



June 2022

Wilderness Therapy Programs: *A Systematic Review of Research*

Wilderness therapy programs combine therapeutic elements with outdoor activities in a natural setting to help treat individuals with a range of needs including behavioral, emotional, psychological, and substance use issues. In 2021, the Washington State Legislature directed The Washington State Institute for Public Policy (WSIPP) to conduct a research review of wilderness therapy programs related to behavioral health. This report, the first in a two-part series, summarizes findings from our systematic literature review.

Section I provides an overview of our legislative assignment and the focus of this report. **Section II** defines wilderness therapy and describes various programs, how they operate, and who they serve. **Section III** details our systematic literature review process. **Section IV** synthesizes the main findings from our literature review of wilderness therapy programs serving youth and adult populations. Finally, **Section V** offers a discussion about our main findings and what they reveal about evidence-based practices in wilderness therapy programs.

Summary

In 2021, the legislature directed WSIPP to conduct a research review of wilderness therapy and assess stakeholder interest in Washington.

Wilderness therapy programs are set in remote locations, include therapeutic elements like cognitive behavioral therapy or reflection time and include outdoor activities such as camping and backpacking.

Due to limitations in the literature, we could not estimate the effect of wilderness therapy or determine if it is cost beneficial. We conducted a systematic literature review and summarize the landscape of programs including populations served, program models, and general findings.

We identified 88 studies evaluating programs for youth and adult populations in need of behavioral, mental health, and substance use support. There was a large amount of variation in this literature. Many studies found improvements in outcomes like self-concept, behavior, and clinical measures like depression, when comparing outcomes measured after treatment to measures before treatment. However, most studies did not use comparison groups, and they could not conclude that improvements over time were caused by program participation. Other studies reported mixed findings or no changes in outcomes over time.

Since the empirical methods used to evaluate wilderness therapy have been limited in their ability to estimate the impacts of treatment, future research should include comparison groups and statistical controls to measure program effectiveness.

Suggested citation: Cramer, J., & Wanner, P. (2022). *Wilderness Therapy Programs: A systematic review of research* (Document Number 22-06-1901). Olympia: Washington State Institute for Public Policy.

I. WSIPP's Assignment

In 2021, the Washington State Legislature directed WSIPP to conduct a research review of wilderness therapy programs and assess interest in these programs in Washington.¹ We are tasked with publishing two reports, one by June 30th, 2022 and one by December 1st, 2022.

This report addresses components (a) and (b) of the legislative assignment, outlined in [Exhibit 1](#), to the best of our ability. In a second report due December 2022, we will address component (c) and assess the interest of stakeholders in Washington who currently participate in wilderness therapy programs or may want to in the future.

Due to limitations in the primary program evaluations we reviewed, which we describe later, we were unable to estimate the average effect of wilderness therapy programs and whether or not they are cost beneficial. Instead, we summarize key findings from a systematic literature review of wilderness therapy programs with a behavioral health focus. We draw from this review to describe the landscape of wilderness therapy programs, the populations they serve, and what the literature indicates about therapy models and evidence-based practices.

Exhibit 1 Legislative Assignment

...the Washington State Institute for Public Policy [shall] partner with a content expert to conduct a wilderness therapy research review. The University of Washington Evidence Based Practice Institute and Washington State University Impact Lab must assist the institute in identifying a content expert. For the review, the institute must:

- (a) Identify wilderness therapy program models related to behavioral health which have a treatment approach which is well defined or definable and have a strong evidence base to be added to reporting guides for being identified as an evidence-based practice for mental health, including identification of target populations for these programs;**
- (b) Identify wilderness/adventure program models available for prevention services which are cost beneficial; and**
- (c) Assess the interest and likelihood of support for programs of this nature among relevant interest groups, such as state prevention coalition tribes, if such programs were listed as approved cost beneficial prevention programs by the division of behavioral health and recovery and the Washington State Health Care Authority.*

Engrossed Substitute Senate Bill 5092
Chapter 334, Laws of 2021

¹ Engrossed Substitute Senate Bill 5092, Chapter 334, Laws of 2021, amended by Engrossed Substitute Senate Bill 5693, Chapter 297, Laws of 2022.

II. Background on Wilderness Therapy Programs

The field of outdoor adventure and experiential education programs is often traced back to the Outward Bound model, a program developed in the 1940s that guides individuals (in small groups) through wilderness expeditions and aims to build individuals' sense of self, interpersonal skills, and lifelong learning.

Often, these outdoor adventure programs include activities like backpacking, camping, rock climbing, and ropes courses as a foundation to develop program participants' independence, social responsibility, and leadership skills. Though these programs are usually based in remote and natural settings, some can be offered indoors, in local communities, and even virtually.²

Wilderness therapy programs are a subset of this broad field of outdoor adventure programs because they embed therapeutic elements into daily outdoor activities. While some outdoor adventure programs consider exposure to nature as therapeutic in and of itself, in this report, we consider therapeutic components to include a range of activities including treatment models like cognitive behavioral therapy (CBT), individual and group therapy with mental health professionals, and practices like reflection, emotional regulation, and goal setting.

There is no single definition of wilderness therapy, but the programs we reviewed in the literature often possess the following three elements:

- Programs take place in a wilderness, remote, or natural setting;
- Programs use models like cognitive behavioral therapy or therapeutic elements like self-reflection to support program participants; and
- Programs utilize outdoor activities like camping, backpacking, and outdoor education to build personal and interpersonal skills.

While there is large variation in wilderness therapy programs, models tend to be one of three types:³

- Expedition-style: Small groups of participants backpack and set up camp in new locations every few days or weeks. Participants work in teams and learn survival skills. Program length ranges from several days to several months.
- Short-term or long-term residential: Individuals live in the same camp over the program duration, participate in hiking, backpacking, and/or solo excursions, and learn outdoor skills (e.g., meal prep, survival skills, navigation). Short-term programs tend to run 2 to 4 months, and long-term programs generally run 5 to 12 months.

² Gass, M., Gillis, H.L., & Russell, K. (2020). *Adventure therapy: theory, research, and practice*. Routledge, New York, NY.

³ Bettmann, J., Gillis, H.L., Speelman, E., Parry, K., & Case, J. (2016). A meta-analysis of wilderness therapy outcomes for

private pay clients. *Journal of Child and Family Studies*. 25, 2659-2673.

A range of therapeutic elements is used in these program types. For example, some programs employ mental health professionals who facilitate individual and group therapy based on clinical models like CBT. Other programs do not use licensed therapists or specific treatment models but support participants with therapeutic elements like time for reflection, mindfulness practices, and conflict resolution.

