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Understanding and Mobilizing Effective Responses to Ecocide:

The Need for Heart-Centered, Trauma Informed Ecosomatics

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Understanding and Mobilizing Effective Responses to Ecocide:

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Andrea L. Bell

Abstract

This theoretical paper examines ecopsychological principles as defined by Pye (2024 forthcoming) to explore underlying narrative and psychoneurophysiological reasons for the massive and ongoing ecocide of the Anthropocene. The paper also calls for societal change, providing specific recommendations based on the multidisciplinary knowledge reviewed. Contrary to widely circulating cultural narratives, we humans are completely dependent on Earth's biogeochemical cycles, neither superior to other life nor specially entitled to destroy it. Yet, ecological destruction continues to accelerate. Such ongoing ecocide is illogical, highly traumatizing to all life on Earth and contrary to our inherent love for nature. Framing the problem with Lori Pye's Five Ecopsychological Principles provides an excellent lens for detecting ecocidal narratives and practices. This survey of existing knowledge, particularly Polyvagal Theory (Porges 2011), suggests that toxic, destructive societal narratives create and are created from trauma-related overwhelm, individual and collective autonomic dysregulation, and distortion of subcortical autonomic threat responses. The paper concludes with specific recommendations for discouraging ecocidal practices and fostering regenerative narratives and actions whose implementation will contribute to the thriving of all Earthly life.

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My work is loving the world.
Here the sunflowers, there the hummingbird—equal seekers of sweetness.
Here the quickening yeast, there the blue plums.
Here the clam deep in the speckled sand.

Are my boots old? Is my coat torn?
Am I no longer young, and still not half-perfect?
Let me
  keep my mind on what matters,
which is my work…

Excerpt from “The Messenger”
Mary Oliver (2006)

Chapter 1: Description of the Capstone Project

This paper is a multidisciplinary exploration of the largest, most complex and terrifying problem on earth. It is also a call to change. Modern humanity's incessant destruction of Earth's biosphere and ecosystems is, unfortunately, the defining characteristic of the Anthropocene era. Lewis and Maslin (2015) suggested formally recognizing the Anthropocene as the geologic epoch defined by human domination, that is, the period of humanity's large-scale effects on Earth's biotic and abiotic systems. Pervasive, multi-systemic degradation of the Earth's life support systems is senseless and myopic. On an emotional level, a full understanding of the extent of anthropogenic destruction is absolutely terrifying (Buhner 2022; Edwards and Buzzell 2009).

Over the past several decades, scientific journals and public news media have increased their reporting of ongoing anthropogenic ecological degradation. We are all being made aware of these terrible side effects of our modern systems of agriculture, transportation, extraction, and consumption. "To feed and fuel our 21st century lifestyles, we are overusing the Earth's bio-capacity by at least 56%." (World Wildlife Foundation 2020.) However, the destruction continues—indeed, it continues to accelerate, as evidenced by measurements of carbon emissions, habitat loss, species extinctions, pollution, etc. "Nature is declining at rates unprecedented in human history...We are eroding the very foundations of our economies, livelihoods, food security, health and quality of life worldwide." (United Nations 2019, 1). The ongoing severe degradation of the basic conditions required to sustain life is threatening to extinguish it. Without life, there is no resolution to any of the other large, pressing problems—many of which stem from and intertwine with economic and ecocidal practices, e.g., the false and malignant

hierarchies of racism (Kendi 2019). Therefore, pervasive anthropogenic ecocide—humanity's destruction of life-supporting ecological systems—is the largest and most terrifying problem humanity and our fellow species here on Earth have ever faced.

Worldwide, scientists from many different nations and disciplines have pleaded for the cessation of such destruction. They have held global conferences, written books (e.g., Carson 1965, Bekoff 2014, Jahren 2020, Liboiron 2021), signed petitions and released enormous quantities of data documenting the results of ecocidal behaviors. Nevertheless, humanity has not mounted a sufficient collective response to their pleas, as evidenced by the accelerating destruction.

This paper explores some of the underlying reasons for humanity's ongoing suicidal and homicidal destruction without any consistent, widespread and effective response (opposition and change) by the general public. In ecopsychology we view these underlying reasons as *subterranean*: invisible, yet highly influential. The submerged roots of these destructive practices can be found across larger sociocultural levels and in the individual subconscious psychophysiology of each of us. Humans have collectively amassed a vast array of knowledge helpful and relevant to this massive global problem. However, communication and collaboration across cultures and disciplines has not yet been sufficient to drive an effective, informed practice for systems change and biospheric restoration.

This paper will explore some of the relevant knowledge already in existence, drawing especially from ecopsychology and somatic psychotherapy, that could potentially bring humanity towards substantial biospheric restoration. I will explore the implications that surface as we combine these bodies of knowledge, and then offer some

recommendations for individual and societal changes. My recommendations are based on the fundamental precepts of ecopsychology and somatic psychotherapy, as articulated by Lori Pye (2024 forthcoming), Andy Fisher (2013), Peter Levine (2010); Pat Ogden (2006) and Daniel J. Siegel (2020, 2022). These recommendations offer basic units of knowledge essential to those wishing to engage in direct healing work. They support the global paradigm change that Joanna Macy calls "The Great Turning": away from ecocidal behavior and towards collaboration, restoration and healing (Macy and Brown 2014).

Ecopsychology, also known as ecological psychology, is an emerging field of knowledge and practices. In the Western world, ecopsychology first appeared in the 1970s and 1980s, as a response to ecocidal mindsets and behaviors (e.g., Roszak 1992). As Jan Edl Stein explains, "the newly emerging field of Ecopsychology…views human experience in a more systemic and embedded place in the interconnected and interdependent web of life" (2023, 32). Ecopsychology addresses our widespread anthropocentrism, guiding the way towards our recognition and embodied experience of the fundamental interdependence of all life on Earth. Lori Pye (2024 forthcoming) has articulated five fundamental ecopsychological principles, integral to this project; they will be explored in depth below and interwoven throughout the paper.

The field of somatic psychotherapy—that is, neurophysiologically informed trauma therapy—arose in the Western world more or less around the same time as ecopsychology, with the work of Peter Levine, Pat Ogden, Bessel Van der Kolk, and Eugene Gendlin. Somatic trauma therapy invites the primal animal, and its innate self-regulatory mechanisms, back into the therapy room, and indeed, back into our daily lives.

Therapists and participants actively work with the responses of humans' subcortical developmental, attachment and threat response systems that automatically arise when we are confronted with potentially dangerous external circumstances. Although somatic psychotherapy was developed relatively recent by clinicians (not by researchers), it is now building a robust base of empirical evidence. Somatic Experiencing International maintains a page on the website listing its increasing research base (SEI 2023).

These two related fields share a full awareness and inclusion of humans' primal, earthy nature; however, they have not yet begun to work together to the extent needed to address large systemic problems. As it turns out, the study of trauma—humans' automatic responses to overwhelming situations—is essential in understanding and reversing our species' continuing ecocide. "In the midst of climate change—a process that is undisputedly traumatic and is perhaps even the greatest trauma—understanding trauma and its effects on our minds and bodies has become more important than ever." (White 2015, 192). This understanding is "an essential piece of the process of moving towards the place that Ecopsychology has long since sought to bring us to" (193).

In the spirit and tradition of both disciplines, this paper examines the huge, global problem of anthropogenic biosphere destruction and its effects. The union of these disciplines constitutes an offering in the newly emerging Western field of Ecosomatics. An understanding of the ecopsychology and somatic psychotherapy fields would suggest that the term "Ecosomatics" may be redundant, as all aspects of the human body are inextricably ecological. However, the term remains useful in helping current narratives transition to a more integrated approach.

In this exploration, I work with ecopsychological and psychoneurophysiological, trauma informed lenses. Western humanity needs ecopsychology for multiple reasons, including its capacity to frame and explain the perceptual inputs into our psychophysiology which tend to result in ecocidal behaviors. Ecopsychology also guides us back to our inherent love of all life, and towards a well-balanced participation in Earth's ecosystems. Similarly, an understanding of the psychoneurophysiology of individual humans helps explain the stuckness of ecocidal behaviors, and ongoing individual behavioral inputs into the larger collective of narratives and practices.

Both fields are, by their very nature, interdisciplinary; and as such, this paper will explore a wide variety of sources. It will include Western scientific papers, as well as other ways of learning and knowing. The arts, humanities and wisdom from Indigenous, Earth-based cultures provide very longstanding bases of knowledge and ways of being in the world, much of which predates Western scientific knowledge—and, not coincidentally, the vast majority of the ecocide. However, the focus of my suggested interventions will be the Western world and its citizens, because Western cultural and economic practices are the primary source of the ecocidal practices defining the Anthropocene. This began with the advent of agriculture and the Industrial Revolution, and later intensified with the advent of nuclear manipulation. Non-Western countries, which may or may not retain more land-based histories and traditions, are struggling to survive in a global game written and directed by Western powers, which came to their wealth largely through colonization and exploitation of other lands and peoples (Kendi 2019; Liboiron 2021).

Goals and Objectives of the Project

In order to explore and develop a deeper understanding of the drivers of ecocidal behavior, this project draws from wide and diverse bodies of knowledge which have not sufficiently cross-pollinated. For an outline of the knowledge bases included, please refer to the Table of Contents. This paper is also a call to change: Based on the resulting synthesis of these diverse bodies of knowledge, I will provide psychoneurophysiologically informed recommendations for the necessary transition to ecologically supportive and sustainable ways of life. These recommendations will include a collection of general principles essential for those developing effective ecologically supportive interventions in the Western world.

Rationale

This paper is one facet of my response to the most terrifying, pervasive and all-encompassing problem of all times—large scale and multifaceted ecocide, the anthropogenic destruction of Earth's capacity to support life. It is an attempt to discover and illuminate the underlying reasons for ongoing human-caused biospheric destruction and offers recommendations flowing from the synthesis of existing knowledge.

Research Questions

This paper attempts to answer the following questions:

1. What are the largely unrecognized, underlying reasons for humanity's illogical mass destruction of terrestrial life?

2. Why does ecocide continue, despite its widespread threats to biosphere, biomes, ecosystems, and organisms?
3. Which existing bodies of knowledge could be effectively engaged and interwoven, to effectively address this global catastrophe?
4. What are specific concepts that can be actively and deliberately called upon to help guide us away from ecocidal practices and behaviors?

Methods and Methodology

This theoretical paper is a wide-reaching, interdisciplinary review of Western scientific literature and other diverse bodies of thought, knowledge and experience. It offers a theoretical exploration of the implications of combining these diverse sources of knowledge, in order to explore and synthesize potentially effective solutions currently overlooked. As such, this paper proposes a new framework for understanding and addressing the globally pervasive phenomenon of ecocide, and constitutes a new theory within the evolving field of Ecosomatics.

Research Limitations

This paper addresses an enormous, complex and stubborn problem; however, as it is a capstone rather than a dissertation, it is subject to time and spatial constraints that are quite challenging for this huge topic. Additionally, this paper is written from a Western perspective, by an author born and raised in a relatively privileged position in Western culture. As such, its findings may not apply cross culturally, as noted in several sections of the paper.

This project focuses on (and in so doing makes some assumptions about) the average general populations of developed Western countries. Such assumptions carry an inherent margin of error. For example, limitations on document length preclude exploration of conditions such as narcissism or sociopathy, which have been described as being particularly salient in political leaders and policy makers (Khorram-Manesh and Burkle 2023). Similarly, this paper does not include exploration of the global military industrial complex, its self-perpetuating nature, or its vast and terrible impacts upon planetary life. It is noteworthy, however, that such conditions of deep selfishness and disregard can potentially be seen as an expected outcome of trauma (Fisher 2013) and constitute an enormous obstacle for ecologically sensitive policy making.

This paper explores Polyvagal Theory in the context of ecocide. Potential criticisms or limitations of Polyvagal theory will be explored in later sections of the paper. This project is an initial attempt to link and cross-pollinate many diverse bodies of knowledge; and, as such, will undoubtedly result in additional study, exploration, field testing and refinement.

Chapter 2: Review of Scholarship

The nature of this paper is to be inclusive of a variety of work likely to be helpful in unraveling the largest problem we have ever faced, that of widespread anthropogenic ecocide. Within this widely-cast net, there are nonetheless several publications which have provided the foundation of the understanding I am bringing to this endeavor.

Peter Levine's (2010) *In An Unspoken Voice: How The Body Clears Trauma and Restores Goodness* provides a nuanced and practical understanding of the human trauma

response, and how we can help each other metabolize and clear this high-charge autonomic arousal out of our nervous systems. Drawing from biological sciences, the humanities, Indigenous knowledge, cross-cultural mythology, and psychotherapy, Levine explains the tenets of his life's work: that trauma is a normal, non- pathological automatic response to overwhelming circumstances; and that in trauma, the threat response cycle remains "stuck on ON" in the body, creating pre-conscious, distorted responses in the body's attempt to survive. He details how to detect which phase of the innate threat response cycle someone may be stuck in; and how to engage the body's own capacity to metabolize and discharge the old circumstances. *In An Unspoken Voice* is an elegant summary of Somatic Experiencing, the theory and practice of which undergirds all of my clinical work and, in fact, almost everything I do in the world.

Levine's work is a practical synthesis of many scientific theories, including Stephen W. Porges' (2011) *The Polyvagal Theory: Neurophysiological Foundations of Emotions, Attachment, Communication, Self-Regulation*. Porges' theory, detailed in this very dense volume, illuminates the links between the human mind, and the autonomic nervous system. He elegantly describes the autonomic neural pathways of calm ("social engagement"), fight, flight, and freeze (immobility) responses—so familiar to those of us who work with (or live in) states of post-traumatic stress. As Porges explains, "Changes in peripheral physiological state can influence the brain and alter our perceptions of the world. Thus, affect and interpersonal social behavior are more accurately described as biobehavioral than psychological processes" (257). In other words: our responses to stress are automatic, physiological, involuntary, and inextricably intertwined with our surroundings. Porges' work is essential to providing this understanding of fight, flight

and freeze stress responses; how babies develop the circuits for social engagement; and how we humans can help each other shift into autonomic arousal states appropriate to current circumstances.

"What motivates me as an ecopsychologist is simply a concern for life. I became an ecological thinker because of my disquiet over the violation of nonhuman life, because of the tearing of my heart over the wasting of the earth" (Fisher 2013, xiii). With these words, Andy Fisher summarized and focused the murky thoughts and feelings that had begun to drift uncomfortably upward from my unconscious mind, increasingly tugging on my sleeve and begging for more attention. Fisher's seminal work, *Radical Ecopsychology: Psychology In The Service of Life* (2013) provides a precise and comprehensive analysis of how we humans have come to be so destructive of our only home, each other and our own selves. Fisher articulates our profoundly destructive illusions of separation from and commodification of the natural world. His academic and humanistic treatment of ecopsychology explores, at macro and micro levels, how these horrors had come about in the first place, particularly "the suffering that is veiled by a reigning ideology" of the expansion of capital at the cost of the natural world (161). Instead, Fisher advocates building a mature, reciprocal relationship between humans and the larger natural world: "we are members of the biotic community, rather than its mere exploiters" (5). Our minds and bodies are in the world and of the world; we become anguished and destructive when relegated to intellectualized withdrawal and separation. This is the "radical" in *Radical Ecopsychology*: the necessary change at the roots of the problem.

Stephen Buhner's (2022) last book was also essential in the initial formation of this project. Buhner was a multitalented individual whose recent loss is felt keenly, even as his contributions to continue enlighten and guide us. The entirety of page 2 of his final work, *Earth Grief: The Journey Into And Through Ecological Loss*, is dedicated to a long list of his multiple and complex fields of study. *Earth Grief* is a raw, unflinching, and brutal descent into humans' apocalyptic destruction of the biosphere and his (our) emotional responses when we witness it. "I think that it's about time for all of us to look with unafraid eyes at what is right in front of us, to seriously grapple with the truth that's been set before us, to actually look with clarity at the diagnosis we've been given" (114). Buhner insisted that, with enough persistence and capacity for tolerating the emotional ramifications of humanity's self-made hell, there is transcendence on the other side. While he appears to have completely bypassed Levine's recommendations for titrated exposure to our stressors, Buhner's courageous writing is essential to this paper, in its brilliant articulation of our deep love for the earth and the depths of ecological despair.

Anna Tsing's (2012) essay, "Unruly Edges: Mushrooms as Companion Species. For Donna Haraway," provided another essential inspiration for my work. Her essay is a testament to humanity's love for, and complete intertwinement with, Planet Earth. Her writing interweaves anthropology, history, ecology, mycology, sociology and feminism as she narrates a crucial transition in human history. Tsing describes the interdependence and respect between human foragers and other species, and how everything changed with the advent of stationary agriculture. In addition to highlighting human-nature relationships that have been, and could be again, her paper is subtly infused with love and reverence for the greater-than-human world. Tsing's skillful multidisciplinary approach

remains true to Western scientific knowledge and discourse, even as it mentors the reader in understanding and feeling our roots in the greater than human world.

Having been made more aware of humanity's relationships with the biosphere, we are now in need of some guidance for what to do about all of it. Linda Buzzell and Craig Chalquist are therapists and philosophers who have dedicated decades of their lives to ecopsychology. Their 2009 anthology, *Ecotherapy: Healing With Nature In Mind*, is a collection of 31 essays from many different perspectives within the world of ecopsychology. Their collection includes work from highly respected ecopsychological authors Robert Greenway, Andy Fisher, Joanna Macy, Richard Louv, and the editors themselves. The book's essays are organized into several themes. Some authors explore ecopsychological elements currently missed by mainstream, conventional therapies; others describe the vital role of community, and how to build it. Some of the essays delve into ecospirituality, the essence of being a human interconnected within a living, breathing world. Many essays explore multiple applications of ecotherapy, including inter-species encounters, and how to help a client awaken their own ecological consciousness. Buzzell and Chalquist's compilation of ecopsychological theory and experience provides gripping insights, as well as a practical how-to guide for moving through the destruction and towards healing.

Chapter 3: Finding and Ecopsychological Applications

Pye's Five Ecopsychological Principles

In exploring Western humanity's existing systems, culture and practices, an Ecopsychological perspective proves essential for discerning which cultural narratives

and behaviors are helpful, versus those which lead us deeper into destruction. When evaluating a belief or practice, one may ask: Is it supporting or damaging to life, that is, the thriving of a diverse, well-balanced ecology, its aquatic, atmospheric and terrestrial substrates and its native organisms? This question is a good starting point; however, real-world processes are complex, and attempts to apply this question alone may prove confusing.

Lori Pye (2024 forthcoming) has developed the first systematic method in western ecopsychology; her method helps us discern whether and how we are violating the basic ecological principles that have created and sustained life on Earth for billions of years. Pye's approach is inclusive of one of the central tenets of narrative therapy: that cultural narratives circulate around society and permeate all of us, silently forming our worldview and basic assumptions—for better or for worse. Pye defines "toxic" narratives as those which cause movement away from the natural cycles and balance fundamental to life processes. She holds that human cultural and psychological processes are in fact *not* separate from these fundamental ecological principles, and that this illusory belief of human separation and superiority (*anthropocentrism*) is a toxic narrative and a major driver of ongoing destruction. In so doing, Pye draws on the concept of *natureculture* developed by Malone and Ovenden (2016): "the idea that nature and culture are so tightly interwoven that they cannot be separated into "nature" and "culture" (1).

Listed below are the Five Ecopsychological Principles governing ecology, including human psychological and cultural systems, as described by Pye:

1. **Energy:** Energy is fundamental to all matter and biological life processes. Energy flows within and between living organisms, Earth systems, and throughout the universe, in continual complex processes of relationship and interdependence.
2. **Diversity:** Wide varieties of biological, genetic and behavioral differences exist within and between life systems, including human cultures and perspectives. Oceanic and terrestrial landscapes are also very diverse. These differences are essential in creating and maintaining a healthy, living biosphere.
3. **Decay and Renewal/Waste:** All life eventually breaks down into its fundamental components, and ecosystems recycle these components into renewed life. In modern human systems, however, this process tends to be feared or ignored, leading to stagnancy, adaptation failures, and waste.
4. **Relationality:** All organisms and earth systems, including the human psyche, are constantly exchanging energies and elements, in relational contexts. Survival is not an individual endeavor, but the product of countless ongoing collaborative relationships. This calls into deep question the concept of "individual."
5. **Change:** Life is a fundamentally dynamic process; nothing remains static or permanent. Everything morphs into new conditions and new forms.

These five processes govern ecological and psychological processes and are fundamental to all life. Stratton (2017) gives an excellent example illustrating the interdependent ecology of the human psyche. In her description of the massive quantities of highly toxic wastewater created by mining, she points out that companies are allowed to create such waste without ever cleaning it up, and this abdication of responsibility is seen as a normal result of "necessary" business. She points out the compelling metaphor: the pools of toxic

waste that our culture creates in our minds and behaviors, allowing us to engage in such pathological behaviors. “The truth of a culture of denial and emotional disconnect lies in these ponds, which seep into the groundwater and sometimes spill over into waterways as a complete subversion of ethics to economic imperatives” (Stratton 2017, 43.).

Pye’s Five Ecopsychological Principles will be interwoven throughout this paper. Many of the points to follow will include a reference to one or more of the principles in brackets, e.g. [Diversity], or [Energy, Change]. These notations will support our recognition of the fundamental nature of these principles that are interwoven throughout all aspects of biospheric life. Where one or more of the principles are being violated, the name of the principle will be in italics, e.g., [*Diversity, Waste*]. Additionally, in each section I have provided an expanded example of how one or more ecopsychological principles are being supported or violated in the context of the topic being discussed. Due to temporal and spatial constraints, I am not able to expand each point with an extended exploration of how it relates to Pye’s principles. However, my hope is that the reader will see first-hand the relevance of Pye’s principles across a multiplicity of situations and issues.

The practice of viewing concepts through Pye’s ecopsychological lens provides a solid foundation for understanding which human narratives and behaviors support ecological flourishing, vs. those that are toxic and destructive. The Five Ecopsychological Principles are also particularly helpful for examining the stuckness of traumatic overwhelm in the human nervous system. If this literature review and analysis can support a relevant and satisfactory set of responses to ongoing ecological destruction, then it will be extremely useful—not only towards supporting the emerging fields of

ecopsychology and somatic psychotherapy, but more importantly, helpful to supporting the continuation of life on Earth.

Humanity's Love for Earth is Innate and Fundamental

The function of human emotion is to provide strong guidance towards survival. We are driven, at levels deeper and more primal than cognition, by these vital, energetic biological signals, towards things that our midbrain thinks are good for us (and our loved ones), and away from things that are assumed to be bad for us. For example, we are naturally repulsed by the sight and smell of a dead, rotting creature; this instinctive energy of disgust and moving away protects us from the pathogens associated with organismic decay. This emotional survival guidance is a natural process of energy flow in right relationship to the environment, congruent with the ecopsychological principle of [energy]. Unfortunately, as we all undoubtedly know from lived experience, our emotional signals can sometimes go awry (Levine 2010).

Attachment (which will be explored in greater detail in subsequent sections) provides a particularly deep form of emotional experience. These primal bonds secure the survival of a dependent creature, even when its care needs create considerable strain for others. As such, attachment demonstrates the ecopsychological principle of [relationality] between organisms: the relationship is prioritized above individual parental survival, because ensuring infant well-being supports the survival of the species. Although contemporary Western culture tends to overlook this fact of basic biology [*relationality*], each of us is as dependent on Earth for our next meal and our next breath as an infant is

dependent upon a parent. It stands to reason, then, that humans' deep love for the Earth and its biosphere are fundamental to our ongoing existence [energy, diversity, relationality].

The natural state of a human is that of being in love with the Earth and its biosphere. Ecologist E.O. Wilson (1986) called this innate Earth love "biophilia." In fact, in every aspect of our being, including mind and culture, we are fundamentally inseparable from the rest of the natural world [energy, diversity, relationality]. In the following section, I will explore human love for our planet, biosphere, biome and creatures, from several different perspectives.

Indigenous, Earth Based Cultures.

"Somehow, in modern times, we have forgotten the wisdom of these ancient traditions." (Siegel 2006, 18) This quote from a well-known modern psychiatrist illustrates humans' unfortunate departure from millennia of living in greater balance with the biosphere, its other forms of life and the natural rhythms that govern our existence. Such departure violates the principles of [*diversity, relationality, change*].

In exploring humans' innate love for the earth and its biomes, it makes sense to begin with the people who have lived on and cared for the land for many thousands of years. It is vital for those of us raised in Western/industrialized contexts to listen, deeply and respectfully, to what Indigenous peoples would like to say [energy, diversity, relationality, change]. Before we do so, some particular clarity is needed. The issue of cultural appropriation and ongoing oppression, disregard and commodification of Native peoples, is a very delicate matter and must be addressed here [*diversity, relationality*].

Such treatment has caused profound intergenerational trauma, and the wound is kept fresh by ongoing oppressive treatment. In an awful example of the fixity characterizing traumatic systems, this keeps Native and non-Native peoples continuing in the patterns of historical trauma and the largely unrecognized holocausts suffered by Indigenous peoples (Mitchell 2018). Such [*change*] is destructive and not in right relationship to life.

Humanity is unlikely to succeed in stopping our destructive ways and supporting biospheric recovery [change] without a thoughtful, respectful, widespread and consistent invitation and inclusion of Traditional Ecological Knowledge (TEK) as described by Cajete (2000) [diversity, relationality]. Natives' lived experiences of thousands of years immersed in deep relationship with local biomes, intertwined with land-based spirituality and cultural practices, are vital to resolving the massive destruction created by essentially opposite ways of thinking. My (non-Indigenous) understanding is that TEK is a way of being in the world. Indigenous understandings are *not* tools for conquering, controlling or accumulating (Liboiron 2021; Fisher 2013). Invoking Indigenous knowledge in any endeavor—including that of attempting to reverse the increasing trend of ecocide—*must* be done respectfully and invitationally. As Andy Fisher warns, "ecopsychologists must guard against becoming part of the historical process of colonizing and appropriating indigenous cultures" (Fisher 2013, 5). To include TEK forcibly, or from a perspective of extraction or commodification, would be an attempt to solve a massive problem using the very same thinking that created it in the first place. Even aside from being morally unacceptable, such efforts fundamentally could not succeed [*diversity, relationality*].

