



Therapeutic landscapes, outdoor programs for veterans, and public lands

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ABSTRACT

In recent decades, scholars have developed ideas about therapeutic landscapes that explore how social processes, symbolism, and physical features generate diverse meanings. We examine here how therapeutic landscapes are produced and utilized for outdoor programs for military veterans, particularly veterans experiencing post-traumatic stress. Outdoor programs for veterans (OPVs) provide restorative opportunities through nature immersion and outdoor recreation. OPVs involve diverse social settings, activity types, durations, geographic and land management contexts, and degrees of therapeutic intervention. In many combinations they can generate therapeutic landscapes conducive to some degree of recovery. Our analysis relies on qualitative data gathered through semi-structured interviews with OPV providers and participants, mental health specialists, and public land officials. Arguing against a reductionistic approach, we suggest that the diversity of OPVs and disparate character of activities, locations, and dosages may contribute in important ways to the efficacy of these programs. Ironically, the very qualities that present challenges for measuring and evaluating the benefits of OPVs may prove to be advantageous with respect to therapeutic outcomes. We highlight how public lands present a distinctive set of attributes that make them particularly well-suited to provide therapeutic opportunities, and that agency policies can shape the development of therapeutic landscapes.

1. Introduction

People have turned to natural landscapes for millennia for physical, spiritual, or emotional relief. The Ancient Greeks visited mountain hot springs for their therapeutic qualities. In North America, health resorts and cure cottages cropped up in the Ozarks, Adirondacks, and Rocky Mountains in the 1880s to treat a variety of medical conditions (Nash 2006; Lieffers 2011). More recently, outdoor programs have adapted and extended these diverse traditions to military veterans, offering therapeutic opportunities for people experiencing post-traumatic stress, traumatic brain injury, and other effects of combat or deployment (Derrien et al., 2020). Outdoor programs for veterans (OPVs) come in many different forms, durations, and activity types, but hold in common the expectation of beneficial effects by immersing people in natural environments. A critical dimension of many of these programs is the connection of physical, social, and experiential elements that contribute to beneficial outcomes and create therapeutic landscapes.

The treatment of post-traumatic stress has grown in urgency during

the past two decades with increased diagnoses among military veterans returning from “post-9/11” wars in Afghanistan and Iraq and a growing recognition of the debilitating effects of post-traumatic stress. Potential symptoms include heightened states of arousal, disordered sleep, flashbacks, headaches, and anxiety (PTSD 2018a). Severe experiences linked to military combat are common causes of post-traumatic stress (Hoge et al., 2004; Smith et al., 2008), but it can also accumulate with prolonged periods of direct or indirect combat exposure. Trauma is also often associated with sexual assault, domestic violence, natural disasters, vehicle accidents, and other unexpected or unresolved losses (Jones et al., 2001; Holder et al., 2017; PTSD 2018a).¹

The U.S. Department of Veterans Affairs (VA) estimates that each year, post-traumatic stress affects approximately 12 percent of Gulf War veterans and between 11 and 20 percent of those who served in Iraq and Afghanistan; lifelong, more than 30 percent of U.S. veterans of the Vietnam War also experience PTSD (PTSD 2018b). When additional combat-related emotional, psychological, and physical injuries are included, post-9/11 rates of military “polytrauma” approach 50 percent

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¹ Post-traumatic stress is often diagnosed as a particular medical condition – post-traumatic stress disorder, or PTSD. We utilize the more general term, post-traumatic stress, unless referring to the diagnosed condition of PTSD. To many trauma survivors and health professionals, the symptoms associated with PTSD do not necessarily represent a “disorder,” but rather come from individuals’ very necessary efforts to process extreme events.

(Mernoff and Correia 2010). Other studies have found that more than two-thirds of post-9/11 veterans have diagnosable mental health issues (Dietrich et al., 2015).

The VA routinely prescribes a mix of treatments to veterans with PTSD, including cognitive behavioral therapy, pharmaceuticals, and eye movement desensitization and reprocessing. Many veterans also pursue alternatives to therapy, including self-medicating (drugs, alcohol, and/or cannabinoids), and group or individual activities such as meditation, mindfulness exercises, art, acupuncture, yoga, or outdoor activities (Libby et al., 2012; Wynn 2015). The latter are often done ad hoc or individually, but can be organized in veteran-specific outdoor programs that seek to offer restorative experiences in a variety of landscapes. (Some mental health specialists view therapy as only occurring when trained counselors or therapists are facilitating treatment directly, so we remain cautious about labeling these alternative approaches.)

In this paper, we build upon research in health geography and environmental psychology to examine how therapeutic landscapes are envisioned, produced, and utilized by those connected to OPVs. Gesler (1992) and others advocate a pluralistic view of therapeutic landscapes, highlighting how these come with diverse characteristics and emerge from particular socioecological contexts. Building on these views, we offer a brief description of OPVs and how these can present challenges to standard concerns and treatment in the care of post-traumatic stress, and propose that the diversity of programs and settings may contribute to their overall efficacy. Public lands as a setting for OPVs offer attributes that make them particularly well-suited as therapeutic landscapes (see Palka 1999; Derrien et al., 2020). These broad geographies of recovery often take place in national forests, national parks, wildlife refuges, or state or locally-protected areas. While a number of OPVs operate on private lands or a mix of private and public lands, we focus on public lands here for multiple reasons: most OPVs seem to include at least some reliance on public lands or waters; the role of public land management agencies presents opportunities to treat OPVs in a more systematic way than has previously occurred; and military veterans often describe distinctive connections between their service to the country and the public lands they later return to visit. As public land management agencies begin to recognize the value of our nation's parks, forests, and refuges for human health and well-being, finding ways to expand these benefits to veterans and others is becoming increasingly important.

