UVic Sustainability Scholars Program

Community-Engaged Care for Rare, Threatened and Endangered Species in an Urban Nature Park

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Disclaimer

This report is a product of the UVic Sustainability Scholars Program, a partnership between UVic and various on- and off-campus organizations offering internship opportunities to graduate students working on sustainability-focused research projects that advance sustainability in the region. This project was conducted under the mentorship of Swan Lake Christmas Hill Nature Sanctuary staff.

Territorial Acknowledgement

I acknowledge that the Nature Sanctuary is on the ancestral territories of the lək'ʷəŋən peoples, represented by the Songhees and Esquimalt Nations, and W̱SÁNEĆ peoples, represented by the W̱JOŁEŁP (Tsartlip), BOḴEĆEN (Pauquachin), SṮÁUTW̱ (Tsawout), W̱SIḴEM (Tseycum) and MÁLEXEŁ (Malahat) Nations. I respect the vital relationships of First Peoples with these lands and waters for countless generations.

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Report Summary

- Supporting the basic psychological needs of **autonomy** (i.e., feeling volitional), **competence** (i.e., feeling skillful) and **relatedness** (i.e., feeling socially connected) in context of promoting environmentally sustainable actions can help increase motivation to perform such actions.
- Need fulfillment can be facilitated through provision of a need-supportive environment/conditions (e.g., providing explanations for why someone would want to engage in a behavior can support autonomy; toleration of failure can support competence; teamwork can support relatedness).
- Feeling connected to nature is a crucial first step to caring more about the welfare of the environment, and thus can lead to greater engagement in PEBs. Nature connectedness can be facilitated through nature exposure, participating in stewardship (and other PEBs), and practicing mindfulness.
- We must change the way we think so that we may be better able to address challenges, including better serving equity-deserving groups. Some of the ways this could be done is through thinking outside the box, shifting perspectives and worldviews, and the use of pro-environmental communication.
- It is necessary to decolonize our thinking. One way this could be done is through Two-Eyed Seeing, which considers the strengths of Indigenous and Western ways of knowing equally in order to determine best solutions in order to sustain the Earth. This method can also help facilitate more meaningful engagement in collaborative settings.
- Partnering and outreach with organizations that serve equity-deserving groups as well as Indigenous Knowledge Keepers can help reduce barriers to nature accessibility. Building respectful and trustworthy relationships with equity-deserving groups is essential.
- In communicating with someone who does not or cannot be convinced to care about the environment, communication strategies such as message framing may be more effective, as they can be used to appeal to a person's existing values and attitudes. Message framing works best when they communicate support for basic psychological needs and intrinsic goals. To find out these attitudes, it can be helpful to approach a person with acceptance, openness, and curiosity rather than judgement.

Community-Engaged Care for Rare, Threatened and Endangered Species in an Urban Nature Park

Background

Swan Lake Christmas Hill Nature Sanctuary is an urban greenspace that serves as crucial habitat for a variety of rare, threatened, and endangered species. As human densities increase and urbanization spreads further, there is concern regarding the possibility of urban areas encroaching upon vital, species-rich habitats such as Swan Lake. To emphasize the importance and ensure the protection of such key biodiverse areas within urban landscapes, the current literature was reviewed to investigate strategies used by other urban nature parks to promote species conservation and nature engagement, with particular notice to ones addressing the equity-deficit; literature in psychology was also explored to investigate strategies relevant for motivating pro-environmental behaviors (PEBs). In supplement to this literature review, casual conversations with Swan Lake visitors/volunteers further elucidated reasons that people engage with the Nature Sanctuary.

From an environmental psychology standpoint, the research on promoting species conservation can be summarized in three main themes: the importance of supporting basic human psychological needs, the importance of fostering connection to nature, and, lastly, shifting mindsets to better tackle sustainability issues and promote PEBs. In this report, I will elaborate on each of these overarching themes and discuss useful strategies for promoting species conservation and nature engagement, especially those that support equity-deserving groups.

Supporting Basic Psychological Needs

In reviewing the literature, one of the reoccurring themes was reflective of a well-known theory in social psychology called self-determination theory (SDT; Ryan & Deci, 2017). This theory posits three universal psychological needs that are fundamental for human wellness: autonomy, competence, and relatedness. When these needs are met, it leads to more "self-determined" intrinsic motivation, which can be understood as having internally derived reasons for performing behaviors—you're doing something because *you want to* (Reeve, 2018). Thus, intrinsically motivated activities are done out of inherent interest and enjoyment and are often described as "fun". Experiencing psychological need satisfaction is also a prerequisite for psychological growth, flourishing, and well-being (e.g., positive emotions, feelings of worthwhile life; Pyszczynski et al., 2010; Ryan & Deci, 2017). In contrast, frustration of these needs can reduce intrinsic motivation and well-being. Although there are nuanced differences, the conceptualization of self-determination in Indigenous cultures expresses similar themes reflective of psychological need fulfillment. Indeed, Indigenous self-determination is considered integral to well-being and connotes the collective ability to make decisions and is based upon freedom and non-dominion (similar to autonomy), and respect in all relationships, with relationships to the land being particularly important (similar to relatedness; Kuokkanen, 2019).

In the context of performing environmentally-friendly behaviors (as well as in many other types of behavior), intrinsic motivation is of the upmost importance. Much research has demonstrated that this type of motivation is the most effective for promoting sustained engagement in PEBs (Zhao, 2024). In addition, the more that individuals perceive their basic needs to be satisfied, the more they are motivated and interested toward PEBs (Cooke et al.,

2016), such as pulling invasive species and other stewardship activities. However, whether needs are satisfied can also depend on whether a person experiences a need-supportive or need-frustrating environment, and need-supportive conditions can be facilitated through many different strategies (Ryan & Deci, 2017).

The following section will explain each of these basic psychological needs, how they can be supported (or impeded), and examples of need supportive strategies that environmental organizations have attempted in order to promote nature engagement and conservation.

The Need for Autonomy

Autonomy can be defined as the need to feel a sense of free-will, volition, and self-endorsement in regard to one's actions (Ryan & Deci, 2017). Behaviors can be considered autonomous when they are guided by our interests, values, and preferences (Reeve, 2018). Satisfaction of the need for autonomy was reflected in many of the conversations I had with visitors of Swan Lake. For example, upon asking what brings them to the invasive species pull events, one volunteer replied that they come because the activity aligns with their interest in gardening and that they like being outdoors. Another volunteer noted that this was their idea of fun, and yet another person remarked that they enjoy training their eye to find the invasive plants.

Unfortunately, the current literature appears to present a pattern of autonomy frustration in the context of PEBs. For example, in a survey for the 2023 Canadian City Parks Report with over 2000 Canadian residents across 35 municipalities, residents reported that they felt they did not have influence over what goes on in their local parks (Park People, 2023g). This reflects autonomy frustration because residents do not feel that they have the opportunity to exert their will, despite a strong interest and desire to do so. In fact, 56% of city residents reported interest in advocating for park improvements or green space protection. Worse, those that *do* seem to have influence over parks have historically been the most privileged voices. It is clear that residents want to enact change, and thus giving them the opportunity for environmental engagement is important for satisfying the need for autonomy and increasing well-being, especially for equity-deserving groups.

Luckily, there are several ways to support the need for autonomy. The literature on self-determination theory notes six main strategies that one can do to support a person's need for autonomy: taking the other person's perspective, facilitating conditions in which people can motivate themselves (i.e., nurturing psychological need satisfaction), acknowledging and accepting expressions of negative emotions, displaying patience (e.g., waiting calmly during periods of behavior adjustment), using invitational language (e.g., using terms like "may" instead of "should"), and providing explanatory rationales (Reeve, 2018; Ryan & Deci, 2017).