Dr. Frank Lake (2024), USDA Forest Service Ecologist and Tribal Liason, is clear and direct in his discussion of these issues. In a podcast entitled "TEK (Traditional

Ecological Knowledge/Indigenous Ecological Knowledge) with Frank Lake," he explains that widespread land use change—appropriation of Indigenous lands— has eroded the traditional knowledge base, to the detriment of all:

> Western science hasn't been able to prevent a climate crisis. It hasn't found a technological fix. It hasn't been able to because of politics, socioeconomic conditions, power, and positionality of industry and other factors, government, private sector, all those, that haven't allowed Native people to maintain their knowledge systems and practices, who haven't allowed Native people to have closer ties and access and steward their indigenous homelands that are now national forests, Federal lands, national parks, state parks, private industrial land, private property, or county or other lands, right? So look at what have been the factors that have reduced the body of available knowledge, and then now look at a point where society is coming to Indigenous people, and saying, 'could you help us with solutions, because now we're imperiled and now we're at lack of, system collapse…we don't have enough water, forests are burning up beyond what we could possibly manage,' right?…I just want people to reflect on that, right? 'For a long last 4 generations, or 750 years, your knowledge hasn't been important, you've been not important to the conversations about solutions, and now because our society is getting burned up and over…running out of water, has forms of insecurity, has instability, we're coming to you to ask us how to finally solve this. …and more importantly, we're coming at it from a colonial Western society perspective that's extractive. We need your knowledge for us', not, 'how could we partner to empower you to maintain the knowledge you have, to regain it for

> the aspect of that you need to…that then could be of benefit not only to tribal community, but also society and the local public.'… It's not enough that they took the land, took the gold, took the timber, took the water, and took the fish, now they're taking the knowledge. Right?…Where's the reciprocity? (qtd. in Fullner 2024) [*energy, diversity, relationality, change*]

As a White person of relative social and economic privilege, my intent is to elevate, not appropriate. Aware humility is extremely important in this endeavor [energy, relationality]. For these reasons, I have included publications and direct quotations from Indigenous people, in order to help elevate their work and their wisdom. I consider these voices my mentors, and I approach this from a perspective of listening, learning and gratitude. Any objections or concerns about the inclusion of Indigenous knowledge and wisdom should be directed towards me, for further dialogue [energy, diversity, change].

This interdependent love and respect for biome and creatures is how humans have lived for eons, prior to the introduction of technology and toxic cultural narratives. For Indigenous, land-based people, the land, rivers, sky, and animals are not objects—they are *family*, intertwined with the people in a reverent kinship (Cajete 2000; Wall Kimmerer 2013) [diversity, relationality].

> Key questions for [pre-colonial] traditional Native Americans included how individuals and the tribal community could ecologically respect the place in which they lived, and how a direct dialogue among the individual, the community and the natural world could be established and maintained. (Cajete 2000, 178)

Cajete continues:

> Native cultures have traditionally aspired to live in accordance with an ideal of reciprocity with the landscape, guided by cultural values, ethics, and spiritual practice. Living a life of relationship through ethical participation with nature is the idea behind the practice of Native science and its orientation to place. (183)

Max Liboiron (2021), an Indigenous researcher in the field of marine plastics, points out that land relations are *always* present during science—even though in Western science such land relations are not recognized or named. Instead, entitlement to land access and exploitation are presumed [*relationality*]. Liboiron defines Land as "the unique entity that is the combined living spirit of plants, animals, air, water, humans, histories and events recognized by many Indigenous communities" (7). Land is not a noun; it is energetic and relational [energy, relationality]. Liboiron defines land without a capital "l" as "the concept from a colonial worldview" which does not honor the love and spirit of the Land. The love and reverence for the Land is pervasive and palpable in Liboiron's definition. In contrast, the presumption of land access and exploitation clearly demonstrates the rationale behind the Western concept of "sacrifice zones", areas of land excavated, poisoned or otherwise destroyed in order to obtain desired resources or produce desired goods. An example of a sacrifice zone is that of the pools of toxic wastewater in the destroyed ecosystem, described above by Stratton (2017). In the Western/colonial view, sacrifice zones are deemed acceptable and inevitable to meet human goals and desires [*relationality, waste*].

Native science and relationship with ecology is a lived experience. There are no illusions about impartial or "objective" observers; humans are embedded in and part of

the whole picture. In Native science, information comes from all aspects of the human's experience, including emotions, memories, stories, and visions (Cajete 2000) [relationality]. This perspective is the opposite of the Western scientific presumption of separateness, the illusion of objectivity, [*relationality*], and the entitled, destructive manipulation of natural systems without renewal [*waste*] (Cajete 2000). I note that in Western cultures, the only arena in which emotions and bodily sensations are seen as respected and legitimate sources of information, is that of psychotherapy. The dynamics of transference and countertransference are seen as pertaining to that field alone, and only in service of helping "neurotic" or "psychotic" people improve their functioning and experience in order to better assimilate to mainstream society.

In contrast, Cajete explains the vital importance of "finding heart":

> In Mesoamerican philosophy, the human heart has housed the soul, the place where our highest form of compassion resides…Finding heart is a metaphor that captures the impassioned purpose and spirit essential in sustaining the effort needed to transform our lives. (288)

In short—love is an essential ingredient in the Land and in all human endeavors.

Good Feather (2021) explains that connection with Earth is necessary for healing and spiritual knowledge. "There are ailments or issues in our lives that can only be learned or healed by having our bare feet on the ground, our hands in the soil or our bodies in the water in quiet observation and with all our senses receiving the natural earth energy swirling around us" (69) [energy, relationality].

Arts and Humanities.

"Forget not that the earth delights to feel your bare feet and the winds long to play with your hair" (Gibran 2020, 58).

Across many eons and cultures, the arts are offerings from the unique hearts and creativities of the artists. Each artist is unique, their culture, life experiences and outlook unlike those of any other. The creations of each artist combine to create a variety of thriving and robust fields of art and culture. There is truly something for everyone, and this is congruent with the principle of [diversity]. The life energy artists have invested in their work is palpable; its creation and offering to others are congruent with the ecopsychological principle of [energy].

Perhaps no subject has as much art dedicated to it as that of Nature. From the photography of Ansel Adams, the paintings of Bob Ross, the works of William Shakespeare, and the poetry of Walt Whitman and Mary Oliver, the undeveloped natural world and its creatures appear time and again in the Western art world [energy, diversity, relationality]. This is a direct result of humans' innate wonder and awe of the world around us, another example of ecologist E.O. Wilson's *biophilia* (Wilson 1986).

For an excellent example of poetry dedicated to the love of plants, creatures, and Earth, please refer to Kai Seidenburg's book of poetry *Poems of Mirth and Spirit: Seventy Poems and Forty Practices to Develop Your Connection with Nature* (2017).

Western Scientists.

Although the work of Western scientists is usually couched in analysis and statistics, the underlying motivation is often wonder, awe and love for Nature. This is not only acceptable, but essential (Bekoff 2014). Spatial considerations permit a few salient examples.

Rachel Carson (1965), a marine biologist who famously raised awareness of pesticides' deadly path through waterways, commented, "Those who dwell among the beauties and mysteries of the earth are never alone or weary of life. Those who contemplate the beauty of the earth find reserves of strength that will endure as long as life lasts" (41). Carson's statement couched in the language of the Five Ecopsychological Principles reminds us that through such [relationality], [energy] is renewed.

Aldo Leopold (1949) was a writer, naturalist, ecologist and conservationist from the United States. His concept of The Land Ethic holds that humans are morally responsible to the land, the natural world and our entire community, which includes Nature [relationality].

Marc Bekoff (2014), a biologist and behavioral ecologist, comments that "We live in a troubled and wounded world that is in dire need of healing" (2). In support of this healing, he advocates for abandoning of the false idea of scientific objectivity or neutrality, and for compassion, ethics and empathy for nonhuman animals.

Perhaps the most iconic quotation from a Western scientist involving love for the natural world comes from Carl Sagan (1994), author of the famous "Pale Blue Dot" (6-7):

Look again at that dot. That's here. That's home. That's us. On it everyone you love, everyone you know, everyone you ever heard of, every human being who ever was, lived out their lives. The aggregate of our joy and suffering, thousands of confident religions, ideologies, and economic doctrines, every hunter and forager, every hero and coward, every creator and destroyer of civilization, every king and peasant, every young couple in love, every mother and father, hopeful child, inventor and explorer, every teacher of morals, every corrupt politician, every "superstar," every "supreme leader," every saint and sinner in the history of our species lived there--on a mote of dust suspended in a sunbeam. The Earth is a very small stage in a vast cosmic arena. Think of the rivers of blood spilled by all those generals and emperors so that, in glory and triumph, they could become the momentary masters of a fraction of a dot. Think of the endless cruelties visited by the inhabitants of one corner of this pixel on the scarcely distinguishable inhabitants of some other corner, how frequent their misunderstandings, how eager they are to kill one another, how fervent their hatreds. Our posturings, our imagined self-importance, the delusion that we have some privileged position in the Universe, are challenged by this point of pale light. Our planet is a lonely speck in the great enveloping cosmic dark. In our obscurity, in all this vastness, there is no hint that help will come from elsewhere to save us from ourselves. The Earth is the only world known so far to harbor life. There is nowhere else, at least in the near future, to which our species could migrate. Visit, yes. Settle, not yet. Like it or not, for the moment the Earth is where we make our stand. It has been said that astronomy is a humbling and character-building experience. There is

> perhaps no better demonstration of the folly of human conceits than this distant image of our tiny world. To me, it underscores our responsibility to deal more kindly with one another, and to preserve and cherish the pale blue dot, the only home we've ever known.

Psychotherapy.

There is a massive and multidisciplinary body of social science literature reliably demonstrating that nature exposure supports and expands well-being in humans. (Chalquist 2009; Buzzell and Chalquist 2009.) Many clinicians will attest that Nature is by far the most prominent and reliable aid in supporting a client's self-regulation. Mountains, gardens, beaches, skies, prairies, trees, therapy dogs, and horses, are all intrinsically supportive of human self-regulation, helping us create physiological homeostasis and an accompanying psychological sense of beauty, awe, love, and well-being. This oft-measured benefit to our physical and psychological energy systems from relationship with the elements of the natural world is in keeping with the principles of [energy, diversity, relationality]. It is common and accepted practice to invoke such nature elements for supporting psychotherapy via the engagement with the greater than human world. Such practices in the context of Western psychotherapy date back to one of its founders, Carl Gustav Jung, who opined that "atrophy of instinct" is responsible for modern pathology, and that "We pay a huge price for civilization. We have lost the connection to our very soul, our life's breath" (in Sabin 2016, 15) [*energy, diversity, relationality, change*].

Ecosomatics: An Emerging Field.

Ecosomatics is a new and emerging field in the Western context. It entails a deep exploration and felt experience of the fundamental intertwinement between human body and environment, particularly the natural, undeveloped environment and its creatures. As such, Ecosomatics recognizes the rightness of all of the Five Ecopsychological Principles. “The inner world of self and body is inextricably linked to the outer world of biosphere and biome” (Pallant 2023, back cover). Ecosomatic practitioners invoke and expand the innate love between humans and other Earth elements: “Sensing our corporeal embeddedness is an important step towards caring and becoming accountable for the effects of our actions on nonhuman forms of life” (Rufo 2023, 90). This quotation demonstrates advocacy for the emotional and behavioral [energy] of care, honoring interspecies [diversity], the inherent [relationality] between organisms, and societal [change] towards being supportive of all life.

Although he didn’t particularly define his work as ecosomatic, Stephen Buhner (2022) was a powerful and prominent practitioner of ideas and felt experiences generally representative of Ecosomatics. “And I have also gone, when my heart was breaking, when I had nothing else to hold me or to hold onto, to Earth, to the great forests and mountains, to the wildness of this world, and they have held me in my grief” (175) [diversity, relationality, decay and renewal].

For the most part, contemporary ecosomatics presents with a micro-level focus, its writers and practitioners concentrating their interventions on individual or small group clinical interventions. This paper is, in part, an attempt to expand the field of ecosomatics

beyond that of individual practice and into awareness and interventions on micro and macro levels.

Attachment Theory.

> There is much room for discussion about attachment trauma and its neurobiological effects on the human capacity for complexity, creativity, and relationality, functions that are indisputably crucial for sustainability. (White 2015, 196)

Attachment theory is fundamentally all about love and relationship between organisms. It is difficult to imagine a deeper or more fundamental energy than our love for one another. In keeping with the Five Ecopsychological Principles, love and relationship are essential to our well-being and in fact our very existence [energy, diversity, relationality].

The Western understanding of attachment began about 100 years ago, with the work of John Bowlby and Mary Ainsworth, who explored attachment in the context of mother-child dyads. Since that time, attachment theory has been expanded into the repair of romantic relationship dynamics in adults. This is a natural extension: modern neuroscience has discovered that the neural circuits supporting parent-child attachment are later repurposed for adult romantic relationships (Huberman 2021). Attachment is vital to human functioning, health and well-being throughout our lifespans. It provides the neurobehavioral foundation for co-regulation, a highly important part of human self-regulation (Poole Heller 2017), in which our autonomic functioning is influenced and

supported by interactions with other humans. In fact, infants and children are born without the capacity to downregulate their stress responses. They build such capacity over time, through millions of interactions with securely attached caregivers in a safe environment. During this time, the parents are essentially functioning as the child's parasympathetic nervous system. As they do so, the child's relational and parasympathetic capacities are gradually developed and strengthened. When such consistent parental co-regulation does not occur for whatever reason, the child grows into an adult with deficits in their capacity to self-regulate; this condition is referred to as *developmental trauma*. Our brains are relational; we cannot truly self-regulate alone (Poole Heller 2017) [energy, relationality, change].

Attachment patterns or "styles" are generally placed into one or more categories; however, a person's attachment patterns may contain elements of multiple attachment styles and may change between different interpersonal situations. Typical categories of attachment include *secure*, *anxious* (or *anxious/ambivalent*), *avoidant* (or *avoidant/dismissive*), and *disorganized* (Poole Heller 2017).

Attachment is biological, experiential, scientific, artistic, poetic, earthy, primal, and completely fundamental to human experience and survival. As a somatic psychotherapist, the way I generally explain attachment to my clients is by directing their attention to a few questions: "What is the nature of the interactions, emotions, patterns, and energies that an individual brings to various relationships? Within a particular relationship, what energies and patterns do you notice?" [energy, relationality]

Human attachment patterns form early, between the ages of 0-18 months, and become embedded in our implicit memory. As such, our attachment patterns are demonstrated in our automatic unconscious or semi-conscious behavior (Poole Heller 2017).

The Western fields of psychology and psychotherapy are almost entirely anthropocentric in limiting the exploration of attachment to parent-child or romantic relationships [*diversity, relationality*]. However, people are now challenging and expanding this interpretation; attachment is in fact actually multifaceted and multidirectional. We form attachment relationships with friends, communities, society, various nonhuman elements of ecology and place, and even intangible aspects of life experience. Trauma therapist Linda Thai (Benazzo and Benazzo 2024) describes that, after forced displacement and becoming a child refugee, her symptoms did not match those predicted by mainstream research or models of trauma or attachment. Thai explains that such lack of awareness and appropriate support can lead to dismissal of a person's symptoms, inappropriate blame of self or parents, and internal fragmentation. Therefore, as explained by podcast hosts Benazzo and Benazzo, we must "reconceptualize secure attachment more holistically…embracing the relational richness of our multi-layered lives, help[ing] transform isolation into belonging."

Jessica Fern's (2020) theory of nested attachment explores intertwined relationships across multiple levels, including attachments to oneself, relationships, home, local communities and culture, societal, and global/collective [diversity, relationality]. The latter category is inclusive of the other-than-human living world. Fern comments:

> The earth is alive. It is where we come from, it is what nourishes life and it is where we will return to. If we are going to talk about attachment relationships it would be remiss not to mention our original mother: Mother Earth. For many of us, our relationship to the environment is dissociative and overly abstracted. [*relationality*] (93)

I would say this dissociation is in fact representative of modern humans bringing a very disorganized attachment relationship into our interactions with Earth. Although there is a widespread love and appreciation for our fellow creatures and undeveloped landscapes, nonetheless, our cultural norms and narratives support our taking from the biosphere with entitlement, and without consideration, attunement or empathy for the effects of our actions upon the nonhuman world [*energy, diversity, waste, relationality, change*].

Fern's and Thai's contributions to the field of attachment is vital. The lens of human attachment is needed, to explore our love for the greater-than-human world, as well as what happens when our attachments become damaged. Adding love and secure attachment, passion and compassion, back into science, academics, and all aspects of daily life, is an essential element in world-saving. Indeed, Poole Heller (2017) explains that people who have a predominantly secure attachment style are intrinsically more community-minded, demonstrating caring for others and the planet. This vitally important observation arose from her copious clinical experience working with attachment. Some have suggested that humanity return to a mother-child relationship with the Earth (Weintrobe 2021), a secure and de-idealized attachment, in which we learn rules, limits and other wisdom from our nurturing parent. In any case, we must choose to propagate a different humanity than the one we have been raised in; we must fall back

into mature, reciprocal love with the Earth (Eisenstein 2023) [energy, diversity, change]. This is essential to our survival.

Some, perhaps many, may disagree with my fundamental assumption of biophilia and attachment to Earth. They may say that this is nonsense; that they themselves don't care about the Earth. Some may even claim that involvement with nature is childish, primitive, even grubby; that humans have moved beyond the concerns of the dirty lower animals. Indeed, such toxic narratives and viewpoints are major players in the biospheric destruction examined in the following section. They are the result of dismissive and/or disorganized attachment, long recognized as drivers of problematic behavior and suboptimal outcomes for self and or others. This overall maladaptive state can be framed as a response to stress and trauma, the result of traumatic wounding.

Ecocide: Anthropogenic Ecospheric Destruction

> Over the relatively short span of human history, major innovations, such as the domestication of livestock, adoption of an agricultural lifestyle, and the Industrial Revolution, have increased the human population dramatically and have had radical ecological effects. (Bar-On, Phillips, and Milo 2018, 1)

Ecocide is generally defined as large scale ecological destruction with wide impact; the concept of ecocide as a prosecutable crime is currently winding its way through international law, particularly in Europe (Crook, Short, and South 2018.) In the broadest sense, ecocide is defined as ecological destruction (Mehta and Metz 2015), whether by individuals or by widespread human practices; and that is the definition that I will use

here. Obviously, destruction of the biosphere that creates and sustains life is a violation of all Five Ecopsychological Principles [*energy, diversity, waste, relationality, change*]. Since homicide refers to the murder of one or more individual humans, it follows that ecocide can refer to the murder of one or more ecological organisms or elements, on small or large scales; that is how the term will be used throughout this paper.

Unfortunately, many behaviors common to modern humans are causing widespread ecological destruction, including a massive worldwide collapse of biodiversity. While many ecocidal practices may appear unrelated, they are all driven by illusory separation from and dominance over the biosphere, and by our ignorance or disregard of ecological and ecopsychological principles. Furthermore, various types of ecocide tend to intertwine in that their impacts amplify one another. Appendix 2 of this paper offers an overview of the widespread destruction, focusing on the most commonly practiced categories of ecocide.

Ecocide Causes Distress and Trauma

Unsurprisingly given our innate biophilia, the widespread destruction of our living planetary systems causes intense distress. These survival responses are subcortical and instinctual, sparking emotions and psychophysiological energies demanding attention to these awful threats. Vast numbers of people and other organisms are physically and/or emotionally impacted by the ongoing ecocide. Some researchers (Dumont et al 2020, Burke et al 2018) have found evidence of increasing suicide rates related to climate change. “There is convincing evidence that the impacts of the greenhouse gases, air pollution, and higher global temperatures directly increase suicide risk, making this an

issue of global concern for psychiatry." (562) As biospheric collapse continues, due to climate change and other results of ecocidal behaviors, literally everyone will be impacted (Doppelt 2023). One simple way for the reader to potentially gain an experiential example of such eco-dysphoric distress would be to read Appendix 2: Types of Ecocide herein, while monitoring one's emotional and somatic responses to the information presented.

The scientists working with the natural world are particularly vulnerable to ecologically based dysphoria, due to their constant direct exposure to the losses (Einhorn 2023). Most of the rest of us usually manage to avoid such frequent exposure to the actual toll we are collectively exacting on Earth's biosphere, with the exception of survivors of ecological disasters: mega-fires, huge storms, etc. Nonetheless, ecologically-based anxiety and dysphoria continue rising, as landscapes perish, extinctions continue, and information seeps into the general population.

The energy put into enacting ecocidal behaviors violates the principle of [*energy*], because this wrong use of energy drives narratives and behaviors which directly reduce the thriving of living systems. Ecocidal behaviors violate [*diversity*] in reducing biodiversity; they violate the principle of [*waste*], because of the tremendous amounts of toxic waste created, on emotional and physical levels. The principle of [*relationality*] is violated because ecocide ignores the needs of those life forms suffering from these practices. The principle of [*change*] is also violated because these changes occur well outside of natural ecosystemic processes; and they threaten the existence of ecosystems and biospheric life.

Buhner (2022) lists 39 varieties of distress and dysphoria related to ecocide, and comments:

> Every one of us who loves Earth encounters [these feelings] sooner or later. They are each an element of our emotional response to the field, the signal being given off by the damaged ecosystems around us, by the destruction of what we love, the dying of that which has given our species its existence, which has birthed each and every one of us. (21)

A few pages later, he summarized, "We feel these wounds with the sensitive antenna of our heart's affections for the world" (24) [energy, diversity, relationality; decay and renewal].

Louv (2008), famous for his proposal and articulation of "Nature Deficit Disorder," quotes a child who was describing her relationship with a beautiful forest and waterfall: "And then they just cut the woods down. It was like they cut down part of me" (14) [*energy, diversity, waste, relationality, change*]. Similarly, Fern (2020) discusses a client who has all of her physical needs met; but if the earth is not OK, she's not OK.

Panu Pikhala, in his introduction to Vakoch and Mickey's (2023) volume, explores ecologically-based distress as "a global anxiety" akin to nuclear anxiety (2). He also notes the difference between pathological vs. situation-based anxiety, commenting, "In this book, the contributors strongly emphasize the non-pathological character of eco-anxiety (as do other leading scholars)… and many writers approach it as a form of existential anxiety" (4). In this exploration of ecologically based distress, he lists: Worry and fear; horror, terror, dread and panic; grief and feeling of loss; anger, feelings of

injustice, and indignation; frustration; guilt, shame and disgust; and expectation and enthusiasm (4-7).

The scope and intensity of this trauma is not solely an individual problem; it has profound sociological implications. Seth Abrutyn (2023), drawing on Erikson's (1994) work, proposes a theory of *social trauma*, or "the collectivization and enculturation of social pain" (1). This occurs under circumstances in which an entire community experiences trauma of sufficient magnitude, extent and duration. In other words, the "evolved negative affective response" from the social pain (1) becomes an aspect of the collective, and is transmitted throughout the culture. Erikson (1995) himself agrees, noting that traumatized communities are not solely a collection of traumatized individuals: "sometimes the tissues of community can be damaged in much the same way as the tissues of mind and body," and that traumatic wounds can combine to "create a mood" that is "different from the sum of the private wounds that make it up" (183). Biospheric collapse is very similar to the various social traumas in Abrutyn's article, except that it is much larger and more pervasive, ultimately impacting everyone on Earth.

Stratton (2017) eloquently describes her own response to the death of 4,000 snow geese in the toxic waters of a mine in Montana (USA). I invite the reader to notice their own emotional and somatic response to the following paragraph:

> …the toxic silence of thousands of geese chilled me to the bone. Their untimely death resonates as a tragic image of wild beauty and spirit sacrificed to the ugliness and emptiness of a violent culture preoccupied with material wealth. The death of the snow geese demonstrates the painful truth of connectedness—an unforeseen result of a century long assault and plunder of the earth for mineral

> wealth […] Creating havoc for other species has become business as usual, and corporations will fight through the courts for their right to destroy habitat in the pursuit of wealth. The undeniable error of an anthropocentric worldview stares us straight in the face" in that corporations are legally protected from consequences for ecocide. (41)

Edl Stein (2023) describes awareness of environmental threat as "a deep, ontological insecurity" that most people try to push away (31), typically resulting in numbing and disconnection. She has seen a consistent increase in anxiety in her ecopsychological therapy practice over the past 15 years, due to the "bedrock of fear—of climate chaos and ecological collapse" (32). And why not—what could be more anxiety-provoking than the collapse and death of everything one knows and loves? Ecologically-based distress is a huge and often unrecognized factor in widespread increases in anxiety, stress and other dysregulation. Our bodies, intrinsically intertwined with the rest of Earth's life systems, sense that something is terribly wrong.

Levine's Somatic Experiencing (SEI, 2008) teaches practitioners how to recognize and treat various types of trauma, referred to as "categories." Each different category of trauma creates predictable patterns of stress response in the human nervous system [energy, relationality]. For example, psychophysiological symptoms resulting from medical trauma tend to look and feel quite different than the symptoms following a car accident. One of these categories of trauma is called *Inescapable Attack*. Such assaults may be inescapable due to a variety of environmental factors: inanimate restraint (e.g., being pinned by a rock, or trapped in a burning building); being overpowered by another human or animal; or being physically able to fight or escape, but not doing so due

to sociocultural constraints inhibiting fight or flight responses. Since the fight or flight response is intense but unable to complete, survivors typically present with a high charge sympathetic arousal stuck in their nervous systems. In other words, there is a strong biological imperative to escape or defend oneself; but it is blocked, resulting in a *lot* of stuck internal energy and distress. Therefore, people also generally present with unresolved conflicting impulses, including terror, irritability, hopelessness and immobility.

Although Somatic Experiencing hasn't yet formally recognized this, global anthropogenic ecocide falls under the category of Inescapable Attack for all living beings experiencing the destruction. We know that we are intertwined with and dependent upon Earth's ecosystems, which are being relentlessly assaulted. Since the problem increasingly affects the entire Earth, there is literally nowhere to flee, even for those few humans having the money and freedom to do so. Corporations and governments, shielded by impersonality and legal protections, also have copious financing, power, and inertia. This makes fight a very challenging option, even if one is able to correctly orient to the source of destruction. Since the problem feels so enormous, complex and intractable, there is an accompanying sense of helplessness and hopelessness. Unlike a sudden discrete event like a car accident, ecocide is pervasive and ongoing, a never-ending series of terrible events, an awful exemplification of "death by a thousand paper cuts." At the same time, modern humanity has essentially normalized and dismissed ecocidal behaviors; some of these thought patterns will be discussed in the section below exploring toxic narratives. This normalization is essentially gaslighting; it creates

confusion and additional difficulty orienting to the source(s) of the distress, which in turn increases cognitive and autonomic disorganization.