Throughout this report, we refer to programs that combine therapeutic components and outdoor activities in a natural setting as **“wilderness therapy.”** We refer to programs that use outdoor or adventure activities to build participants’ personal and interpersonal skills, but do not use therapeutic elements, as **“adventure programs.”**

In our literature review, we collected research on both wilderness therapy and adventure programs. In [Section IV](#), we synthesize information from wilderness therapy studies specifically because these programs are most aligned with the legislative assignment ([Exhibit 1](#)).⁴

⁴ Contact authors for information about research on adventure programs.

Exhibit 2

Definitions of Programs Included in our Review Synthesis

- ✓ **Wilderness Therapy Programs:** Embed therapeutic components like cognitive behavioral therapy, individual therapy, or reflection time and goal setting with outdoor activities in remote settings.
- ✗ **Adventure Programs:** Use outdoor or adventure activities like backpacking, camping, rock climbing, and kayaking to build personal and interpersonal skills but do not include therapeutic elements.

[Accreditation, Licensing, and Costs](#)

As the field of outdoor adventure and wilderness therapy programs have become more popular over time, associations like the Outdoor Behavioral Healthcare Council (OBHC), the National Association of Therapeutic Schools and Programs (NATSAP), and the Association of Experiential Education (AEE) have initiated efforts to professionalize the industry by studying program effectiveness, sharing information, and establishing standards and best practices. For example, in 2013, OBHC and AEE partnered to create a voluntary accreditation program to develop standards for wilderness therapy programs.⁵

⁵ Outdoor Behavioral Healthcare Council website: [AEE OBH Accreditation](#).

Additionally, some states including Utah,⁶ Arizona,⁷ Oregon,⁸ Georgia,⁹ and North Carolina¹⁰ have established licensing processes for programs, including wilderness therapy, and have created statutory requirements for components like using mental health professionals and treatment plans and developing wilderness safety procedures.¹¹

Typically, wilderness therapy programs are high cost, though costs vary depending on services and program length. While cost details are not usually reported on program websites, a 2017 survey of 28 programs estimates that, on average, participants pay a daily rate of \$558 and a one-time fee of \$3,194 in 2020 dollars.¹² For a 30-day program, this translates to a program cost of about \$20,000 per person. A 90-day program costs about \$53,000 per person.

Generally, health insurance does not cover wilderness therapy programs, though some insurance providers may reimburse program participants for a portion of the cost.

[Existing Research on Wilderness Therapy](#)

There is a large amount of research on wilderness therapy and adventure programs. To introduce a portion of this literature before we discuss our overall review, we summarize five meta-analyses that reviewed wilderness therapy programs (see [Exhibit 3](#)

for details).¹³ [Appendix I](#) includes five additional analyses on adventure and wilderness therapy programs.¹⁴ [Appendix V](#) includes a list of citations.

The analyses in [Exhibit 3](#) included studies with a range of populations, most of which were adolescents or young adults. In these analyses, self-concept constructs (e.g., self-esteem) were the most frequently measured outcomes, though behavioral and clinical outcomes (e.g., depression, and locus of control) were also common. Other outcomes included academic, social development, and delinquent behavior.

Overall, the five analyses indicate a positive relationship between wilderness therapy programs and outcomes. Authors reported improvements from pre-treatment to post-treatment in measures of self-concept, clinical measures, academic performance, behavior, delinquency, and recidivism. However, the authors of these analyses consistently reported several limitations that influence the interpretation of their results.

- 1) Studies in the analyses describe a range of program models, populations, and outcomes, making it challenging to estimate effects and succinctly summarize results.

⁶ Utah Department of Human Services website: [License Types](#). See "Outdoor Youth Program."

⁷ Arizona Department of Health Services website: [Residential Facilities Licensing](#).

⁸ Oregon Department of Human Services website: [Child-Caring Agency \(CCA\) Licensing Rules](#).

⁹ Georgia Department of Human Services website: [Outdoor Child Caring Programs \(OCCP\)](#).

¹⁰ North Carolina Division of Health Service Regulation website: [Mental Health Licensure and Certification Section](#).

¹¹ This is not an exhaustive list of states with licenses and regulations but represents states with established policies.

¹² All kinds of therapy website: [How much does wilderness therapy cost?](#) The one-time fee covers equipment, clothing, food, therapy sessions, and evaluations.

¹³ Meta-analysis is a method used to assess the weighted average effect of a program across multiple studies. We describe WSIPP's meta-analytic approach in [Section III](#).

¹⁴ Included in the Appendix because adventure and wilderness therapy programs are combined in analyses.

- 2) Studies often reported limited (or no) program or population information, making it difficult to understand program mechanisms and for whom programs may work or not work.
- 3) The methodological quality of studies is low, and results are likely not causal. Most studies do not include comparison groups and instead measure outcomes for individuals before and after participating in programs.¹⁵ Therefore, authors cannot conclude that changes are caused by wilderness therapy participation since other factors separate from the program or just the passage of time may drive results.

We conducted a systematic literature review (see [Section IV](#)) beyond the analyses summarized here because we wanted to identify rigorous program evaluations that examined wilderness therapy programs serving populations in need of behavioral, mental health, and substance use support.¹⁶ We emphasize the limitations above because they were also present in the studies we reviewed and highlight the challenge we faced when trying to estimate the effectiveness of wilderness therapy.

Research on Exposure to Nature

Though not a focus of this report, we want to acknowledge an adjacent line of research focused on exposure to nature and what it may indicate for the effectiveness of wilderness therapy programs.

Recent systematic reviews and a meta-analysis examined the impact of nature on mental health and physical outcomes. See [Appendix V](#) for study citations. This research indicates that exposure to nature is associated with positive changes in the following:

- mental health outcomes;
- behavioral and emotional functioning;
- cognitive abilities like executive function and academic performance; and
- immune system health and measures of stress like blood pressure.

The research on nature varies in terms of treatment, populations, and outcomes. For example, nature may include access to a green space, hiking, gardening, or living with a view. Further, studies range in methodological rigor.

While high-quality program evaluations are needed, the observed benefits in this body of research suggest that outdoor components in wilderness therapy programs may benefit participants in addition to the therapeutic components they receive.

¹⁵ Four of the five meta-analyses combined studies with and without comparison groups together. Fleischer, C., Doebler, P., Burkner, P., & Holling, H. (2017). *Adventure therapy effects*

on self-concept - a meta-analysis disaggregated results by these categories.