1.1. Geographies of therapeutic landscapes

The concept of therapeutic landscapes was first articulated in the early 1990s (Gesler 1992, 1993). Gesler brought forward ideas from “new cultural geography,” which defined landscapes not as static physical settings, but as sites produced through dynamic social processes, symbolism, and physical features (see Cosgrove and Jackson 1987; Gesler 1993). Gesler notes that a principal goal of the health care system has always been to provide a therapeutic landscape for medical care and treatment – that is, an environment “in which physical and mental healing can take place” (1993: 171) – but that defining or conceptualizing precisely what constitutes a therapeutic environment can prove elusive. Gesler highlights that few people are inclined to mention hospitals, for example, as “therapeutic places,” even though in industrialized societies these are the sites most devoted to physical or mental health (1993: 171). The concept of place is also important in the context of the new cultural geography, as “place” is distinguished from the more abstracted terms of “space” or “landscape” by the creation of specific social values in certain locations (Relph 1976; Tuan 1977). As Jackson (1986) describes this distinction, “Landscapes become places through the meanings that they have for different human subjects” (p. 120).

Gesler suggests that in order to create a therapeutic landscape, “It appears that there must be environmental, individual, and societal factors that come together in the healing process” (1992: 735). One of the key assertions regarding therapeutic landscapes is that healing spaces

act in ways that are dynamic, relational, and context-sensitive (Williams 1998, 2017; Wilson 2003; Conradson 2005; Lea 2008; Bell et al., 2018). Places are not necessarily *de facto* therapeutic, but rather facilitate therapeutic experiences via interactions between humans, other living organisms, and their social and physical environments (Olwig 2019). Various physical and social elements may contribute to therapeutic outcomes, but the relationships between these attributes are mutable and not deterministic (Gesler 1993). In the face of these dynamic relationships, individuals respond to landscapes in a variety of ways. As Bell et al. (2017) point out, a place that may seem relaxing or comforting to one person can feel risky or unsettling to another (see also Milligan and Bingley 2007).

For more than two decades, health geographers have sought to highlight the importance of going beyond physical characteristics of landscapes to examine the cultural dimensions of health and place (Gesler 1992; Wilson 2003; Brooke and Williams 2020). Conradson (2005) emphasizes that positive therapeutic experiences, “always derive from particular forms of socio-natural engagement. They are not in any sense pre-determined outcomes” generated by a landscape on its own (p. 338). Andrews (2004) describes how even imagined places can prove useful in therapy, and that these too can serve as a form of therapeutic landscape. Milligan et al. (2004) observe that much of the therapeutic landscapes literature focuses on the characterization of places as health promoting, and point to the need for complementary research that expands this concept to explain how such landscapes can be actively constructed. Bell et al.'s (2018) review of research on therapeutic landscapes described these as “increasingly porous, hybrid, and relational” in character (p. 125), and advocated terms such as “assemblage” or “enabling places” to capture more accurately the dynamic involving place and personal experience. Studies of dynamic and socially produced qualities of therapeutic landscapes have extended to research on landscape colors (Lengen 2015; Brooke and Williams 2020), the role of age or accessibility (Milligan et al., 2004; Finlay 2018), and the significance of movement (Doughty 2013; Gladwell et al., 2013). A key theme that emerges from much of this scholarship is one of contingency, where specific combinations of people and place matter in the construction of therapeutic landscapes.

1.2. Restorative environments and recreation

Research in environmental psychology and recreation supports the idea that natural environments can offer restorative qualities to people experiencing chronic illness or stress (Bowler et al., 2010). Haluza et al. (2014) found multiple cases where nature appeared to have a harmonizing effect on study participants and led to decreased stress levels. Nature exposure helps people work through life problems and improve well-being (Mayer et al., 2009), with evidence of lasting effects (Svarstad 2010), particularly with frequent immersion opportunities (Capaldi et al., 2015). Natural scenery or landscapes were found to have positive effects for short-term recovery from stress and physical illness as well as long-term health benefits (Velarde et al., 2007).

The literature on restorative environments offers several conceptual frameworks relevant to our study. Ulrich (1983) posits that natural environments can reinvigorate and calm people, allowing them to elicit positive states that override negative emotions and lead to recovery. Kaplan (1995) emphasizes that natural environments are particularly well-suited for reducing stress, especially when they include: (a) a feeling of “being away” from routine thoughts and concerns; (b) a feeling of “extent” to allow for full immersion; and (c) compatibility between desired behavior or individual goals and the appropriateness of the setting for achieving those goals. On this account, the ideal setting should elicit solace, safety, and be free of stressors (Kaplan 1995).

