors,” that has spread across the United States and which seeks to shift the nature of formal education beyond the fixed classroom.

As global society is coping with the environmental crisis, it is necessary to address it from many pluralistically, including distinct perspectives across the rural-urban gradient. The EoE cycle reveals the negative space within policy that is currently failing to identify the ultimate causes of the environment crisis by eroding the biocultural interlink between society and the world around its people. Future policy must incorporate a biocultural viewpoint in the assessments of our technologies, policies, and societal structure to prevent the EoE cycle from becoming a permanent process within the mechanisms of the global economy. As such, EoE is a justification for a biocultural adaption for MDGs and SDGs.

The Biocultural Framework already emphasizes the importance of local ecological knowledge, traditional livelihoods, and the coevolutionary relationship between biological and cultural diversity. EoE makes explicit how this biocultural connection is lost through the pressures of global development, providing a stronger argument as to why a biocultural approach should be adopted when developing sustainable development goals. The biocultural framing has greater sensitivity to the nuanced relationship between culture and place, its multi-generational heritage, and the great time that is required to develop understanding of ecosystem management by local communities. By marking the loss of this biocultural understanding with the concept of EoE, we can explicitly create a conceptual placeholder for this knowledge and where it should be present within education, policy, and practice. By identifying its importance, even when it is lacking in practice, we simultaneously address its invisibility while creating the space to work on
the recovery of these more sustainable ways of thinking and practices in the instances they have been lost.

Cities and rural communities remain networked through the ‘world-system.’ 266 These communities—whether or not they desire to live within the cultural sphere of this world system—are nonetheless managed and guided by the policies, physical structures, and economics that fuel the global system. This ‘engagement by default’ is analogous to the age-old discussion regarding nation-state identity—we cannot choose the country in which we are born therefore raising the ethical question as to whether or not we are bound by the laws of that society. A similar ethical dilemma persists for those embedded within the global infrastructure: How can local communities maintain local ways of life when embedded within the dominant practices of the global economy? Further, this infrastructure is so far-reaching that it is fundamentally influencing cultural relationships with local environments. The influence of the global economy reaches farther than the laws of the nation-state through the shifting of goods and services across political lines. If the EoE cycle is driven by this global system remains unquestioned, it will remain the default mode of human management of systems, and inevitably lead to the decline of ecological functioning, or at least at a level that is able to support this particular configuration of global society. 267 Conceptualizing EoE as a critical placeholder for biocultural losses reminds us to look at the interrelated dynamics of the structured world around us and the ways formal education, industrial agricultural, and the global economy influence our imagination and capacity


267 MEA 2000, “[T]he bottom line of the MA findings is that human actions are depleting Earth’s natural capital, putting such strain on the environment that the ability of the planet’s ecosystems to sustain future generations can no longer be taken for granted. At the same time, the assessment shows that with appropriate actions it is possible to reverse the degradation of many ecosystem services over the next 50 years, but the changes in policy and practice required are substantial and not currently underway.” Available online: http://www.millenniumassessment.org/en/About.html#1
to engage the world according to our ecological conscience. We must integrate the discussion of EoE within sustainability discourse throughout the urban fabric—reminding ourselves that every vacant lot, every structure built, and the experiences these spaces create has the potential to drive our global society towards or away the flourishing of biocultural diversity.


———. “Biocultural Ethics: From Biocultural Homogenization Toward Biocultural