¹⁶ In our literature review, we included the studies in the meta-analyses described in this section and [Appendix I](#).

Exhibit 3
Meta-Analyses of Wilderness Therapy Programs

Study	# of studies	Population	Outcomes	Change in outcome and magnitude
Beck & Wong (2022)	11	11 – 26-year-olds, predominantly White males.	Self-reported delinquency	↓ Large
			Caregiver-reported delinquency	↓ Large
Bettmann et al. (2016)	36	Private pay clients. Studies must include programs that serve less than 50% court-involved participants. Most participants were White males.	Self-esteem	↑ Small-moderate
			Locus of control	↑ Moderate
			Behavior	↑ Large
			Personal effectiveness	↑ Small-moderate
			Clinical measures (e.g., depression)	↓ Moderate
			Interpersonal measures	↑ Moderate
Bowen & Neill (2013)	197	Participants were mostly between 10-17 years old. 74% of participants were male, 15% female. 45% White, 10% POC, 7% multiracial, 38% unknown. 63% of individuals were characterized as being “at-risk”, 26% had clinical diagnoses, and 11% were court-involved.	Academic performance	↑ Small-moderate
			Behavior	↑ Small-moderate
			Clinical measures (e.g., anxiety)	↓ Moderate
			Family development	↑ Small-moderate
			Morality/spirituality	↑ Small
			Physical health	↑ Small-moderate
			Self-concept	↑ Small-moderate
			Social development	↑ Small-moderate
Fleischer et al. (2017)	30	Participants deemed “at-risk” or in treatment for behavioral or mental health issues. Mean age of 18 and 69% were males.	Locus of control	↑ Small-moderate
			Self-efficacy	↑ Small-moderate
			Self-esteem	↑ Moderate
Gillis et al. (2016)	21	Mostly male participants ages 14 to 15 receiving mental health treatment.	Behavior	↑ Moderate-large

Notes:

Arrows indicate the direction of change in outcome (all changes in this table represent desired outcomes).

Green arrows indicate change is statistically significant at the 95% level, and gray arrows indicate not statistically significant.

We use Cohen’s scale to categorize the effect sizes reported in the analyses.

Effect sizes 0.0 - 0.20 are small, 0.20 - 0.50 are small to moderate, 0.50 - 0.80 are moderate to large, and 0.80 and greater are large.

Cohen, J. (1969). *Statistical power analysis for the behavioral sciences (1st ed.)*. New York: Academic Press.

III. Research Review Process

The legislature often assigns WSIPP to evaluate program effects and associated costs and benefits. We use a standardized approach to fulfill these assignments.

WSIPP's Meta-and Benefit-Cost Analysis Process

First, we conduct a systematic literature review to collect studies on a given program or policy.¹⁷ Second, we screen studies to identify rigorous evaluations in which authors demonstrate a program's causal impact.¹⁸ Third, once we have a collection of rigorous studies, we perform a meta-analysis to quantify the program's average effects on the outcomes measured in the studies.¹⁹ Quantifying the magnitude of those average effects allows us to conduct a benefit-cost analysis. Finally, we estimate the program's cost to operate on a per-participant basis and use the effect sizes²⁰ from our meta-analysis to estimate the expected future benefits for program participants.

Ideally, we would use this approach to estimate the average impact of wilderness therapy programs on outcomes (e.g., depression, substance use) among specific populations (e.g., adults and adolescents) and link these effects to future impacts like higher education attainment, employment, and earnings. The usual WSIPP process would enable us to address the legislative

assignment's directives to a) identify wilderness therapy program models with a behavioral health treatment approach that have a strong evidence base and b) determine if wilderness therapy programs are cost beneficial.

However, we were unable to conduct a meta- or benefit-cost analysis of wilderness therapy programs because studies did not meet our standards of methodological rigor. Similar to the limitations we identified in previous meta-analyses, most studies did not include comparison groups. Instead, most researchers compared outcomes for individuals before and after they participated in wilderness therapy programs. While researchers can observe changes in these individuals' outcomes like depression or behavior over time, researchers cannot determine what would have happened to outcomes in the absence of the program.

In the few studies with comparison groups, the authors did not use statistical methods to ensure that individuals in wilderness therapy programs and comparison conditions were similar or control for other factors that may influence outcomes beyond the program itself. As a result, the authors cannot demonstrate a causal relationship between programs and outcomes, and we could not include these studies in a meta-analysis.

¹⁷ We collect peer-reviewed and non-peer reviewed studies.

¹⁸ We look to see that authors include treatment and comparison groups and use statistical methods to control for pre-treatment group differences and other factors that could drive results other than the program itself. We include only causal studies in our meta-analyses to ensure that our estimated effect reflects the program's true impact.

¹⁹ Meta-analysis estimates a weighted average program effect using statistical information reported in studies.

²⁰ An effect size is a standardized statistical measure that allows us to compare program effects on an apples-to-apples basis across multiple studies.

In addition to the methodological limitations, many outcomes measured in the studies cannot be monetized in our benefit-cost model.²¹ Therefore, even if authors could demonstrate a causal link between programs and outcomes, we may not be able to conduct a benefit-cost analysis.

A cost-effectiveness analysis published in 2019²² compared the costs of wilderness therapy programs²³ to the costs of treatment-as-usual (TAU) programs²⁴ treating adolescents with substance use issues and comorbid conditions like depression and anxiety.²⁵ This analysis estimated that, on average, a wilderness therapy participant pays \$17,000 less than a participant in TAU.²⁶

To rigorously evaluate if wilderness therapy programs are cost-beneficial, we would estimate the average effect of the program on outcomes like depression or substance use disorder (SUD) and then link the change in depression or SUD symptoms to future benefits, like earnings. With this information, we could compare the cost of wilderness therapy programs and determine if it is greater or less than the long-term monetary benefits that program participants experience. If the benefits of the program outweigh its costs, then we would determine wilderness therapy is a cost-beneficial program.

Unfortunately, since the research to date cannot conclude if wilderness therapy has a causal effect on outcomes, we cannot estimate the average effect of wilderness therapy programs or whether they are cost beneficial. If rigorous research is published in the future, we can revisit these questions and conduct these analyses.

[Our Process for Conducting a Systematic Research Review of Wilderness Therapy Programs](#)

We address component (a) of the legislative assignment by conducting a systematic review of research studies focused on wilderness therapy programs. Although we cannot quantify the magnitude of the effects we would expect from wilderness therapy programs, we can describe the landscape of wilderness therapy programs, the therapeutic practices they use, and identify how to improve the research in order to study its effects in the future.