Of these strategies, the one that appears most often in the literature on PEBs is providing explanatory rationales. This strategy entails communicating the *why* of a behavior—explaining the reasons behind why a behavior is worthwhile, important, and/or useful to perform on a personal level. For instance, in a project focusing on ecological restoration in cities, they aimed to change the appearance of a greenspace to be more wild and less manicured, in effect decreasing cost to maintain the grounds while simultaneously increasing plant and insect biodiversity (Klaus, 2024). This change in appearance was met with backlash from the public. However, after it was explained that the purpose of the project was to increase biodiversity, the

public became in favor of the project, completely changing their opinion. Providing a rationale helps people internalize the value of an activity that was not previously seen as worthwhile, making an activity more self-endorsed and thus supportive of the need for autonomy. Another interesting application of this strategy involved a visual demonstration of why an action was beneficial (Dullau & Grewe, 2024). Specifically, one project situated a pre-grown meadow mat in an urban park area and labeled plant species in areas of lower vs. higher biodiversity (i.e., more plant labels existing in the high biodiversity meadow) to illustrate the benefits of greater biodiversity and why the city may want to consider establishing urban meadows.

These strategies would work even better when used in conjunction (Reeve, 2018). One example mentioned in the literature appeared to encapsulate several of the mentioned strategies: meeting people where they are at (Jordan, 2023). This approach demonstrates autonomy support as it could involve perspective-taking, displaying patience, as well as identifying their passions or interests to promote intrinsic motivation.

The Need for Competence

Competence can be defined as the need to feel capable and effective in one's environment, often through the development of skills, understanding, or mastery (Ryan & Deci, 2017). This involves having a sense of control and belief in one's abilities to overcome challenges and achieve goals deemed important by the individual (Wullenkord, 2023). Additionally, competence-satisfying activities have an optimal level of challenge, where activities are not too difficult or too easy for the given individual's skill level. Thus, understanding which behaviors are pro-environmental and know how to engage in them facilitates the need for competence and increases the likelihood of engaging in PEBs (Darner, 2009; De Young, 2000).

There are several ways to support the satisfaction of the need for competence. These methods include providing clear expectations (e.g., "what to do" is clear), progress-enabling guidance (e.g., modeling how to do the task; providing help as needed), constructive feedback (e.g., communicates strengths and what can be improved), and allowing room for error (e.g., encouraging failure as part of the learning experience; Reeve, 2018). Although park annual reports do not often use such language, we can still make educated guesses about which strategies may have been used when findings reflect satisfaction of the need for competence. For one, reports often mentioned forms of teaching or training skills related to the land. For instance, in a program connecting post-secondary Indigenous students to the land, individuals were taught survival skills, such as how to stalk and track prey, outdoor cooking, and fire safety (Dumont, 2024). At the end of this program, students reported greater self-confidence in their newfound practical survival skills, which reflects satisfaction of the need for competence in that students felt capable as a result of developing these skills (Ryan & Deci, 2017). Although not specifically reported, this program likely used progress-enabling guidance as a primary strategy, such as providing assistance, modeling how to do a behavior, and offering tips, as well as tolerating mistakes or failure as individuals learned new skills (Reeve, 2018).

Similarly, the Environmental Youth Alliance (2023) provides a free land-based education and paid employment training programs to support equity-denied youth in developing the skills and confidence to become environmental stewards. As a result of participating in this program, 96% of youth reported feeling that they gained new skills in land stewardship, and 91% of youth reported feeling more confident in their abilities as land stewards. Again, although not

specifically reported, since this program involved training for a paid position, it may have involved competence supportive strategies such as constructive feedback and clear expectations (Reeve, 2018).

However, in the event that activities that are too challenging or require skills and know-how that one does not yet possess, there is the potential for competence frustration (Reeve, 2018). Indeed, competence frustration is related to amotivation and feelings of helplessness, lack of perceived control, and lack of self-efficacy (Pelletier et al., 1999). Put simply, amotivation is a state in which individuals do not foresee the consequences of their actions; as a result, individuals who experience amotivation often doubt their actions, which often can lead to giving up. In the context of pro-environmentalism, amotivation is a significant issue: if people are unable to see how their actions can make an impact, then they are less likely to engage in pro-environmental actions. An example of amotivation can be seen in a comment made at the Annual General Meeting at Swan Lake, where a member expressed that the older generations have left a mess for the younger generations, and that they were glad they would not around anymore when everything "goes to shit". This comment conveys the notion of helplessness and relinquishing responsibility to the younger generations, as the individual appears to have little hope that things will get better during the remainder of their lifespan.

Indeed, amotivation toward the environment often goes hand in hand with the development of helplessness beliefs (Pelletier et al., 1999). These beliefs can stem from a several different sources. One source is feeling a lack of perceived control over their environment, which results in expecting strategies to fail or be ineffective at producing desired outcomes. Another reason helplessness develops is due to a lack of self-efficacy, where one does not believe they have the capability to perform a behavior successfully. Additionally, helpless-oriented individuals tend to see failure as an indicator of personal inadequacy, rather than as part of the learning process (Reeve, 2018). In turn, this intolerance of failure can lead individuals toward a state of despair.

Thus, it is important that the environment or social context allows room for error by supporting and tolerating failure as part of the experience of learning (Reeve, 2018). As noted earlier, allowing room for error is one way that the environment can facilitate satisfaction of the need for competence (Reeve, 2018). Having this tolerance for failure permits an individual to engage in problem solving, recognize when they need help, and reevaluate coping strategies. Tolerating failure may be especially vital when one does not yet possess the skillset needed to accomplish a task. For instance, in order to reduce barriers to getting involved, Everett Crowley Park advertised that there are no minimum skills or requirements for participating in volunteer events (Park People, 2024a). Moreover, tolerating failure can help one to develop a sense of personal control; instead of interpreting failure as a threat, one can instead see it as a challenge (Reeve, 2018; Skinner & Wellborn, 1997). Perceiving that one has control in the outcome of events and the surrounding environment can help lead to satisfaction of the need for competence (Liu & Zhao, 2022). High perceived control reflects mastery beliefs, where an individual feels that they are capable of both obtaining desired and preventing undesired outcomes (Peterson et al., 1993; Reeve, 2018). Mastery-oriented individuals view failure as constructive feedback about how to improve (Clifford, 1984); this leads to enhanced performance and optimism (Reeve, 2018).

In addition, when a behavior is too challenging or difficult, one might consider making it easier or more convenient to perform (Zhao, 2024; Green-Demers, 1997). For sustainable action to succeed, it is recommended that climate change interventions are made to be easy, rewarding, and pleasant to engage in (Zhao, 2024). Indeed, reducing the difficulty of a PEB can help support the need for competence, as it enhances feelings of self-efficacy, which in turn encourages PEBs (Lauren et al., 2016). This effect occurs because competence satisfaction promotes self-efficacy (Raven & Pels, 2021), which supports feeling confident that one can do what it takes to succeed at a task (Pelletier et al., 1999). This is demonstrated in a study (Lauren et al., 2016) showing that self-efficacy can result in "spillover" effects; it was found that engaging in easy PEBs results in heightened feelings of self-efficacy in relation to PEBs, which in turn motivates greater effort and persistence in performing more difficult PEBs in the future. When high self-efficacy is paired with high mastery beliefs (i.e., high perceived control), it can promote hopeful thinking (Reeve, 2018; Zhang et al., 2018).

The Need for Relatedness

Relatedness can be defined as the need to feel a sense of social connection, belongingness to groups or communities, and mutual caring with others (Reeve, 2018; Ryan & Deci, 2017; Wullenkord, 2020). Having the need for relatedness supported manifests as feeling understood, accepted, and supported by others, and that the other person likes you for who you are. Broadly, the need for relatedness can be nurtured and satisfied when the social environment is supportive. Some of these ways to promote feelings of relatedness include teamwork, forming social bonds, responsiveness, individualized conversations, friendly communication, and inviting social interaction.

The concept of the need for relatedness is also reflected in notions of wellness in Indigenous communities. For example, Leroy Littlebear (2024) noted that the values of sharing, cooperation, generosity, caring, amiability, and trustworthiness are important to Blackfoot sense of wellness. It has also been noted that "community" is one of the seven main components that make up Indigenous wellness widely across Indigenous groups (Luger & Collins, 2022), and often looks like spending time outdoors with loved ones.