During the writing of this section, I happened upon a conversation with an employee at a major marine aquarium. She described that the aquarium has had to create policies and practices to respond to the public's strong feelings of eco-anxiety, which surface every day as people see and interact with the beautiful marine organisms housed at the aquarium. Their biophilia and their awareness of ongoing ecocide produces intense eco-anxiety. This is congruent with the Five Ecopsychological Principles: distress is a normal emotional and energetic response to the wasteful and selfish destruction of our fellow creatures. Many of these creatures touch us deeply on an emotional level, in addition to their contributions to the global web of life that sustains us all [energy, diversity, waste, relationality, change].

Theodore Roszak (1992), who is sometimes referred to as the founder of Western Ecopsychology, provided a theory for the interconnectedness underlying this intuitive distress. He proposed that Jung's "collective unconscious" has another dimension: the ecological unconscious. "The core of the mind is the ecological unconscious. For Ecopsychology, repression of the ecological unconscious is the deep root of collusive madness in industrial society; open access to the ecological unconscious is the path to sanity" (302).

Along with but no less important than the humans, nonhuman life is also being massively impacted, as evidenced by the global biodiversity crisis as described above. We have all seen heart-wrenching photographs of animals suffering from the effects of human activities. Other-than-human life has its own value; it is not a commodity. "The

natural world's beauty, complexity and fragility suggest that it and its components in their own right have interests worthy of protection, or at least that our liberty to exploit nature is not limited solely by the claims of other people" (Gray 1996, 22). This quotation from a law journal demonstrates that the concerns surrounding ecocide are truly cross-disciplinary.

Ecocide: Utterly Illogical and Morally Reprehensible

This ongoing global ecocide is utterly illogical and morally reprehensible. In other words, the well-to-do in the Western world valuing our current lifestyle more than the ecological foundation of biogeochemical cycles, is a grave violation of all of the Five Ecopsychological Principles. In our pursuit of wealth and convenience, we Western humans are creating huge energy imbalances, wiping out biodiversity, building up toxic waste, failing to honor other species and landscapes; and creating unsustainable biospheric change [*energy, diversity, relationality, decay and renewal*]. The real "bottom line" is not the economy; it is the capacity of the Earth to sustain life. Paradoxically, a value for human life and our right to live peacefully is generally recognized and supported by laws in most Western countries. Regardless, enforcement is at best uneven, with large and powerful corporations able to "get away with" vast amounts of damage, in the name of economy and profit. Without life, however, there is no economy; there are no human rights; there is no healing from racism, misogyny, nor the rights of LGBTQIA people. Eventually, even the wealthiest humans will no longer be shielded by their hoard of resources (Doppelt 2023).

Restorative Action is Slow and Uneven

Many people and organizations are engaging in land restoration work, e.g., John D. Liu, an ecologist who has founded a movement of "Ecosystem Restoration Camps" across the globe. Liu (2019) comments: "My own journey has led me to understand that it is possible to rehabilitate large-scale degraded landscapes, including restoring vast areas degraded over historical time" (1). His three decades of experience in restoring degraded habitats lends credibility to his comment; this is an important and hopeful statement. Nonetheless, land restoration efforts are currently not sufficient to offset ongoing land use change; habitat loss remains the main driver of plant and animal extinctions. Nor can such efforts keep up with the problem of increasing carbon emissions, although they undoubtedly help somewhat. Whaley (2023) details the slowness of humanity's collective response to the problem of anthropogenic ecocide:

> Furthermore, humanity as a whole has been exceedingly slow to respond to this multi -layered crisis of our own creation. We have long recognized what our continued apathy and ignorance would bring to our shores. We have known about increased temperatures, rising sea-levels, expanding wildfires, diminished crops, vanishing water and increased violence. Mass starvation is on its way. None of this is novel information. We cannot pretend we didn't know. Yes, there are nefarious agents preventing change and pumping billions into obfuscating truth and propagating lies. But, we have known this for decades—and still we remain silent. (Whaley 2023)

As Andy Fisher comments, "Environmentalists have long been frustrated by how easily 'fear for the economy' displaces 'fear for the ecology'" (2013, 87). The underlying

narrative embedded in this distortion of priorities is that money is more important than life itself. This narrative prioritizing financial transactions over Earth's life support systems is an important factor in our collective slowness to change our ecocidal practices. The section below about toxic narratives explores their involvement in perpetuating ecocide.

Psychotherapy and "The Helping Professions".

Aside from the recent advent of ecopsychology, the "helping professions" have overall been extremely slow to respond to the biospheric crises. Our profession's traditional structure is highly myopic: literally (we remain in a small office, usually unable to use our eyes to see long distances) and figuratively, in working with individuals and small groups. We work on the micro level, usually staying indoors all day, in our controlled environments; generally ignoring the wider social context. Wounding caused by this wider social context becomes privatized, the individual's responsibility alone. Some therapists do acknowledge collective stress and trauma, but their influence is generally limited to offering their clients individual coping skills, one client at a time, not systemic repair (Doppelt 2023).

Furthermore, access to psychotherapy has been highly restricted by socioeconomic factors. Those who suffer the worst systemic consequences, such as poverty, racism, pollution, "food deserts" and lack of access to undeveloped landscapes, usually have the least access to desperately needed supports (Doppelt 2023). Such socioeconomic restrictions also impact the specialty training needed for therapists to become truly competent in the treatment of traumatic stress. Trauma competence requires

copious training and supervision well beyond that currently provided in graduate school, as well as a lot of time away from work. Few public social service agencies pay for such education for their clinicians—who tend to abandon the highly stressful conditions in such agencies after licensure anyway, for the more comfortable sector of private practice. This brief sketch of socioeconomic impacts on access to trauma-competent psychotherapy provides a stark image of great inequality, failure to value human [*diversity* and *relationality*], and vast unmet need.

Psychology, the study of mind and behavior, has largely ignored the huge problem of ecocidal narratives and behaviors, as well as their impacts, particularly upon those of lower socioeconomic status unable to pay for psychotherapy. Despite copious scientific documentation of the impending threats of climate change, the psychotherapy field as a whole appears disoriented towards this global threat, and unprepared to support people through its traumatic effects—much less help them mobilize towards eco-supportive action [*energy, diversity, waste, relationality, change*].

There are a few groups within the larger field of psychology that are currently mounting a response to climate change and its impacts. According to its website, the American Psychological Association Climate Alliance was initiated in 2007. It released a report and "action plan for psychologists" (APA Climate Alliance 2022). The report lists terrible effects of climate change for humans; acknowledges resistance to change by individuals, corporations and think tanks, including downplaying expected effects; and offers many recommendations. It suggests psychologist involvement in systems changes; helping individuals and communities with adaptation; helping change public attitudes; and conducting further research. These findings and recommendations are solid and on-

point. The Climate Alliance and its findings do not appear to be particularly prominent within the APA, nor is exposure to this information required for licensure renewal. The report acknowledges, “Today only a small number of psychologists address climate change as a part of their professional work” (APA 2022, 15). Additionally, the report is still highly anthropocentric. It does not consider the suffering of non-human forms of life or ecosystems; those trained solely in Western psychology may be unaware of the narrow, anthropocentric perspective inherent in this academic discipline (Buzzell 2023). Such biases seem congruent with psychology’s long history of animal experimentation for human purposes [*diversity, relationality*]. The report does state that “solutions to climate change should take into account its interactions with other environmental problems, including pollution, biodiversity loss, ocean acidification, soil depletion, deforestation, animal diseases, and pandemics.” Beyond this sentence, there is no further explanation, guidance or research around these other vitally important impacts of ecocide [*diversity, relationality, change*].

However, a recent email from the Climate Psychology Alliance of North America (2023) describes this organization’s multifaceted efforts to bring the issue of anthropogenic climate change to the larger psychological community and the public. They described a campaign for their multi-faceted action plan. Their plan includes an updated Climate Aware Therapy Directory; APA accreditation for professional development trainings; distribution for a peer reviewed Educator’s Guide to Climate Emotions manual; micro-grants for research aiming to explore the relationship between climate, emotions and action; trauma informed Climate Journalism programming; legislative outreach trainings; Regional Coordinating; and Youth and Parent Support

Programs (Climate Psychology Alliance of North America 2024). This organization's action plan and website offer the most comprehensive plan to address anthropogenic climate change I have seen within the helping professions. These efforts constitute a wonderful beginning; however, the Climate Alliance remains mostly focused on the issue of climate change rather than the broader problem of ecocide. Like most of the emerging field of climate psychology, the Climate Alliance does not appear to address the inherent rights of nonhuman animals, landscapes, ecosystems or the biosphere. Practitioners would benefit from "some knowledge of the wider fields of inquiry that climate psychology is rooted in," because climate is "a critically important part of [the human-nature] dysfunction, but not the whole" (Buzzell 2023, 1).

The National Association for Social Workers (NASW) is the governing body of my own profession, social work. A review of NASW's climate change report (Dorn 2022) mostly addresses social justice issues for humans, related to climate change and environmental pollution, in keeping with the field's long tradition of advocating for disempowered humans. Similarly, the NASW website has a page dedicated to "Environmental Justice and Climate Change," indicating that at least some study and discussion is occurring at NASW. As a Licensed Clinical Social Worker in the most populous state in the USA (California), I was completely unaware of any of this until I specifically sought it out. There is no mention of ecological issues in the NASW Code of Ethics, and no required study for licensure renewal. To date, I have received many thousands of flyers advertising a very wide variety of continuing education; not one of them has even mentioned climate change or other forms of ecocide [*energy, diversity, waste, relationality, change*].

Lastly, my proposal to teach an Introduction to Ecopsychology at a recent conference organized by the California Association of Marriage and Family Therapists (CAMFT) was rejected, without comment or any further invitation to explore the topic. A brief online search of CAMFT and ecological awareness yielded one webpage titled "CAMFT is going green!" by offering electronic rather than paper voting for their internal elections [*energy, diversity, waste, relationality, change*].

The Gap.

Life on Earth is nothing short of a miracle. Energy continually organizes itself into particles and atoms; from there, into compounds, then a living system, the whole somehow greater than the sum of its components. Life itself as we know it arises from a highly complex series of these biochemical interactions: of sunlight, temperature, water, minerals, and elements from the explosion of long-dead stars. Biochemical energy is a constant and countless series of transactions occurring every second, in an extremely rare planetary biosphere formed over billions of years. However, we are collectively using the energy provided to us by our very participation in these ecological systems, to erode the certain precise conditions that make most insect, fish, bird and mammalian life possible, including our own [*energy, diversity, decay and renewal, relationality, change*]. A field of locally native wildflowers is highly supportive of ongoing life processes; a paved parking lot is not. A logging operation or power plant is even more destructive. The globally widespread practices of modern lifestyles and economics are clearly incompatible with ongoing happiness, thriving and even life itself; I refer to this massive disconnect as *the gap*. To continue these ecocidal practices is illogical, immoral, and an

affront to nature, humanity, and god(s) (Gray 1996). “There is no true human health on a sick planet” (Linda Buzzell qtd. in Vakoch and Mickey 2023, 61).

In the next chapter, we will explore the factors responsible for the creation and maintenance of this gap, across macro (societal) and micro (individual) levels.

Societal Factors: Toxic Narratives

> I suggest that the traumatized self includes a self that is trying to cope with mounting, cumulative damage to the world and to the self that resulted from the upsurge in omnipotent thinking that consumerism encouraged. (Weintrobe 2021, 110)

A narrative is a widely circulating cultural story, often unconscious or semi-conscious. Whether or not we are aware of it, each narrative serves as a lens focusing our perceptions, conveying and reinforcing a particular worldview and belief system. Looking at Pye’s Five Ecopsychological Principles, we can define a *toxic narrative* as one that normalizes or encourages attitudes, practices and behaviors that violate the principles and justify damaging life (ecocide). Stratton (2017) explains how toxic narratives impact individual humans:

> An Ecopsychological consideration of difficult emotions also considers the emotional energy present in the world within cultures and ecosystems, and how these may impact the individual. As open systems, our bodies are constantly exchanging energy with the world in which they are immersed and adjusting in response to that energetic exchange. (2)

There are a plethora of toxic narratives circulating around modern Western society. Many different analyses have been offered, by a wide variety of authors. Spatial considerations limit this exploration to several particularly common and problematic narratives. There is a clear need for further study linking toxic narratives to systemic and individual ecocidal behaviors and practices.

Long-time ecological activist and ecotherapist Joanna Macy (Macy and Brown 2014, 3) asserts that modern industrial society promotes institutionalized forms of three "poisons", or groupings of highly toxic narratives, which take on lives of their own within our society. She names *greed* (consumerism), *aggression* (the military industrial complex, defending our greedy interests), and *delusion* (entitlement, denial, etc). Such emotional energies and their ensuing behaviors are out of balance, severely damage the biosphere, and as such are serious violations of the ecopsychological principles of [*energy* and *relationality*] (Macy and Brown, 2014). Similarly, Gray (1996), arguing against ecocide, cites arrogance, ignorance and greed as contributing factors.

James Hillman's (1995) *Kinds of Power* explores various foundational assumptions of Western culture, including that of perpetual, limitless *growth* [*waste, change*]. Challenging conventional notions, Hillman asserts, "Getting bigger is not always better," and, "Growth has taken on a cancerous tinge" (46-47). His analysis was later supported by world famous naturalist David Attenborough, who told the British Royal Geographical Society, "Anyone who thinks you can have infinite growth in a finite biosphere is either a madman or an economist" (qtd. in Cardwell 2013). Dhara and Singh (2021) agree, explaining why exponential growth is no longer possible despite technological advances. Rather, "*all* resource use curves must be *simultaneously* flatlined

and *all* pollution curves *simultaneously* extinguished" (1). Rex Weyler (2019) agrees: "All genuine solutions to our ecological dilemma must include a contraction of human scale. We must relinquish our expectation of endless economic growth. However, this appears as the one solution ignored by most people, governments, corporations, and even many environmentalists."

Hillman also explores the narrative of *efficiency* as promoting linear thinking and ignoring the unintended consequences (e.g. toxic wastewater from mining operations) [*relationality*]. Hillman's efficiency is directly related to the narrative of *commodification*: the heartless notion that money is the bottom line, and everything must be organized around maximizing financial profit. This highly toxic narrative strips living creatures (including people) of their inherent value; they become a commodity, something to use so that others may achieve desired profit. This ignores the inherent sacredness of life, erasing any relationality or loving care [*diversity, relationality*].

The following three toxic narratives, unfortunately in wide circulation, are all closely intertwined. In the United States, the narrative of *individualism* is particularly rampant [*relationality*]. This idea of the primacy of the independent human—and that everyone can and should be self-sufficient—ignores the fundamental intertwinement of life on Earth. It is closely related to the narrative of *exceptionalism*. Weintrobe (2021) describes exceptionalism as a false belief that one is (or humans are) exceptional and special, somehow more valuable and important than anything or anyone else on Earth. Such exceptionalism supports commodification; they combine to create a sense of *entitlement.* With entitlement, we feel that it is perfectly fine for us to have whatever we want, without considering others. And so, we rearrange our views of reality in order to

support this narrative, such as denying or ignoring the resulting damage to other life. All of these intertwined narratives are actively propagated by advertisers, making consumers feel special and entitled, in order to profit from their purchases. Ominously, Weintrobe also points out that unchallenged exceptionalism tends towards authoritarianism.

Anthropocentrism is closely related to human exceptionalism; it is the arrogant and inaccurate assumption of human superiority and entitlement [*diversity, relationality*]. "We humans—big brained, big footed, overproducing, over consuming, and invasive mammals—have for a long time acted as if we are the only animals who matter. We have made huge and horrific global messes, impacting every environment and ecosystem and all other species" (Bekoff 2014, 3). Anthropocentrism is heavily socially reinforced in Western culture (Weintrobe 2021), but it is clearly disproven by the most basic ecological literacy. Kirsch (2023) points out that humans have traditionally justified our treatment of other animals by invoking our supposedly superior intellectual capacities. This ignores the fact that may animals have "very active and thoughtful minds" (Bekoff 2014, 6). Intelligence manifests in many different forms, and furthermore, suffering requires no intellect. Despite this supposed superiority, "only humans commit atrocities such as war, genocide and slavery" (Bekoff 2014, 42).

Buzzell and Chalquist (2023), discussing biospheric degradation, note that "All of these crises share the disruption of our delusion of being separate from and superior to the natural world" (42). All of these toxic narratives are major contributors to modern humanity's psychological disconnection from the rest of Earth's biosphere. Bekoff (2014) calls this process of detaching our psyche from the rest of nature "unwilding." Weintrobe (2021) dissects a relatively recent cultural process that is certainly congruent with

unwilding. She describes a widespread media campaign of neoliberal government propaganda, beginning in the 1980s. She asserts that these influences "shifted the moral compass by relentlessly encouraging people's ordinary exception" (46), creating widespread entitlement, and a disregard for the resulting destruction of natural systems.

Louv (2008), a well-known champion of children in nature, comments, "Our society is teaching young people to avoid direct experience in nature," and that this cultural bias (narrative), which I would call *biophobia,* is to the detriment of our mental, physical and spiritual health (2) [*diversity, relationality*]. His book, *Lost Child in the Woods: Saving Our Children from Nature Deficit Disorder* is a scathing testament to human disconnection from nature. He explains: "Nature Deficit Disorder describes the human costs of alienation from nature, among them: diminished use of the senses, attention difficulties, and higher rates of physical and emotional illnesses." Furthermore, he states, "as we grow more separate from nature, we continue to separate from one another" (36). Instead, we need "a nature-child reunion." These narratives of nature inferiority justify its destruction, while alienating us from that which we need for our own regulation and balance [*energy, diversity, waste, relationality, change*].

Of course, individualism, exceptionalism, entitlement, and anthropocentrism have been repeatedly disproven by ecology and developmental biology. These studies of holobiontic layers of intertwined life demonstrate collaboration, in the creation and maintenance of ecological organisms. The reality of such intertwined relationships are, unsurprisingly, echoed in the human psyche, as psychiatrist and author Dan Siegel comments: "The mind is both relational and embodied" (2006, 18) [energy, relationality, decay and renewal].

It is unfair, myopic and inaccurate to judge ourselves superior by valuing only our own qualities—a violation of the principles of [*diversity* and *relationality*]. In contrast, an elephant could potentially judge themselves superior because of their fantastic, multi-functional trunks, and their capacity to find water over long distances—that is, if elephants were subject to the same alienation from nature and resulting cognitive errors as humans. Studies of biodiversity and ecosystemic interdependence support a "yes/and" worldview. There is no need to assign a hierarchical value when everything simply occupies a different, interdependent niche, each of them vital for ecosystemic thriving.

Another pervasive cultural narrative adjacent to the toxic four explored above, is that of *intellectualization*: the idea that cognition is superior and masculine, while emotions are primitive, weak, and feminine. This arrogant, dismissive and misogynistic bias, actively promoted by neoliberal thinkers such as Ayn Rand (Weintrobe 2021), can be found everywhere: "The separation of the emotions from intellect begins at an early age," and a cultural pattern of control by force (violence) begins in school; children are punished, medicated or both for strong emotional responses (Stratton 2017, 38). Such bias, of course, violates the ecopsychological principles of [*energy, diversity, relationality*] in that it is a wrong use of energy, inconsistent with the fundamental neurobiology needed by our children; oppresses instinctive or primal ways of being; and doesn't honor diversity or relationship. The reality is that we humans are passionate, emotional and relational animals. Intellectualization is a damaging distortion of our actual physiology and life experience; and as any therapist can attest, the effects of repressing our affect for the sake of conformation to this toxic narrative, is often devastating, particularly over the long term.

> An overemphasis on logical, linguistic and literal thinking may tilt the balance of our minds away from the important sensorimotor, holistic, autobiographical, stress-reducing, image-based self-regulatory functions of our non-verbal neural modes of processing. Linking these two very different but important ways of knowing is the essence of creating balance in our lives and in our understanding of complex human experiences such as trauma. (Siegel 2006, 17)

As Siegel explains, such a balance makes us flexible, adaptive, energized, coherent and stable. Peter Levine (who holds PhDs in animal stress physiology and human psychology) agrees: "…as we distance ourselves farther and farther from our instinctual roots, we have grown to be a species hell-bent on becoming better and better at making life worse and worse. We have been quite successful at distancing ourselves from our vital core" (226) [*energy, diversity, waste, relationality, change*].

There are additional pernicious narratives that emerge from individualism, exceptionalism and anthropocentrism. Max Liboiron (2021) describes what I would call the narrative of *colonial entitlement*: assumed access to Indigenous lands, to be used as a non-reciprocal resource; and that "You can't make and hoard capital without stealing Land first" (13). In this short sentence, Liboiron articulates the origin of today's massive inequities in wealth—which, not incidentally, are deeply involved with ongoing ecocidal practices. "…excellent research describes the sweet trifecta of capitalism, colonialism and pollution" (13). However, this trifecta carries a fatal flaw; as Indigenous people like Liboiron have repeatedly pointed out, it is inherently unsustainable. As John D. Liu (2012) explains in his documentary, *Green Gold*: "The source of wealth is the functional ecosystems. The products and services we derive from those are derivatives. It's

impossible for the derivatives to be more valuable than the source." However, functional ecosystems carry no value in economic theory, but their derivatives are assigned great value. This is a massive yet overlooked flaw in the very design of our global economy. If our illusion of happiness is based on production and consumption, "…we'll turn everything into a desert," Liu adds. In contrast, he points out that true wealth isn't linked to products, but to living healthfully and happily in nature, breathing clean air (Liu 2012).

Indigenous writer Sheri Mitchell (2018) analyzes *just war theory*: the idea that war, with its accompanying violence, ecocide, and genocide, is an acceptable option. She states that we have come to believe that battle and conquest are somehow natural to us. Mitchell points out that we have (failed) wars on terrorism, drugs, poverty; we battle anxiety, depression, our fat, and many other things—failing to consider collaborative approaches. The deep embedding of battle and war in the cultural psyche is even reflected in our day-to-day language. However, as Pallant (2023) explains, the constant narratives of war and fear in our culture unsettle our nervous systems and keep us stuck in the fear response; the message is that "danger lurks everywhere" (113). As such, they point out, it becomes difficult to focus on work and attend to our families—a psychoneurophysiological response which will be explored in detail in the following sections [*energy, waste, relationality*].

These toxic narratives described above are all serious violations of Pye's Five Ecopsychological Principles. They create an artificial, illusory disconnect from—and entitlement to—the other-than-human ecology that creates and supports our very lives. This results in arrogance, unbalanced behaviors, and widespread ecocide for the temporary benefit of relatively few. Such narratives undergird Westerners' mistaken

belief that we are above and not subject to the five principles that create balance, sustainability and ongoing life. In their messages of isolation, hierarchy, violence, and destruction, these narratives are traumatic, to society, communities, families and individuals. They also contribute to the social unacceptability of discussing ecologically based dysphoria, in that they create the perception that the "growth" and "progress" that create ecocide are necessary and inevitable. This communication block in turn increases individual disorientation and dysregulation.

Crook, Short and South (2018) point out that there is now an "anthropogenic rift" between humans and the rest of nature in the Anthropocene; and that its cause is "growth-driven capitalism," because capitalism's organization and demands for unlimited growth in a finite biosphere is inherently anti-ecological (10) [*energy, diversity, waste, relationality, change*]. The fact that these toxic narratives are intertwined with our current practice of capitalism means that they are self-reinforcing and particularly difficult to dislodge; however, they require immediate critical re-examination, and a hefty dose of [decay and renewal]. Liboiron (2021) offers a critical distinction between colonialism (settler entitlement to Indigenous Lands) and capitalism (an economic system focused on increasing acquisition of capital), although they are usually interwoven.

Vulnerability to Toxic Narratives

Why are we Western humans so prone to going along with these grave errors?

Narratives create group expectations and practices, which, along with the autonomic threat response cycle discussed in the next section, contribute to the formation of *implicit memory* patterns. Implicit memory patterns are subcortical, stable, autonomic

responses that originate below the conscious level of awareness (Van der Kolk 2006). Since we are biologically and emotionally interdependent, tribal affiliation and conformation is a survival-oriented behavior. Its prevalence varies somewhat between cultures and individuals, but our interdependence is largely unavoidable. Cultural and familial narratives, and their associated implicit memory patterns, get into our subcortical systems early and deep, when we are very young, before we know anything else. When we are young, most of what our parents say and do just seems like the way things are, to our young, developing minds. “Trauma responses can become conditioned, obfuscating our ability to adequately assess mixed signals of safety and danger and effectively leaving us in a perpetual ‘state of emergency’” (White 2015, 195). Widespread toxic cultural narratives, such as those described above, are a huge contributor to the normalization of distorted, ecocidal behaviors and practices. Furthermore, the pain resulting from larger-level toxic narratives and ecocidal practices becomes privatized to individuals, usually pathologized as “mental illness” or economic poverty that is seen as being somehow deserved.

Individual Psychoneurophysiology

> Trauma has a huge impact on all aspects of our civilization and individual lives. Yet, the reality of trauma is often overlooked in societal approaches to public policy, education, and the resources offered for the promotion of mental health. How can the pain of trauma so often be missed? (Siegel 2006, 16)

> Fundamentally, life is about making our way in the world, and how we do that depends on the hard wiring of our brains. (Van der Kolk 2006, 20)

What are the effects of these stressful and misleading societal narratives upon the nervous systems of individual humans? What happens at the level of an individual person trying to cope with the challenges of modern society?

Lack of Skills in Affect Tolerance and Metabolization.

Modern Western culture and its narratives tend to disregard, invalidate and pathologize people's normal emotional experiences. "We have been trained to avoid feeling or looking too closely at the pain that we carry. If it starts to creep out of its hiding place, we are quick to subdue it" (Mitchell 2018, 65). As our emotions are inherent psychophysiological indicators of threat or well-being—and also provide the richness making life worthwhile—such repression and intellectualization are detrimental to resilience and thriving and thus is a violation of the principle of [*energy*]. Denial or pathologization of others' lived experiences is also a violation of the principle of [*relationality*]. Since we are encouraged to repress our emotional responses rather than confronting them, our culture does not teach essential life skills for living as a permeable, emotional human being. There are many activities, drugs and other distractions available to "save" us in those moments when further repression feels impossible [*energy, waste*].