We cast a wide net in our literature review to collect studies that encompass the field of wilderness therapy and adventure programs. We did not restrict our search by publication date or type, populations, outcomes, or study methodology.

²¹ Our benefit-cost model has not been adapted to include outcomes like self-concept or resilience, so we cannot determine how program effects on these outcomes influence future benefits like earnings.

²² Gass, M., Wilson, T., Talbot, B., Tucker, A., Ugiankis, M. & Brennan, N. (2019). The value of outdoor behavioral healthcare for adolescent substance users with comorbid conditions. *Substance Abuse: Research and Treatment*, 13, 1-8.

²³ Called outdoor behavioral health programs in the study.

²⁴ Outpatient, detoxification, and residential programs.

²⁵ This study also estimates that long-term benefits of wilderness therapy outweigh the relatively high costs. However, that conclusion is based on correlational evidence.

²⁶ The results assume individuals participated in programs from beginning to end for 90 days.

In total, we collected 530 studies published between 1969 and 2022. We identified broad categories in this literature, including wilderness therapy and adventure programs for behavioral health, substance use, and individuals in the criminal justice system. We also identified programs that focused on people with intellectual and physical disabilities and physical health. Since the legislative assignment references “wilderness therapy program models related to behavioral health,” we focus on wilderness therapy programs serving individuals with behavioral, emotional, psychological, and substance use issues.²⁷

Exhibit 4 depicts our review process. See Appendix II for more information.

Content Expert Support

In the legislative assignment, WSIPP was assigned to coordinate with the University of Washington’s Evidence Based Practice Institute (EBPI) and the Washington State University’s Impact Lab to identify a content expert to help inform our review.

We sought the expertise of Dr. Keith Russell during our literature review and synthesis. Dr. Russell is a researcher of outdoor behavioral healthcare programs, a licensed clinician, a professor in the College of Humanities and Social Sciences at Western Washington University, and previously worked as a wilderness educator. Dr. Russell shared materials to help us understand the landscape of wilderness therapy research, what types of therapeutic practices exist, and how programs operate in Washington and elsewhere.

We also received feedback from researchers at the UW’s EBPI and WSU’s Impact Lab regarding the scope of our literature review and this report. Researchers at the EBPI and the Impact Lab have conducted reviews of wilderness therapy and outdoor recreation programs in the past. Researchers at UW identified 52 studies of wilderness therapy programs focused on adolescent mental and behavioral health.²⁸ Due to variation across programs and populations and small sample sizes, they determined the effectiveness of wilderness therapy to be inconclusive and that effects on mental health, delinquency, recidivism, and social-emotional learning outcomes vary.

Researchers at WSU reviewed seven studies on outdoor recreation prevention programs for American Indian/Alaska Native youth.²⁹ Outdoor recreation programs are considered promising for indigenous youth because their settings and activities are often connected to cultural values and traditional practices. Impact Lab’s review found positive associations between participation in these programs and resilience, mental health, cultural identity, prosocial behavior, and self-concept outcomes. Researchers also found a connection between participation and lower depression and reduced alcohol use. Researchers do caution, however, that most programs were not rigorously evaluated.

We included studies from the EBPI and Impact Lab reviews above when screening and synthesizing research for this report.

²⁷ Contact authors for information about research on adventure programs specifically.

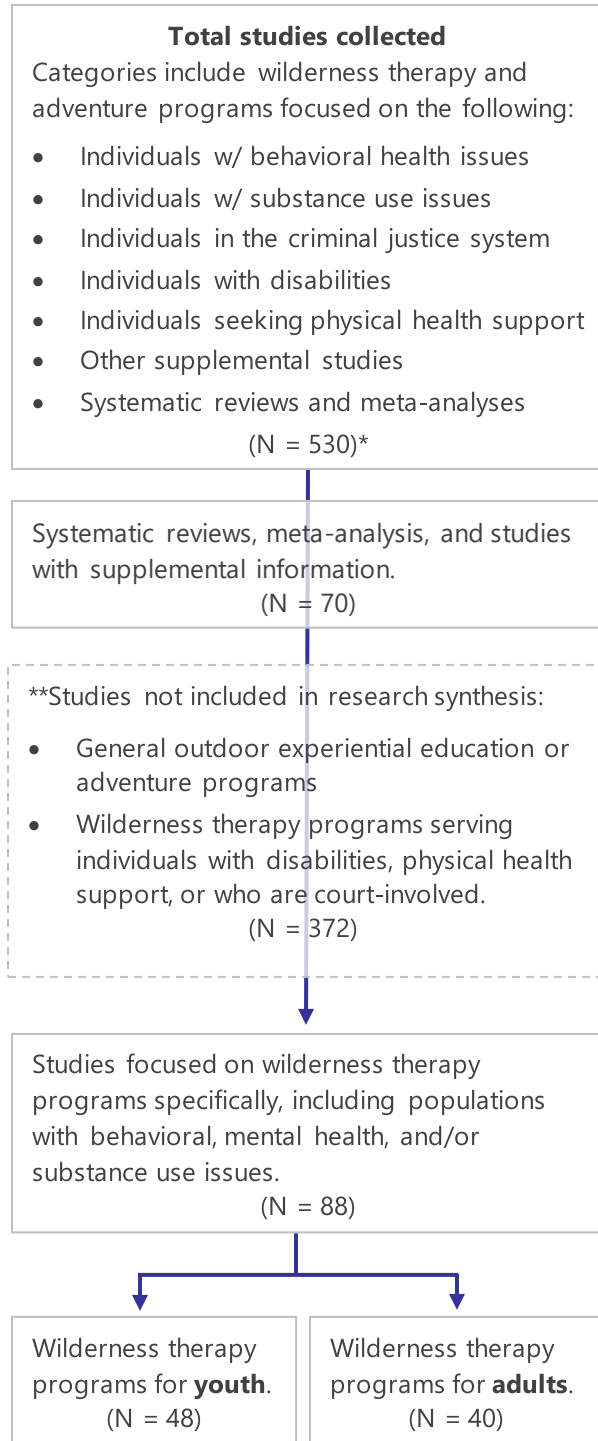
²⁸ Walker, S., Almquist, L., & Ngo, S. (2021). *Effectiveness of wilderness therapy programs on mental and behavioral health: a rapid evidence review*. Evidence Based Practice Institute and CoLab. The University of Washington.

²⁹ Price, F., & Weybright, E. (2020). *Review of outdoor recreation prevention programs serving indigenous people*. Poster presented at the annual meeting of The Academy of Leisure Sciences, Champaign, IL.