Such a sense of community can promote pro-environmental actions in several ways. For one, stewardship activities can bring about the creation of social bonds. For example, in a conversation at an invasive species pull event at Swan Lake, a long-time student volunteer told me that they liked the community that the restoration activity brings together, so much so that they have been consistently volunteering for four years. This sentiment reflects that a sense of community can be brought about by doing activities together that you can connect over and that are important to you, promoting feelings of mutual caring and liking. A sense of community can also be developed even through online activities. For example, the National Audobon Society created virtual events for individuals who are passionate about birds and bird conservation (Beatley, 2022). There are also many online interactive citizen science communities that exist on apps, such as Merlin, Ebird, and iNaturalist. These platforms could give marginalized groups, such as low-income, elderly, or physically disabled, access to nature as well as fulfill their need for relatedness.

Another way to support the need for relatedness is through meaningful conversation, as this allows people to deepen care and connection with each other (Reeve, 2018). Such connections could be built at the individual level or at the community level. For example, I

observed many personal conversations at Swan Lake, both during restoration events and people walking on site. During these conversations, individuals often shared with each other serious topics, such as family, ailments, and hospitalizations. At the community level, meaningful or difficult conversation can happen surrounding things like Healing Forests (*About*, n.d.), which honor the memories of departed Indigenous individuals. Not only do Healing Forests increase a sense of belonging and connection to culture for Indigenous peoples, they also bridge connections with members of other cultures. In coming together at Healing Forest sites, Indigenous and non-Indigenous peoples can pay their respects, develop mutual respect and understanding of each other, and move toward reconciliation.

Moreover, the strategies of inviting social interaction, friendly communication, and cooperation and teamwork seem particularly relevant in encouraging PEBs. For example, Tartu City Center Parks in Estonia put out an open invitation to local residents to help with restoring an intensively managed area and to bring bulbs to plant (Unt et al., 2024). This invitation proved very successful: many people showed up to participate, and even spread the word of the event, expanding the community and breeding further stewardship. I also personally witnessed friendly communication frequently during stewardship events at Swan Lake. For instance, one woman at a restoration event expressed that the volunteers she has worked with are always so nice. At another event, I observed a lighthearted and fun community who were easy to talk with, and there was clearly a core group present that had built friendships through participating in this activity together. Finally, an excellent example of teamwork can be seen in the Adopt a Park program in Brampton, Ontario (Brampton, 2024). This program gave the opportunity for groups of five or more people (e.g., schools, families) to maintain a park together for two years, as well as lead several park stewardship activities in the park.

Fostering (Re)connection to Nature

Since time immemorial, connection with nature has played a key role in human health (Browning et al., 2014), as is evidenced in the traditions upheld by many Indigenous groups to this day. Indeed, traditional practices and values of a variety of Indigenous groups place importance on connection to and relationship with nature as a source of mental wellness. For example, according to Leroy Little Bear (2024), a Blackfoot researcher, some key Blackfoot worldviews include that all of creation is interconnected, and that the land is psychologically important for Blackfoot identity and fulfillment of physical needs, including customs relating to conservation practices. Similarly, Cree peoples see themselves as interconnected with humanity and nature (Spiegelaar, 2024). They also view nature as a teacher and knowing the patterns of nature is seen as an indicator of well-being. As a final example, *Minobimaatisiiwin*, meaning “the good life" and "continuous rebirth”, is a concept central to Anishinaabeg value systems and involves honoring the self and others as part of creation (LaDuke, 2010). Evident in this value system is also the importance of maintaining a balanced and deep understanding of the relationship between humans and the environment; this includes taking care of the land.

In addition, recent research in environmental psychology supports the role nature plays in well-being. For example, exposure to nature has been linked to greater feelings of happiness and worthwhile life (White et al., 2017), as well as vitality and life satisfaction (Ryan et al., 2010; Wolsko et al., 2019). Another study (Mayer et al., 2009) found that nature exposure led to feeling more connected to nature, which then facilitated a sense of meaning in life.

However, *exposure* to nature does not always guarantee feeling *connected* to nature. For example, it was found that higher park use was associated with higher physical and mental health, but *only* if park users felt connected to nature (Park People, 2024c). Furthermore, some forms and features of nature exposure seem to produce a sense of nature connection more reliably than others. For instance, studies have shown that visual components of nature, such as having an unimpeded view of nature over a distance and having visual access to biodiversity, are especially supportive for nature connection and subsequently well-being (e.g., stress reduction, improved cognitive performance, positive emotions; Browning et al., 2014). Additionally, volunteer stewards reported that elements of parks that made them feel most connected to nature included trails, natural areas (i.e., wildlife, forests, native plants), and the presence of water (Park People, 2024c).

Connecting to nature is an important prerequisite to caring about it and wanting to protect it (Jordan, 2023). Indeed, research has shown that greater nature connectedness is related not only to greater well-being, but also to greater engagement in pro-environmental behaviors (PEBs; Capaldi et al., 2014; Zelenski et al., 2015). This can be seen, for example, in the case of park stewards. Those who participate in stewardship activities tend to feel more connected to nature, compared to those who participate in recreation activities (Park People, 2023b). In addition, according to 2023 survey results from participants who worked with Free the Fern Stewardship Society, it appears that participating in stewardship breeds interest in other or additional PEBs, such as volunteering for other environmental organizations, practicing energy conservation, planting native species at home, and seeking out more ways to learn about environmental issues (Park People, 2024b).

Despite these positive benefits of nature connectedness, there are various barriers blocking the path to obtaining them in modern society. For one, common to Western worldviews, people may believe humans to be separate from or superior to nature (Beatley, 2016). This perception can manifest as fear of nature in a variety of capacities (e.g., germs, insects, predatory animals) and can further contribute to a feeling of disconnect. The belief that nature is separate has also often led people to think of nature as something remote and pristine rather than something that is all around us. This unhelpful worldview is only getting reinforced as, with urbanization on the rise, people are spending more and more time indoors (MacKerron & Mourato, 2013), to the effect of feeling more of a disconnect with nature, both physically and psychologically (Zelenski et al., 2015). This disconnect is detrimental to human health, and the reduced feelings of connection to nature may also result in people feeling less inclined to engage in PEBs (Schultz, 2000; Zelenski et al., 2015).

Importantly, this lack of nature connection is disproportionately impacting equity-deserving groups. For instance, it was found that only 59% of park users who identified as a visible minority felt strongly connected to nature, compared to 73% of white park users, and most of those who reported participating in stewardship identified as white, able-bodied, cis-gender women (Park People, 2024c). Moreover, access to green spaces within urban areas have historically been reserved for the wealthier population (Wilson, 2023). Thus, there is a great need to extend the same benefits that can be gained from urban nature more equitably across the cityscape. This section will discuss strategies to promote PEBs through facilitating nature connectedness and examples of how these strategies were applied in the context of urban nature parks. In reviewing the literature, the main strategies to increase feelings of nature connectedness appear to be through nature exposure, stewardship, and mindfulness.

Nature Exposure

Although nature exposure is perhaps the simplest way to promote feelings of nature connectedness, not everyone is eager to go outside. As stated earlier, because people have become increasingly separated from nature due to urbanization, this disconnect may have led to the development of fears or aversion to nature that further distances them from being able to connect to nature (Beatley, 2016; Phillips et al., 2023). Whatever the case, it is of vital importance to meet people where they are at in terms of comfort level.