Fascination, or a sense of awe, can serve as another important element of restoration and recovery (Kaplan and Kaplan 1989). Research has examined the importance of awe in helping people cope with stress; in a study of military veterans and underserved youth

engaged in whitewater rafting, awe was the most notable emotion for predicting changes in well-being and reducing stress in participants (Anderson et al., 2018). Nature immersion can elicit awe in participants through the therapeutic and restorative elements of wilderness (Wolsko and Hoyt 2012), and is a sentiment commonly described by visitors to national parks.

While the Kaplans emphasized individual transformation, other studies have delved into social aspects of natural environments and the health benefits of being outdoors together (Hartig et al., 2011; Overholt 2012). Natural environments can spark conversation and connection with others that are beneficial for well-being (Korpela et al., 2008; Wolsko and Hoyt 2012). Shared difficulties in outdoor activities can result in bonding and new coping strategies (Harmon 2019). For many veterans, connecting with other veterans who have experienced similar conditions is an important element of rehabilitation or recovery.

Physical activity outdoors has also been studied for its role in the recovery process. Korpela et al. (2008) described three determinants of restorative experiences: physical activity, nature exposure, and sense of safety and security in a group or in a place. Early research on the benefits of recreation made linkages between outdoor recreation (or leisure) and improved ability to cope with stress. Outdoor leisure can buffer the impacts of stressful life events, generate hope for the future, empower people to create a new narrative of their life story, and serve as a mechanism for personal transformation (Kleiber et al., 2002). Physical exercise in its various forms also contributes to mental health (Thompson Coon et al., 2011; Gladwell et al., 2013; Whitworth and Ciccolo 2016; Wolsko et al., 2019). Moreover, those with mental illness participating in “green exercise” have shown greater improvements in self-esteem than the general population (Barton and Pretty 2010).

The literature on restorative environments acknowledges the therapeutic effect of nature immersion and physical activity, with increasing attention to social dimensions. The geographic and institutional components have been less frequently explored. As public agencies acknowledge and plan for the restorative role of outdoor recreation, they contribute to the creation of therapeutic landscapes (Williams 2002). Forests and natural spaces provide opportunities for physical activity, stress reduction, and improved health outcomes (Lee et al., 2009; Hansen-Ketchum et al., 2011; Cervinka et al., 2020). Across the U. S., federal and state lands typically offer the largest and most available settings that meet these terms. Public land agencies, in turn, develop, maintain, and keep trail systems and other outdoor spaces accessible, thereby contributing to the creation of therapeutic landscapes.

1.3. Outdoor programs for veterans

A growing body of literature explores how outdoor activities and exposure to natural environments can promote positive physiological, affective, and cognitive responses to symptoms related to traumatic stress (Dustin et al. 2011, 2016; Mowatt and Bennett 2011; Duvall and Kaplan 2014; Poulsen et al., 2015; Hawkins et al., 2016; Walter et al., 2019). One of the fundamental goals of OPVs and treatment of PTSD is to help survivors manage their symptoms and learn how to flourish despite the impacts of traumatic experiences (IAFF, 2018; NIMH (National Institute of Mental Health)). Considering the unique combinations of time, place, and experience that trauma survivors negotiate, the wide-ranging character of OPVs seems particularly well-suited for veterans’ ongoing management of stress.

There is growing evidence that OPVs can be effective either as a complementary or primary therapy for post-traumatic stress and PTSD (Van Puymbroeck and Lundberg 2011; Vella et al., 2013; Duvall and Kaplan 2014; Dietrich et al., 2015; Poulsen et al., 2015; Westlund 2015; Poulsen 2017). Numerous studies and literature reviews provide evidence of health benefits of OPVs for individual cases, but knowledge of how, why, or under what circumstances these programs work remains incomplete (Caddick and Smith 2014; Wynn 2015; Davis-Berman et al., 2018; Greer and Vin-Raviv 2019). OPVs differ substantially in terms of

dosage (duration, recurrence, and frequency of experience), maintenance (follow-up after programs conclude), activity type and difficulty, degree of therapeutic intervention, program objectives, social dynamics, and the physical landscapes in which programs operate (Derrien et al., 2020). To date, the VA has expressed support for some OPVs, but considers these diverse forms of treatment as not yet meeting its required standard of evidence-based therapy (Veterans Health Administration 2017; VA/DOD 2017). In light of the growing trend to utilize OPVs as one treatment for post-traumatic stress, it is important to examine not just the composition of the programs themselves, but also the physical, social, and policy contexts in which the programs operate.

2. Methods

To assess experiences offered by OPVs on public lands, we conducted 36 semi-structured interviews with land managers, outdoor program providers, program participants, researchers, and health professionals in 2018 and 2019. For this exploratory study, we limited our focus to veterans’ programs that primarily relied on federal public lands, and used chain referral sampling to identify potential interviewees (Birnacki and Waldorf 1981). We also identified sources from direct contacts and online searches of OPV providers. Our chain referral list included directors of trail conservancies; program managers from federal land management agencies specializing in permitting, trail administration, recreation, partnerships, and other areas; veterans’ program organizers and guides; and mental health specialists such as trauma therapists and clinical psychologists who serve veteran populations. Some interviewees were also military veterans and/or former OPV participants. We considered our sample saturated and ceased seeking additional interviewees when the amount of new information waned with successive contacts and multiple interviewees referred us to the same sources (Morgan 2008).