Affect tolerance is, simply, the capacity of an individual to tolerate emotion (Selvam 2018) [energy]. Affect tolerance usually refers to one's own internal experiences; however, as emotions are "contagious" and shared via mirror neurons, the

ability to tolerate others' affective experiences is also essential [relationality]. My 20 years of practice as a licensed clinician lead me to agree with Selvam's assertion that "the primary task in therapy should be the building of a greater affect tolerance in clients" (1), because this psychophysiological capacity is so indispensable in building resilience. Without affect tolerance, individuals do not develop the understanding, skills, relationality, or psychophysiology to successfully cope with and metabolize difficult experiences. This leads to an emotional backlog built up from decades of repression; and this avoidance and backlog of unmetabolized emotion leads to a different kind of distress, one that lingers far beyond the duration of the original experience [*energy, waste*]. As Mitchell (2018) comments, "But the pain cannot be held at bay; it remains ever-present, stalking us and taunting us. We can never rest, because the pain will find us." (66) Andy Fisher (2013) agrees: "….and so we come to trail a growing bag of unfinished experiences behind us, especially those involving the grief and anger our superegos chide us against expressing" (77). Resmaa Menachem (2017) refers to the stuck pain we repress and avoid as "dirty pain." He describes how allowing oneself to experience "clean pain", the emotional responses to life's difficulties, allows them to metabolize and complete.

People who haven't developed the capacity to face and metabolize their own emotional experiences, will instead develop a toxic, unprocessed buildup that requires a lot of life energy to continue repressing [*energy, waste, change*]. Such chronic repression is believed to be a major contributor to autoimmune illness, the rates of which have soared in recent decades (Mate 2003). Somatic Experiencing refers to this autonomic, involuntary repression as *undercoupling.* For psychodynamic therapists, a closely related concept is *dissociation:* the unconscious and involuntary self-protective disconnection

from intolerably uncomfortable aspects of awareness. The constant strain of dealing with this unmetabolized waste further drains the organism, its resources, its flexibility and adaptability [*energy, diversity, change*]. It also robs us of presence, joy, and the capacity to live a deep and satisfying life. This is so important, it bears repeating: Dissociation not only strains the body but also numbs and disconnects us from the rich experiences of the present moment.

Such emotional skills are not generally taught in schools; it is left up to families, many of whom are burdened by intergenerational trauma and socioeconomic stressors, and therefore scrambling to survive. Such toxic conditions may rob them of the psychophysiological resilience to mentor emotional skills such as affect tolerance [*energy, relationality, waste*]. Most people, pressed by work schedules and other complex demands across areas of their lives, no longer have the psychological downtime to downregulate from and integrate day to day experiences. Casual in-personal social engagement was also severely diminished by quarantine measures necessitated by the COVID-19 pandemic. This life saving measure further increased a pre-existing loneliness epidemic across the Western world. Loneliness and isolation lead to use of screens and social media to meet social needs—further disconnecting us from our inner selves and each other [*energy, diversity, waste, relationality, change*].

A concept closely related to affect tolerance was introduced by noted psychiatrist and author Daniel J. Siegel (2022): Siegel's "Window of Tolerance" refers to the range of autonomic arousal—including emotion— which a person has the capacity to tolerate without losing executive functioning. Within the Window of Tolerance, metabolization of incomplete experiences is still possible [energy, decay and renewal, change]. Some have

described it as the emotional range in which we are able to think and feel at the same time. Within the Window of Tolerance, information can be integrated; sympathetic and parasympathetic arousal remain generally balanced. This Window is dynamic and affected by physical conditions, such as fatigue and hunger. It varies considerably between individuals, with trauma survivors tending to have a narrower window and more difficulties tolerating their own internal states, processing information and calibrating responses appropriate to the current situation (Ogden Minton and Pain 2006) [*energy, waste, relationality, change*].

If we keep our conscious emotional state well beneath this Window, dissociating from and not facing our difficult experiences, then nothing shifts within us. We are also subject to repeated rounds of Menachem's "dirty pain" as the repressed material begins to resurface. On the other hand, if we take on more affective charge than our psychophysiology can handle, thus going above our Window of Tolerance, we are flooded and retraumatized; cognition increasingly distorts, eventually going off-line. "Trapped between feeling too much (overwhelmed or flooded) or feeling too little (shut down and numb), and unable to trust their sensations, traumatized people can lose their way" (Levine 2010, 136). This presents a very challenging bind for the trauma survivor plagued by incompletely metabolized internal experiences.

Kain and Terrell (2018) drew upon their clinical experience to expand Siegel's Window of Tolerance. They have proposed a *faux* Window of Tolerance, in which a person chronically functions outside of their sustainable physiological capacity. In these cases, the autonomic nervous system relies upon external supports, such as alcohol, overwork or screen addiction, to create a distraction or numbing so that the person feels

as though they are downregulating stress and functioning within their inherent capacity. However, in reality, they are still stuck in chronic stress and activation. A person chronically functioning with a faux Window of Tolerance might say something like, "I'm just fine so long as I have my two glasses of wine after work!" People can function in chronic dysregulation for so long that they do not know the difference. In cases of severe developmental trauma, they may never in their life have truly dropped into their Window of Tolerance, or a state of full presence and embodiment. It is crucial to recognize that someone who does not regularly experience good self-regulation tends to lack the felt experience to understand what they are missing, and often thinks they are "just fine":

> This is not regulation, but it will sometimes feel that way to clients who have not experienced genuine and sustained self-regulation. …they chronically operate beyond their threshold of regulation. Because they don't have access to genuine self-regulation, they will come as close as they can by applying defensive accommodations. (134)

Increasing our affect tolerance, that is, widening our Window of Tolerance, is a psychophysiological capacity that must be built over time, with guidance and support [energy, decay and renewal, relationality, change]. A key foundation of Levine's Somatic Experiencing solves the dilemma of repressing vs. flooding. *Titrated exposure* refers to supporting trauma survivors to access manageable bits of their psychophysiological experiences. This involves guiding the trauma survivor to touch into the pain, briefly experience it, and then move their attention back towards a felt sense of safety. The intensity of traumatic material, and the amount of time spent with it, gradually increase as the survivor's psychophysiological capacity to metabolize it increases [energy, diversity,

decay and renewal, relationality, change]. Without opportunity or guidance for such "workouts", our Window of Tolerance remains narrow, our backlog of "dirty pain" ever growing [*waste*].

The general lack of affect tolerance and resulting lack of emotional intelligence in Western culture drives a widespread buildup of undischarged autonomic activation and emotional residue [*waste*]. This in turn drives distress, avoidance [*energy, change*], and imbalanced, distorted behaviors including addiction, overconsumption, and other varieties of short-sighted selfishness [*waste, relationality*].

Modern Western humanity has failed to think its way out of ecocidal behaviors, because survival physiology inevitably over-rides cognition. We must think *and* feel our way out of these terrible patterns, and this means putting the love back into our day to day lives and our relationships with other species [energy, diversity, relationality]. It also means facing the damage we are causing and the deep pain that results (Buhner 2022). As Mitchell (2018) comments, pain is an amazing teacher; it provides a strong signal that tells us where and when [change] is needed. Long-term avoidance and repression of our pain shuts off the warning signal that would motivate us to needed action. Such repression is a violation of the principle of [*waste*] because it wastes opportunity for decay and renewal of old stuck traumatic residue in the system; wastes opportunity living a life unencumbered by this residue; wastes opportunity for needed change—increasing self-regulatory capacity; and the resulting behaviors often create relational or ecological waste. Individually and collectively, such avoidance blocks our own maturation and growth; it also inhibits return to planetary equilibrium. In contrast, Peter Levine (2010) describes how access to emotional memory can serve as our ally. Such powerful energies

permit us to sustain difficult but necessary change. This moves us past the faltering of cognitively held goals, which are easily overwhelmed by subcortical structures.

Synergistic Effect: Overwhelm.

Given all of the above, it is unsurprising that modern humanity faces a plethora of deep and terrifying problems created by ourselves. Every day, we are assaulted with reminders and experiences of our collective problems: the housing crisis; recession; racism; sexism, gender- and disability-based discrimination; a global pandemic; unemployment; health problems caused by our toxic ways of life; traffic jams; litter; a widespread epidemic of loneliness; lack of access to healthy food; unresponsive customer service; lack of access to health care; war; homelessness; substance addiction; funding and philosophical crises in education; and widespread political corruption. Such a plethora of problems creates pervasive distress, including a collective atmosphere of disconnection and hopelessness (Doppelt 2023). We are distracted from felt connection with all that is good, right, and beautiful, within ourselves and in the world around us.

Worse, the enormous disruptions looming from the global climate crisis are highly likely to drastically increase this collective sense of overwhelm. “Everyone will be impacted. This is a population level problem.” There will be “cascading disruptions” to the systems people rely on for our basic needs (Doppelt 2023). Sociologist Kai Erikson (1994) defines *community trauma* as “a blow to the basic tissues of social life that damages the bonds attaching people together and impairs the prevailing sense of community.” There is “a gradual realization that the community no longer exists as an effective source of support and that an important part of the self has disappeared”

(Erikson 1994, 233). Doppelt (2023) adds: “Pervasive traumas feed on themselves and can create epidemics.” When traumatic events are “severe, widespread, cumulative and prolonged,” such as those resulting from climate change, different management approaches are needed; the standard previous approaches to single event trauma do not work. Unfortunately, community traumas are not well understood by most people, including public servants; without this understanding, our collective capacity for effective response declines substantially (Doppelt 2023).

This collection of societal problems also violates all of the Five Ecopsychological Principles. For example, such drastically uneven access to resources such as food, health care, education and employment opportunity violates the principles of [*energy* and *relationality*] because of the artificially uneven access created by current socioeconomic systems, and the associated lack of care for others. It creates needless waste in the form of wasted opportunities and wasted lives, violating the principle of [*waste*]. Political corruption is another excellent example of violating the principle of [*decay and renewal*], in that nonfunctional systemic elements are artificially protected from being discarded and renewed; this creates [*waste*].

Additionally, the media floods modern humans with information about our destruction of the world; however, there is no corresponding information about how to nurture it (Kimmerer 2015). I would add that there is little to no mentoring about how to get through any of this; these stressors are mostly normalized and undercoupled. This whole picture reveals how completely modern humanity has attempted what is actually impossible—to depart from the five principles governing all terrestrial life. As Bekoff (2014) comments, “Most people run within very narrow worlds, so that they never feel

and can't imagine that all people are connected and that human life is completely dependent on nature's health" (34). However, such departure is a deadly illusion; we too are products (and creators) of the biosphere. We should neither attempt nor even want to escape our right relationship with the rest of the biosphere.

The large imbalances stemming from societal toxic narratives, and the resulting societal problems, combined with the inability to face and metabolize our inner experiences, creates a massive onslaught of synergistic pressures on communities, families and individuals. This negative synergy of cumulative complex stressors tends to cause chronic overwhelm, severely reducing or removing our capacity for effective, timely response (Fern 2020). Basically, we just decompensate:

> One of the most robust findings of the neuroimaging studies of traumatized people is that, under stress, the higher brain areas involved in executive functioning—planning for the future, anticipating the consequences of one's actions, and inhibiting inappropriate responses—become less active…Traumatized adults are prone to revert to primitive self-protective responses when they perceive certain stimuli as a threat. (Van der Kolk 2006, 23)

Hill (2023) agrees, pointing out that: "All other functions are dependent upon the fact that our affect state is regulated." He continues, "Everything mental rides on top of a regulated homeostatic system." Such massive, pervasive and inescapable stress throughout society impacts everything, including family life and parenting. This creates loops of dysregulation resulting from, and contributing to, intergenerational trauma. [*energy, waste, relationality*]

Kain and Terrell (2018) describe a physiological phenomenon they have observed in their clinical work, helping individuals with severely dysregulated nervous systems: "…when access to safety is so lacking, dysregulation becomes pervasive, to the point that it sets the foundation for development of the person as a whole—what we are calling *foundational dysregulation*" (76). In people with foundational dysregulation, the autonomic nervous system is trying to adapt to complex and multiple stressors. Ultimately, the body is unable to organize, causing it to actually work against itself. They describe a lack of *coherence* between tissues when they are not working together as a cohesive whole for the benefit of the entire organism. They note that this phenomenon stems from developmental trauma, fundamentally overlapping with disorganized attachment—which is shaped by early caregivers, who are in turn carrying their own trauma history and current allostatic load. This concept of foundational dysregulation on the collective level could potentially be driven by a mechanism suggested by Abutyn's (2023) paper proposing the existence of social trauma. He notes that the resulting social pain is observable in our individual neurophysiology, and that it is driven by our capacity to affectively attach ourselves to a wide variety of physical and abstract objects. This is at least as important as physical pain: "The personal becomes collective, saturating and priming the individual's self for the experience of social trauma, or collectivized social pain" (12).

Polyvagal Theory: A Deeper Exploration of The Human Autonomic Nervous System.

> Though typically not mentioned in studies of the nervous system, the context of colonialism and power-over culture is essential to understanding the mechanics of the modern human nervous system. The social systems that we have built are collapsing and the lack of a social safety net is impacting more and more people. We are all traumatized to some extent. Global warming, a pandemic, all of the -isms — these are danger signals to the body and it is very human to have overwhelming stress responses to these things. To ignore these aspects of our reality in the conversation about the nervous system would be a dire mistake. (Elisabeth 2023)

In order to solve these deep and entangled conundrums and find better ways to express ourselves in the world, we need to understand the functioning of our own unconscious minds—specifically, our autonomic nervous systems.

Stephen Porges' Polyvagal Theory (2011) is a complex and technical deep-dive into the functioning of the autonomic nervous system (ANS). Whether or not proponents of Polyvagal Theory are specifically aware of it, the theory is inherently ecopsychological. The mammalian autonomic nervous system has undergone millions of years of evolution: shaping and adaptation of automatic organismic survival responses to biospheric and ecosystemic conditions. As such, the responses predicted and explained by Polyvagal Theory direct organismic psychophysiological [energy and change] in response to biospheric [energies and changes], evaluating and responding to whether or

not they support our ongoing life processes. Mammalian organisms must respond to the [diversities] of environmental and social conditions, and the various relationships [relationality] between creatures and environmental elements. The fact that these autonomic responses have neuroplasticity, the capacity for change in response to environmental conditions, demonstrates the principles of [decay and renewal] and [change].

Porges's (2011) seminal book can be difficult to digest for readers unaccustomed to scientific papers, so the following is the way I explain the basics to my therapy clients. Our ANS consists of a specific set of nerve pathways, which interact with all of our major muscles and organs, including facial and vocal muscles. The ANS operates mostly below the level of consciousness; although if we stop and notice, it "talks" with us every moment of our lives, using what Levine (2010) calls the "language of sensation" [energy, diversity, relationality]. Such "language" includes muscular tension, movement impulses, temperature changes, tremors, and physical sensations such as fluttering, itching, prickliness, high charge energy, etc. The language of sensation paired with the accompanying interpretation from our limbic system is what produces the experience of affect, or emotion.

One of Peter Levine's many outstanding contributions to the field of trauma therapy is his SIBAM model (2010). The SIBAM model explains how sensation (S), image (I), affect (A), behavior (B), and meaning (M) form the basic "channels" of human experience; and how an understanding of their relationships provides essential guidance in untangling traumatic experiences [energy, decay and renewal, change]. Levine's

SIBAM "channels", which draw on Eugene Gendlin's "felt sense," make up the language of our ANS. In so doing, they provide a vital interface for therapeutic intervention.

The ANS is divided into two branches: the sympathetic nervous system (SNS), responsible for fight and flight states; and the parasympathetic nervous system (PNS), responsible for rest and digest states. When we discuss the PNS, we are mostly talking about the vagus nerve, the longest nerve in the body. It has two branches, one that originates more towards our back (the *dorsal vagal* branch) and another that is thought to have evolved more recently; it is more towards the front of our body (the *ventral vagal* branch). The dorsal vagal branch is unmyelinated, meaning it lacks the fatty sheath that speeds response times. The ventral vagal branch is myelinated. Corresponding to these three major autonomic branches, our ANS essentially has three modes of functioning, which profoundly influence our day-to-day experiences and behavior.

The *social engagement* mode is our baseline. It is also known as the *ventral vagal* mode, a reference to the neural pathway with the most tone when we are in this mode. (*Tone* refers to the rate of neural firing; increased neural tone along a neural pathway means that pathway has a higher rate of firing.) In social engagement, the highest rate of neural firing is along the front portion of the vagus nerve; we are calm, embodied and fully present. We can enjoy the present moment. Our cognitions, emotions and behaviors are situationally appropriate, not distorted by unmetabolized prior experiences. Our blood pressure, temperature and respiration are in a normal range. Ogden, Minton and Pain (2006) have mapped Siegel's Window of Tolerance model onto the Polyvagal Theory; they point out that the ventral vagal/social engagement state is our optimal arousal zone, inside of the Window of Tolerance [energy, diversity, relationality].

Once our brain's limbic system detects a potential threat—which Porges refers to as the *neuroception* of threat (or, at other times, of safety)—it starts up a specific sequence of responses known as the *threat response cycle* (Levine 2010) [energy, change]. The threat response cycle is characterized by a narrowing of perspective, which reduces our ability to perceive or focus on anything unrelated to the perceived threat. The triggering of the threat response cycle is precognitive, instinctual, and highly shaped by the individual's previous experiences. As every situation is different, stuck unmetabolized responses to previous stressful experiences are often inadequate for current situations. This is a major reason why our emotional signals can lead us astray [*energy, waste, relationality, change*].

Triggered by the neuroception of threat, the sympathetic nervous system (SNS) activates [energy]; the PNS will decrease its tone, effectively "getting out of the way" of the SNS. Depending on the specific nature of the threat perceived, the SNS will produce an increasingly high-charge arousal, drawing upon the organism's energy reserves and creating a strong desire to either *fight* (defend boundaries or territory) or *flight* (quickly remove oneself from the situation). In the mapping proposed by Ogden et al (2006), these fight or flight responses represent hyperarousal. Some hyperarousal is containable; however, increasing hyperarousal will eventually result in an activation state above the Window of Tolerance.

If, however, the organism is overwhelmed and judges that fight or flight will not be effective responses in a particular situation, the more primitive branch of the PNS will also become active. This simultaneous activation of the SNS and PNS creates a *freeze* (immobility) response. In polyvagal terminology, the freeze response is also known as the

dorsal vagal response—again, referring to the branch of the parasympathetic vagus nerve most active during this state. Low tone (that is, low firing rate along a neural pathway) dorsal vagal activity is responsible for digestion, whereas high tone dorsal activity—triggered during high tone SNS arousal—puts us into a state of increasing immobility. This is basically a "wait until the problem goes away" strategy; and, if the threat doesn't go away, the accompanying disconnection and numbing will protect the organism from much of the terror and pain. The freeze response is normal, nonpathological and adaptive for brief periods of stress [energy, relationality, change], but *not* as a stuck response to daily living. In the wild, nonhuman animals tend to "shake off" this stress, quickly metabolizing it and "resetting" their nervous systems for the next encounter. In the human world, however, the more complex and enduring circumstances create a tendency for the traumatic residue to remain stuck and incomplete in the ANS. This is the physiology behind survivors of childhood sexual abuse reporting that they watched the assault happening from above, as though they were floating near the ceiling. It is also the reason that numbing our distress also robs us of joy, creativity and the experience of a deep and meaningful life. According to Ogden et al (2006), this hypoarousal represents being below our Window of Tolerance. Both SNS and dorsal vagal PNS arousal impair executive functioning and distort cognition. Again, this innate response is adaptive in dealing with short-term survival issues. It becomes maladaptive when it remains unmetabolized and stuck, unduly influencing our responses to new situations [*energy, diversity, waste, relationality, change*].

It is vital to note that these arousal states are not discrete; rather, they blend together. Dorsal vagal hypoarousal almost inevitably has a high tone SNS charge

"waiting under the surface," to be expressed once the dorsal vagal tone decreases. This leads to the phenomenon Somatic Experiencing therapists refer to as "coming out of freeze": a challenging time in therapy arising once the dorsal vagal (freeze) response begins to recede. The individual is faced with a lot of high charge arousal and the imprints of previously repressed unpleasant experiences that need to be gradually metabolized in order to re-establish equilibrium [energy, decay and renewal, change].

If these fight, flight and/or freeze responses are greater than the individual's window of tolerance, then they are likely to become repressed, ignored, and numbed, creating stuckness and the lack of flow, metabolization or integration [*energy, waste, change*]. It is vital to note that the freeze/immobility response occurs along a spectrum. Somatic therapists have long been aware that many people live the bulk of their lives in what has been termed a "functional freeze": with sufficient unmetabolized distress to require repression and numbing, but not enough to require shutdown of the entire organism.

Since many of us have so little in the way of emotional support and/or affect tolerance, we become stuck in the dysregulation of the chronic stress response—which then feeds and is fed by happenings on larger social levels. *This is why we can't think our way out of the tremendous problem of global ecocide.* All of these conditions—toxic narratives, developmental and attachment traumas, poor affect tolerance, overwhelm, and our polyvagal wiring—prevent the development of *vagal braking*, that is, the capacity of the parasympathetic nervous system to reduce systemic fight/flight freeze response, returning to proportionate, effective defensive responses, or social engagement. This capacity for downregulation is not active in the infant or young child. It is developed

throughout childhood through myriad interactions, in the context of healthy attachment and generally non-traumatic societal conditions. The fact that parental attachment styles and societal conditions vary widely, is a huge factor in why some people have more resilience than others. On a large, public scale, we can see these factors combining to create widespread disconnection from the greater-than-human world. So, such disconnection becomes a positive feedback loop, creating ever greater cycles of stress response cycle, distorted behaviors and distress. “None of these extreme physiological responses are compatible with logical thought, social connectedness, or a balanced response to our environment and others in it” (Kain and Terrell 2018, 82).

Polyvagal Theory in The Context of Ecocide.

A working comprehension of our autonomic under-wiring, afforded to us by the Polyvagal Theory, provides a very useful lens for exploring the different varieties of ecologically related dysphoria in Western cultures. Severe, subcortical stress, often frozen into place by low affect tolerance and overwhelm, is a typical response to the Inescapable Attack of ecocide, as well as to the multitude of related pressures caused by and reinforcing the toxic narratives [*energy, diversity, waste, relationality, change*]. Furthermore, the inherent dysregulation produced by such extreme stressors, well outside of our Window of Tolerance, tends to perpetuate ecocidal practices and preclude necessary change.

It is important to emphasize that this section discusses fight, flight and freeze responses that are disproportionate and stuck, due to the influences of chronic stress, dysregulation, overwhelm, and community trauma described above. Stuck and

unmetabolized stress responses are a violation of the principle of [*decay and renewal*], in that the nervous system, lacking needed supports, cannot metabolize them. Then, the life energy associated with the stuck response is not available for new responses more efficiently calibrated to the current situation; this in turn represents a [*waste*] of opportunity and life energy. These inherent self-protective responses need to have time and support to be completed and cleared, their stuck energy discharged from the autonomic nervous system, so that they are not hanging around creating trouble. Therefore, these responses, while predicted by Polyvagal Theory and generally non-pathological, are in fact inefficient; they are improperly calibrated to the complex, pervasive and overwhelming demands of the present day. In practice, there is a fine line between non-pathological autonomic responses that are not quite sufficient to deal with current circumstances, vs. an adaptive response that efficiently mobilizes a person towards needed change. This is where support and attunement from others is essential. Proportionate and well-calibrated fight, flight and (time-limited) dorsal vagal responses are both adaptive and necessary for motivation and mobilization. The recommendations and protocol at the end of this paper are designed to help restore adaptive mobilization, a response to ecocide from a polyvagal perspective [energy, diversity, decay and renewal, relationality, change].

Many authors offer basic descriptions of several different categories of ecologically based dysphoria. Pihkala (2023) describes the varieties of ecologically based dysphoria and responses to ecocide: worry and fear; horror, terror, dread and panic; grief and feelings of loss; anger; feelings of injustice and indignation; frustration; guilt, shame and disgust; expectation and enthusiasm (5-7). Buhner (2022) describes his own

ecologically based dysphoria in detail; he includes a list of over 40 different affective experiences in response to ecocide. Edwards and Buzzell (2009) described several predictable stages of ecologically related dysphoria they have observed in their therapy work as individuals gradually "wake up" to (or come out of freeze around) the realities of biospheric destruction: denial, awakening, shock, despair, and empowerment [energy].

These dysregulated states consistently arise in the context of ecocide and biospheric destruction, the dysregulation deepened in the presence of multiple other stressors. Such toxic external conditions tend to push individuals outside of their Window of Tolerance. This results in observable categories of behavior related to ecologically based dysphoria. However, these emotions and behaviors can be understood and shifted, using the principles of Polyvagal Theory. Such affective and behavioral states are subcortically driven and generally impossible to manage with executive functioning. Furthermore, under conditions of chronic stress, we cannot distinguish between "I was being threatened," "I might be threatened" and "I am being threatened NOW" (Van der Kolk 2011) [*energy, diversity, waste, relationality, change*].

The Fight Response.

The fight response is characterized by high SNS arousal, combined with the limbic (midbrain) interpretation that aggression will afford the best chance of survival. It is a known response to ecocide (Davenport 2017) and, in its dysregulated, disproportionate form, also an ongoing cause of ecocide. What does this fight response look like in this context?

Chronically stuck, dysregulated fight response tends to be reactive, excessive, and partly or entirely below the level of executive control. High charge SNS arousal directed towards fight inherently involves a dissociation from relationality in favor of immediate survival. Such abandonment of relationality is necessary if someone or something is immediately physically threatening our life. However, as a stuck generalized response to a complex global situation requiring dialogue and cooperation, this distorted [*energy*] is ineffective and damaging, a violation of the principles of [*energy* and *relationality*]. Such energy blocks needed [*change*]—violating that principle also. "Our trauma response is in the business of self-protection, not the business of complex problem solving" (White 2015, 195; Doppelt 2023). This preclusion of cooperation is a huge and pervasive obstacle to Macy's "Great Turning" away from ecocide and towards ecologically sound behaviors.