Exhibit 4

Meta-Analyses of Wilderness Therapy Programs

Flow of collected studies



Notes:

* 70 + 372 + 88 = 530 studies total

** Studies outside the scope of our assignment.

See [Appendix II](#) for information.

Review processes

Search criteria

Publication date: No restrictions; dates range from 1969 to 2022.

Publication type: No restrictions; peer-reviewed and non-peer reviewed studies.

Search terms: "Wilderness therapy", "wilderness adventure therapy", "outdoor therapy", "outdoor adventure therapy", "outdoor behavioral health", "outdoor residential program", "wilderness residential program", "adventure therapy", "ecotherapy", "ecopsychology", "nature therapy", "nature-based therapy", and "recreation therapy".

Reasons studies excluded from meta-analysis (most to least common)

- Study did not include comparison group.
- Study was not a program evaluation.
- Study had comparison group, but the author(s) did not use statistical methods to control for pre-treatment group differences or other factors.
- Sample size was too small.

Coding criteria for literature synthesis

- Authors and publication year
- Publication type
- Target population
- Outcomes
- Program name and location
- Program description
- Description of therapy model/elements
- Program length
- Methodology, sample size, limitations
- Results

IV. Research Review Findings

This section summarizes findings from our systematic review of studies on wilderness therapy programs serving youth and adult populations.

Wilderness Therapy Programs for Youth

We reviewed 48 studies³⁰ evaluating wilderness therapy for youth specifically (i.e., programs included a range of therapeutic practices and were conducted in natural settings).³¹ For additional information on studies focused on youth, see [Appendix III](#). For a list of citations see [Appendix V](#).

Populations

Most of the 48 studies evaluated programs that served diverse populations of youth who were either diagnosed with behavioral, mental health, or substance use disorders and/or exhibited other characteristics like signs of social withdrawal, low academic performance, and risky behaviors like underage drinking.

On average, program participants were 13 to 18 years old, and there tended to be more males than females. About half of the 48 studies did not report race or ethnicity information, but of the studies that did, approximately 26% of participants identified as Black or African American, 2% identified as Asian, 6% identified as American Indian/Alaska Native, 3% identified as multiracial, 7% identified as Hispanic or Latino, and 69% identified as White.³²

Outcomes

There were many different outcomes measured in the 48 studies. Self-concept and behavioral or emotional measures were most commonly reported. Clinical outcomes like depression, anxiety, and locus of control were also common. Other outcomes less frequently reported were substance use, academic performance, family development, and resilience.

Program Models

Program length generally spanned between one week to three months. Most of the studies described programs with outdoor activities like camping, hiking, and backpacking along with experiential learning components which taught individuals how to set up camps, prep meals, and navigate in remote locations. Some programs also embedded solo activities where participants hiked or camped alone for one to several days (usually in proximity to program staff).

³⁰ See [Appendix V](#) for citations. Studies were published between 1981 and 2021 and include peer-reviewed and non-peer-reviewed articles.

³¹ Some studies did not provide enough information to determine if a program was wilderness therapy or not and are not included in this synthesis.

³² Figures exceed 100% because race and ethnicity categories are not mutually exclusive in studies and individuals may select more than one category, including multiracial. There were 18 studies that focused predominantly on White populations, two studies that focused predominantly on Black/African American populations, and one study that focused on American Indian/Alaska Native populations.

See [Exhibit 5](#) for a summary of program characteristics reported in the 48 studies.

There was a wide range of therapeutic models used in the studies we reviewed. About a third of the studies described programs with well-established clinical models. These programs employed mental health professionals who used treatment models like CBT or family therapy to guide individual or group therapy sessions at least once a week. Therapists often created treatment plans, monitored participants' progress, and created aftercare plans to help individuals transition out of the program. These practices were embedded into daily programming, which included outdoor activities described above.

About 20% of the studies described wilderness therapy programs that included individual and group therapy sessions within daily outdoor activities. Typically, these therapy sessions were facilitated by licensed clinical staff, but there was no description of explicit treatment models like CBT. About half of the studies we reviewed used a range of therapeutic elements but did not employ licensed therapists to carry out individual or group therapy sessions. Staff in these programs used therapeutic elements like reflection, relaxation, goal setting, and emotional and behavioral regulation to teach participants how to navigate challenging personal and social situations.

See [Exhibit A6](#) in [Appendix III](#) for examples of the types of therapeutic elements programs used.

Results for Youth Populations

As we mentioned earlier, most study authors did not use comparison groups to evaluate program effectiveness. Authors usually compared outcomes for individuals before and after participating in wilderness therapy programs. Therefore, study results reflect potential changes over time but do not demonstrate a causal relationship between wilderness therapy programs and youth outcomes.

Most studies reported that outcomes like behavior, self-concept, clinical symptoms (e.g., depression, anxiety), social development, substance use, resilience, and family relationships improved after participation in a program.

About 17% of studies reported mixed results.³³ In other words, authors observed improvements in some outcomes like behavior and self-esteem when participants exited the program, but they did not observe improvements in outcomes like social or family connectedness. Also, several studies reported no changes over time.

³³ Here, mixed refers to studies that report statistically significant improvements for some outcomes and null effects

for other outcomes. No studies reported statistically significant undesirable effects.

Exhibit 5

Programmatic and Therapeutic Features of Youth Wilderness Therapy Programs

Program names	
<ul style="list-style-type: none">○ Onward Adventures○ Catherine Freer Wilderness Therapy Expedition○ The Family Wheel○ Youth LIVE○ Crossing the Alps○ Quest Psychological Summer Camp○ RedCliffe Ascent○ Synergia Learning Ventures	<ul style="list-style-type: none">○ Eckerd Wilderness Educational System○ New Vision Wilderness Adolescent Program○ Project Hahn○ Project Challenge○ Alaska Crossings○ Sage Walk○ Anasazi○ Aspen Achievement Academy
Program length	
<ul style="list-style-type: none">○ Ranges from two days to ten months (average one week to three months)	
Recreation or adventure components	
<ul style="list-style-type: none">○ Camping, hiking, backpacking○ Adventure activities include rock climbing, spelunking, mountain biking, canoeing/kayaking, whitewater rafting, and rope courses○ Solo activities for one to several days include backing and camping alone away from group and staff○ Experiential learning includes building shelter, organizing camp, meal prep, making fire, and navigation	
Therapeutic components	
<ul style="list-style-type: none">○ Licensed therapists facilitate Individual and group therapy○ Therapists develop individualized treatment and aftercare plans and monitor participants' progress○ Family therapy sessions provided before and/or after programming○ Therapy models included CBT, family therapy, choice therapy, narrative therapy, grief therapy, gestalt therapy, brainspotting psychotherapy, art therapy, multisystemic therapy, solution-focused brief therapy	<ul style="list-style-type: none">○ Group processing meetings○ Journaling and self-reflection assignments○ Mindfulness training and exercises○ Anger management○ 12 steps for substance use treatment○ Conflict resolution○ Dedicated time each day to reflect on activities and experiences and set goals for the future
Practitioners and staff	
<ul style="list-style-type: none">○ Licensed Psychologists○ Licensed Psychiatrists○ Substance use counselors○ Social Workers	<ul style="list-style-type: none">○ Teachers○ Trained counselors○ Trained outdoor survival and wilderness guides○ Volunteers trained in grief counseling