We conducted interviews by phone and in person, guided by approximately ten questions that we modified for different categories of interviewees and piloted during preliminary conversations (see supplemental document for list of questions). Follow-up questions allowed elaboration or clarification. Since this study was exploratory, questions were open-ended and broad, inquiring about individuals’ knowledge of OPVs, including the kinds of places where these occurred, experiences with administrative processes, institutional and programmatic challenges, and new partnership opportunities. Interviews ranged from 10 to 120 min, with most lasting about 30 min. We audio-recorded all but six interviews and for those took detailed notes. Recordings were transcribed and checked for quality. Our research plan was approved by the University of Colorado Colorado Springs Institutional Review Board. All interview subjects were provided consent forms before participating.

Our analytical approach identified recurring topics relevant to the study (Braun and Clarke 2012). All three authors conducted the analysis and have extensive and varied experience researching and recreating on public lands throughout the United States. Throughout our analysis, we challenged our preconceptions and biases from our (and others’) prior experiences through our iterative coding process and on-going discussions about the potential for alternative interpretations of data. This reflexive process took place over several months and resulted in strong concurrence and confidence in our findings.

Analysis proceeded in four stages. In the first stage, all three authors read the whole body of interview transcripts, taking notes and creating a list of codes related to types of programs, the interactions between programs and land management agencies, and challenges and opportunities in program implementation. We then coded duplicate interviews to compare coding strategies for a sample of interviews to ensure that our codebook was being consistently applied. In the second stage, the researchers applied the initial set of codes to systematically analyze the interview transcripts, allowing for the addition of emergent codes. In the third stage, the researchers re-read the interviews, applying emergent codes and ensuring consistency in coding styles across the

research team. Finally, the researchers compiled and read through the coded segments, categorized sub-themes within the codes, and produced summary documents that described the content of coded segments and offered illustrative quotes. These were then circulated, discussed, and refined among the entire research team.

2.1. Study findings

In this section, we present themes identified in our analysis that help us understand how OPVs create therapeutic landscapes through social, biophysical, temporal, movement-oriented, therapeutic, and management relationships. We include direct quotes from our interviews to accentuate key points relating to these themes.

2.2. Social aspects of therapeutic landscapes

Therapeutic landscapes develop within physical and social environments. In our interviews, we found that the connections OPV participants make with other veterans are among the most common benefits of these experiences. Camaraderie and teamwork are important elements of military service. When transitioning to civilian life, many veterans struggle to relate the rigors of training, deployment, or combat with a society that has not been through these trials (Mobbs and Bonano 2018). Peer support plays an important role in recovery from trauma (Hundt et al., 2015). Interviewees suggested that participating in an immersive, outdoor program with other veterans provided interactions conducive to team-building, a shared purpose, and making connections with others experiencing similar challenges reintegrating with civilian society. The realization that one is not alone in working through post-military adjustments is a valuable outcome of many OPVs. Program providers often recognize the role of social bonding in the recovery process, designing activities to feature this aspect, while also recognizing that participants may connect with their environment in more solitary ways. As one program provider commented, “Being away from it all has been very good for [participants], but they are still part of a group. So, they get both the solitary and the communal aspects of it.” Solitude can also pose challenges to program participants; one interviewee noted, “Nature has the ability to heal, but it can be detrimental. It can be too quiet and people get too deep in their heads.”

Providers shared ways they sought to help find the right mix of solitude and interaction for participants. To do this, many OPVs couple activities that are conducive to time alone and making personal connections to nature with more social opportunities. As one OPV provider described veterans on a long-distance thru-hike: “They go expecting solitude, but on the trail you are surrounded by a lot of people. Campfires. Dinners. All walks of life are out there. You develop trust and it’s very comforting.”

2.3. Biophysical aspects of therapeutic landscapes

Social dimensions of OPVs interact with biophysical settings, generating opportunities for therapeutic landscapes. Whether activities occur in a remote mountain range or an urban garden, the physical setting plays a role influencing the character of the therapeutic experience. From our interviews it became clear that the selection of the physical environment for programs was often an important consideration. Providers recognize that they can create feelings of “being away” for veterans, both in a social sense – away from usual social dynamics – but also in physical separations from everyday settings and routines. As Kaplan (1995) observed, scenic views, wildlife encounters, iconic or dramatic features (e.g., waterfalls, canyons, forests), and the heightened use of senses required to navigate outdoor environments can promote rehabilitation and facilitate participants’ emotional growth. Some programs emphasize remote or exotic locations while others rely on more accessible environments to create these responses.

Interviewees described the importance of settings’ biophysical

characteristics, such as those that provide opportunities for physical challenge and adventure, or solitude and contemplation. OPV activities play a role in shaping the selection of biophysical settings. Mountaineering requires a massif or steep pitch. Backpacking demands space enough to accommodate hiking and overnight camping. Some outdoor activities may share the same physical setting, but create different therapeutic landscapes with very different engagements in these places: rafting and fly-fishing, for example.