Selfishness and lack of responsibility to others are, unfortunately, reinforced by widely circulating toxic narratives promoted by unfettered capitalism, such as individualism, exceptionalism and commodification. As such, these toxic narratives support chronic dissociation from relationality. They may cause perpetuation of selfish, aggressive behaviors well beyond those necessary as an immediate survival response. Indeed, Doppelt (2023) comments that "continual activation of the limbic system caused by relentless stresses and traumas are also blocking climate solutions," because people go into fight, flight or freeze responses, opposing things that might seem threatening to them, but entirely missing the larger picture of what is needed to emerge from the crisis.

Behaviors often associated with the fight response include a variety of forms of aggression and acting out: anger, rage, indignation, irritability, dismissiveness; boundary

crossing; crime, violence, lack of accountability, and many varieties of selfishness [*energy, diversity, waste, relationality, change*]. When accompanied by high SNS arousal, this dysregulated fight response leaves the person insufficiently grounded to enable working towards long term goals. Furthermore, dysregulated aggression is inherent to abusive conduct towards others (human or nonhuman). Human recipients of abuse often respond with overwhelm, fawning, and shame, which involves freeze physiology, a substantial contributor to our collective stuckness around ecocide (see related sections below).

Low affect tolerance is a frequent precursor to disproportionate fight response: When we do not know how to be with the pain, we act it out on someone else (Mitchell 2018). As Davenport (2017) comments: "Those who have difficulty tolerating emotional vulnerability are more likely to lash out. If an individual is feeling weak or powerless, anger can make them feel stronger" (59). This is particularly true in the case of shame, arguably the most painful of human emotions (shame will be explored in detail below).

Fisher (2013) eloquently describes how a stuck fight response can appear as *nihlism*: He describes how, in our spiritually devoid, consumeristic culture, it is easy to lose a sense of true meaning.

> When there is no contact, participation, or experience, there is no meaning. By contrast, for many of those who have indeed spent a life in open contact with nonhuman beings, the natural world is peopled with beautiful and mysterious others deserving of respect and solidarity. (87)

Violence often originates from repressed aggression combined with an inner sense of impotence: "…acts of rageful violence can be seen, in part, as desperate attempts to

assert one's existence or personhood, so as to defend against the painful feeling that one is a nothing, or a nobody" (88). When humans experience a feeling of not belonging, or not mattering, we are capable of terrible acts of violence and destruction. For those witnessing acting out behaviors inexplicable from one's own privileged point of reference—particularly when the acting out occurs in chronically disempowered individuals and populations, impacted by the relentless inescapable attack of community trauma, poverty and/or racism—this understanding is utterly essential [diversity, relationality, change]. When applied to populations with higher socioeconomic status, this understanding may also explain the appeal of exceptionalist thinking and entitlement, as compensation for possibly insufficient developmental supplies and low self-esteem.

Narratives supported by stuck fight response would include those embraced by the "prepper" community: the mentality of resource hoarding and "everyone for themselves," rather than the communal approach—diversity, relationality and exchange—needed to overcome these problems.

Alternatively, a dysregulated, eco-dysphoric fight response may potentially include eco-terrorism: violence directed against those perceived to be committing ecocide. Such acts are not effective in halting systemic ecocide, instead evoking negative attitudes towards the environmental movement. Furthermore, contrary to the prevailing mythology, it is impossible to solve enormous and pervasive problems such as ecocide with dysregulated responses and the same sort of violence that initially created it [*energy, diversity, waste, relationality, change*].

One important thing to remember about anger and the fight response is that a well-tuned fight response is extremely useful in provoking mobilization out of the freeze

response [energy, change]. The challenge is to help guide the anger, so that it becomes well-regulated and well-attuned to the specific details of the particular threat. Anger contains an imperative, a strong need to defend one's boundaries and those of one's close relations. Like all subcortical drives, it must be well regulated, responsive to cortical inhibition, and balanced with a basic sense of [relationality], in order to be helpful rather than harmful. Somatic Experiencing Practitioners refer to the capacity for a well calibrated, non-dysregulated fight response as *healthy aggression*. It involves just enough fight response to effectively stop the threat, and no more than that. Indeed, Contreras et al (2023) conducted a survey of the ecologically related emotions (or "eco-emotions") of 102 participants. The researchers found that "eco-anger", or anger in response to ecological crises, was the only reliable predictor of environmentally supportive behaviors over time. Their results highlight the importance of this vital survival energy in resolving anthropogenic ecological crises.

The Flight Response.

The flight response, like the fight response, is characterized by a heightened SNS charge; in flight response, it is combined with the subcortical interpretation that the organism's best chance of survival is to flee. The associated emotion is fear. The popular term "eco-anxiety" is the most well-known example of the flight response in relation to ecocide. However, in the case of biospheric collapse, there is literally nowhere to go, ensuring that such flight response will remain stuck. This stuck high charge SNS arousal is a waste of the person's physical energy and a waste of the opportunity to live a calmer and presumably happier life. Furthermore, it is not physically or emotionally healthy to

carry stuck flight response in one's nervous system over the long term. Thus, the condition of having stuck autonomic flight response violates the ecopsychological principles of [*energy, waste,* and *change*]. The stuck stress response creates a change wherein the person is out of natural balance and thus out of right relation to the environment and ecology. Due to the narrowing of perspective associated with the physiology of the threat response system, persons stuck in high charge flight response to ecocide may actually be *less* likely to choose ecologically and relationally sensitive behaviors, because of the immediate biological imperative of individual survival physiology.

Indicators of being stuck in the flight response include: existing in a state of high anxiety; restlessness, easily startled; panic attacks; difficulty concentrating, insomnia, restless leg syndrome, and other characteristic indicators of anxiety. Eco-dysphoric individuals may be preoccupied by news stories detailing ecological devastation; or they may fervently avoid exposure to such news. They may experience nightmares or doom-filled fantasies related to ecological collapse. Some will feel stuck, powerless and unable to do anything about the problem; others may over-function past their Window of Tolerance, leading to ineffective actions and activist burnout. Narratives supported by a stuck flight response would include those of hopelessness, powerlessness, fear, and paranoia—all clearly ineffective for defending ecosystems against ecocide or affecting systemic change [*energy, relationality, change*].

Fern (2020) characterizes chronic eco-anxiety as a preoccupied attachment to the Earth, likely triggered by others' dismissive Earth attachment—witnessing others' attitudes towards Earth as a means to an end, or a place to throw one's garbage. Insecure

attachment in babies is an adaptive response to insufficient caregiving; it is never the baby's fault. As such, we can see preoccupied Earth attachment as a predictable adaptation to current global biospheric conditions.

The midbrain of each individual, shaped by previous life experience, selects the threat response (fight, flight and/or freeze) that it gauges as most adaptive to current circumstances. Therefore, we would expect the experience of eco-anxiety to differ between socioeconomic groups. Indeed, Achtitah and Mentak explain:

> The eco-anxiety one feels as a response to a global threat differs in degree or intensity from one individual or group of people to another. The degree of emotional distress is often related to how directly and perceptibly one's environment is threatened (Gifford & Gifford, 2016). The effects of the pandemic, or any other global disaster, fall disproportionately on those with less economic privilege and social status." (93)

However, they also note that social media spreads eco anxiety even to those not directly affected (91); and can also be "a major source of rumors and false information" with "no exception, and without being self-contained or restricted" (90). That is, the media demonstrates observable symptoms of foundational dysregulation, and is not acting coherently in its societal and systemic function. [*energy, waste, change*].

Since our society demands functioning at the expense of emotional health, another place we can look for the effects of eco-anxiety will be as a silent contributor to autoimmune illness. Mate (2003) provides copious documentation and explanation of how stuck stress responses are implicated in autoimmune disorders [*energy, waste, change*].

The more we ignore the imperative message of fear—the need to mobilize—the higher the SNS arousal goes. This escalating SNS arousal in turn increases the likelihood that the fear will begin to blend with the freeze (immobility) response, leaving us increasingly stuck and unable to face the consequences of our actions. This leads to lack of action and a resulting worsening of biospheric degradation [*energy, change*]. Indeed, Heeren et al (2022) found that, in over 2,000 European and African French speakers, eco-anxiety was associated with pro-environmental behaviors—attempts to address the looming threat—*unless* the distress was excessive, which they called "eco-paralysis." In other words, eco-anxiety greater than the individual's Window of Tolerance reduced study participants' attempts to respond to ecocide [*energy, waste, change*]. Thus, overwhelmed individuals suffer "eco-paralysis," with the result that the internal experience of eco-anxiety and the actual environmental threat both increase. "Eco-anxiety is a misnomer. it is eco-*fear*: rational, realistic fear for our waning chances for surviving as a species on a planet undergoing rapid transformation" (Buzzell and Chalquist 2023, 43).

The Freeze Response.

> For human beings the best predictor of something becoming traumatic seems to be a situation in which they can no longer imagine a way out; when fighting or fleeing is no longer an option and they feel overpowered and helpless. (Van der Kolk 2006, 24)

> There are so many things I care so deeply about, and I feel so powerless to do anything to help any of them. —Anonymous personal communication to author 9/2/23

When a stuck SNS charge becomes high enough, greatly exceeding the individual's window of tolerance, the dorsal vagal branch of the parasympathetic nervous system responds by increasing its tone. It over-rides the high SNS arousal, resulting in an overall experience of hypoarousal that we refer to as the *freeze response*.

Individuals experiencing a freeze response will demonstrate and/or report numbing, non-responsiveness, sluggishness, "brain fog", reduced ability to think or concentrate; or even a system-wide immobilization and shut down. Their cognitive and emotional responsiveness are impaired or, at worst, inaccessible. "When hypoaroused…clients suffer another kind of torment…a numbing, a sense of deadness, emptiness, passivity, possibly paralysis; and or too distanced from the experience to be able to process information effectively." Top-down regulation is compromised and meaning making becomes biased; their capacity to respond optimally is severely compromised. (Ogden Minton and Pain 2006, 65). This last-ditch survival response becomes stuck and chronic; it violates the principle of [*diversity*] because it robs the person of their capacity to enact a variety of responses to diverse situations and stimuli. It wastes their capacity to live a deeply felt meaningful life [*waste*]. What might this spectrum of freeze and immobility responses look like in the context of ecocide?

Many people impacted by high tone dorsal vagal influence will report emotional numbness. Living in such a state violates the principles of [*relationality* and *waste*]

because of the wasted opportunity for passion and deeply felt relationships—important ingredients in a meaningful life. People stuck in a dorsal vagal state present with low energy and motivation [*energy*], greatly reducing their capacity to take on anything outside of immediate necessity, particularly something as complex as social change or ecological preservation. Alternately, they may be high functioning, having selectively dissociated from particularly painful topics (like ecocide), pouring the underlying SNS arousal into other activities, such as work addiction [*energy, relationality, waste*]. Others are generally well regulated, only collapsing in the presence of particular triggers (e.g. when exposed to information about ecocide). Persons experiencing a substantial degree of freeze response are likely to espouse narratives of just getting through the day, or waiting for the problem to go away. As Pallant (2023) comments, "Doing nothing [about ecocide] means I've resigned myself to a sinking ship," and that resignation is exactly the emotional state created by the freeze and immobility response [*waste, change*]. As a freeze state deepens, we become" impervious" to social cues in our shutdown, even those we would have welcomed under less distressing circumstances. Shifts in our physiological state create different responses to the same stimuli (Van der Kolk 2006, xiv.) [*relationality*].

People who have experienced developmental trauma may be particularly prone to going into the freeze response as a primary line of defense. It is the most adaptive response in young, powerless children, who are completely dependent on the relationship with their caregiver and thus need to numb the intense pain associated with abuse or unmet needs [*energy, relationality, waste, change*]. Van der Kolk (2006) comments, "The essence of trauma is utter helplessness combined with abandonment by potentially

protective caregivers" (24), illustrating the need for a child to adapt to circumstances created by—or experienced by—their parents. If this hopelessness continues, an affected person may develop alexithymia: a chronic state of being out of touch with one's own emotional and bodily states and needs [*energy, relationality waste*]. Individuals impacted by this adaptation also tend to have difficulty attuning to others' states and needs—illustrating how the adaptation predicted by polyvagal theory directly gets in the way of potential solutions to ecocide and the biospheric crisis [*energy, relationality, change*].

As Renee Lertzman (2020) points out, a lot of stuckness around the problem of ecocide is invoked by the perception of being in a bind: "damned if you do, damned if you don't." Such binds are a classic example of stimuli that tend to provoke a freeze response. Modern bureaucratic systems are vast and seemingly impenetrable. In their mindless, nearly unstoppable inertia, they demand so much of us every day, even when we are not actively fighting them to effect change [*change*]. This is a direct pathway to the freeze/immobility state as a response to ecocide. We turn away from the news, eat something, drink something, or call someone on the phone to share the latest gossip. When internal states become intolerable, we look for regulation wherever we can find it [*energy, waste, change*].

Immobilization may feel like the best response to get through the day; but as a response to a complex global trauma threatening life as we know it, it is highly ineffective. Indeed, Pihkala (2024) notes that inhibited ecological grief, such as that involving a freeze response, has been noted as a major cultural and environmental problem, in that "people suffer from the lack of emotional flow" (26) and this state tends to inhibit engagement with sustainability efforts. In Polyvagal terms, disconnection and

numbness inherently silence the feedback signals—our emotional distress—designed to tell us that something is wrong and desperately needing our attention [*energy, relationality, waste, change*]. Chalquist (2023) describes that hopelessness is a child's position, a defense against pain from the state of the world, and in adults, it becomes an excuse to not take action. As a remedy, Chalquist invokes Macy's concept of *active hope*: refusing to accept that this is how things are going to be; and taking responsibility to do something about the problem [energy, relationality, composing and renewal, change].

At the same time, it is vital to recognize that the unfathomable scale of the ecological devastation related to ecocide is nearly beyond human comprehension. It is too much to take in, in its entirety. Therefore, I find it likely that most of us will actually need some degree of disconnection and numbing in order to hold off overwhelm, thus preserving our capacities to function effectively in The Great Turning. However, our nervous systems cannot be dominated by a state of complete numbing and immobility. Again, such distinctions are subtle, but vital.

Shame.

Shame is the primary affective response accompanying the dorsal vagal state of freeze and immobility. It is an arresting emotion, triggering the physiology of collapse, stillness, and wanting to hide. Healthy shame inhibits antisocial behavior and supports pro social behavior; it is time limited and accompanied by relational repair with others. Learning to bear healthy shame supports affect tolerance and a sense of belonging (Kain and Terrell 2018) [energy, diversity, decay and renewal, relationality, change].

Because stuck, toxic shame is so excruciatingly difficult to bear, it is often repressed, thus exerting its effects below the level of consciousness. Shame involves the immobility of the freeze response and, like the freeze response, is intended to be time-limited, not chronic. It is perhaps our most painful emotional state (Fisher 2013). Its psychophysiological purpose is to stop us in our tracks, so that we do not do something terrible or irreversible. In human cultures, shame needs for interpersonal repair to happen quickly, so that the shame doesvnot stick around, becoming stagnant and toxic. Interpersonal repair requires a willingness to listen, affect tolerance, and accountability, all of which comply with the principles of [energy, diversity, relationality, decay and renewal, change]. However, as described above, these skills are becoming increasingly rare in the modern world. This scarcity and the resulting common buildup of painful shame is thus a violation of all five principles. In the absence of supportive relationality, the stuck emotional energy is not broken down and renewed; and the stuck, repetitive affect inhibits diversity of experiences. Change is also inhibited because of shame's prohibitive effect on risk taking [*energy, diversity, relationality, decay and renewal, change*].

Shame is of particular importance to the problem of ecocide because all modern adult humans know that we are collectively and individually responsible for the ongoing practices of ecocide; yet, we feel powerless to stop it. As such, ecocide and our awareness of it constitute a *moral injury*:

> In traumatic or unusually stressful circumstances, people may perpetrate, fail to prevent, or witness events that contradict deeply held moral beliefs and expectations…Individuals may also experience betrayal from leadership, others in

> positions of power or peers that can result in adverse outcomes... Moral injury is the distressing psychological, behavioral, social, and sometimes spiritual aftermath of exposure to such events. A moral injury can occur in response to acting or witnessing behaviors that go against an individual's values and moral beliefs. (Norman and Maguen 2023)

The authors further point out that moral injury often involves guilt, shame, disgust, and anger; and that it has a lot of overlap with post-traumatic stress disorder. Weintrobe (2015) explores moral injury specifically in the context of ecocide: "the helplessness of feeling caught up in a vast machine that prevents one from acting with care and conscience…the collapse of one's inner ideals…guilt at one's actions within this framework" (278-279). She emphasizes that experiencing moral injury is a sign of mental health; it means that one has access to caring [relationality].

Shame often leads to overconsumption, which of course promotes more ecocide. Shame can be soothed by distraction, or by trying to "make oneself better" via the consumption of consumer products, advertised for just such an occasion [*energy, waste, change*]. A dopamine hit can be quite effective in pulling someone out of the dreadful physiology of freeze, immobility, and shame. Like all emotions, shame is here to say something important; it should be carefully listened to in the context of trusted, supportive others [energy, decay and renewal, relationality].

An understanding of shame and moral injury reveals the reason why the general population withdraws as the scientists scream ever louder for ecological relief. As Stratton (2017) explains, we *know* we are killing everyone else, and each other. "This remorseless termination of life is perhaps our greatest collective source of shame" (39).

Shame, based as it is in physiological immobilization, is *not* an effective motivator: "Environmental messaging that uses fear, guilt or shame as motivators only increases disengagement in a population that already overwhelmingly believes they are not good enough" (79) [*energy, diversity, relationality, waste, change*].

Fawning: Please and Appease.

> The feeling of being unloved…is unbearably anxiety provoking, leaving us all alone in the cosmic void. We thus agree to obey or adopt meanings opposed to our organismic self—what Rogers called 'conditions of worth'—as a way to minimize any threatening differences between ourselves and others and so to secure some measure of love and social belonging. (Fisher 2013, 76) [*energy, relationality, change*]

Fawning is often seen in individuals who had to adapt to rageful, narcissistic parents, oppressive political regimes, or anything else that profoundly overpowered a child's developing autonomy. Not surprisingly, fawning behaviors are usually accompanied by a chronic state of well masked anxiety (stuck flight response) Such individuals lacked the support they needed as children to develop a healthy, adaptive fight response (healthy aggression) and interpersonal boundary system. Such parenting violates the principle of [*energy*], in that the person lacks access to the healthy aggression needed to survive and truly thrive in the world. This parenting also violates the principle of [*relationality*] in that the parent fails to support the process of healthy individuation needed to thrive in the world. They often present with exquisite interpersonal attunement,

a necessary survival skill in such early environments. However, they may severely lack awareness of and skills for attending to their own internal environments, having undercoupled these interoceptive signals in order to mitigate external threats [*energy, waste, relationality*]. The restoration of the fight response is a very effective antidote to the anxiety, masking, and lack of genuine intimacy resulting from a stuck survival strategy of fawning. Therefore, one important focus of somatic trauma therapies is that of helping the person *interocept* (sense their internal environment) and relax around their felt experience of healthy aggression—without dissociating from it or acting out. On larger cultural levels, fawning may be a response to the stuck toxic narratives maintaining the status quo, including the military industrial complex. As with so many of the responses explored here, fawning may be a highly effective adaptation for short term individual survival. It is inherently highly ineffective for challenging the socioeconomic systems' stranglehold on global ecology [*energy, relationality, change*].

Grief.

Grief is the emotion we experience when one of our attachments is amputated. Uncomplicated grief is a normal life experience, generally within the Window of Tolerance, and thus can be tolerated (with support) and metabolized into a much less painful state over time. Therefore, uncomplicated grief is congruent with the principles of [energy, decay and renewal, relationality, change]. Characterized by intense pain and sorrow, it blends SNS arousal and dorsal vagal immobilization. However, grief can be complicated, usually by other intertwined elements of trauma, for example, developmental trauma, betrayal, or natural disaster. Complicated grief tends to fall

outside the Window of Tolerance and is more difficult to resolve. Furthermore, as trauma therapist Linda Thai points out, we don't grieve our losses when we are in survival mode; we end up repressing the affect, increasing our overall allostatic load (ctd. in Benazzo and Benazzo 2024).

Horror is the category of trauma that happens when we witness the suffering and death of others. This too involves more complex grief; additionally, horror is very likely to contain some elements violating the five principles. Since a person grieving is witnessing destruction of beloved Lands and creatures, part of the normal, healthy grief response to ecocide also involves horror [energy, diversity, relationality].

My working definition of ecological grief is simply an emotional response to ecocide and its ensuing losses. Cunsolo and Ellis (2018) offer a more precise definition: "the grief felt in relation to experienced or anticipated ecological losses, including the loss of species, ecosystems, and meaningful landscapes due to acute or chronic environmental change." (275)

Panu Pihkala (2024), a leading researcher in the field of ecological distress, has recently proposed a new theoretical model linking the many different forms of ecological grief and loss to existing, more general theories of grief and loss. Drawing from a broad base of existing research, his model also distinguishes various subtypes of emotional responses to ecocide; indeed, this article is a deep-dive into the psychosocial dynamics of grief and loss. While he specifically mentions the profound bereavement endured by Indigenous people as a result of colonization, he also clarifies that, as a Western researcher, his model may be biased towards Western experiences.

Pihkala's model of "ecological sorrow" distinguishes loss from grief. Loss is further divided into tangible/intangible loss; ambiguous loss; nonfinite loss; and shattered assumptions. Grief involves disenfranchised grief; chronic sorrow; anticipatory grief; and complicated grief. He then delineates "special" forms of this ecological sorrow: traditional loss and grief; life world loss; and shattered dreams. Congruent with the work of Somatic Experiencing, Pihkala notes that individual experiences of grief and loss are shaped by many different psychosocial and cultural factors. I would add that these varying factors are themselves largely shaped by interpersonal and survival adaptations described in Polyvagal Theory. Pihkala describes that his goal for this excellent and groundbreaking article is to assist sustainability efforts by providing further information about important psychosocial dynamics involved in such endeavors. Furthermore, this article provides insight into the surprisingly wide variety of deep emotional responses to ecocide. In other words, in describing the variety of profound suffering we endure in response to ecological destruction, Pihkala offers testament to how completely we humans build our entire psychophysiological existence upon having a safe, stable and welcoming Earth. His description of the "lifeworld loss" resulting from ecological destruction, offers further insight.

Probably the most visceral accounting of grief as a response to ecocide is Stephen Buhner's *Earth Grief* (2022). Eloquently and bluntly, Buhner describes how all-encompassing and terrible this deep mourning for the profound loss of life can be, if one really goes deeply into one's own emotional responses. Most people don't have this degree of affect tolerance; Buhner seems to have been unusual in this regard. The characteristic intensity of Earth grief may tend to drive a more dorsal vagal response:

turning away and numbing, rather than mobilizing to stop the threat [*energy, waste, relationality*]. Alternately, the underlying SNS charge can sometimes be channeled into other driven and compulsive behaviors. Since many modern Western people have never been mentored to orient towards the Land and our inherent interconnections with it, this particular grief and loss can be difficult to discern. Ecopsychologists have long observed that ecological grief, and its underlying contribution to mood disorders, tends to be ignored or gaslit in the context of most mainstream psychotherapies [*energy, diversity, waste, relationality, change*]. It is in there somewhere; but many of us have no idea how to orient towards it, much less deal with it.

Weintrobe (2021) points out that working through grief and loss is a necessary part of a maturation process: coming to terms with the reality of Earth's finite capacities. Such de-idealization contradicts widely circulating assumptions, is inconvenient to those wishing to maximize their profit, and may feel crushing to the individual experiencing it.

Denial.

> Only when insulated inside a bubble of denial can we feel comfortable about this subject. (Weintrobe 2015, 14-15)

Due to the intensity of Earth grief and its tendency to invoke a freeze/shame response, it is easy to surmise its relationship with denial. This primitive, unconscious defense mechanism is an unconscious, last-ditch effort to avoid that which is too intense, overwhelming and anxiety provoking, by disconnecting from the threat (Davenport 2017). White (2015) agrees: "The climate change mentality is unconscious and, like all

pathological ways of relating, emerged for a reason and serves an important psychic function. It cannot simply be 'cured'…psyche has a life of its own" (194). Such dissociation and the resulting denial is generally not too problematic as a short-term response, so long as it is quickly metabolized and the issue is then faced and dealt with. However, denial of major issues, or denial that does not budge, violates the principle of [*energy*] because the threat response and autonomic arousal remain stuck instead of flowing into appropriate action, a response which metabolizes the energy. For the same reason, denial is also a violation of the principle of [*decay and renewa*l]. Unfortunately, denial of our ecocidal practices and their devastating results is encouraged by Western culture; concern about the problem is often met by those in power with "silence devoid of care" (Weintrobe 2015, 11). In the case of denial, it is easy to see how larger cultural narratives intertwine with this fundamental human defensive response. Weintrobe cites *magical thinking*, a widely circulating and seductive narrative: "the false belief that any inconvenient costs or harmful consequences of living in the neoliberal economy can be discounted or do not exist" (13). She describes two intertwined forms of denial commonly used to avoid facing the consequences of our ecocidal practices: *negation* (it is not true) and *disavowal* (it is true, but it does not matter). After these defenses collapse, and one must come to terms with climate change, she describes how those of economic means can engage the fallacy of "arkism," an emotional disconnection from the world's suffering while one secures one's own future, as far removed from the destruction as possible [*energy, diversity, waste, relationality, change*].

Unfortunately, although making up our own "reality" clearly is not working for most life on Earth, denial may be fiercely defended. It often feels much easier to deny

rather than face a terrible threat. So, then, it becomes a necessity of emotional survival to push or chase away, or make wrong, those who are actively challenging our denial. This is particularly salient when the denier lacks capacity for interoception and affect tolerance. “The strategy of violence is to deal with the problem of pain and suffering by trying to annihilate what are perceived as the sources of distress” (Fisher 2013, 189). Similar to a miscalibrated anger response, denial is a major obstacle to recognizing the effects of ecocide, much less creating systemic change [*energy, relationality, waste, change*].

Mertens (2023) cites denial’s relationship to fear and habituation. She points out that the reasons for our denial and immobility are commonly known enough to be circulating in social media. Still, the crucial roles of self-regulation and emotional support—required to move past denial and immobility—are *not* generally being discussed in addressing ecological crises [*energy, relationality, waste, change*].