Luckily, with modern technology, there are plenty of ways to connect with nature for different levels of comfort. Indeed, nature connection can be sparked even through virtual means. For example, Pasca et al. (2021) demonstrated that people exposed to pictures of natural environments (e.g., forest) felt more connected to nature compared to those who looked at pictures of less natural environments (e.g., traffic on a road). Similar results have also been found with exposure through video (Mayer et al., 2009) or virtual reality (Ahn et al., 2016). Another interesting option can be seen in Phipps Conservatory and botanical gardens in Pittsburgh, Pennsylvania, USA, where they brought the sounds of nature inside buildings (Beatley, 2016). To execute this, sound artists were hired to record sounds from the surrounding area throughout the changing seasons of the year. The sounds of nature were then broadcast through speakers within the conservatory, allowing for connection to nature while remaining indoors. Not only would these options be a useful starting point for those with fears or aversion to nature, they also may be especially useful to allow nature connection for equity-deserving groups, perhaps especially those with physical disabilities. Another nature exposure option which has become popular since the COVID-19 pandemic is hosting online gatherings, which could be used for environmental conferences, learning events, or perhaps even virtual park tours. This option may also help break down cost-prohibitive barriers to accessing nature (e.g., traveling to far away park could be expensive; Beatley, 2021).

While nature connection can be experienced through simulated nature, exposure to actual nature is still more effective (McMahan & Estes, 2015; Yeong Choe, 2024). Although real nature could be intimidating for some, small steps can be taken toward connecting. Indeed, individuals do not have to visit a historic destination park to feel connected to nature (Park People 2024c); rather, it could be as simple as stepping outside the home to look at the moon, or going on a five-minute walk (Dumont, 2024). The Urban Park Rangers' Weekend Adventures Program in New York is an excellent demonstration of the fact that nature can be close to home (Beatley, 2016). The most popular activity this program offers is family camping trips, where families are able to camp together in city parks. For no cost, these families are provided with camping supplies and activities guided by Park Rangers, such as night hikes and wildlife viewing. This enables families—who otherwise would have found the cost or travel prohibitive—the opportunity to connect with and learn about nature. Another incredibly successful case that promoted nature connection was the Urban Forest Visual project in Melbourne, Australia (Beatley, 2016). For this program, citizens had the ability to email their favorite trees through an online virtual map that was created, which provided corresponding email addresses for all 77,000 trees in the city. Not only is this program an excellent example of accessible, nearby nature, but it also gets people to continue thinking about and feeling connected to the natural environment even when they are away from nature. This program has great potential to be applied at different scales (e.g., at the park level) and for different species to foster various different connections to nature.

Nature connection can also be fostered through participation in interactive and citizen science activities. For example, the Eden Place Nature Center in Chicago has a variety of program activities to participate in, such as seed collection and birdwatching (Beatley, 2016). They also have citizen science opportunities, such as monarch butterfly monitoring (i.e., tagging); this is a more accessible activity as people can engage in it both on and off-site. Another notably creative initiative was put on by the Waterfronts Initiative, which sought to encourage residents to connect with and visit nearby marine nature (Beatley, 2016). In order to raise public awareness about how quickly oil spills can spread, they arranged for an organized drop of biodegradable drift cards. Residents were then invited to participate in the challenging task of retrieving we drift cards and registering online where they were found.

Importantly, many organizations have been recently attempting to create programs to foster nature connection specifically for equity-deserving groups. One way this has been done seems to be in the form of guided walks. For example, High Park has developed a program called “Branching Out”, where individuals whose native language is not English have the opportunity to be trained by a naturalist to lead hikes in their native language (Park People, 2023c). Another example is the development of a guided sensory-based walking tour for blind and visually impaired park visitors at Mount Royal Park (Park People, 2023d).

There have also been efforts to increase inclusivity of low-income citizens in park programs. For instance, the Everett Crowley Park Committee has promoted greater accessibility for such groups through hosting free lunches for volunteers, holding events near wheelchair accessible trails, and family-friendly weekend events for those who work during the week (Park People, 2024a). Engagement was additionally promoted by advertising events in local community centers, providing programs for local schools, and onboarding local residents to the park committee so that their voices may be heard. Further, the Darlington Ecological Corridor fosters inclusivity through opportunities for low-income residents to take free gardening courses as well as help themselves to the site’s public garden plots, fruit trees, and medicinal plants (Park People, 2024c). A final example is Free the Fern Stewardship Society’s creation of a Native Food Forest, where volunteers planted native fruits, vegetables, and other edible plants for the benefit of food-insecure individuals (Park People, 2024b).

As well, there have recently been more efforts to be inclusive of Indigenous peoples and cultures. This is well-illustrated by the creation of Healing Forests, which are spaces dedicated to the land’s Indigenous peoples and their ancestors (*About*, n.d.; *Healing Forests*, 2024; Park People, 2024b; Park People, 2024c). These spaces can be anywhere from a few trees to an entire forest and are meant to honor residential school survivors, victims, and families, as well as missing and murdered Indigenous women. This is a National Healing Forest Initiative, where the spaces have the purpose of promoting reconciliation, healing, and building respect for one other and nature. This can also involve Elders and survivors sharing their experience. Establishing a Healing Forest does not have to be expensive, as existing sites could be used and the David Suzuki Foundation also offers funding. In addition, Free the Fern Stewardship Society in partnership with Indigenous knowledge-holders have put on events such as cedar weaving, native plant identification, and salve-making (Park People, 2024b).

Moreover, as is exemplified in Indigenous practices and worldviews (LaDuke, 2010; Littlebear, 2024; Spiegelaar, 2024), feeling connected to land could lead to seeing the self as *part* of the land: an organism who, like other organisms, is partaking and participating in the

environment (Smith, 2020). Indeed, this is further supported by research in psychology, where individuals who feel more connected to nature rate their feeling of "oneness" with nature higher on the inclusion-of-nature-in-self-scale (Martin & Czellar, 2016; Schultz, 2002). This high level of connectedness could lead to viewing and treating the environment as equally valuable to human life. This could even go so far as to grant a natural area "personhood", protecting and giving a natural area the same rights as humans. For example, in New Zealand, the status of legal personhood was bestowed on the Whanganui River, which the Indigenous Māori see as their living ancestor (Cheater, 2018). Although this is not currently a common practice, normalizing the extension of personhood rights to the natural world could serve as a necessary part of reconciliation and respect for Indigenous peoples.

Participating in Stewardship

Urban nature parks are essential spaces for city-dwellers to access and connect with nature, including through park stewardship. In fact, Park People (2023a) report that 98% of people who volunteered in stewardship activities felt connected to living things and the environment. Moreover, stewardship engenders greater feelings of nature connectedness compared to other nature activities: survey responses from over 700 park users from three different large urban nature parks revealed that 75% of people who engaged in park stewardship reported feeling more connected to the environment and other people, compared to only 51% of people who engaged in recreational activities. Additionally, it seems that stewardship inspires further stewardship. In a 2023 survey, 48% of stewards at Champlain Heights reported that they started conducting conservation work at home and/or in their neighborhoods (i.e., planting native species/pulling invasive, tending a garden) since volunteering (Park People, 2024b).

We have much we can learn about park stewardship through the wisdom of Indigenous peoples. Due to a deep relationship with the land and being the original caretakers, Indigenous peoples have great knowledge in regards to biodiversity conservation. Many of these practices across groups involved restraint in resource use, such as hunting only outside of breeding seasons and granting total protection to keystone species and habitats (e.g., preserving sacred Ficus groves; Gadgil et al., 1993). Finally starting to get the recognition they deserve, several organizations have partnered with Indigenous Elders and Knowledge Keepers to pass along their wisdom of how to take care of the land. For instance, Stanley Park Ecological Society has been working in part with the Environmental Youth Alliance, empowering youth from equity-denied communities to become environmental stewards (Park People, 2023e). This entails a free land-based education program, where BIPOC youth learn about traditional stewardship protocol from Elders and Knowledge Keepers. In addition, the youth receive paid training/employment to develop stewardship skills involving native plant horticulture, plant medicine, and ecological restoration.