Natural environments can be conducive to arousing awareness, stimulating memory, or providing a sense of awe or escape (Korpela and Ylen 2007; Ratcliffe and Korpela 2016), which can be positive experiences for some, and negative for others (Milligan and Bingley 2007). A clinical psychologist we interviewed emphasized the importance of considering biophysical differences in determining the most effective programs: “For one person, being out in nature might be relaxing and peaceful. Maybe they grew up in a rural location and being in the woods has a calming influence. For another person, that could be on the peak of their stress chart. It’s all an individual-based approach – there is no one-size fits all.” As Williams (2002) notes, what is restorative remains highly fluid and subjective. Regardless, the interplay between the biophysical setting and human experience plays a role in producing a therapeutic landscape. This openness has advantages, since many different settings can serve the purposes of OPVs, but also poses a challenge to standardizing outdoor program prescriptions. As one provider asked, “Does what works in the Cascades work in Central Park, does it work in the desert, does it work in Mississippi?”

2.4. Temporal aspects of therapeutic landscapes

OPVs vary in duration and frequencies of recurrence, what mental health specialists and program providers often refer to as “dosage.” Some programs provide short-exposure experiences with multiple repetitions (e.g. 20 min/day on a weekly basis), others are “once-in-a-lifetime” opportunities, such as a 6-month thru-hike on a national scenic trail, and many programs range in-between, from 3- to 5-day guided adventures to quiet weekends at a riverside camp.

Programs must strike a balance between accessing particular places and accommodating the dosage needed for the activity’s geographic (spatial) and temporal requirements. This means that programs that occur frequently (often with shorter duration) may take place in proximity to where participants live – for example, a local chapter of an OPV might head to a nearby national forest for weekly outings – while more extended or infrequent opportunities might require significant travel and logistics.

Our interviews documented widely varying claims and little consensus on ideal program durations and dosage. Many interviewees pointed to three to four days’ duration as the minimum needed to break free from daily routines and anxieties, and to get into the rhythm of the outdoor experience. As one OPV provider and researcher explained, “At least three days: day three is when people start feeling better and begin to connect with nature.” Another interviewee, commented, “A lot of guys will talk about three-day magic ... Four days, if you can get it, is fantastic.” A mental health specialist and OPV team leader tried to find a balance between impact and accessibility, noting that, “Four days away feels great, but then the question is how do we keep that up? Can I get this same benefit from 20 min each day in my local park?” This highlights the idea that therapeutic landscapes may be created from a variety of contexts.

The landscapes needed for various dosages are different: what might work well as a therapeutic landscape for a three-day outing would fall short for a three-month program. The extent, connectivity, and accessibility of the landscape influence the sorts of activities and engagements that will be possible. One popular OPV was developed based on a six-day model, but one of its leaders considers eight days the “perfect sweet spot.” A clinical psychologist who has spent time on the trail with OPVs suggested, “The therapeutic element doesn’t even really kick in until

after two weeks ... it takes about a month for a therapeutic benefit to really begin." Several interviewees emphasized the benefits of extended experiences. One mental health specialist asserted, "I don't see how anything less than two months could accomplish what occurs during a six-month program." Another program provider spoke to the benefits of multi-month outings: "The magic number for dosage is three months in order to create changes in the brain that convey lifelong impacts."

2.5. Movement within therapeutic landscapes

Program providers we interviewed led programs with a range of outdoor activities, some strenuous or adrenaline-producing (e.g., technical climbing, white-water rafting), some requiring steady, low-intensity movement (e.g., hiking, fly-fishing), and others focused on calming or reflective practices (e.g., horticulture or animal therapy). All of these feature some sort of physical movement and engagement with the biophysical landscape. Some interviewees commented on the therapeutic value of physical activity outdoors. According to one administrator of a long-distance trail, extended time on the trail offers important health benefits associated with motion, noting, "Once they get out on the trail, the physical activity, movement, it really helps. There is a rhythm of movement ... the steady rhythm of walking, stepping. You get this with hiking, but you can also have similar steady motion with paddling, riding, and other activities." Another trail administrator commented, "There is something about the pace of walking, breathing, it gives you time to think ... through the movement of it. It creates endorphins. The whole physicality of it is good, the rhythm of walking. It gives you peace." Participants in outdoor programs that emphasize outdoor work and employment skills also spoke of the benefit from working outdoors and getting fresh air. Program leaders talked about the physical labor component of these programs as being implicitly therapeutic, with a combination of physical exertion, outdoor environments, and accomplishing tangible goals.

2.6. Therapy within therapeutic landscapes

OPVs exhibit diversity in terms of therapeutic programming. Some OPVs include built-in therapeutic components designed and led by mental health professionals. This may consist of individual counseling or group therapy. In some cases, a therapist will accompany the group and be available just in case issues emerge during the program. Other programs include formal or informal therapy sessions led by lay professionals or co-led by program participants. One OPV provider explained, "I can't think of a group of veterans that didn't sit around the campfire or while they're walking, talk about their experiences, so even if there's no formal component they're definitely talking about it and processing it and kind of being each other's therapist." Another interviewee emphasized the impromptu nature of some of these interactions: "These conversations happened naturally, like you have a bond over time. And so, that component of the talk therapy is really effective." Other health specialists attached to OPVs may provide auxiliary health services, like guided meditation, yoga, or mindfulness training. Some programs emphasize simply being outdoors, engaging in recreation programs, with physical activity itself as the therapeutic practice.