Several authors (Buhner 2022; Levine 2010; Mitchell 2018; and Siegel 2006) describe a common cultural norm of language supporting intellectualization and disconnection from felt, lived experiences—an insidious form of denial. Siegel states, “…the seduction of words and ideas can keep us from direct experience…On a societal level, such an imbalance can keep us in a state of denial” (16). Levine (2010) describes how such distancing in terminology dissociates us from our animal instincts—which are necessary for trauma healing, including Earth healing. Mitchell bluntly states, “those words become a shield from the razor-sharp points of the pain” (66)

Even though it will be overwhelmingly painful at times, entailing tremendous sequences of shock and despair, we *must* open ourselves to feeling again. Buhner (2022)

describes the softening and coming out of bracing that occurs when we step into full presence in the world around us. This tolerance of our own internal responses is a key, foundational skill, a prerequisite for solving our problem of anthropogenic ecocide. Human dissociation from the world—an effective solution for getting by in the short term—is at the root of the problems we now face. As Hillman (1995) put it, "We have lost the response of the heart to what is presented to the senses." He discusses "the brutality hidden inside the civilized language of dissociative terms like progress or anthropomorphism or science" (p 27). Andy Fisher (2013) agrees: "And over the decades of my life I have found that there is a soul damage that comes from that, from acquiescing to the dissociation. And I can't escape the feeling that somehow, when I do so, I have started to collaborate in my own, and Earth's oppression "(28-29).

As we consider the role of impaired self-regulatory capacity in the problem of ecocide, we need to remember that dissociation, denial, and other autonomic responses do not stem from conscious choices. They are automatic responses, designed to stack the odds in favor of our moment-to-moment survival. These survival responses did not evolve in the context of world-wide biospheric collapse. However, we can and must learn to be mindful and begin to notice our automatic responses and patterns. Then, with support from one another, we can titrate our exposure to that which we need to perceive and feel, gradually widening our Window of Tolerance and, along with it, our resilience.

Neuroplasticity: Pattern Change Essential for Solutions

We humans do have innate and effective mechanisms for working through and discharging stuck stress responses. As we engage with this inherent self-regulatory

capacity of ours, we also become capable of changing the stressful societal narratives that need [decay and renewal]. *Neuroplasticity* is "the capacity of neurons and neural networks in the brain to change their connections and behaviour in response to new information, sensory stimulation, development, damage, or dysfunction" (Rugnetta 2023). Caught in unconscious, pervasive toxic narratives and underdeveloped emotional skills, and lacking support and mentoring, most Western people are unable to reliably access neuroplasticity and its associated self-regulatory mechanisms. This underdeveloped self-regulatory capacity makes it very difficult to move through stuck psychophysiological dysregulation, towards attuned, compassionate and effective responses [*energy, diversity, waste, relationality, change*].

Levine's Somatic Experiencing specializes in engaging neuroplasticity for provoking needed shifts in traumatic memory systems. Carefully titrated exposure to traumatic memories, within the person's window of tolerance [energy, relationality] engages a psychophysiological phenomenon: a wave of energy throughout the body that increases, peaks and then decreases, without conscious volition. The nervous system approaches the stressful, highly charged material; tolerates it; metabolizes and completes it, and then deactivates, settling into a nice parasympathetic state of ventral vagal engagement. Following one or more such cycles and settling, the person becomes much more relaxed, relational and rational. Levine calls this phenomenon *pendulation*, and it is a prime example of the ecopsychological principles in action.

Specifically, pendulation follows the ecopsychological principle of [energy], in that during a pendulation, energy is able to flow through and complete needed [change] rather than remaining stuck. The old, outdated implicit memory network is [composted

and renewed] into updated patterns more adaptive to current circumstances. Pendulations may be completed alone by those with sufficient experience in navigating them. Persons with a history of developmental trauma usually require attuned support from a well-regulated therapist or other trusted person, in order to develop their capacity for distress tolerance, pendulation and, eventually, stable self-regulation. Such attuned support from a subjectively safe person, replicates (or replaces) the original foundation of building self-regulation, in which a parent or other caregiver engages their own stable nervous system in interactions that help the infant develop self-regulatory capacity. Such interactions may originally occur in childhood, and/or later through a trusted attachment figure. This inherent need for interactions with a safe attachment figure provides an example of how humans need [relationality] to support the development of psychophysiological self-regulation. This is why change is often more difficult to accomplish alone, as compared to in the context of attuned support.

Pendulations provoke metabolization of outdated, inefficient implicit memory systems associated with the stuck traumatic stress response. Consistent, careful engagement of the body's innate capacity for pendulations over time, builds affect tolerance, and a fundamental confidence in one's own nervous system. It is truly a wild experience to feel within one's own body these involuntary swells of sensation and affect, the associated epiphanies and then the response settling and deactivating—all done by the body, without conscious volition. Such experiences also bring profound relief, and the capacity to engage with the world in new ways. This is the "experiencing" in Somatic Experiencing. Unfortunately, such engagement of our inherent self-regulatory capacity is

nearly unheard of in mainstream culture; it must retake its place as common knowledge and life skills [energy, relationality, decay and renewal, change].

Andrew Huberman (2022) is a neuroscience researcher at Stanford University; he also offers a podcast offering public education in neuroscience and physiology. His podcast episode about neuroplasticity describes physiological details of how these changes occur in the brain. He explains that in childhood, neuroplasticity is rapid and automatic. However, adults can access it too, although it requires a little more work. He then describes the brain state needed for adults to access our inherent capacity for neural [change]. Adults must access physiological [energy], in association with the neurotransmitter norepinephrine; and focused attention. The combination of these two conditions releases acetylcholine in two separate areas in the brain, unleashing our potential for adaptive change in our neural networks (Huberman 2021). Such energy and focus open the "gate" for us, so that neuroplasticity, new learning, and pattern change in the brain, can be accessed in adulthood. He describes that the actual neural rewiring occurs in the brain during a good night's sleep, hopefully the night following the new learning.

Conclusions

Trauma distorts our ability to see our world clearly, to relate to it as it is. This poses a challenge for us in resolving complex problems that also hold the potential for further trauma. Our trauma response is in the business of self-protection, not the business of complex problem solving. Unfortunately for us this

> higher-level function is exactly what may be necessary for us to shift away from the current exploitative paradigm in relationship to nature. (White 2015, 195)

> I think that what is essential for this problem is a global consciousness, a view that transcends our exclusive identifications with the generational and political groupings into which, by accident, we have been born. The solution to these problems requires a perspective that embraces the planet and the future because we are all in this greenhouse together. (Sagan 1985)

Summary and Analysis.

The looming specter of biospheric collapse is a result of Western humans' foundational autonomic dysregulation, our arrogant and disconnected domination over the terrestrial cycles that create and sustain life. Such dysregulation generates and is generated by widely circulating toxic narratives. This unfortunate illusory departure from our place in the global biosphere creates and is created by the human response to trauma; and it is elegantly captured by Pye's articulation of the Five Ecopsychological Principles. We are not separate from or somehow better than the rest of the biosphere; and we need to rid ourselves of such destructive notions as soon as possible [energy, diversity, decay and renewal, relationality, change]. Fortunately, ecopsychology and somatic therapy get to the root of the problem, offering diverse and powerful solutions.

While fleeing the effects of our actions may seem appealing, there is no escape from such foundational dysregulation within us. We must engage the tools offered by ecopsychology and self-regulatory practices. In other words, we must understand and

solve our problems, as envisioned in Joanna Macy's "Great Turning" (Macy and Brown 2014). Taking such initiative to right our dysregulated actions entails using our individual and collective energy for supporting well-balanced terrestrial life—not splurging Earth's ecosystems on our desires and conveniences. It means supporting biodiversity rather than perpetuating the current anthropogenic mass extinction. It means facing and breaking down old narratives and practices that no longer serve us, instead embracing those that support biogeochemical cycles and life's flourishing. It means abandoning human exceptionalism, in favor of biophilia and life's inherent interdependence. It means embracing change that, while uncomfortable, is vitally necessary. Therefore, human efforts to move ourselves and our society out of foundational dysregulation supports all Five Ecopsychological Principles [energy, diversity, decay and renewal, relationality, change].

Many developed nations continue promoting the narrative of colonization of other planets. Such futile escape fantasies ignore the fact that everything we humans are—every molecule, every biochemical exchange, every bit of our evolution and culture—is completely rooted in and dependent on Earth's biosphere. It is presbyopic and unrealistic to devote so much energy and Earth resources to escaping this indescribably beautiful planet, in favor of distant barren landscapes devoid of life [*energy, diversity, waste, relationality, change*]. Such efforts also involve a failure of responsibility to the other creatures we have placed in the crosshairs of extinction; they do not go there willingly. What hope do we have of "starting over" in such punishing extraterrestrial environments, their landscapes and atmospheres unshaped by the countless interactions of living organisms? Like all terrestrial life, we humans are created and sustained by the biospheric

and biogeochemical cycles and interactions over billions of years. Human bodies are also completely dependent on the specific conditions found on Earth: atmosphere, gravity, radiation shielding and biogeochemical cycles. Furthermore, any attempt to solve the problem we have created with more of the same narrow, selfish mentality—exploitation and colonization of other lands, after having ruined our own—replicates rather than resolves the root of the problem [*energy, diversity, waste, relationality, change*].

Anthropogenic ecocide and its resulting biospheric collapse threaten the end of everything we know and love. This represents the hugest trauma possible, unimaginable in its enormity, devastation, and shame. Overwhelming by its very nature, the problem of ecocide and collapse is highly likely to perpetuate varying states of autonomic dysregulation, fight, flight, freeze and immobility, and their blended varieties of grief, shame, fawning, and denial. Such responses are predictable through the lens of polyvagal theory. Pending further collapse and the ensuing chaos, they are usually effective on an individual "just get through today" basis. However, these subcortical strategies are completely ineffective for such a pervasive and overwhelming global circumstance, which requires immediate cooperation and reparative actions. Our autonomic threat response cycle did not evolve in such a context. Unfortunately, these predictable emotions and behaviors create a positive feedback loop; they are fed by and in turn feed ongoing ecocide [*energy, change*].

Modern Western society as a whole is clearly displaying symptoms of Kain and Terrell's (2018) foundational dysregulation. Stuck in never-ending loops of stress and unattuned responses between individuals and bureaucracies, the societal body is fragmented, inflamed, and working against itself. It is acting like an individual human

body wracked by dysregulation, inefficiency and autoimmune disease. This lack of coherence between societal elements is easily observable in toxic narratives and behaviors, and their results, including poverty, homelessness, discrimination, and ecocide [*energy, diversity, waste, relationality, change*].

My understanding of Polyvagal Theory leads me to hypothesize that colonialism, defined by Liboiron (2021) as the taking of and entitlement to Indigenous Land, and using it to build vast wealth inequities, is itself a distorted set of worldviews and practices rooted in dysregulation and/or trauma. Colonialism inherently involves disconnection, and an appalling lack of relationality, reciprocity, cooperation, empathy, and balance. According to Kendi (2019) it also initiated and spread racism, which was invented as an excuse for the exploitative practices of the African slave trade. Colonization—like most other acts of war—is fundamentally an indicator of reduced access to social engagement (ventral vagal) states, and disproportionate fight energy without the needed vagal braking [*energy, diversity, relationality, change*]. Colonialism is not a right relation to the natural world. This hypothesis is in no way intended as any excuse for such genocidal behavior; rather, it is an understanding of the subterranean functioning of human systems, necessary to provoke effective changes. To heal it, we must heal the underlying trauma and disconnection, the wrong relation to world and others. It is difficult to imagine how we can mount an effective, collaborative response to the massive and complex problem of exploitation and ecocide, when many people's nervous systems are so stuck in these misaligned, distorted, high-charge subcortical survival strategies. Such behaviors are fed by and feeding back into trauma and its toxic narratives [*relationality, waste, change*].

Recommendations for Society, Policymakers and Healers.

> We face a real emergency that requires real action fast, but action with constructive purpose needs to be contained by understanding.
>
> (Weintrobe 2015, 14)

Fortunately, the vast array of knowledge already amassed by humans does provide us with effective solutions. Having surveyed much of this available information, across many cultures and disciplines—how can we apply this knowledge to actively support Macy's "Great Turning"? Specifically, what do we need to keep in mind, and what actions must we take, in order to shift away from exploitation, destruction, and disconnection—instead moving towards relationality, caring, and thriving?

Ecopsychology is not solely an emerging academic discipline. Its most essential application is that of practice; and here it is in an excellent position to catalyze individual and collective mobilization towards needed change. Ecopsychology emphasizes the wonder and the awe, the beauty and immensity of the natural world, and our inherent biophilic response to it. We are simultaneously being made by the world and making it; and we know this in our bones. Such humble and loving [relationality] are vital elements in this essential work. Compliance with the five principles is also essential in mending the root cause of ecocide: humanity's collective exceptionalism and anthropocentrism, and the resulting distorted disconnection from the biosphere. Polyvagal Theory and general competence in working with trauma, in combination with Ecopsychology, provide us with a powerful theoretical perspective, adaptable across diverse situations.

This theoretical paper has provided a wide-ranging overview of Ecopsychology, Polyvagal Theory, somatic psychotherapy, and many diverse cultural customs and bodies of work, all of which are directly relevant to resolving the massive problem of global ecocide. My conclusions and recommendations come from this review, and from my own clinical and ecological experience. They ultimately constitute a synthesis: how it all comes together to produce a new, practical model to address ecocide and the associated suffering. Further dialogue and empirical testing will undoubtedly be vital in the ongoing evolution of this work.

The following section provides a brief review of principles for healing offered by earlier ecopsychological writers. Next, I offer my own suggested list of general Ecosomatic principles, flowing from the knowledge summarized earlier in this paper. Individual and larger societal levels are fundamentally inseparable, as these are simply different aspects of the same organism; all life constantly exchanges energies and elements with its environments. Nonetheless, for ease of organization, these principles can be roughly divided into these two basic foci— individual and larger levels—although there is substantial overlap.

Suggestions from Earlier Ecopsychological Authors.

> Seismic shifts are occurring in sections of the human climate, with caring values gaining ground and a paradigm shift underway in science. Both of these developments are part of care's new imagination forming. (Weintrobe 2015, 241)

Howard Clinebell (1996) was one of the first widely read Western authors to construct a series of four steps for eco-healers and educators interested in catalyzing Ecopsychological healing. A modification of Joanna Macy's "spiral" model, his paradigm was designed as "an effective path for enabling people to move from denial, disempowerment, despair, and paralysis about the world and the ecojustice crisis, toward hope, empowerment, and motivation for earth-caring action" (177). Predating Polyvagal Theory, Clinebell's model is a good starting point, representative of early ecopsychological thought and likely quite effective.

Linda Buzzell and Craig Chalquist (2023) offer a protocol: a set of twenty basic principles for eco-resilience, which they define as "the ability of individuals, communities and ecosystems to respond and adapt to disturbance" (43). Modeled after permaculture principles rather than interpersonal neurobiology, their protocol includes care for the earth, care for each other including non-humans, care for self, story, art, and vision. All twenty of their principles are congruent with Pye's Five Ecopsychological Principles; and all involve love and reverence [relationality]. (Example: "Explore Reverent Practices—Cultivate Awe and Appreciation of the More-Than-Human.") They also recommend building small, robust localized systems that interlink with other systems, because huge systems like our global food chain are so vulnerable to imbalance and collapse. I find their suggestions quite useful and adaptable across many different situations [diversity, relationality, change].

Ecosomatic Principles: Essential for Supporting Change

The following principles flow naturally from ecopsychology, Polyvagal Theory and an applied understanding of the psychophysiology of trauma. They are intended to be general guidelines, nuggets of understanding to help change-makers focus their efforts across a wide variety of situations. These bits of knowledge can be drawn upon for any sort of change work, including writing, therapy groups, community groups, retreats, classroom work, media reporting, blogging, political meetings and actions, etc. These principles are presented here in their purest ideals. One must hold the awareness that quick thinking, creativity and flexibility will be needed for their adaptation to "the real world." Intercultural competence, sensitivity, creativity and patience are also essential. Progress often comes in a long, mostly consistent series of small steps.

Individual Level: Understanding and Healing Our Own Inner Workings.

Psychoeducation is a vital component of my work as a somatically focused trauma therapist. Comprehension reduces or eliminates disorientation, shame, guilt, and stigma, often immediately—which offers opportunity for coming out of overwhelm and freeze [energy, decay and renewal, change]. It reduces cognitive dissonance, itself a form of organismic incoherence. I find myself pointing out to my clients, over and over again, that this basic functional information about autonomic regulation and affect tolerance is *not* taught in schools—but it needs to be. Indeed, to my knowledge it is not taught anywhere outside of somatic therapy, except in the completely unregulated forum of social media. Physicians leave medical school understanding the physiology of autonomic functioning, but they tend not to focus on its affective or behavioral

consequences. The public's access to this vital information is at best uneven and limited [*energy, diversity, waste, relationality, change*].

In order to catalyze the global healing needed to work through ecocide, people must become better informed about the basics of human emotions and the autonomic threat response cycle. We must develop a widespread functional understanding of our own psychoneurophysiology; from there, we must individually and collectively begin the work of increasing our psychophysiological self-regulatory capacities, increasing our capacities for self-regulation and co-regulation of each other (Doppelt 2023). Indeed, White (2015) asserts that "climate change can be aptly understood as having evolved as a result of traumatic experience—aggression, isolation, addiction" (192). In contrast, an understanding our inner workings increases our capacity to tolerate and change our own autonomic and emotional states, and as such is congruent with the ecopsychological principles of [energy, decay and renewal, relationality, and change]. Andrew Huberman's (2023) free public podcast is an excellent example of a scientist directly serving the public by making this essential information available, interesting, and free of charge.

Also essential is an understanding of the mechanics and symptoms of intergenerational trauma—the passing down of traumatic implicit memory patterns from one generation to the next, through culture, narratives, somatic resonance, and the modeling of affect tolerance. Such an understanding supports all of the Five Ecopsychological Principles [energy, diversity, decay and renewal, relationality, change]. This information must be widely taught, in schools and other institutions, engaging learning styles attuned to the cultural and developmental backgrounds of the learners.

Such awareness is a personal journey whose effects ripple outwards, impacting family, community and society. It sets the stage for a culture-wide development of greater affect tolerance. Narrow, underdeveloped windows of tolerance lead to overwhelm, freeze, and acting out, driven by primitive drives for immediate self-preservation. At the same time, an inability to tolerate our own autonomic arousal and affective states reduces our individual and collective capacity for connection and joy—including our inherent biophilia, a major motivation standing ready within each of us to help guide us out of this massive mess. We must think *and* feel our way out of this global catastrophe. Such growth essentially results in a species-wide maturation.

One major inspiration for this study is the fact that the role of human self-regulation and trauma has been almost entirely overlooked in efforts to catalyze beneficial systemic and individual change. This tremendous collective oversight continues to surprise me even as I near completion of this project. As neuroception and the threat response cycle are foundational to every thought, emotion and behavior we have, this omission is critical and must be mended immediately.

It is vital to note that other cultures have different conceptualizations and practices around trauma healing; these are very likely to be quite different from the explorations and recommendations in this paper. Trauma healing must be conducted with cultural competence, and open dialogue between cultures. Those of us already well-schooled in concepts and methods presented here must maintain openness to cross-cultural dialogue and learning. [diversity, relationality, change]

The following are specific recommendations for developing our understanding of how humans function, and applying that understanding towards increasing our individual and collective self-regulatory capacities.

The Neuroception of Safety: Ecocide is dysregulated behavior. As such, stopping ecocide and healing its effects fundamentally involves trauma work: supporting people in untangling the dysregulation and lack of coherence that blocks widespread healing. *All trauma work begins with the neuroception of safety*. Without it, we automatically and primally fall back on self-defensive responses. This awareness is particularly vital in working with individuals who currently do not have reliable access to affect tolerance or self-regulation.

Supporting the neuroception of interpersonal safety is in keeping with Pye's Five Ecopsychological Principles, particularly the cultivation of [relationality], which reminds us that ecosystemic function is dependent upon cooperation and interdependent relationships. This in turn supports the [energy], [diversity] and creativity needed to move forward in problem solving [energy, diversity, decay and renewal, relationality, change]. Healthy, secure attachment across multiple levels—family, friends, community, ecosystem and planet—is also fundamental in creating a lasting felt experience of safety. Most or all of the recommendations in this section will generally support the development of secure attachment. Sometimes, supporting a neuroception of safety will mean holding strong boundaries against toxic narratives, dysregulated nervous systems and the potential for violent actions.

Attunement and deep listening.

"To stay above the healing threshold, we need a context for containing our pain that is larger or stronger than the pain itself" (Fisher 2013, 190). Davenport (2017) agrees, recommending therapists engage in deep listening to everyone in every role in society, also noting that diverse perspectives generate solutions. Without the essential interpersonal ingredient of attunement and deep listening, people will be largely unable to make the internal shifts to challenge the old stories and ways of being creating planetary strain. This approach utilizes thinking entirely different than that which created the problem [diversity, relationality, change]. Edl Stein (2023) adds that we also need to expand these empathically attuned containers to not only focus on humans, but also to include the natural world in safe and gentle ways. Plants and animals clearly communicate too, if only we know how to listen.

Put The Love Back!

> To make the vital, unique contributions needed to help resolve the ecological crisis, counselors, therapists, teachers, parents, and health professionals must learn to practice a new dimension of listening—*responsive and loving listening to the earth*. (Clinebell 1996, 14)

> Ecotherapy and eco education recognize that love, hope and laughter are key energies for empowering ecological healing and learning….The most effective source…is from one's love of the earth, from generating reality-based hope, and

> savoring the satisfactions from deepening one's relationship with the earth and being nurtured by it." (Clinebell 1996, 71)

> In the north the ice is melting. What will it take to melt the ice in the human heart? (Angaangaq Lyberth, Inuit Nation, quoted in Bekoff 2014, 27)

> For small creatures such as we, the vastness [of the universe] is made bearable only through love. (Carl Sagan, quoted in Sulleyman 2021)

Love is an essential part of how we humans work [energy, diversity, relationality]. Contrary to the narrative of intellectualization, we humans are *not* predominantly cognitive and logical. We need support, encouragement, hope, enjoyment, and the experience of small successes to move us out of freeze and overwhelm, and "get the ball rolling." We must engage in nourishing practice such as finding simple joys, laughing often, and experiencing a sense of meaning, connection and purpose (Doppelt 2023). We also need support from others and a sense of secure attachment—to each other and the greater than human world. In fact, even trauma healing should be fun (and funny) sometimes.

Weintrobe (2015) posits that every human mind has caring and uncaring parts; her work describes how to recognize and self-regulate both aspects of our being. She offers a simple question as a diagnostic aid: Is care or uncare in charge? In any case, we humans need lots of positivity and love in our social circles, along with guidance and mentorship, to support strengthening of the caring parts of our psyche. An essential part of this

endeavor of caring, will be uncoupling "bottom line" indicators of well-being from economic growth. The well-being of all life—*not* money for relatively few— is the real "bottom line." Unfettered neoliberal capitalism such as described by Weintrobe promotes exceptionalism and entitlement to a degree that is truly sociopathic; such narratives and destruction must not be tolerated.

Our innate biophila is a wonderful and essential ally in this endeavor: all we have to do is help people access, and then strengthen, their own felt experience of their Earth attachment. The passion is there already, as evidenced by the copious art, song, and other odes to the greater-than-human world. If we truly and deeply love something, and we can feel that love, we will work tirelessly to protect it. Besides, it is the love that makes this enormous quest worthy in the first place.

Engage biophilia.

Humanity's innate attachment and love for the land and its creatures—including other humans—is an essential ally. Spending time in nature is well known to support all aspects of human self-regulation, as evidenced by physiological markers (blood pressure, cortisol levels) and increased relationality. This is congruent with Pye's principle of [relationality] as well as Bekoff's (2014) principle of *rewilding*: restoring our inherent biophilia and connection with the greater than human world. Such benefits are also congruent with an important principle of somatic psychotherapy: anything that the client can put their attention on that supports joy, relationality and self-regulation, must be included in the therapeutic work. (I frequently say to my clients that such so-called "resources" must be nontoxic, legal and not harmful to others.) Supporting affect

tolerance of joy and goodness is as essential to trauma therapy as working through the actual trauma itself. Pallant (2023) agrees, noting that there must be carefree moments of joy, to prevent paralysis and create necessary balance. “These activities reinforce the importance of spontaneity, adaptability and participation in the creative principle, the life force activated, its generative reach widespread” (2-3). Engaging fun, art, celebration and humor are vital as we learn to walk this challenging road together.

Mentoring.

This paper has articulated a modern Western reconception of fundamental life principles, vital understanding that has somehow nearly become lost in our time. Indigenous cultures pass along essential knowledge and life skills through the vital developmental processes of mentoring, including story telling (Cajete 2000). Learning is most effective when it comes through relationship and lived experience. So, those of us who have been afforded the resources and time to obtain this vital knowledge outlined here, have a practical and moral obligation to share it [diversity, relationality, change]. Diversity of perspectives is an essential ingredient. No one is exempt from receiving mentoring or new knowledge. Ecological literacy and trauma competence are essential skills which need to become commonplace. Such mentoring is vital for undoing Bekoff’s (2014) “unwilding,” in which “fear of and unfamiliarity with the outdoors can also get in the way” of people becoming involved in remedies to ecocide (38).

Engage Neuroplasticity.

As anyone who has ever attempted to change entrenched habits knows, such pattern change is difficult. However, it is quite possible; and in fact, this capacity is an essential part of our inherent makeup. [Change] is one of the Five Ecopsychological Principles because the conditions that make life possible are dynamic and ever-changing. Humans, being part of Earth's life system, also have the capacity to change and adapt; it is embedded in our nervous systems. We must create widespread awareness of neuroplasticity and other basic principles of our psychoneurophysiology, as well as teaching and supporting each other in this work.