Some organizations are making promising strides toward making stewardship opportunities inclusive for other equity-deserving groups as well. For example, Free the Fern notes that their stewardship activities are carried out by volunteers across generations and backgrounds who learn how to identify native versus non-native plants together (Park People, 2024b). Mount Royal Park has fostered inclusivity by offering stewardship opportunities to individuals part of L'Hirondelle: a local non-profit whose mission is to welcome and help immigrant and refugee communities settle into their new living environments (Park People, 2023d). Another example can be seen in the Kindness Farm, an expanding project in India put on

by the Visakha Society for Protection and Care of Animals (VSPCA; Tallam & Nath, 2022). A large part of this project involves addressing local food and water security for the impoverished by teaching community members how to sustainably grow their own food (e.g., through teaching how to promote biodiversity) and harvest rainwater, as well as addressing poverty by providing jobs in which residents manage the Farm. Notably, this project also specifically aimed to allow people to gain an appreciation for and realize the importance of biodiversity.

Practicing Mindfulness

Connecting to nature can be facilitated by practicing mindfulness. In essence, mindfulness can be defined as paying attention to the present moment in a nonjudgemental way (Beloborodova & Brown, 1964). Mindfulness is often understood as having three main components: mindful attention (i.e., sustaining attention to the present moment), awareness (i.e., monitoring present experiences), and acceptance (i.e., an attitude of openness, nonjudgement, and curiosity about the present moment; Bishop et al., 2004; Cardaciotto et al., 2008; Huynh & Torquati, 2019).

Studies have shown that mindfulness and nature connection are linked (Howell et al., 2011; Nisbet et al., 2019). Although feeling connected to nature can occur from simply being exposed to nature, mindfulness can *enhance* this effect. For instance, in one study (Nisbet et al., 2019), participants who went on a guided meditation walk outdoors reported greater felt nature connection and awareness of surroundings, compared to those who went on a regular guided outdoor walk. Mindfulness may be particularly important for those who care the most about nature, as high concern for the environment can be linked to higher rates of anxiety, depression, and other mental health deficits (Fraser et al., 2013) that could easily lead to developing defeating and fatalistic attitudes (e.g., viewing climate action as pointless; Wamsler & Brink, 2018). However, practicing mindfulness may protect against these negative effects, as findings have shown that greater mindfulness is associated with reduced stress and greater ability to cope with negative emotions (Huynh & Torquati, 2019), as well as the absence of fatalist attitudes (Wamsler & Brink, 2018). This could help the people who are most passionate about sustainability issues maintain their mental health resilience and persevere in behaving sustainably and participating in environmental activism.

As well, the importance of mindfulness is inherently reflected in many Indigenous cultures. Indigenous authors Luger & Collins (2022) mention that, broadly, one of the seven values of Indigenous wellness is “ceremony”, which encourages people to spend time outside and be consciously aware of one’s connection with the land, appreciating all that the land provides. Moreover, in Cree, Anishnaabe, and other Indigenous cultures, nature is treated as a teacher: through using the five senses to be aware and carefully pay attention to one’s surroundings, one can learn about the world and its inner workings (Dumont, 2024; Spiegelaar, 2024). In the practice of observing and understanding how all life is intertwined, people form a deep sense of connection to land and greater spiritual consciousness. Spending time outside and building a relationship to the land also leads to greater awareness of one’s own actions; this can manifest as forming a reciprocal relationship with the land, becoming more aware of one’s environmental footprint, and “leaving no trace” (Luger & Collins, 2022).

Indeed, greater mindfulness is linked to greater engagement in eco-friendly behaviors (e.g., Barbaro & Pickett, 2016; Richter & Hunecke, 2022; Wamsler & Brink, 2018). One reason for this may be that mindfulness seems to increase empathy and compassion for both other

people *and* the world surrounding them (Shapiro et al., 1998; Tipsord, 2009). For instance, meditators reported feeling a sense of compassion, interconnectedness, and interdependence, all of which led individuals to want to reduce suffering for the self, other humans, as well as non-human life (Thiermann & Sheate, 2022). Another reason is that mindfulness helps us to reflect on our values and act in line with them (Brown & Kasser, 2005; Ericson et al., 2014). Because mindfulness allows us be more aware of our decision-making processes, we may be more likely to consciously choose to engage in a sustainable behavior rather than automatically participating in consumerism out of habit (e.g., instead of online shopping for a fast fashion item, deliberately choosing to shop at a thrift store). Choosing to act in alignment with one's values parallels a similar finding that mindfulness facilitates the translation of intentions into actions (Chatzisarantis & Hagger, 2007), suggesting that mindfulness also has the potential to translate pro-environmental intentions into pro-environmental actions (Ericson et al., 2014).

In cultivating such intrinsic values, mindfulness promotes self-determined pro-environmental motivation, which can lead to pro-environmental behavior (Green-Demers et al., 1997). To illustrate, Thiermann et al. (2020) found that, compared to non-meditators, practiced meditators had greater levels of mindfulness, nature connectedness, environmental concern, and pro-environmental motivation (e.g., expressed desire to protect environment out of love and gratitude for nature). Unsurprisingly, mindfulness can lead to pro-environmental motivation through satisfaction of the basic psychological needs. Mindfulness facilitates autonomy satisfaction due to greater awareness of thoughts and emotions, which increases the likelihood of making choices or performing behaviors that are self-congruent (Beloborodova & Brown, 1964). Mindfulness can facilitate competence satisfaction through greater focus on the task at hand and noticing progress. Finally, practicing mindfulness can facilitate relatedness satisfaction because it allows us to become nonjudgmentally receptive, increasing felt connection toward others.

There are several ways we can foster mindfulness in nature. For example, one study (Nisbet et al., 2019) had a mindful outdoor walking meditation protocol. This procedure involved three separate instructions that were given five minutes apart. First, individuals were invited to pay attention to their steps as they walked; second, they shifted their attention to observing a single aspect of nature (e.g., color of leaves, scent of air); finally, individuals were instructed to become completely immersed in nature while withholding judgement. After this exercise, participants reported feeling more connected to nature and more aware of their surroundings. Another way to cultivate mindful experiences in nature is through forest bathing, otherwise known as the Japanese practice, Shinrin-yoku. Forest bathing involves becoming mindfully immersed in one's surrounding environment and consciously engaging with the senses (Clarke et al., 2021). Shinrin-yoku practices most commonly involve outdoor walking, meditation, and recreational activities, often with the goal of facilitating relaxation and mental health (Forest Therapy Society, 2005; Kotera et al., 2022). This accurately reflects my personal experience during a forest bathing session conducted on Swan Lake grounds. For example, during this experience, I was able to use my senses to take in the surroundings and felt a deep sense of connection with the surrounding waters and land.

Importantly, for Indigenous groups, land-based awareness teaching may be an ideal approach for promoting mindfulness. For example, as part of a mental health program for Indigenous post-secondary students to reconnect and heal their relation to land (Dumont, 2024), awareness was trained through practices such as "sit spot", where one picks a spot in nature to sit and observe the surrounding environment. They were also taught practical skills that required

mindful awareness, such as tracking prey, fire awareness safety, and outdoor cooking. After the program, students reported higher connectedness to the land, awareness, and positive emotional experience. In a sharing circle, the students also verbalized that they experienced mindfulness, and felt present and connected to their surroundings.

Shifting Mindsets to Overcome Challenges

Enacting change and promoting PEBs can come with many challenges along the way. One of the most significant challenges involves the barriers to park use for equity-deserving groups. Indeed, it has been shown that marginalized groups are often less frequent or non-users of parks (Bedimo-Rung, 2005) for a variety of reasons. For example, Indigenous and Black peoples have reported concerns with policing, ticketing, and social judgement as barriers to park use (Park People, 2023g). Other common reasons include lack of time, money, information or support from the city, transportation, safety concerns, maintenance/inadequacy of park facilities (Bedimo-Rung, 2005), and lack of clarity in how to get involved with community engagement (Park People, 2023g). Many of these reasons depict how marginalized groups are experiencing the same park differently than non-marginalized groups. There are also currently many inequities in terms of the distribution of nature in cities. For example, it has been found that tree canopy coverage was associated with income level (Beatley, 2016; Schwarz et al., 2015). Likewise, poorer and racialized neighborhoods are often urban heat islands and generally have less access to green spaces (Park People, 2023g). It is clear that many of these obstacles exist due to systemic issues embedded in society, largely originating from and perpetuated through colonial mental models.