2.7. Managing therapeutic landscapes

The management of public lands to provide therapeutic experiences is often implicit or passive, but it can be proactive. A public land management agency could establish designated forest therapy areas or provide facilities, interpretation, or programming explicitly to enhance or communicate the therapeutic qualities of landscapes. However, in our interviews with public land managers we heard little about the intentional creation or reproduction of therapeutic landscapes and there was no indication that such institutional commitments were prevalent. A few cases, however, demonstrate the potential to manage therapeutic

forests. At the W.G. Jones State Forest in Texas, agency officials work with Texas A&M University to manage a nearby forest for health and rehabilitation benefits (Stueckemann 2019). In Colorado's Mesa County, public health officials worked with a network of county, state, and federal land managers to create a trail system for community health and wellness (Kuhr 2019). These examples suggest that alliances between public land managers, public health officials, and program providers could yield new opportunities to generate therapeutic landscapes.

Decisions made by public land managers do play a role in the creation of therapeutic landscapes and shaping the potential for therapeutic opportunities. Land managers we interviewed generally favored the idea of therapeutic uses of public lands or were open to partnering with health agencies that could help make therapeutic connections for the public. However, these remarks were largely aspirational and locally achieved. One U.S. Forest Service official stated, "Maybe locally it's happening, but it's a huge opportunity to really strategically partner in with the medical community and the health services community and ... Veterans Affairs, or whomever." Even as public land agencies begin to appreciate ways they can shape therapeutic landscapes, it will require a degree of intentionality to support OPVs and promote opportunities for people to gather, seek therapeutic experiences, or heal across physical and managerial landscapes. One military veteran said it would require, "figuring out a more formalized connection between [institutions] so that our public lands factor fully into troop readiness as well as veteran health." Casting toward a similar vision, an agency official imagined, "Our public lands will be places for people to go to recover."

In contrast with agency officials, the OPV and mental health providers we interviewed generally had well-developed notions of therapeutic landscapes on public lands as already existing and serving people in need. These therapeutic landscapes were presented as more than just an opportunity, and instead as an ongoing and integral component in the success of the program. As one OPV provider explained, "I'm a huge advocate for public land[s] and appreciating them, and believe that another part of our mission as a program is to educate veterans on the values of those public lands, and by getting them on the land, they are actually able to see it and feel it and be part of it."

3. Discussion

Our interviews with outdoor program providers, veterans, mental health specialists, and land managers support the idea that public lands serve in various ways as therapeutic landscapes for those seeking health and wellness benefits following trauma. We focus on three major implications that emerge from our findings: 1) Therapeutic landscapes are heterogeneous constructions created by socio-ecological relationships; 2) Therapeutic public lands, specifically, are shaped and managed by natural resource institutions; 3) OPV providers generate unique therapeutic landscapes by emphasizing different program elements or objectives.

3.1. Heterogeneity in the social construction of therapeutic landscapes

Landscapes envisioned, produced, and reproduced as therapeutic are constructed in various ways and at various scales by individuals, programs, mental health providers, and agencies. These social constructions affect the ways people experience places. Therapeutic landscapes are transitional and dynamic (Brooke and Williams 2020); there are spatial and temporal dimensions that are created, negotiated, and re-generated by the groups and individuals involved. One provider may treat a particular grove or canyon as a special therapeutic place and return there repeatedly with program participants. A health center may convene a weekly walking group along a public river trail they consider "the healing path." While these examples represent practices within a contained group, the activity may not be reproduced as therapeutic beyond the particular provider that is organizing it. In other words, someone not included in these experiences might visit that same path or

grove and find little or no therapeutic effect; conversely, they might encounter something quite transformative. In interviews with OPV providers and mental health professionals, we heard about therapeutic landscapes that were diversely envisioned and produced. As we suggested in our study findings earlier, it is possible for particular environments, such as deserts, to induce feelings of expansiveness, openness, and opportunity in some veterans, but for others the same environment could recall places where they experienced trauma.

3.2. Therapeutic landscapes and natural resource institutions

The potential for therapeutic use of public lands can also be enhanced or curbed based on rules that govern individual or group use of public lands. As public land management agencies become more aware and intentional in their role as providers of therapeutic landscapes, these institutions will need to contend with new considerations about how land management practices affect opportunities for people to heal. For example, policies that restrict large group gatherings may constrain therapeutic opportunities spatially or temporally. Landscape design features may favor or deter certain types of outdoor experiences. Limited availability of group camping sites can make it difficult for some programs to gather. Conversely, interpretive signs that identify areas as important for recovery efforts, such as hot springs or ceremonial sites, could help promote public awareness or consideration of therapeutic qualities, and prompt imaginative thinking about places that may be therapeutic, whether these occur on site or off (Andrews 2004). Another important consideration relates to conflicting or overlapping therapeutic landscapes. Greater awareness of OPV programs and their intended resource uses can help public officials plan for and manage the land to minimize the likelihood of use conflicts.

Considering that access to natural spaces and settings for physical outdoor activity is important for improved health outcomes, land management agencies play a role by maintaining appropriate trails and recreation facilities, and allowing OPVs to bring groups onto public lands. When public agencies recognize the restorative function of these areas, they play an intentional role in the creation of therapeutic landscapes (Williams 2002). OPV activities, while often taking place in a guided group format, often closely resemble existing recreational activities such as hiking, backpacking, or rock climbing. While agencies have managed outdoor recreation for more than a century, adding an explicit focus on therapeutic or restorative qualities potentially brings a new dimension into focus.