Levine understands that cognition and logic alone are not sufficient to sustain difficult change needed over the long term. He describes a solution based in neuroscience: "Resolutions falter as soon as we are under stress or get distracted by the myriad of day-to-day tasks. For more sustained and meaningful goals, volitional memory is inadequate" (2010, 306). He continues, "…we need to access a deeper, more intrinsic, memory system, one that engages our emotional compass and guides our responses without overt conscious directives…. *emotional-experiential memory* must be evoked" (306-307) [energy, change]. Here is an example of how to evoke emotional-experiential memory: For someone who would like to increase their physical fitness, but has difficulty finding the motivation, the abstract awareness that fitness adds to longevity and quality of life may not be sufficient. People tend to experience much greater success when they have a social context and a goal, e.g., by joining a running club and training for a particular event they find particularly fun or meaningful. The ensuing social-emotional experiences provide motivation and lay the foundations for implicit memory and ongoing

habits even after the event is over. Emotional-experiential memory engages our emotional signals to continue our motivation, long after the cognition and willpower have faded. It engages our implicit memory systems, which are not dependent on the intellectualization so favored by current narratives. This access to emotional memory is one important way to access our neuroplasticity, our capacity to sustain desired change over the long term, until it becomes embedded in our automatic habits.

Grief Work.

Unfortunately, exploration of biophilia these days is almost certain to bring up what Buhner called "Earth grief." He writes:

> Like this: I feel pain and grief and emptiness because the trees I loved have been cut down and what I need right now is for you to hear my pain and grief and emptiness and for you, the one who loves me, to hold me while I grieve, to hold me as the pain comes out of me in these sounds, in this sea that flows from my eyes, until I have let enough of the pain out that I can deal with the grief I feel, until I can go on. (33)

As many therapists have observed, grief is its own animal. It requires the development of a unique skill set, particularly a lot of affect tolerance, in both the supporter and the person experiencing grief. Of course, in the case of Earth grief, those lines blur considerably, further complicating things. The risk of not tending to our grief is that it can easily become overwhelming, sending us outside of our Window of Tolerance and into dissociation and avoidance or denial [*energy, relationality, waste, change*]. Some ecotherapists specialize in Earth grief work.

Coming Out of Freeze.

The most effective way to regulate ecological anxiety and other dysphoria is to come out of the freeze response, individually and collectively, mobilizing ourselves into effective action. The threat response cycle is an inborn, non-ignorable warning and response system. It "wants" us to use the tremendous energy it activates, in effective action to resolve the threat detected by the midbrain. Ignoring the problem, repressing stress and anxiety and powerlessly waiting for dreaded outcomes is a recipe for inducing and perpetuating the freeze response. Over time, people stuck in the highly stressful internal state of the freeze response tend to experience worsening dysregulation, and worsening outcomes [*energy, waste, change*]. Individually and collectively, we must become aware of the specific psychoneurophysiological supports and conditions we needed to move out of freeze and immobility, and into effective action. Rebecca Solnit (2023) writes: "We are deep in an emergency, and we need as many people as possible to do what they can to work toward the best-case scenarios and ward off the worst. Involvement depends on a sense of personal power—the capacity to make an impact" (4). Indirectly, Solnit's comment addresses this very process of many individuals coming out of freeze and into effective mobilization.

Supporting mobilization out of overwhelm and freeze includes an understanding and tolerance of our need for healthy aggression, otherwise known as well-regulated anger. This is *not* violence, but rather, enough internal drive and mobilization to support us in effectively taking action against ecocide, such as was found by Contreras et al (2023) [energy, decay and renewal, change].

Mobilization.

As people become well-informed and supported, and they witness others around them acting in an ecosomatically informed manner, they will begin to come out of freeze around the issue of ecocide and its related abominations. This will create an intrinsic tendency to orient and mobilize towards problem solving in the way that best suits each person's particular perceptions and skill set. Perhaps the only good thing about living in such a massive and multi-faceted problem is that opportunities for mobilization are available everywhere. There is no wrong way to mobilize; you can basically start anywhere, given good faith and compliance with the Five Ecopsychological Principles [energy, diversity, decay and renewal, relationality, change].

Collective Level: Society Wide Actions

Decolonization and Repair.

As we move towards increasing ecological literacy and compliance with the Five Ecopsychological Principles, the need to decolonize will become increasingly evident [energy, diversity, decay and renewal, relationality, change]. As with all of the other recommendations in this section, specific details of what this will look like are beyond the scope of this very broad theoretical overview. However, increasing our compliance with ecopsychological principles requires that we stop taking things that are nOt ours. As any therapist will tell you, relational repair is indispensable for restoring relational health and survival.

Righting the wrongs we have collectively caused, and continue perpetuating, requires accountability, apology and action. Such repair is particularly vital for

Indigenous people, whose Land has been appropriated and decimated, and who are still recovering from genocide and other ongoing forms of oppression. It is also vital for all people currently oppressed by systemic and cultural racism and other "isms." This will require an abandonment of the narratives and practices of racism, anthropocentrism, and all forms of entitlement. This in turn will require copious and widespread internal anti-racism and decolonization work, which needs to be modeled and taught across our institutions [diversity, decay and renewal, change]. As Doppelt (2023) emphasizes, everyone must be invited to the figurative (and literal) table; we must not leave anyone behind. As described above, Indigenous peoples have collectively developed a particularly rich knowledge base and cultural heritage, essential for planetary restoration. They must be invited with honor and respect to participate in restoration efforts; and they must be listened to. Cultural appropriation is not an acceptable option. Such essential relational repair work sets the stage for the true intercultural collaboration needed to address the problem of massive global ecocide. "Survival physiology brings urgency and extinguishes curiosity and creativity" (Kain and Terrell 2018, 82). On the other hand, working cross-culturally increases exposure to new ideas, enhancing creativity and diversity.

In keeping with the Five Ecopsychological Principles, repair work must extend to the greater-than-human world [relationality, change]. The suffering of nonhuman organisms and habitats at our arrogant hands has been unspeakably immense. Mountains were never "ours" to destroy with machines and explosives, destroying habitats and poisoning waterways to obtain desired minerals. Oceans are not "ours" to exploit with industrial fishing nets, killing everything entrapped and devastating entire marine

ecosystems. Plains are not “ours” to extirpate native plants and wildlife for our financial goals of vast numbers of cattle—incidentally increasing global carbon emissions. We must take immediate active steps to shift our practices and supply chains of extraction, agriculture and transportation, so that they are no longer in complete disregard of the biosphere that sustains all life [diversity, relationality, change].

Rufo (2023), drawing upon the work of David Abram, suggests that “Sensing our corporeal embeddedness is an important step towards caring and becoming accountable for the effects of our actions on nonhuman forms of life” (90) [diversity, relationality, change]. Again, the details of this massive shift are beyond the scope of this overview, but the need to support ecological resilience is immediate and multidimensional. We must practice Macy’s “active hope,” that is, keeping focus on what is possible and taking the actions to support it. Allowing the immensity and complexity of this problem to produce a defeatist attitude without even trying will only ensure defeat and increasing suffering.

Accountability.

Part of increasing our ecological literacy and awareness of our biospheric intertwinement means that we must understand and address our massively disproportionate ecological impacts. This essentially represents relational repair with Indigenous people and the greater than human world. Weintrobe (2021) conceives of this accountability as a collective maturation of humanity, in which we are no longer falsely idealizing our earth mother as an endless supplier of food and waste removal. Along similar lines, Whyte (2018) comments:

> Determining what exactly needs to be done will involve the kind of creativity that Indigenous peoples have used to survive some of the most oppressive forms of capitalist, industrial, and colonial domination. But above all, it will require that allies take responsibility and confront the assumptions behind their actions and aspirations.

As obvious as it may seem, such accountability and repair is likely to be tricky and unpopular, as the following example clearly demonstrates.

The global human population of nearly 8 billion humans as of the time of this writing (United States Census Bureau 2023), and the associated pressure on Earth's resources, is clearly not sustainable in a finite biosphere. Most of humanity's ecological pressures would be greatly lessened with a much smaller number of people. The ensuing discussion is quite sensitive. Humans' desire to reproduce is deeply rooted in mammalian biology, which evolved even before there were humans, during which time the Earth's abundance must have truly seemed infinite. This desire has wound its way deep into cultural and religious belief systems and practices, which need to be respected, not oppressed. Furthermore, this particular discussion has been greatly impacted by historical and ongoing genocides, which have at times included experimentation and involuntary sterilization practiced upon disempowered or conquered populations. Such horrendous practices clearly provide evidence of dangerous, elitist and highly toxic narratives about who is "worthy" to reproduce and who is not. It would only perpetuate injustice to expect populations impacted by genocide and low numbers to abstain from reproduction; these populations must be supported and restored. Widespread populations, particularly those with a large ecological footprint, must be encouraged to reduce. As difficult as these

discussions will be, they seem preferable to involuntary reductions of human population resulting from unchecked biospheric collapse (Bekoff 2014). We *must* find ways to actively support human biodiversity and diverse cultural practices, and honor those who have already disproportionately borne the brunt of violence and exploitation. As we humans cannot change the Five Ecopsychological Principles or the ecological laws governing life on Earth, we must simultaneously find ways to engage in such honoring while also moving into compliance with these natural laws. Such change requires public education. Bekoff (2014) points out that while few enjoy following limits set by government, people are much more likely to make sacrifices that are "seen as fulfilling an undeniable, agreed-upon social good" (26).

Community Building.

Resource hoarding is profoundly short-sighted, and it springs from an essential failure to develop strong community relations [*diversity, relationality*]. As any farmer will tell you, attending to basic survival needs alone is exhausting and impractical—not to mention then having to constantly defend one's stash from desperate and hungry people [*diversity, relationality*]. Humans survived via division of labor in small to medium sized communities for most of our history; we function best in such small groups, neither isolating nor overwhelming in size. Community provides a sense of belonging and connection; this supports the autonomic regulation essential to our psychological and emotional functioning [energy, diversity, relationality]. This is vital in creating hope, mobilization and resilience. "The priority must be to help everyone develop the capacity to buffer themselves from and push back against the stressors and

find constructive new sources of meaning, purpose, courage and hope" (Doppelt 2023). Overcoming problems is so much easier with the support of community, and diverse perspectives are vital for problem solving [diversity, relationality, change]. We must leave no one behind; we must build social connections across cultural, economic, racial and geographic boundaries in communities. Such connections build purpose and reduce the toxic isolation and loneliness generating hopelessness and other forms of autonomic dysregulation and "mental health problems." In this way, people can relearn how to care for the planet that created and supports us: "Caring begins with ourselves and other people, but it enlarges us in a way that leads us to care for the rest of nature as well. When we begin to care, we want to protect all life." (Andrews 2009, 193)

This approach to transforming community trauma into resilience is essential; it is a proactive public health approach rather than the current practice of reactively responding unevenly to individual traumas. We *must* respond to this emergency with a public health approach, working proactively on community levels, as opposed to our current practice of working reactively to support some (usually privileged) individuals (Doppelt 2023). Also, community provides a vital aspect of self-regulation. Accountability for one's actions happens naturally in face-to-face relationships, without the mask of anonymity [relationality, change].

Public Education.

Agents of change must cultivate a working understanding of mammalian threat response cycles, including the recognition of when someone is stuck in threat response, and how to support them in moving out of it [energy, decay and renewal, relationality,

change]. In Doppelt's (2023) words, we must "foster universal 'literacy' about mental wellness and transformational resilience by helping everyone become 'Trauma and Resilience Informed.'" Advanced theoretical education such as that explored here is not required to develop a basic understanding of how humans work, nor to help others learn about it. This is demonstrated on a daily basis by many thousands of somatic therapists explaining the basic principles of trauma physiology to a wide variety of clients [energy, diversity, decay and renewal, relationality, change]. The cultural transition to trauma competency will require efforts to spread relevant psychoeducation throughout the populace.

The public must also be informed about the extent of our collective ecocidal practices and the resulting damage. Our current systems of extraction and production, and their toxic results, are hidden from most Western consumers. We must face what is happening in order to change it. This is an essential step in coming out of the generalized response of freeze and immobility. Keith Parker, a senior fisheries biologist who faces the results of ecocide on a daily basis, demonstrates the healthy response of facing ecocide and engaging the threat response in a helpful and effective manner:

> All the terrible things I've seen, all the detrimental changes to the environment, all the impacts of climate change — I use it to fuel my motivation to be a better scientist, to be a better human being, to be a better steward of the land. And honestly, part of it is anger. That's fuel, OK? I get mad, and I turn that anger into fuel that motivates me. (qtd. in Einhorn 2023)

In order to return to complying with the Five Ecopsychological Principles, we must teach them, as well as their practical application. Each of them is essential. Given our current situation, there must be particular emphasis on decay the old toxic narratives, and the practices that flow from them.

Greater Involvement of the Helping Professions.

Modern Western humans' widespread loss of competency in dealing with our own inner experiences is described in detail in the sections above. This unfortunate phenomenon of human internal disconnection also highlights the need for "the helping professions" to deepen our involvement in solving the ecocidal crises, as ecocide is driven by this disconnection. Such an approach will be substantially more effective and rewarding than our current practice: limiting ourselves to the endless treatment of individual wounding caused by the effects of toxic narratives and systems. Since psychology is the science of human behavior, having amassed over 100 years of study, we practitioners must abandon our collective myopia, applying our copious and useful knowledge towards biospheric survival. This is not incongruent with our current mission; human thriving and biospheric thriving are fundamentally the same thing. We must become ambassadors between humans and the nonhuman world, particularly for those humans suffering from Louv's *nature deficit disorder*—the deficits in knowledge and self-regulation resulting from diminished contact with the greater than human world. We must help other humans cultivate greater connection with biophilia, respect and reciprocity. The development of such a capacity and attunement requires therapists' continual engagement in our own inner ecotherapeutic work—not only our own affect

tolerance, but also our own felt experiences with the greater than human world. In our practices, it also involves abandoning the language of "the machine": the linear efficiency of "evidence based" interventions, designed to return "the patient" back to service as soon as possible. Instead of continually mucking about in "the problem" from a detached, intellectualized perspective, we must make a place for soul, art, poetry, and the organic experience of being alive (Robinson 2009). However, truly being a "nature ambassador" goes well beyond engaging with the natural world solely for human benefit—a rather self-centered, non-relational practice that Buzzell (2009) refers to as "level 1 Ecotherapy." Rather, we therapists must engage our collective wisdom towards "removing the dualistic cleavage of our 'inner' lives from our 'outer' world; this 'bifurcation of reality' may be the core problem for Ecopsychology to address" (Fisher 2013, 5). Undoing this bifurcation is deep work, "radical" in Fisher's sense of getting to the roots of the problem. Psychodynamically, it involves healing the deep, destructive splitting in human psychology between ourselves and the rest of nature, as that splitting is a major force driving ecocide and human suffering. The emerging field of Ecosomatics offers a wonderful set of practices for this healing (e.g., Rufo 2023).

On societal levels, mental health professions are in an excellent position to convey essential knowledge and support, as well as provide advocacy for needed systemic changes (Li et al 2022; Climate Psychology Alliance of North America 2024). Indeed, the primary reason I initiated this paper was that it has become frustrating and exhausting to focus on amending the effects of systemic traumas, in a never-ending succession of one individual at a time. Social work in particular has wonderful tools and practices in place for exposing the effects of toxic narratives and supporting

disempowered populations; it simply needs to broaden its lens to include the nonhuman world. Also, the profession's long-standing focus on empowerment and advocacy *must* be called upon to increase opportunities for access to nature, for people disempowered by racism and socioeconomic status. Social workers could potentially find inspiration in the APA Climate Alliance. As described above, they have a multifaceted action plan in place and are currently attempting to advance their plan, within the field of psychology and in the larger public sphere.

Somatic trauma therapists, who are increasingly called upon to deal with the impacts of climate change, must become ecologically literate and involved in the solutions to ecocide. An ongoing anthropocentric focus is simply insufficient. We are the custodians of an essential knowledge base—elegant, practical, flexible and highly effective. We must develop specific training to ensure our competence in treating the effects of ecocide that have already arrived, and those looming on the horizon. The accompanying natural disasters and profound losses are well beyond the vast majority of therapists' training. Somatic Experiencing training is the only clinical training I am aware of that addresses anything like this: One portion of one training module (perhaps around 90 minutes within a three-year program) is dedicated to supporting humans impacted by natural disasters. However, this protocol was developed before the effects of biospheric degradation had advanced to such a profound degree. It is inadequate for the widespread collapse and resulting community trauma we are currently facing, particularly as we are no longer working with a remote instance of "someone else's trauma"; the therapists are also impacted by the same phenomena. Our training also lacks information or even mention of supporting people to come out of stuck ecological anxiety and into resilience.

This oversight could be easily mended: it is inherent to classic Somatic Experiencing theory and practice to support mobilizing out of freeze, into effective defensive responses to ecocide and biospheric collapse.

Particularly objectionable in the helping professions is the frequent occurrence of therapist "gaslighting" of their clients' eco-dysphoria: "It won't happen in your lifetime" or "They'll figure it out eventually" are toxic, misleading statements in the face of the actual current situation. This stance, often stemming from the therapist's own ignorance and/or discomfort, damages the therapeutic relationship and perpetuates stress, self-doubt and immobility [*energy, diversity, waste, relationality, change*].

Recalibration of the Media.

The current problematic role of the media is widely known, in its tendency to increase public stress levels—hence the old newsroom saying, "if it bleeds, it leads." This ubiquitous practice of stirring up strong negative emotions with doom-filled headlines, in order to draw people into consuming the media ("doom-scrolling"), is a massive contributor towards general stress, hopelessness and overwhelm. This creates a strong tendency towards freeze, immobility and stuckness [*energy, diversity, waste, relationality, change*]. At the same time, heavy media consumption is essentially a dissociative state, in which people tend to become passive, immobile and cognitively dominant, unaware of their physical body or surroundings. Oftentimes, people cannot even recall the content they have consumed. Higher internet use has been correlated with higher scores on measures of dissociation, and substantial mental health comorbidities (Bernardi and Pellanti 2009). This suggests that compulsive media use maintains

dissociation and stuckness, likely serving as a poor substitute for treatment and actual interpersonal connection. The waste of time and energy of unproductive internet time is another barrier to the social involvement and systems change that would effectively help people feel, and function, better [*relationality, waste*]. However, nothing has been done to initiate widespread change in media content, towards a media actually supportive of the public, and of solutions. It is hopeful to note that the APA Climate Alliance is currently implementing a campaign to support its plan for trauma-informed climate journalism programming (Climate Psychology Alliance of North America 2024).

The media—television, film, radio, newspapers, magazines, email, and social media—has tremendous potential for disrupting the pervasive cycles of overwhelm. It could instead disburse hope, joy, collaboration, effective solutions, and triumphs. Although media consumption is very passive, and often a contributor to isolation and loneliness, such hopeful content could potentially help isolated or hopeless individuals begin to mobilize. In reality, there is a lot of helpful and effective work being done in the world, towards public education and ecosystem restoration (e.g., the work of Liu 2012, Tallamy 2020, the entire permaculture movement, and countless others). However, most of us never find out about any of it. Weintrobe (2015) comments that the work of care has been greatly under-reported by the media, particularly during the last 40 years. The public does need to be informed about ongoing developments, including ecosystem collapse; however, such articles *must* also include information about solutions: Who is doing what to address the problem, and how could interested parties get involved? We must pendulate between awareness of what is wrong, and the hope required to resolve it. Furthermore, there must be widespread access to centralized information about groups

actively working to stop ecocide and restore Land. Without such balance, the media is directly culpable for inciting stress, overwhelm, freeze, and lack of mobility towards solutions.

Increase Ecological Literacy.

Similarly, we in Western cultures *must* become more ecologically literate. Entire generations of children are growing up without even the fundamental awareness that food comes from the precise interactions between sunlight, atmosphere, soil, water, and living organisms—*not* from buildings and plastic wrappers [*energy, diversity, waste, relationality*]. Developing ecological literacy requires mentoring, because "To the degree that people suffer with inner alienation from their inherent bonding with nature, the earth's crying will be muted or in a strange language they will not understand" (Clinebell 1996, 14). Infatuated with technology, the general public has lost most of our fundamental knowledge and skills related to the basics of sustaining life. Food growing is relegated to small segments of the population, which are often looked down upon for doing the "dirty work." Meanwhile, the pressures of a huge population and capitalism have resulted in completely unsustainable industrial farming methods and transport, which are perpetuating increasing ecocide. More food must be grown locally on small scales, with community involvement and mentorship. Also, an ecologically literate public would support ecological restoration projects.

Understand and Comply with the Five Ecopsychological Principles.

The general public has no concept of Pye's Five Ecopsychological Principles of Energy, Diversity, Decay and Renewal/Waste, Relationality, and Change. Nor do most people comprehend our fundamental intertwinement with the rest of the biosphere [*energy, diversity, relationality, change*]. Many of us in the city do not even know the names of our local watershed, tree species, or Indigenous tribe. Douglas Tallamy is a professor of entomology and wildlife ecology at the University of Delaware. He is a fervent advocate for homeowners to landscape with locally native plants. Tallamy points out that if homeowners in the United States convert half of their lawns to productive native plant communities, we would create the equivalent of a massive national park, around twenty million acres. Tallamy refers to this restored ecosystem function as "Homegrown National Park" (Tallamy 2020, 62). However, not enough people are listening. Locally native plants are rarely for sale at mainstream nurseries; it is more profitable to draw in the public with showy exotic species, resulting in widespread disappearance of habitat and indigenous species. Casual use of herbicides and pesticides is common and highly problematic. The five principles and other laws of ecology are far more pervasive and fundamental than societal laws, such as traffic regulations; yet, we ignore them. We must undergo a culture wide paradigm shift: away from anthropocentrism and back to the relational, ecologically focused narratives and practices that sustained Indigenous peoples for millennia prior to colonization. Indeed, our very survival depends on it (Cajete 2000) [energy, diversity, decay and renewal, relationality, change]. This essentially represents a process of species-wide maturation.

Flexibility and Adaptation.

Adaptive, flexible and radical: The very nature of living systems is to be dynamic and ever changing. Proponents of change will need to be flexible and adaptive to constantly shifting circumstances. Anthropogenic ecocide presents us with many extremely complex and dynamic situations, continually changing and presenting many surprises, some of them devastating. "There is no one solution to our many and various problems; in fact, there is rarely a single solution to any one problem. We need to be flexible and open at all times" (Bekoff 2014, 13) [diversity, change]. We also must not be afraid to be radical in the sense that Andy Fisher proposes: getting to the roots of the problems, even when that means abandoning comfort. At the same time, it is essential to remain within our Window of Tolerance whenever possible—a focus made challenging by the tremendous natural forces we have unleashed. Consultation, collaboration, and continual re-examination with one another are essential.

As described above in the sections on fight response and shame, these recommendations are extremely likely to be met with the survival energy of intense and unyielding pushback. Dysregulated nervous systems inherently produce distorted thinking and a push for immediate—not long term—survival. This is the way we are all wired; many of the proposed changes are radical, and well outside of our comfort zones. None of these needed changes are supported by toxic, exceptionalist narratives. Additionally, populations with intergenerational experience of colonization, racism, exploitation and oppression need to be quite wary of any negotiations for change; this has been demonstrated time and again.

Potential Criticisms

Addressing the largest series of intertwined problems the world has ever faced is an ambitious and challenging undertaking. The administrative time and space limitations for this project prevent a more complete development of some of the themes explored here. The complexity of the problem of ecocide leaves copious room for additional suggestions as well as other potential concerns. The following represent perhaps the most obvious gaps in this survey and synthesis:

Polyvagal Theory: Some people do not really like polyvagal theory very much. A few critics dispute Porges' accounting of some of the evolutionary and physiological nuances of the theory, particularly relating to the evolution and social engagement function of the mylenated vagus. The Polyvagal Institute offers a page on its website claiming that some of the criticisms are based on "straw man arguments" and misattributions of the theory (Porges 2023).

Many of the details criticized are not necessarily relevant to most "real world" applications of the theory, including this current effort to address the relationships between autonomic dysregulation and ecocide. Whether or not it is accurate in every anatomical or evolutionary detail, many thousands of therapists and others successfully use Polyvagal Theory—and the therapies derived from it—every day. It is effective in helping clients relieve distress and support self-regulation. Those who summarily dismiss Polyvagal Theory (often without experiential investigation) also wrongfully disregard the lived experience of hundreds of thousands of people, whose lives have been changed for the better by the practical therapeutic application of Polyvagal Theory, in Somatic Experiencing, Sensorimotor Psychotherapy, Hakomi, and other therapeutic modalities

[*energy, diversity, waste, relationality, change*]. As our psychoneurophysiological understanding continues to evolve, Polyvagal Theory may well prove to be a needed stepping stone to the next, forthcoming level of understanding [change]. Regardless, one of the main points of Polyvagal Theory remains extremely useful: "Contemporary strategies for health and wellbeing fail our biological needs by not acknowledging that feelings of safety emerge from internal physiological states regulated by the autonomic nervous system" (Porges 2022, 1) [energy, relationality]. We need to understand and work with how our threat response physiologies work. Porges himself explains why:

> Basically, when humans feel safe, their nervous systems support the homeostatic functions of health, growth, and restoration, while they simultaneously become accessible to others without feeling or expressing threat and vulnerability. Feelings of safety reflect a core fundamental process that has enabled humans to survive through the opportunistic features of trusting social engagements that have co-regulatory capacities to mitigate metabolically costly defense reactions. (Porges, 2022, 1)

Another form of criticism comes from Elisabeth (2023). She has criticized Porges for being "too comfortably white male" (i.e., privileged) to properly understand the fawning response [*diversity*]. Indeed, I have noticed that the somatic trauma therapy field has been relatively slow to catch up in addressing fawning, as current somatic therapy theory generally tends to concentrate on the fight/flight/freeze responses, as presented in classic Polyvagal Theory [*waste, change*]. She also states that the theory is too hierarchical, as though ventral vagal were the only desirable state, and any fight/flight/freeze response that appears disproportionate to the current situation is

somehow pathological. She asserts that it is okay to be dysregulated some of the time; I would say that in the context of modern society, it is actually inevitable.

Elisabeth points out that mainstream (privileged) somatic theorists and clinicians may not be sufficiently sensitive to things that are in fact dangers for some people, particularly those who are non-neurotypical and/or non privileged [*energy, diversity, relationality*]. Elisabeth's concerns appear to focus on how Polyvagal Theory is applied rather than criticizing its basic structure. The issues she points out highlight the need for everyone using Polyvagal Theory to engage in our own internal trauma work, including anti-racism work, to improve our relationality and attunement to others [energy, diversity, decay and renewal, relationality, change].