While easier said than done, changing the ways that we think about and overcome challenges is necessary to achieve a sustainable and equitable future. This section will discuss several ways that this might be accomplished, including out-of-box thinking, shifting away from Western worldviews, and pro-environmental communication strategies.

Out-of-Box Thinking

One way that parks have promoted sustainability is by transforming challenges into opportunities. One major existing challenge for parks is a lack of physical space while urban areas continue to grow denser; this has inspired creative thinking and the opportunity to utilize existing spaces more efficiently. For example, Singapore has dealt with limited space by utilizing vertical gardening. Specifically, a 15-story office building called the Solaris was designed with continuous greenery for each floor (Yeang & Hamzah, n.d.). This design allowed for organisms to freely move throughout the connected vegetated areas, promoting biodiversity. As well, nature engagement was promoted through the integration of rooftop gardens, walkways with natural views, and extensive natural lighting in the building.

Other projects have dealt with a lack of space by transforming abandoned sites. For example, VSPCA Kindness Farm project took land deemed as “useless” and turned it into an animal sanctuary and food shed (Tallam & Nath, 2022). This project succeeded in combating climate change through increased biodiversity, reducing food insecurity by teaching local rural residents how to sustainably grow their own food and harvest rainwater, and increasing nature engagement through connection to land and animals. A similar transformation is occuring in Freshkills Park in New York. Formerly the world’s largest landfill, Freshkills Park is in the process of being transformed into a large nature park. (NYC Parks, n.d; Wilson, 2023). Since the

closure of the landfill in 2001, the area has become highly biodiverse, now home to more than 200 different species.

Another challenge commonly faced by parks is damage to sensitive ecosystems due to increased use of parks. On the other hand, a greater number of people could also be an opportunity to recruit more park stewardship volunteers. For example, new volunteers could help build formalized nature trails so there is less likelihood of the creation of informal bike or walking paths (Park People, 2023e). Additionally, more park users can mean more advocates for change. Indeed, community advocacy is one of the most effective ways to raise support for greater funding and park projects and initiatives.

Perhaps the most significant challenge, however, is in reducing the equity deficit. Although surveys have been conducted across Canada to better understand barriers to nature engagement, these surveys often do not include the data needed to make an effective difference for equity-deserving groups. Indeed, often the majority of survey respondents are park users who are not members of marginalized groups (Park People, 2023b), while equity-deserving groups are often non or less-frequent park-users (Bedimo-Rung, 2005) and are thus less likely to take these surveys to begin with. As a result, there is still a large gap in knowledge regarding barriers, and it may require some creative, out-of-the-box thinking to overcome them.

Partnering and outreach with organizations that serve equity-deserving groups seems to be one promising strategy for barrier-reduction. Particularly, the City Park Stewards program in North Vancouver is an excellent model for the inclusion of equity-deserving groups (Park People, 2023f). This program is a city-led plan that organizes stewardship events for residents to partake in on a monthly basis. In effort to include marginalized populations in their events, City Park Stewards contacted partner organizations that serve equity-deserving communities (e.g., at-risk youth, immigrants, homeless). Cleverly, they also conducted outreach to other programs that would involve these populations, such as English classes at public libraries.

After the stewardship event, park staff conducted voluntary paid interviews with marginalized community members to build relationships with these members, as well as to get feedback on their experiences and how to improve the program (Park People, 2023f). Through these interviews, two main barriers were discovered: accessing transportation to the event and discomfort in traveling to unfamiliar parts of the city. To address these barriers, the city of Vancouver now offers free bus passes to stewardship events, and, if available, a staff member from the partner organization may accompany individuals to the event. Additionally, as a result of preparing for this event, City Park Stewards took away several key learnings. For example, since there is high turnover in the people that these organizations serve, ongoing in-person visits and posters are more effective strategies of outreach, rather than online methods. Additionally, creating a welcoming entry point for those new to stewardship can be valuable to increasing comfort of the participants; this could be done through hosting custom kick-off events in partnership with the specific organizations serving the equity-deserving community of interest.

Another effective approach to partnering with organizations is through co-management. Co-management entails working in collaboration with a network of partners who have well-defined roles and responsibilities denoted in management agreements (Park People, 2023a). This innovative approach is exemplified in Montreal's Darlington Ecological Corridor, where adaptability of the project was an asset. Indeed, partnering with a variety of stakeholders (e.g., academic institutions, community organizations, non-profits, residents, and local government)

led to expanding the project scope to address both ecological and social well-being. In particular, this goal was accomplished through partnering with Multi-Caf, a local organization that combats food insecurity, and the YMCA; as a result of this collaboration, a vegetable garden was built on site to reduce food insecurity and engage youth in urban gardening practices.

Although we are aware of some of the common barriers that marginalized groups broadly experience, it may be important to deduce barriers at the local level, as different barriers and solutions may be context-specific. This is where community-based social marketing (CBSM) comes into play. CBSM is a pragmatic approach based in social psychology that aims to identify barriers and benefits to sustainable behaviors at the community-level (McKenzie-Mohr, 2000).

CBSM involves 5 main steps. First, specific behavior(s) to promote are chosen. Second, barriers and benefits to the behavior of choice are identified through a combination of reviewing past literature as well as active research in the community of interest, predominantly using methods such as observational studies, focus groups, and/or surveys. Broadly, some major barriers that commonly inhibit sustainable action include a lack of motivation, forgetting to act, a lack of social pressure, a lack of knowledge, and structural barriers (i.e., inconveniences, such as time and money; Aronoff et al., 2013). This step is crucial to effectively overcome barriers, as they can be complex and multiple in nature. Third, strategies are developed to address the specific barriers identified (McKenzie-Mohr, 2000). These strategies include social norms, commitment, prompts, incentives, feedback, social diffusion, goal setting, and convenience (McKenzie-Mohr, & Schultz, 2012), and are often much more effective when used in combination. Fourth, strategies are then piloted on a small segment of the community to test their effectiveness. The intervention is then evaluated in terms of affecting behavior change (McKenzie-Mohr, 2000). This is measured in a direct and tangible way, for example comparing residential electricity consumption before and after intervention. Finally, after determining the intervention is effective, the intervention is implemented across the rest of the community. All these steps are essential, and excluding steps or assuming barriers instead of assessing them can result in overall ineffectiveness of an intervention (Cole & Fieselman, 2013). There is great potential to use this method to promote PEBs in the community surrounding Swan Lake in the future.

Shifting Perspectives and Worldviews

In order to promote sustainability, it is necessary to challenge mainstream ways of thinking. It has been noted that the colonial values and beliefs upon which Western industrial society was built are at the source of the ecological crisis (Dunlap & Liere, 1984). These values broadly include individualism, materialism, and progress. Because this way of thinking was pervasive in Western societies for the last few centuries, it is often referred to as the “Dominant Social Paradigm”, or DSP (Dunlap et al., 2000; Scott et al., 2016). The DSP is known to stem from four fundamental assumptions about humans and their relationship to nature: (1) humans are separate from and superior to nature, (2) nature can and should be controlled, (3) humans have the right to maximize their own economic gain, and (4) growth and progress is good and always possible. While not everyone identifies with these assumptions, many people in Western cultures still endorse the DSP worldview to varying degrees (either consciously or unconsciously; Dunlap & Liere, 1964). Because the DSP continues to play a role in guiding individual and societal behavior to this day, this worldview presents a large obstacle to a more sustainable future (Nisbet et al., 2009).