Many public lands also feature unique characteristics that make them particularly well-suited for outdoor-based programs. Across more than 250 million hectares, federal public lands in the U.S. include many of the country's wildest rivers, highest mountains, most extensive forests and wildlands, best-maintained trail systems, and greatest opportunities for camping, quiet reflection, and other activities integral to OPVs. For informal programs, such as weekly outings by local groups of veterans, accessing these areas is low-cost or free, and most commercial programs can secure permits to utilize vast areas of public land relatively inexpensively.

Choices agencies make about how and where to manage recreation infrastructure, facilities, and settings can make a difference in how those spaces are perceived and experienced. Furthermore, other management objectives can alter physical landscapes that influence the experiences of OPV participants. For example, in areas where logging or mining have occurred, OPV activities that emphasize wildness or solitude may be precluded. Alternatively, where lands are designated as Wilderness or managed for non-motorized use, access may be difficult for some veterans with disabilities. In either case, agency policies can dramatically shape the character of the therapeutic opportunities provided.

3.3. OPVs and the production of therapeutic landscapes

Our research also documented what may seem obvious: each OPV

produces its own therapeutic landscape by bringing together a unique combination of characteristics and actors. These range from group size and composition; activity type, duration, and intensity; the extent to which therapy and therapists are explicitly incorporated; route and geography; and more. A number of characteristics – including weather, accidents, interpersonal dynamics, or food preferences – can also occur well beyond the control of program providers.

Although these differences seem to create an environment of *non-standardized* care for survivors of traumatic experiences, this may serve a useful function for these programs. Given the conceptualization of therapeutic landscapes as dynamic socio-ecological settings (Gesler 1992; Conradson 2005; Brooke and Williams 2020), a pluralistic approach to providing therapeutic opportunities may be constructive. This creates a potentially uncomfortable fit for OPVs in a treatment paradigm that medicalizes PTSD and seeks to prescribe a particular response for a particular set of symptoms. However, a more open approach can accommodate treatments for post-traumatic stress that more fully account for the complexity of this condition and many trauma survivors' long-term interests of recovering and maintaining health without pharmaceutical or clinical commitments.

Despite the dynamism and heterogeneity found in OPVs and the therapeutic landscapes they produce, it may still be useful to try to identify certain structural components within them. The figures below seek to acknowledge the heterogeneity and fluidity of OPVs and therapeutic landscapes, while also recognizing that a number of key elements are often present. These figures offer a conceptual framework that might be applied to therapeutic landscapes in other contexts, but also could be used by land managers or program providers to evaluate benefits, needs, and constraints in offering OPVs. Fig. 1 illustrates how multiple components or experiences of an OPV interact and contribute to the creation of a therapeutic landscape. As we have already described, each program – or more accurately, each iteration of each program – consists of different combinations of place, people, and experience. Elements include the biophysical landscape, the temporal element (length, duration, and frequency), the activity taking place, the therapeutic component built into a program, the institutional aspect (how the lands are managed), and social aspects, such as individual or group dynamics. Taken together, these features generate a unique and fluid therapeutic landscape.

Therapeutic landscapes may shift, depending on the unique constellation of program components and landscape features. Fig. 2 offers the same schematic, but modified, as an example, to represent two specific types of OPVs. The first centers on a physical/mental challenge of rock climbing. In this example, the group context and adrenaline-producing activity are prioritized, with an emphasis on promoting interdependence and building trust among veterans with shared experiences. In this case, the biophysical setting is important (a climbing venue) as is the physical activity, but the management context may be relatively less important and the therapeutic component may be implicit. The second example focuses on trauma survivors hiking in a wilderness setting for an extended period. Here, participants are asked to be self-sufficient as a group, relying exclusively on food and gear they carry in backpacks, and programmatic elements might include wilderness skill development, periods of solitude, and a mix of group and individual activities. In these aspects, the therapeutic component and connection with the biophysical environment might be the most prominent program attributes. This schematic can be modified to map the features of any OPV to understand features of the therapeutic landscape and to assist program design and permitting.

A growing literature acknowledges that nature immersion has been shown to reduce stress (Haluza et al., 2014), restore and reinvigorate the mind (Kaplan 1995; Ulrich 1983), and generate a sense of awe that contributes to processes of recovery (Wolsko and Hoyt 2012). As researchers continue to explore the reasons why and how OPVs provide therapeutic benefits, important questions remain to be addressed with respect to program dosage, how long OPV benefits persist, if these



Fig. 1. Stylized representation of OPV production of therapeutic landscapes.

Social: Describes the type or degree of interpersonal relationships, group dynamics or social identities (from solo to large-group).

Biophysical: Emphasizes the role of nature or the reliance/focus on physical or environmental characteristics.

Temporal: Reflects the duration, frequency, and recurrence of outdoor experiences (or dosage).

Activity: Describes the intensity or nature of movement or exercise (minimal, moderate, high-intensity)

Therapy: Describes the role of therapeutic activities (none, implied, informal, or formal)

Management: Role/importance of public land governance in providing opportunities.