Wilderness Therapy Programs for Adults

We reviewed 40 studies specifically evaluating wilderness therapy for adults.³⁴ For a more information on the terminology, empirical methods, populations, outcomes, and therapeutic models in the adult literature, see [Appendix IV](#). For a list of citations see [Appendix V](#).

Populations

Most of the 40 studies evaluated programs serving adults with behavioral, psychological, or substance use disorders. Several studies focused on general populations, veterans, or survivors of domestic violence.

On average, participants were young adults ages 18 to 25 years old and were mostly male. In studies where race and ethnicity information were reported, approximately 1.7% of participants identified as Black or African American, 1.4% identified as Asian or Pacific Islander, 3.4% identified as American Indian/Alaska Native, 0.2% identified as multiracial, 1.7% identified as Hispanic or Latino, 3.3% identified as other, and 84% identified as White.³⁵

Outcomes

Outcomes reported in the adult literature were similar to those measured in the youth literature. The most common outcomes were self-concept and behavioral or emotional measures.

Program Models³⁶

Of the 40 studies, adults participated in wilderness therapy programs for a minimum of three days to a maximum of nine weeks. On average, the length of stay across programs was one month, though several evaluations utilized the Outward Bound model, which lasts about six days. These programs leveraged a base-camp approach where participants would remain in the same wilderness setting for the entire duration of their stay. Staff (including licensed therapists, field instructors, and field guides) rotated out of the base camp periodically throughout the participant's stay. The field guides were responsible for clients on a 24-hour basis, whereas licensed therapists or field instructors may only meet with clients periodically during the program.

[Exhibit 6](#) summarizes program information reported in the 40 studies.

Also similar to the youth literature, most wilderness therapy programs for adults included activities like camping, hiking, backpacking, and experiential learning components. In some cases, day excursions, including rock climbing, spelunking, whitewater rafting, kayaking, and rope courses, were offered in addition to regular programming, depending on individual needs. Studies focused on anti-social behaviors and recidivism described programs as having more group activities and reliance on team-building exercises.

³⁴ Study participants are considered adults if they are 18 years or older.

³⁵ Three studies evaluated populations in Norway and New Zealand. Two of those studies (in Norway) were conducted with White participants only.

³⁶ Not all studies reported program information. This description includes studies that did.

There was a wide range of therapeutic components in the studies we reviewed. However, many studies did not describe a particular therapeutic model.

Only five studies described programs with well-established clinical models. These programs employed mental health professionals who used treatment models like CBT to guide individual or group therapy sessions. Treatment plans and ongoing monitoring was common, one study indicated that aftercare was a primary concern of therapists. These practices were embedded into daily outdoor activities.

Thirteen studies described wilderness therapy programs that included individual and group therapy sessions. Typically, these sessions were facilitated by licensed clinical staff, but there was no description of explicit treatment models like CBT. Finally, 16 studies used a range of therapeutic elements (e.g., mindfulness training, journaling, group debriefing) but did not employ licensed therapists or carryout individual or group therapy sessions.

See [Exhibit A9](#) in [Appendix IV](#) for examples of programs and the therapeutic components they use.

Results for Adult Populations

Overall, findings across the 40 studies indicated modest to significant improvements on measured outcomes.

Eleven studies reported improvements to outcomes like life outlook, self-confidence, symptomology (e.g., post-traumatic stress disorder (PTSD), anxiety, and depression), and psychosocial functioning. One study reported that positive effects did not last long after the program ended, though another study reported positive effects 18-months after treatment.

Other studies reported mixed findings.³⁷ Three studies reported improvements on some outcomes (e.g., stress, depression, and PTSD) and no changes on other outcomes (e.g., suicidal ideation, social avoidant behavior). One study reported no effects of wilderness therapy for veterans diagnosed with PTSD, compared to veterans in a treatment-as-usual condition.

Some studies compared program effectiveness between subgroups (e.g., comparing outcomes between male and female clients). However, the authors of these studies primarily reported non-significant differences between groups.

As with the youth literature, none of the studies we reviewed focusing on adults met our methodological standards for inclusion in a meta-analysis. Additional research with comparison groups and statistical controls needs to be conducted in order to determine the impact of wilderness therapy programs among adult populations.

³⁷ Here, mixed refers to studies that report statistically significant improvements for some outcomes and null effects

for other outcomes. No studies reported statistically significant undesirable effects.

Exhibit 6

Programmatic and Therapeutic Features of Adult Wilderness Therapy Programs

Program names	
<ul style="list-style-type: none"> ○ Outward Bound for Veterans (OB4V) ○ Camp Kostopulos ○ Sierra Club Military Outdoors program ○ Friluftsterapi ○ Outward Bound ○ Enviroshunda Creek residential program 	<ul style="list-style-type: none"> ○ Outward Bound with the Adult Probation Positive Experiential Learning (APPEL) program ○ Second Nature Wilderness program ○ Women of Courage (Outward Bound for Women) ○ Outward Bound Mindfulness program ○ Salem DVA Specialized Post-Traumatic Stress Disorder Treatment program ○ Outdoor Behavioral Health (OBH) program
Program length	
<ul style="list-style-type: none"> ○ One day to 1 year (average approximately one week) 	
Recreation or adventure components	
<ul style="list-style-type: none"> ○ Hiking, mountaineering and whitewater rafting, backpacking ○ Rock climbing, canyoneering, canoeing, whitewater canoeing, sailing, sea kayaking, skiing, winter camping, snowshoeing, dog sledding, fly-fishing, rock climbing, rappelling, spelunking ○ Travel safety in nature and training in wilderness areas, leave-no-trace training, first aid and medical training in wilderness environments, and risk management training ○ Instruction in adventure sport skills 	
Therapeutic components	
<ul style="list-style-type: none"> ○ Therapeutic recreation processes (journaling, self-reflection assignments) ○ Individual therapy ○ Individualized treatment plans ○ Small and large group therapy ○ Group process meetings (i.e. debriefs) 	<ul style="list-style-type: none"> ○ Mindfulness training and practice ○ PTSD education ○ Grief work with therapists ○ CBT group therapy
Practitioners and staff	
<ul style="list-style-type: none"> ○ Trained hospital staff & wilderness guides ○ Veteran peer leaders ○ Psychologists ○ Psychiatric nurses ○ Social workers ○ Occupational therapist 	<ul style="list-style-type: none"> ○ Licensed therapists ○ Outward Bound trained instructors ○ Licensed therapist and psychologist specializing in therapy with men ○ Psychiatrist ○ Masters-level mental health professional