Adjusting perspectives surrounding our ideas of "nature" and considering the variety of ways it could look could be one way to overcome this challenge. For example, one way that the belief of human-nature separation manifests is in the prevalent view that nature is physically remote from urban areas (Beatley, 2016), reducing feelings of nature connectedness and sustainable behavior. On the contrary, if we shift our perspective as to what nature looks like, nature can be found everywhere. Nature is not only found in distant national parks, it is also found sprouting from cracks in concrete (Wilson, 2023). Cities are their own unique ecosystem, and connecting to nature can be as simple as stepping outside and gazing at the moon, looking at trees, or taking a five-minute walk (Beatley, 2016; Dumont, 2024; Wilson, 2023). This could be better facilitated through mindfully noticing the surroundings; in reflecting on what is being perceived through the senses, one might come to better appreciate the nature that is all around us.

Further, the assumption that humans should control and be dominant to nature is reflected in the notion is that urban areas should look tidy and orderly, which can lead to negative consequences such as simplified habitats and reduced biodiversity. Indeed, there seems to be a long-held preference for the aesthetic of a cultivated garden, whereas nature that is wilder may be seen as "ugly" or "weeds". This view was reflected in a conversation with a member of Swan Lake at the Annual General Meeting; in discussing an initiative in Victoria that involved implementing native plants/meadow in sections of traffic medians and in place of lawns (i.e., "rewilding"), the member noted that some of the individuals in this program made the comment that they thought native plants would be ugly and preferred a cultivated look. This perspective could be shifted in part through explanatory rationales, a method of supporting the need for autonomy (Reeve, 2018): explaining that replacing lawn with native plants increases biodiversity may lead to perspective change through greater understanding and valuing of rewilding initiatives. In contrast, another individual in this rewilding program displayed a completely different attitude; they noticed that a plant in their yard had holes in it but was pleased because it meant that they had helped feed an animal. This positive reframing aligns with the finding that shifts in attitude can also occur as a result of nature exposure: Wyles and colleagues (2013) found that an aquarium visit significantly improved visitors' attitudes and pro-environmental intentions toward marine life. Another way to bridge this connection to nature is through the practice of perspective-taking. For example, Ahn et al. (2016) conducted an immersive virtual reality study, which allowed participants to view life through the eyes of animals, such as a cow. This perspective-taking experience was found to enhance feelings of nature connectedness and care for the environment.

A particularly notable approach to shifting colonial mental models is systems thinking. Systems thinking can be understood as a process of inspecting how interrelationships between parts of a system influence patterns of behavior and events, and how these parts work together to create a functioning whole (Dobai & Riemer, 2021). Systems thinking can facilitate decision-making for complex issues, such as climate change (Lezak & Thibodeau, 2016). It has been found that those who engage in more systems thinking are also more likely to engage in pro-environmental behaviors, view the natural world as more valuable, and recognize the risks of climate change and support policy interventions that address it. Additionally, systems thinking can help avoid unintended consequences of often well-intentioned climate actions that disproportionately impact equity deserving groups (e.g., green gentrification due to implementation of light-rail transit in low-income/racialized areas; Dobai & Riemer, 2021).

Systems thinking is often visualized using the Iceberg Model, which postulates that observable (or "surface-level") events and patterns are caused by underlying structures and mental models hidden "beneath the surface" (Dobai & Riemer, 2021; Monat & Gannon, 2015). Mental models are considered the bottom-most layer of the iceberg, accounting for values, beliefs, and assumptions that uphold all other layers of the iceberg. Dobai & Riemer (2021) used this model to investigate the complex, multilayered issue of the equity deficit in climate action planning in the Waterloo region. In interviewing municipal actors from this region, they identified that social justice and equity were only beginning to be considered (i.e., event), and that progress of integrating these considerations into climate action was limited due to a lack of meaningful engagement and relationship building between municipal actors and equity-deserving groups (i.e., patterns of behavior). It was further discovered that the perpetuation of the equity deficit was in part due to problematic organization and structure of the municipal government (i.e., underlying structures; e.g., departmental silos, frequent change in government leadership limits the ability to create effective long-term changes), and that these structures are rooted in colonial thinking (i.e., mental models; e.g., climate action focus on economic considerations rather than equity). They conclude that in order to incorporate equity into climate action planning, it is necessary to decolonize our mental models, which can be facilitated through the conscious awareness of worldviews allotted through use of a systems thinking lens. Other suggested pathways toward sustainability justice involve collaboration between municipal actors and equity-deserving groups (e.g., co-production), such as Indigenous peoples, and the use of Two-Eyed Seeing.

In fact, Two-Eyed Seeing may be especially crucial in shifting perspectives to better deal with modern environmental crises (Bartlett et al., 2012). Coined by Mi'kmaw Elder Albert Marshall, Two-Eyed Seeing (or *Etuaptmumk*) recognizes that there are various ways of viewing the world, and two of these ways include Western and Indigenous perspectives (Institute for Integrative Science & Health, n.d.-a, n.d.-b). More specifically, Two-Eyed Seeing refers to finding the strengths in each Indigenous and Western knowledge and ways of knowing, each worldview representing one of the eyes (Bartlett et al., 2012). Two-Eyed Seeing recognizes each worldview (i.e., each eye) as distinct, whole, and valuable, while simultaneously asking that the eyes work together to "envision" and bring about a better world. Indeed, Two-Eyed Seeing is an expedition into what is known as "ethical space", in other words, the space in between Indigenous and Western ways of knowing, which is entered when the two different worldviews are prepared to engage in respectful, empathetic relationships with one another (Ermine, 2007; Goodchild, 2021). When individuals with these disparate ways of knowing come together in this space, the knowledge can be used in working together toward the ultimate goal of sustaining life on Earth (Goodchild, 2022).

Notably, the practice of Two-Eyed Seeing is not a new concept for Indigenous groups. Indeed, the consideration of multiple perspectives is already valued and practiced by many Indigenous peoples as part of seeking harmonious relationships (Broadhead & Howard, 2021; Institute for Integrative Science & Health, n.d.-a). Therefore, Two-Eyed Seeing is more so an opportunity for the *Western* eye to reflect on itself and expand its perspective to worldviews outside of itself. Indeed, the strengths of Indigenous ways of knowing may be more appropriate in certain situations, while the strengths of Western ways of knowing could be more appropriate in others (Bartlett et al., 2012; Institute for Integrative Science & Health, n.d.-a). For example, Indigenous worldviews often involve understanding the world as made up of interconnected and

animate beings, while Western worldviews often involve understanding the world as parts and wholes of objects (Marshall et al., 2010). Two-Eyed Seeing holds awareness and respect for both of these worldviews equally, with no one view dominating the other, and considers what aspects of each may be most appropriate in a given situation (Bartlett et al., 2012; Goodchild, 2021). Respectfully considering and drawing upon different aspects of each worldview can facilitate more meaningful engagement in collaborative settings (Institute for Integrative Science & Health, n.d.-a). Indeed, this multiple-perspectives approach could allow us to work together in harmony with different communities in order to more effectively address different challenges, including nature conservation and equity. Two-Eyed Seeing could even be applied to the concept of systems thinking to further enhance its ability to address issues of sustainability and equity. Indeed, Indigenous relational systems thinking (Goodchild, 2021) applies Two-Eyed Seeing by entering the ethical space between worldviews and considering both the mainstream (i.e., Western) and Indigenous views of systems, while refocusing on interconnectedness of all life.

Pro-Environmental Communication Strategies

Not everyone is eager to perform PEBs. This can be the case for a variety of reasons (e.g., conservative political ideology, prominent DSP worldview, high difficulty involved with behavior change, lack of knowledge/information). It may be especially challenging to convince people who are resistant to the idea of climate change or who do not see value in sustainable actions. In addition, passion for sustainability in some situations could lead to confronting others who are performing unsustainable actions. Even with the best of intentions, this can largely backfire. For one, it has been found that presentation of evidence that opposes existing worldviews may actually lead to attitude polarization, resulting in one becoming only more confident in their beliefs and further reinforcing their existing worldview (Hornsey & Fielding, 2017). In addition, telling others what they "should" be doing can lead to someone feeling controlled and thus frustrating the need for autonomy (Ryan & Deci, 2017). In contrast, successful communication strategies are often supportive of basic psychological needs (i.e., autonomy, competence, and relatedness). Indeed, when people perceive interactions as having features that are supportive of these needs, they are more likely to be motivated toward PEBs (Darner, 2009; Pelletier, 2002; Pelletier et al., 1996). Therefore, it is of upmost importance to be careful to use supportive language and communication styles.