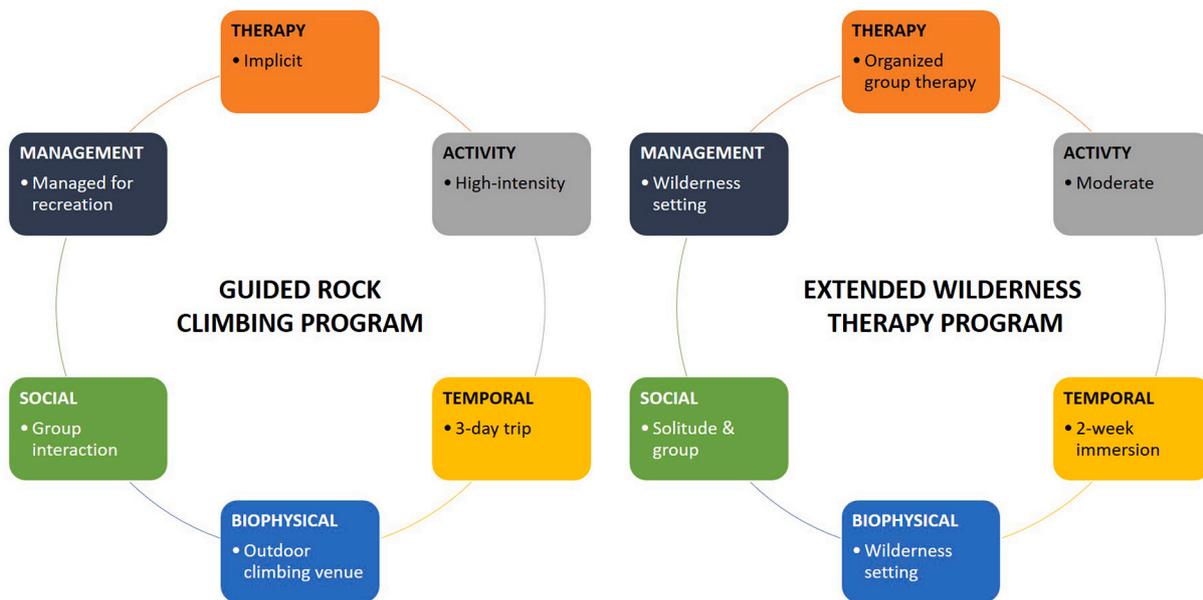


Fig. 2. Representations of informal rock climbing & extended wilderness-based OPVs.

programs lead to new and lasting connections between people and place, and how public land and public health agencies can be most effective in managing OPVs (see Derrien et al., 2020).

Our efforts to understand OPVs through the lens of therapeutic landscapes helps reveal the dynamic interactions of multiple individual, societal, and environmental dimensions within changing contexts and conditions (Gesler 1992). Moreover, our work demonstrates the variety of OPVs in terms of dosage, activity, location, therapy-type, social organization, and intended outcomes. There is no one-size-fits-all program. As (Bell et al. (2019)) cautioned about efforts to “prescribe nature,” it remains important not to reduce “the richness of people’s nature experiences to a standardized homogenous dose” (p. 3).

The commodification of therapeutic landscapes can also pose practical and moral hazards in particular cultural contexts (Wilson 2003). It remains important to recognize prior histories and persistent controversies about competing uses and conflicting values as they pertain to

public lands (see Spence 1999; Jacoby 2001), and we would caution against a broad-brush medicalization of wildlands. OPV providers and land managers will need to continue to navigate these concerns, and research that addresses these issues will fill an important gap in understanding these processes.

4. Conclusions

Outdoor programs for veterans represent an important and increasingly well-established set of opportunities to offer therapeutic experiences on public lands. With a broadened understanding of what constitutes a therapeutic landscape – to include physical places, emotional realms, social domains, and supportive managerial policies – it may be possible to provide reliable opportunities for trauma survivors through outdoor-based programs. These programs can occur across diverse geographies, ranging from federal public lands to urban green

spaces, with especially the former offering unique attributes relevant and important to OPVs. The variety and variability of OPVs helps produce many different therapeutic landscapes; the heterogeneity of program types, activities, and experiences may represent one of OPVs' greatest assets in opening up new kinds of therapeutic landscapes to new constituencies.

In thinking about public lands as places where therapeutic experiences and relationships can be effectively developed, we see multiple possibilities for the production of therapeutic landscapes and treatment opportunities for veterans experiencing post-traumatic stress through nature-immersion or outdoor recreation in restorative environments. Settings where there is time and space distinctive enough from ordinary routines are critical to encourage new social and environmental relationships. In considering the many qualities of public lands and OPVs, our research points to important synergies generated through the bio-physical setting and governance of public lands, and the contributions of movement, the temporal, the social, and the spatial to promote therapeutic outcomes.

CRedit statement

David Havlick: Conceptualization, Data curation, Formal analysis, Funding acquisition, Investigation, Methodology, Writing – original draft preparation, reviewing and editing. Lee Cervený: Conceptualization, Data curation, Formal analysis, Funding acquisition, Investigation, Methodology, Project administration, Writing – original draft preparation, reviewing and editing. Monika Derrien: Conceptualization, Data curation, Formal analysis, Investigation, Methodology, Writing – original draft preparation, reviewing and editing.

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Appendix A. Supplementary data

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