Is this project too utopian? This is certainly one possible viewpoint. However, this criticism can be countered by its opposite: Is it radical *enough*? Likely both criticisms have some validity. However, neither constitutes any meaningful objection to the well-established concepts presented here, nor to their synthesis into a model for healing. My intent is to inspire change towards biospheric restoration, which supports ecosystemic thriving—including humans. It may be utopian to assert that humanity needs other creatures and ecosystems to thrive, for us to also truly thrive; or that we must shift away from war, oppression, self-interest, and ecocide. Nonetheless, this does not make it any less factual. Hopefully, this paper will provide some pathways for such flourishing to take hold.

Chapter 4: Concluding Reflections

This paper has reviewed and synthesized human knowledge already in existence, essential for ending our collective suicidal and homicidal rampage. The following passage is emblematic of the essence of it all, the point I am trying to convey and the reason for undertaking this project in the first place.

> All my life, I have gone to the green places. In joy, in seeking solitude, in anger, and in grief, I have turned to books and crafts to take up my thoughts and, when not even those will fulfill my needs…. always, there are the wild places. What is best is to go far away. To be the only human for miles, to be alone with the world, to sit with everything and breathe the everything. To, as I say to my students, "be so quiet I cannot hear my own breathing". To move so quietly I cannot hear my own steps, and let everything in nature rush in to fill the space.
>
> I go back to nature, running as though to take an overdue dose of medicine. I get out of my car and run to the trailhead, walking stick tucked under my arm until I can tap it down on soil instead of asphalt, as though it as a holy thing, a druid's staff that should not touch manmade things. Somewhere in getting away from the parking lot and getting out of view, in disappearing down a trail and out into the habitat, there is a threshold. When I arrive, I may be carrying a load of grief and stress that weighs me down like a hundred-pound blanket folded around my shoulders, stifling me. When I cross that threshold, I can feel it all fall off me, as though I could turn and see it lying in the dust. I get a good, clean breath that smells of the wild habitat I know and the tension in my scalp eases. I stand straighter. I am an animal in my habitat and I will disappear into the wild. I

> will come back in time and pick up the worries that come with being human but, for now, I will only take with me the things I need to think about most. The rest can wait until I come back for it. (Chroman 2023) [energy, diversity, decay and renewal, relationality, change]

The above passage was written by my instructor in the California Naturalist certification. She also serves as a biology instructor at a local college. She is not an ecopsychologist, nor a somatic therapist; nor, to my knowledge, has she had any significant exposure to these academic disciplines, aside from her patience with my own enthusiastic ramblings. Rather, this passage arose from her own felt and lived experience. It interweaves threads of many of the themes explored in this paper. Her writing illustrates her instinctive sense of emotional and somatic intertwinement with the greater-than-human world, and its medicinal capacity to support human self-regulation. It contrasts the stress and overwhelm of modern life in "civilization," vs the peace felt by taking a break from all that overstimulation. It clearly showcases her awe and reverence for non-industrial, non-human life, as well as the response of her felt sense and autonomic nervous system. Unlike many Western humans, Chroman does not enter natural spaces in order to take from them nonreciprocally; her entire professional life has been dedicated to the study and preservation of the natural world.

In her eloquent passage, Chroman reminds us that such reverence, awe, passion, and peace are innate—if we can only step away from the pressures and distortions of day to day life. Why is this no longer the norm for us? And why does the natural world have to be teetering on the brink of destruction? I'll echo a very old question: *Why does it have to be this way*?

This paper has explored foundational dysregulation in human autonomic nervous systems, profound disconnection from the greater-than-human world, and the toxic narratives that result from and contribute to these conditions. Essentially, our species needs to engage our inherent capacities for [change], including neuroplasticity; it is essential for us to mature and evolve out of our current state.

Additionally, I think the terrible metaphor of the frog in a pot applies to this question of why things are the way they are: The heat—both figuratively and literally—has been turned up gradually, over many decades. Toxic narratives have normalized widespread dysregulation, selfishness and lack of awareness of the natural world. This has given the modern human mind and body time to adapt to less-than-ideal conditions, both internally and in the degradation of ecosystems and biomes. Like the chronic overwhelm of modern life, the heat in the pot drains us, gradually degrading our bodies and spirits. However, frogs can jump! They are true experts at jumping. They just need to remember their capacity for action. Unlike the metaphor, however, it is actually our own (collective) hands that are turning up the heat, obscured by inertia, ignorance, disorientation and overwhelm. Whether or not this is our fault is irrelevant; it is clearly our responsibility to change. Also unlike the frog, we have each other to lean on, if only we can organize and orient ourselves in the direction of collaborative action. As Peter Levine (2019) explained, any time someone engages in trauma healing, making shifts in their nervous system towards coherence, this change positively affects everyone around them. And so, the healing moves out into society in waves. Such coregulation is supported by our modern neuropsychological understanding of our mirror neurons—neural cells in our brains that specifically respond to others' emotional states. This "ripple

effect" of good autonomic regulation moving outwards, is how movements begin—one nervous system at a time. Having relevant and vital information, such as this paper has attempted to convey, is essential. This achingly beautiful blue and green jewel we all live on, has suffered incalculably vast and irrevocable losses at the hands of humanity. It will never again be as it was just a few hundred years ago. However, the vitality of life in Earth's remaining ecosystems can rebound; that is a fundamental property of the life force. We can support a widespread return to lush and beautiful biodiversity. All that is required is our collective willingness to consistently try.

Appendix 1

Examples of Ecopsychological Practices

The Sit Spot Exercise

Note: This exercise is adapted from guided experiences during my Ecotherapy training with Ariana Candell, LMFT (The EarthBody Institute) and Jan Edl, LMFT (Holos Institute). It is, of course, also influenced greatly by my training in Somatic Experiencing.

The Sit Spot exercise is quite popular in ecopsychological circles. It involves deepening relationship with the land, as well as with one's inner world. Specifically, the point of this exercise is to help one drop back into right relationship with the living, greater-than-human world. Relaxation, emotional catharsis, grounding, and insights are often productive and helpful side-effects.

The first step is to choose a suitable location. Ideally, your sit spot location would be a place in which elements of the greater-than-human world are prominent, such as a garden, a lake, a desert landscape, some woods, or a park. It would also be somewhere reasonably accessible to your daily (or weekly) routine—that is, not somewhere so far out of your usual way that you won't be able to get there regularly. If the location has some elements of wilderness, such as venomous creatures, disease carrying insects or irascible mammals, do your research ahead of time and take any needed safety precautions in advance. Just like any time we return to the greater than human world, our decisions and actions are taken at our own risk.

Once you have selected a general location (e.g., a park or a beach), find a specific spot at that location. Check your felt sense: your body's sensations, images and instincts.

What place calls to you? What feels comfortable? If you took the point of view of that particular place, or the animals whose home you're visiting—how would you like it if someone came to sit there? How could you be there in the most humble and sensitive way?

Is there a place at the base of a tree, where you could lean your back up against the tree and feel the rough connection with its bark, your hips grounded atop its roots? Ask the tree, and see whether you get the sense that it agrees to your company. Alternately, is there a large rock ledge to nestle into, where your body could be held and shielded from winds? If you feel into the rock, do you feel welcomed? Or would it rather you sit elsewhere? Such sensitivity and comfort is essential, as this will be a spot you'll return to repeatedly. This should also be a place that is accessible *without* damage to its permanent inhabitants: for example, without trampling delicate plants or soil off-trail.

Settle in to your sit spot. Drop into your felt sense: notice the contact with the Earth. See if you could allow your physical body to drop into that contact, to be held and supported by the Earth, just a teeny bit more. What is that like? What does the Earth ask of you?

As you settle in, be sure to make space for any feelings that may arise, particularly the unexpected. (However unlikely this may be, I must point out that emotional flooding is not the purpose of this exercise. If you start flooding, remember to not go outside of your own personal window of tolerance. Be ready to stand up, move around, or even make a phone call for support, if you need to.)

As you settle in, ask yourself: How is it to just *be*? What do you notice in your felt sense? Is your body bracing, uncomfortable with the newness or the imagined threats? Or

is it melting, grounding into the earth with a deep involuntary breath? Or, is it numb, drowned out by the ceaseless parade of to-do lists and social stimuli? If the latter, would it be okay to spend a little time with the numbness? Do you feel a pull to check your cell phone? If so, could you simply notice the feeling of that pull or impulse, instead of yielding to it? What feelings might be just underneath this pull?

Now, your invitation is to simply be there; and to return every day, or every week, or as frequently as feels manageable and appropriate to you. Over time, you will develop a relationship with this land, and its inhabitants. How have they been affected by human activities? How are they demonstrating resilience (or not)?

Allow your eyes to wander around the area. What elements of Nature do you see or hear? Observe them over time: How do they change as the weeks pass by? What shifts between seasons? How does the light dance differently between tree leaves, from one season to the next?

If the land (or the tree, or the hawk) had something to say to you—what would it say? Try to refrain from thinking of the response; allow it to come to you. Such deep listening could take a little while, if it comes at all.

Ideally, you'd have at least an hour to spend in your sit spot. 45 minutes might do. Three hours might be much better—but, that depends upon the person. Remember the SE principle of titrated exposure: a little at a time, building our capacity over weeks, months, years. Listen for the signal that your body has had enough for one day, and don't try to over-ride that. (How much of your day do you spend over-riding your body's signals?)

A variation of this exercise is to imagine that you are not the observer: *you are being observed*, by the landscape and its inhabitants. As you reorient to yourself now

being the subject of observation—what do you notice in your felt sense? What is the nature of the relationship between you and the observer?

Some people choose to carry a notebook, so that they can journal their observations and sit spot experiences over time.

Tell Your Nature Story

This exercise is heavily modified from Howard Clinebell's (2013) work; it appears as one of the very first steps in his healing model. I have been using various versions of this exercise ever since initially reading his book many years ago. He points out that the telling of ecological stories is often quite illuminative of the autobiographical factors shaping one's nature-related emotions and narratives. As our inner landscape is an intertwined part of outer landscapes, in constant exchange with the greater than human world, this is essential foundational work for reversing ecocide.

The telling of one's Nature Story is a very helpful and flexible exercise. I recommend that anyone attempting to help others with this exercise should undertake it themselves prior to suggesting it to others.

When I suggest this exercise to others, I will often pause, and allow my body to feel into the earthy systems supporting and surrounding me. I will touch into my sense of the Earth as alive and sentient; and respectfully and silently invite (not demand or expect!) it into the interaction with us.

In its simplest form, this exercise can simply consist of a brief, one-sentence invitation: "Tell me (us) your nature story!" This be done on a one-time basis,

individually or in a group. It is usually at its most powerful as an ongoing journaling practice. Deeper explanation of one's nature stories can be prompted by questions such as,

"What is your first memory involving animals, plants, trees, or the outdoors?"

"What is your relationship like with the greater-than-human world?"

"Where were you raised? Did you spend time with animals or gardening?"

"What is your favorite animal and why?"

"Did you have any frightening experiences in nature? What was that like?"

"What is your most memorable moment in nature when you were a child?"

"Where is your favorite landscape, and why is it your favorite?"

"Have you ever saved an animal's life? What happened, and how did you feel?"

"How did you first learn about the ecological crisis?"

"If the Earth could talk, what would it want to say to us?" (This one may require guidance to help a person speak from a place of deep listening rather than projection.)

When the experiences are positive, the biophilia in the room (or Internet connection) is usually palpable. When done in groups, you can often see the group members listening to the story, light up with recognition and resonance. This exercise can be very helpful in eliciting traumatic memories that might be silently fueling an indifference towards the natural world, an avoidance or even acting out (ecocide). (I once saw a video about a man who'd been bitten by a black widow spider and nearly died; he continued acting out this traumatic experience each night, by systematically hunting and killing every spider he could find in his garden.) When the initial traumatic memory is brought up, along with its incomplete defensive response, it then becomes available for

reprocessing via somatic therapy techniques. Somatic Experiencing includes specific training to help people metabolize, complete and downregulate the traumatic residue from animal attacks and other natural disasters.

Appendix 2

Types of Ecocide

> Just as we are not free to throw garbage into our neighbor's yard, we are no longer free to release countless propagules of invasive species onto our neighbor's landscape. We are no longer free to flood our neighbors with storm water that our huge lawns cannot absorb; nor are we free to deplete our neighbor's aquifer by watering our thirsty grass. None of us has the right to destroy the diversity of life that once thrived on our properties—life that is required to run the ecosystems that keep us and our neighbors alive. We do not have the right to starve local pollinator species by removing the native flowers on which they depend. We do not have the right to heat up our neighbor's airspace by cutting down the trees on our property, nor do we have the right to change our neighbor's climate by pumping carbon dioxide into the air when we mow our lawns. In short, we no longer have the right to ignore the stewardship responsibilities attached to land ownership. Our privately owned land and the ecosystems upon it are essential to everyone's well-being, not just our own. Abusing land anywhere has negative ramifications for people everywhere. (Tallamy 2020, 10-11)

The continuous sparking of energy that we call life is a complex phenomenon, and the Earth's systems supporting it are also complex and very diverse [energy, diversity, decay and renewal, relationality, change]. Human activities are degrading most facets of Earth's life support systems [*energy, diversity, waste, relationality, change]*, with the exception of the terrestrial magnetic field, which shields us from cosmic radiation. It emanates from

Earth's metallic core, and as such seems largely immune from human interference. Most or all of these ecocidal activities demonstrate the effects of linear thinking, with anthropocentric goals taking center stage and the resulting ecological effects being ignored, minimized or excused. A switch to circular economies, in which most or all outputs are reusable as nontoxic inputs for something else, would go a long way towards addressing many of these issues.

The recent effects of human activities can hardly be overestimated. The global population of nearly 8 billion humans at the time of this writing (United States Census Bureau 2023), and the associated ecological pressure of our needs and desires, has damaged or extinguished untold numbers of ecosystems and biomes [*energy, diversity, waste, relationality, change*]. Due to human activities, species extinction is currently between one and ten thousand times the expected and natural background rate; however, amphibians are suffering the most with an extinction rate of twenty-five to forty-five thousand times the background rate (Bekoff 2014). This is not only completely immoral [*relationality*] but also suicidal: "Biodiversity is what enables human life…When animals die, we die, too" (30).

Major anthropogenic threats to biodiversity (life) listed by the World Wildlife Foundations' 2020 report include: Changes to land and sea use, leading to habitat loss and degradation; species overexploitation (overfishing, over-hunting); the spread of invasive species and disease; pollution, and climate change, soil degradation and desertification, plant loss, and the collapse of insect populations. To this depressing list, I would also add the highly anthropocentric, ecocidal practice of war. A thorough examination of these horrible phenomena are well beyond the scope of this paper. Spatial

considerations permit me to briefly highlight only a few of the many general categories of ecocide.

Agriculture

Modern agriculture is ecologically problematic in that it is responsible for 80% of global deforestation, 70% of freshwater use, and 29% of greenhouse gas emissions (WWF 2020). The massive scale of humans seizing other creatures' habitat and repurposing it for our insatiable (often wasteful) demands is dispassionately referred to as *land use change*; it is a violation of the principles of [*energy, diversity, waste, relationality, change*]. This practice of destroying animal habitats for our needs is currently the leading cause of species decline (WWF 2020). Furthermore, industrial food production usually involves mono crop practices [*diversity, relationality*] in order to increase efficiency and yield. As such, local biodiversity is sacrificed, leading to vulnerable, unstable ecosystems and the copious use of herbicides, pesticides and chemical fertilizers. These practices create runoff, contaminating other ecosystems and thus diminishing biodiversity elsewhere [*waste*]. Additionally, in the current global demand economy, food is frequently transported long distances after production, leading to "food miles" and increased carbon and pollution emissions. The problems with modern food production are compounded by the massive problem of food waste, in which has been estimated to be as high as forty percent of all the food produced, packaged and transported for human consumption (Jahren 2020). Recently, retail outlets have been criticized for the widespread practice of throwing away food prior to its spoilage, then locking the dumpsters so as to prevent access by others.

Pollution

The issue of pollution is extremely multi-faceted and complex. It includes the biologically disruptive and inescapable spread of pesticides, herbicides, plastic pollution, air pollution, nuclear waste and contamination, and pharmeceutical contamination of waterways (Buhner 2022). Even light pollution, seemingly innocuous at first glance, disrupts animals' day/night cycles and navigation.

Plastic pollution is of particular concern in that it breaks down into small pieces, known as microplastics. These tiny fragments do not fully biodegrade; they continue to leech toxins into living systems that breathe or eat them. By now, everyone has seen photographs of deceased animals, their rotting bellies revealing the plastic scraps the animal had mistaken for a meal. However, smaller particles may be even more dangerous in that they penetrate mammalian bodies without having to be overtly eaten. They have recently been found in human placentas, and even in our brains, presumably releasing their carcinogenic and hormone disrupting chemicals into our bloodstreams. They also tend to masquerade as plankton. Marine life is generally not evolutionarily prepared to encounter small inorganic particles suspended in the ocean, so they consume these particles in large amounts, leading to nutritional deficits and poisoning. Furthermore, microplastics tend to travel long distances via wind and water, leading to their presence in otherwise pristine ecosystems. Plastic pollution is classified as "poorly reversible", in that it tends to be persistent. Natural degradation processes are slow, and human efforts to remediate are "improbable" (MacLeod et al 2021).

We are currently emitting between 9-23 million metric tons of plastic into the hydrosphere and 13-25 million tons into the terrestrial environment every year (MacLeod

et al 2021). Despite our increasing awareness of plastic's devastation, we are producing more of it every year; it is expected to double by the year 2030 (United Nations 2021).

Perfluorooctanoic Acid (PFOA) and Perfluorooctane Sulfonate (PFOS), are examples of a particular category of human-made chemicals. These chemicals are useful in industrial and manufacturing applications such as fire retardants and packaging. They are sometimes referred to as "forever chemicals" because their specific chemical properties tend to evade our biological filtration mechanisms, meaning that they tend to linger in our bodies, as opposed to being eliminated. For example, when the liver filters one of these chemicals into the bowel for elimination, its size and chemical structure may instead allow it to pass through the intestinal wall and right back into the bloodstream. This evasion of our usual biological defenses causes an increase in the time our bodies are exposed to them, as well as the quantity accumulating in our bodies. These chemicals are omnipresent; they may be found in water, air, soil, food, food packaging, manufacturing, and personal care (Environmental Protection Agency 2023). They are known to cause or contribute to a number of serious health issues, including cancer, developmental delays, immunodeficiency, and hormone and other biological self-regulatory difficulties (EPA 2023). When such a chemical is limited or prohibited, the legal prohibition tends to be limited to one particular molecular structure. Therefore, manufacturers may switch to another, similarly structured chemical which has not yet landed on the list of those outlawed. From this evasive behavior on the part of industry, we can infer the toxic narratives of *efficiency* and *commodification* of the "consumer" public, with industry profit being more important than life.

Extraction

Our modern consumption habits require the extraction of vast amounts of raw materials from various biomes and landscapes. Unfortunately, most extractive practices exert highly problematic effects upon local ecosystems. Such effects are ignored, minimized and justified by the desired products. One example of such destructive practices involves the use of explosives to blow the tops off of mountains, in order to obtain desired minerals. Vast gravel pits destroy soil, habitat and local plant biomes, the industrial machinery producing toxic dust and particulate and exhaust emissions. Logging, particularly that of older ("old growth") trees, destroys soils, habitats, and underground root networks. Fracking, the practice of injecting chemical-laden water into the ground in order to flush out oil reserves, is a well-known source of water table contamination. Similarly, Weintrobe (2021) describes the industry term for lush trees and fertile soils standing in the way of oil extraction: it is reduced to the derogatory description of "overburden."

Climate Change

Although land use change is currently the largest driver of species extinction, climate change is expected to overtake it, causing cumulative damage and increased extinction (WWF 2020). "While Earth's climate has changed throughout its history, the current warming is happening at a rate not seen in the past 10,000 years" (NASA 2023). This [*change*] involves the products of human [*waste*]: anthropogenic greenhouse gases, which are mostly the byproducts of industrial energy production and consumption. Such

unmetabolized discharges are greatly disrupting energy cycles, biodiversity, food webs, and biological cycles [*energy, diversity, waste, relationality, change*].

Oceanic plankton is known to produce roughly half of planetary oxygen (National Ocean and Atmospheric Administration 2023), but due to climate change the ocean is heating and acidifying, with media reports of current ocean temperatures off of the coast of Florida (USA) being over 100 degrees Farenheit as of this writing in the summer of 2023. Ocean heating and acidification is leading to tremendous losses of oxygen-producing micro-organisms as well as other biodiversity. Furthermore, climate change is highly likely to cause other catastrophic changes, including intense storms, flooding, droughts, increased heat (impacting agriculture and health), and sea level rise and associated loss of islands and coastlines (IPCC 2021). It also contributes to the spread of invasive organisms, which may be better adapted to tolerate conditions that strain native insect and animal populations.

Introducing Non-Native Species

Weintrobe (2021) describes how unregulated capitalism has created a global economy unconcerned with the environmental side effects of its business practices. The vast movements of humans and goods across ecosystems and biomes have been a major contributor to the widespread problem of human-introduced nonnative species. These species may hitch a ride almost anywhere, including ship ballast water, cargo containers, smugglers' suitcases, the guts of "food animals," or even the food animals themselves. These life forms evolved elsewhere, in other ecosystems containing factors limiting their populations, such as climate conditions, competition, and predators. Without the limiting

influences of these factors, a new species may completely over-run an ecosystem, outcompeting or crowding out the native species, who are still subject to the limitations inherent to their native ecosystem (Bekoff 2014). Sometimes these species are deliberately introduced, as in the case of non-native plants introduced to suit human landscaping esthetics. One unfortunate example is that of the Argentinian pampas grass overtaking the cliffs of Big Sur, California, choking out other plant life, its leaves and blossoms unusable by native organisms. Botanist Doug Tallamy urges everyone to plant locally native plants, pointing out that by doing so, we could effectively restore a total area equivalent to a large national park. Other invasive species were introduced to attempt to solve another human-generated problem, e.g. cane toads or feral cats deliberately released into an ecosystem, to try to consume mice, which had themselves been introduced by sailing ships.

Predation: Over-hunting and Over-fishing

The human population's taste for "seafood" has led to a massive decline in global fish populations. Currently, *all* of the world's major fisheries are overfished. "Industrialized fisheries typically reduced community biomass by 80% within 15 years of exploitation" (Myers and Worm 2003).

Here, Hillman's toxic narrative of *efficiency* rears its ugly head. The commercial fishing industry is well known for its horrific practices in the name of efficiency, including enormous nets that are effectively inescapable by marine life. Such netting practices result in massive kills of everything in the area, including dolphins and even whales. Some of these creatures are cast off as collateral damage, their deaths completely

in vain [*relationality, waste*]. Commercial fishing practices are also known for discarding nets and other plastic waste into the oceans, compounding the global oceanic plastic crises described above.

Human overpredation occurs on land as well, with hunters going "for the biggest animals and…we overfish and over hunt species" (Bekoff 2014, 31) does not even need to be direct. In the United States, the federal Bureau of Land Management (BLM) leases publicly owned lands to cattle farmers for a tiny fraction of the going market rate. Cattle produce money for ranchers; they tend to be given priority over native wildlife, which are displaced or even hunted to avoid competition or predation on the cattle. Furthermore, cattle consume water supplies, which are often quite limited in semiarid range lands. Their feces contaminate waterways; unlike bison waste, it does not break down and support soil regeneration.

Overpopulation

> While overconsumption has been a hot topic for years, many people remain hesitant to address overpopulation. But the plain fact is we are making too many babies. Until the human species stops growing, it will be virtually impossible to cut back on our overall consumption of Earth's resources. (Bekoff 2014, 23)

The current human population of around eight billion has doubled and the global economy has increased fourfold since 1970. This increase is grossly disproportionate to the ecosystems supporting it, particularly as these ecosystems have been tremendously reduced by land use change, particularly industrial applications and housing

development. The massive scale of our demands is grossly disrupting biogeochemical cycles and biospheric balance (Einhorn 2023). We are killing, crowding out and poisoning other organisms, disrupting food webs and other biogeochemical cycles, and creating enormous deposits of toxic waste in the atmosphere, hydrosphere, lithosphere and even in the biosphere—within the tissues of living organisms. Leahy (2018) describes that 75% of Earth's land masses are now degraded as the direct and indirect results of human activities. As such, our demands represent profound violations of all five ecopsychological principles [*energy, diversity, waste, relationality, change*]. Overpopulation, a "key factor in species extinction" (Bekoff 2014, 24), is a magnifier of all human impacts, some of which could potentially be considered sustainable in the context of a smaller human population, although many of these practices would still be violations of the Five Principles.

The increase in human population correlates with, and directly causes, massive declines in other species. During the same time period, there has been a 68% decrease in population sizes of mammals, birds, amphibians, reptiles, and fish (World Wildlife Foundation 2020). Currently, the total global biomass of humans is "an order of magnitude higher than that of all wild mammals combined." Also, "Intense whaling and exploitation of other marine mammals have resulted in an approximately fivefold decrease in marine mammal global biomass." Meanwhile, the total biomass of wild mammals—both marine and terrestrial—has declined by a factor of approximately six, as humans and their livestock increased (Bar-On Phillips and Milo 2018, 1). These findings are generally consistent with those reported by Greenspoon et al (2023), who comment:

> The global composition of mammal biomass reflects human-induced pressures on wild mammal populations: the increasing human population, the growing global demand for animal-based products, and the related expansion of factory farms (20), leading for example to the result where domesticated mammals now outweigh wild land mammals 30 to 1. (4)

In contrast, Anna Tsing (2017) points out that“ meaningful sustainability requires multi species resurgence, that is, the remaking of livable landscapes through the actions of many organisms” (51).

Furthermore, we have reduced the global biomass of plants by half since the beginning of human civilization (Bar-On Phillips and Milo 2018). Loss of plant biomass is particularly troubling due to plants' role in oxygen production, habitat provision and regulation of temperature and water cycles. Loss of plant diversity due to land use change, and grain consumption by livestock, further reduces habitat.

In addition to the alarming increase in the human population during the 20th and 21st centuries, there has also been a huge surge in average per capita consumption habits, particularly in developed countries. The concept of “planned obsolescence”, in which a product is designed to fail to create a need for additional purchasing, is not only disrespectful to the public. From an ecological standpoint, it is obscene. The linear systems of production in most industrial systems only worsens the problem, with each step of production creating the need for more extraction as well as resulting in more toxic waste. Verones et al (2016) offer an important analysis of the environmental consequences of consumption, with the richest and most powerful countries asserting

pressure (demand) and impact (ecological result), both within and outside of their own borders.

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