Broadly, need-supportive communication could be facilitated through appealing to existing personal attitudes and values. For instance, in catering to someone's existing attitudes, it can support the need for autonomy because it could communicate acceptance and support the other person's experience of volition, instead of the person feeling coerced or controlled. Indeed, rather than trying to fight against existing attitudes, which can be difficult to change, one can choose to engage with them; this can be done through message framing, which involves **t**ailoring a message so that it aligns with underlying core values and ideologies (Hornsey & Fielding, 2017). Similar to CBSM, message framing focuses on identifying underlying barriers as a first step to choosing an effective behavior change strategy (McKenzie-Mohr, 2000). To tailor a message, one must first identify the root of the attitude: the beliefs, ideologies, fears, and identity issues that may explain the surface-level attitudes presented (Hornsey & Fielding, 2017). To gain such insight properly, one must be accepting, curious, and open rather than judgmental, argumentative, or combative toward the other person.

In reviewing the literature, Hornsey & Fielding (2017) found that individuals who feel motivated to reject science (e.g., climate change deniers) have attitudes roots in common. One of the identified themes amongst these shared attitude roots is ideologies, values, and worldviews that reflect hierarchy and superiority over nature (i.e., hierarchical worldview, social dominance orientation), independence and freedom (i.e., individualistic worldview, free-market ideology), and belief the world is just (i.e., belief that people get what they rightfully deserve). Additional themes in attitude roots include conspiratorial ideation (e.g., "climate change is a hoax"), vested interests (e.g., ability to maintain high carbon lifestyle), personal identity expression (e.g., showing they are a nonconformist), social identity needs (i.e., conforming one's attitudes to that of one's social group membership), and fears and phobias (e.g., rejecting medical science to avoid fear of medical procedures). In essence, when one or more of these attitude roots feel threatened or challenged, it can lead to the motivated rejection of science in order to uphold these beliefs.

Once these attitude roots are identified, messages can be framed in alignment with them, to the benefit of pro-environmental change. This could mean that even climate deniers may see value in climate change mitigation efforts. For example, one may point out that climate mitigation efforts would lead to the growth of green technology and jobs—an attitude that could be consistent with individualistic/hierarchical ideologies (Hornsey & Fielding, 2017). It was found that messages that appealed to such attitudes were more effective at promoting PEBs among climate skeptics, compared to messages that reiterated evidence of climate change. However, message framing appears to work best when the message is framed in terms of being supportive of intrinsic goals, such as health or well-being (Pelletier & Sharp, 2008). For example, reframing climate change to be an issue of public health, where its mitigation is associated to health benefits is both more compelling and more supportive of intrinsic goals (Maibach et al., 2010; Pelletier & Sharp, 2008). Moreover, framing messages to be need-supportive can be applied to government regulations. Indeed, messages can be designed to communicate freedom rather than restriction, and even when regulations are controlling, people may decide to tolerate them if they can see the value and importance of the regulation (i.e., support autonomy; Wullenkord, 2023).

In addition, people may find messages more compelling if presented by someone they perceive as belonging to the same group through some aspect of shared identity, especially if a behavior of interest is described as normative of that group (Hornsey & Fielding, 2017). Therefore, pro-environmental communication may be more effective if a shared identity is emphasized. In parallel, attitudes can be communicated indirectly through actions. For example, PEBs are more readily adopted if modelled by a person that one socially identifies with (Shah, 2003). This finding aligns with wisdom shared in a Parks People webinar, in which it is noted that people appear to make decisions predominantly based on the decisions those around them are making (Buxton, 2023). Thus, in acting as sustainability role models, we have the opportunity to *be the change* we want to see in the world and move toward a more sustainable future.

Conclusions

Overall, the literature indicates that supporting basic psychological needs, fostering feelings of nature connectedness, and shifting the way we think to address challenges are the main methods through which we can promote nature engagement and conservation.

First, creating a need-supportive environment for performing PEBs through the various supportive methods mentioned earlier can help to fulfill the needs for autonomy, competence, and relatedness, which subsequently lead to greater motivation to engage in sustainable actions (Cooke et al., 2016; Reeve, 2018; Ryan & Deci, 2017). However, most of the time, it does not appear that strategies for supporting basic psychological needs are implemented purposefully or with awareness that this theory exists. As a result, there are also many need-supportive methods that are not being used (e.g., in the literature, autonomy was mostly supported only with explanatory rationales). Consciously using a greater variety of need-supportive strategies could lead to greater likelihood for need satisfaction and thus motivation toward PEBs. Additionally, awareness of how to support versus frustrate the basic needs can be important for environmental engagement.

Second, getting exposed to nature, stewardship activities, and practicing mindfulness are all methods through which feelings of nature connectedness can be promoted, which is known to be associated with greater engagement in PEBs (Capaldi et al., 2014). However, not everyone is fond of the outdoors. As mentioned, there are many factors involved that may prevent someone from wanting to engage in nature (e.g., fear of insects, nature aversion, etc.). Thus, it is necessary to ensure that a person actually *wants* to be outside, rather than feeling forced, as this will not encourage future nature engagement, nor autonomy satisfaction. Instead, one should work with a person's existing comfort level with nature to determine the most appropriate type of nature engagement. Despite the fact that nature exposure may not necessarily mean that one will feel connected to nature, some form of nature exposure—whether it be virtual or real—can act as a first step to building a deeper relationship with the environment. Over time, exposure to nature may even result in overcoming fears. A rather miraculous example of this can be seen in an anecdote shared by educational programming staff of Swan Lake. During an educational program, one of the children appeared to possess a strong fear of snakes, crying just upon viewing it in its enclosure. However, by the end of the activity, the child was able to approach and even touch the snake. This example demonstrates just how much progress could occur from a single exposure.

However, nature is not inclusive or accessible to many marginalized groups of people. Feelings of nature connectedness are not only related to greater engagement in PEBs (e.g., Capaldi et al., 2014), they are also related to greater well-being (e.g., White et al., 2017), depriving equity-deserving groups even more. Therefore, it is important that we make nature more accessible so that *everyone* can benefit. One way this could be accomplished is in partnering with organizations that serve equity-deserving groups. In a similar vein, working together with Indigenous Knowledge Keepers for guidance and wisdom regarding how to connect to the land could help those who feel disconnected and lead to as well as lead to more equitable access to nature.

Finally, in order to move toward a more sustainable future, we need to change the way we think so that we may be better able to address challenges, including better serving equity-deserving groups. Some of the ways this could be done is through thinking outside the box, shifting perspectives and worldviews, and the use of pro-environmental communication strategies. Understandably, this is easier said than done. Indeed, it can be hard to recognize implicit attitudes that we ourselves hold, let alone those that others might hold (Hornsey & Fielding, 2017). Despite this, we need to attempt to be more cognizant of the fact that colonial values and worldviews are still ingrained in Western society, and be mindful of our own biases

and beliefs to prevent them from adding to the problem. One promising way this can be done is through considering multiple perspectives equally through a Two-Eyed Seeing lens (Bartlett et al., 2012). With use of this lens, we may be better able to collaborate with Indigenous groups and build a better, more equitable future going forward.

Despite the dominant colonial mental models, it does appear that the younger generations have begun to dismantle them to some extent. For example, it has been noted that perceptions of nature have started to change (Wilson, 2023); whereas the belief that nature should look tidy, orderly, and cultivated seemed to be dominant in Western society, more people have begun to romanticize “wilder” nature. Perhaps if this view becomes more popular, it can facilitate movements such as delawning/rewilding. There is hope yet for a more sustainable future.

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