V. Discussion

In 2021, WSIPP was legislatively assigned to review research on wilderness therapy programs, identify models with evidence-based treatment approaches, and determine which models are cost beneficial.

In our literature review, we identified 48 studies of wilderness therapy programs focused on youth populations and 40 studies focused on adult populations.

In the youth literature we reviewed, wilderness therapy programs typically served adolescents aged 13 to 18 with behavioral, mental health, and/or substance use issues. Participants were usually enrolled in programs from one week to three months. While enrolled, participants backpacked and organized camps, and learned outdoor skills like fire-making, meal prep, and navigation. Therapy sessions facilitated by mental health professionals or therapeutic elements like reflection and goal-setting were embedded into daily outdoor activities.

In the adult literature, wilderness therapy programs were typically provided to individuals ages 18 to 26 with behavioral, psychological, and/or substance use disorders. We found that adults tended to enroll in programs for shorter periods than adolescents (about 21 days on average). Adults participated in similar outdoor activities as youth.

The majority of studies examining wilderness therapy for youth and adult populations found that outcome measures improved post-treatment, compared to pre-treatment. Typically, improvements were observed for outcomes like self-concept, behavior, and clinical measures of depression, anxiety, and PTSD. Other outcomes like resilience, substance use, and social development were also common in both bodies of literature.

However, we observed that a greater proportion of studies in the adult literature reported mixed results, compared to studies focused on youth (approximately 30% compared to 20%, respectively).

In both the youth and adult literature, we cannot conclude that any observed changes occurred because of wilderness therapy, other factors, or simply the passage of time.

Evidence-based Practices in Wilderness Therapy Programs

Though we were unable to conduct meta- and benefit-cost analyses to estimate the average effect of wilderness therapy programs or whether benefits outweigh program costs, we identified some models grounded in evidence-based research. See [Exhibits A6 and A9 in Appendices III and IV](#).

In the youth and adult literature, about half of the studies we reviewed described the inclusion of therapy sessions with licensed clinicians. Some studies explained that these programs were based on CBT and/or family therapy models. The remaining studies we reviewed described a range of therapeutic elements but included little or no detail about clinical treatment models.

In previous meta-and benefit-cost analyses, WSIPP has evaluated some of the treatment models described in the studies we reviewed. We found that CBT positively impacts adolescents with depression,³⁸ anxiety,³⁹ and ADHD⁴⁰ and adults with depression,⁴¹ anxiety,⁴² and PTSD.⁴³ We have also found evidence that family therapy models reduce substance use disorder⁴⁴ and disruptive behavior disorder⁴⁵ symptoms among youth. We estimated that the benefits associated with CBT for youth with anxiety and adults with depression, anxiety, and PTSD are likely to exceed program costs in the future over 90% of the time.

While there is no research to date estimating the effectiveness of wilderness therapy programs, there is suggestive evidence that wilderness therapy programs using approaches like the ones we analyzed (e.g., CBT, family therapy) may benefit program participants more than wilderness therapy programs that do not use these proven treatment models.

Further, research on the exposure to nature indicates positive impacts on mental health and physical outcomes, which suggests that outdoor activities alone in wilderness therapy programs could benefit participants. Rigorous program evaluations need to be conducted comparing outcomes between individuals in wilderness therapy and clinical treatment programs in order to determine if outdoor settings in wilderness therapy affect individuals beyond traditional treatment methods.

Future Work

To estimate the effectiveness of wilderness therapy, future research would need to compare outcomes between individuals in wilderness therapy and other comparison conditions, like cognitive behavioral therapy, or no treatment at all. With strong statistical controls for pre-existing differences between groups, this type of research design could conclude that differences in outcomes were due to wilderness therapy and not to other observable factors.

³⁸ Washington State Institute for Public Policy. (2017, August). *CBT for children & adolescents with depression*. Olympia, WA: Author.

³⁹ Washington State Institute for Public Policy. (2018, May). *Group and individual CBT for children & adolescents with anxiety*. Olympia, WA: Author.

⁴⁰ Washington State Institute for Public Policy. (2018, April). *CBT for children with ADHD*. Olympia, WA: Author.

⁴¹ Washington State Institute for Public Policy. (2016, September). *CBT for adult depression*. Olympia, WA: Author.

⁴² Washington State Institute for Public Policy. (2016, September). *CBT for adult anxiety*. Olympia, WA: Author.

⁴³ Washington State Institute for Public Policy. (2016, September). *CBT for adult PTSD*. Olympia, WA: Author.

⁴⁴ Washington State Institute for Public Policy. (2015, May). *Multidimensional Family Therapy*. Olympia, WA: Author and Washington State Institute for Public Policy. (2016, June). *Functional Family Therapy for adolescents with substance use disorder*. Olympia, WA: Author.

⁴⁵ Washington State Institute for Public Policy. (2018, July). WSIPP meta-and benefit-cost results: *Brief Strategic Family Therapy*. Olympia, WA: Author.

Currently, there is no systematic data on wilderness therapy programs or participants. With this type of data, we could use statistical methods like matching (using characteristics like age, sex, race and ethnicity, income, mental health diagnoses, and family information) to best create comparisons between individuals in a wilderness therapy program and a comparison condition. Matching and other quasi-experimental designs can help control for selection bias and other unobserved factors that may influence outcomes.

Ideally, we would also use this data to examine how factors like program length, settings, staff experience, therapeutic models, and key program components influence effects and various populations.

A forthcoming report in December 2022 will build on this report and will focus on wilderness therapy programs in Washington. We will assess the interest of stakeholders who currently participate in programs or want to in the future.



Appendices

Wilderness Therapy Programs: A Systematic Review of Research

I.	Meta-Analyses of Wilderness Therapy and Adventure Programs.....	21
II.	Systematic Review Process Information.....	23
III.	Information from Research on Wilderness Therapy Programs for Youth	24
IV.	Information from Research on Wilderness Therapy Programs for Adults	28
VII.	Citations.....	31

I. Meta-Analyses of Wilderness Therapy and Adventure Programs

Exhibit A1 summarizes five meta-analyses that combine adventure and wilderness therapy programs. There is a lot of variation in these analyses in terms of the types of programs, populations, and outcomes assessed. Compared to the meta-analyses described in Section II of the report (focused on wilderness therapy specifically), the authors report a larger range in the magnitude of outcomes and fewer estimates are statistically significant at the 95% level.

Exhibit A1

Meta-Analyses of Adventure Programs and Wilderness Therapy Programs

Study	# of studies	Population	Outcomes	Change in outcome and magnitude
Bedard (2004)	23	Court-involved youth ages 10 to 18.	Behavior	↑ Moderate-large
			Self-concept	↑ Moderate-large
			Recidivism	↓ Small-moderate
Cason & Gillis (1994)	43	Adolescent population ages 11 to 19.	Self-concept	↑ Small-moderate
			Behavior	↑ Small-moderate
			Attitude	↑ Small-moderate
			Locus of control	↑ Small-moderate
			Clinical measures (e.g., depression)	↓ Large
			School grades	↑ Moderate-large
			School attendance	↑ Small-moderate
Fang et al. (2021)	12	Adolescents aged 11 to 19. 50% were male.	Self-efficacy	↑ Small-moderate
Hattie et al. (1997)	96	Adults and university students, average age was 22. 72% male, 28% female.	Leadership	↑ Small-moderate
			Self-concept	↑ Small-moderate
			Academic performance	↑ Small-moderate
			Personality	↑ Small-moderate
			Interpersonal	↑ Small-moderate
			Adventuresome	↑ Small-moderate
Wilson & Lipsey (2000)	28	Adolescents deemed by authors as "antisocial or delinquent youth", ages 10 to 18. 57% of participants identified as White, 14% as multiracial, and 29% were unknown.	Antisocial behavior/delinquency	↓ Small
			Social skills	↑ Small-moderate
			Locus of control	↑ Small
			Self-esteem	↑ Small-moderate
			Psychological adjustment	↑ Small-moderate
			School Adjustment	↑ Small-moderate

Notes:

Arrows indicate the direction of change in outcome (all changes in this table represent desired outcomes).

Green arrows indicate change is statistically significant at the 95% level, and gray arrows indicate not statistically significant.

We use Cohen's scale to categorize the effect sizes reported in the analyses.

Effect sizes 0.0 - 0.20 are small, 0.20 - 0.50 are small to moderate, 0.50 - 0.80 are moderate to large, and 0.80 and greater are large.

Cohen, J. (1969). *Statistical Power Analysis for the Behavioral Sciences* (1st ed.). New York: Academic Press.

II. Systematic Review Process Information

We did not restrict our literature review by publication date or type (e.g., peer-reviewed journal, dissertation), populations, outcomes, or empirical methodology. [Exhibit A2](#) below summarizes the search terms and databases we used to locate studies, the publication type and dates we gathered, and the broad categories collected in our overall review.

Exhibit A2
Research Review Information

Search terms
<ul style="list-style-type: none"> ○ Wilderness therapy ○ Wilderness adventure therapy ○ Outdoor adventure therapy ○ Outdoor behavioral health programs ○ Outdoor residential programs ○ Recreation therapy ○ Wilderness residential programs ○ Adventure therapy ○ Adventure programs ○ Ecotherapy ○ Ecopsychology ○ Nature therapy/nature-based therapy
Publication type and dates
<ul style="list-style-type: none"> ○ Peer and non-peer-reviewed studies published between 1969 and 2022
Search databases
<ul style="list-style-type: none"> ○ Google ○ Google Scholar ○ The Evergreen State College's library, which accesses databases including EbscoHost, JSTOR, ProQuest, ScienceDirect, PubMed, PsychInfo, and ERIC.
Literature categories
<p>We collected a total of 530 studies in the following broad categories:</p> <ul style="list-style-type: none"> ○ *50% focused on programs serving individuals with behavioral and mental health issues ○ **20% focused on programs serving individuals involved in the criminal justice system ○ 10% were systematic reviews or meta-analyses of wilderness therapy and/or adventure programs ○ 10% were not program evaluations or reviews but provided supplemental information on wilderness therapy and adventure programs ○ 4% focused on programs serving individuals seeking programming for physical health reasons ○ 4% focused on programs serving individuals with substance use issues ○ 2% focused on programs serving individuals with disabilities

Notes:

*Studies included in our review of wilderness therapy programs. Studies focused on programs serving individuals in the criminal justice system, individuals with disabilities, and those seeking programming for physical health were beyond the scope of this assignment. Please contact the authors for information on these topics if interested.

** Prior to this report, WSIPP researchers reviewed related programs including 1) wilderness adventure therapy programs for court-involved youth, and 2) Rites of Passage Wilderness Therapy. There are no rigorous evaluations measuring outcomes of interest for these topics. Therefore, we cannot conduct meta-analyses or benefit-cost analyses. See [WSIPP's benefit-cost results website](#) for more information. We can revisit these topics in the future if rigorous research is published.

III. Information from Research on Wilderness Therapy Programs for Youth

Exhibit A3 summarizes information from the 48 studies we reviewed focused on wilderness therapy programs serving youth populations.

Exhibit A3

Information Reported in 48 Wilderness Therapy Studies

Terminology used to describe wilderness therapy programs for youth	
<ul style="list-style-type: none"> ○ Wilderness therapy ○ Adventure therapy ○ Outdoor behavioral health 	<ul style="list-style-type: none"> ○ Adventure-based counseling ○ Outdoor adventure ○ Outdoor residential treatment
Methods used in studies	
<ul style="list-style-type: none"> ○ None of the 48 studies met WSIPP’s methodological standards for inclusion in a meta-analysis ○ In 37 studies, researchers conducted case studies or pre-post designs to observe outcomes before and after program participation. ○ In 11 studies, researchers included comparison groups but did not statistically control for pre-treatment characteristics between treated and comparison groups. <ul style="list-style-type: none"> ○ Participants in comparison conditions either did not receive any services or received other mental health services in outpatient or residential settings instead of wilderness therapy. ○ Samples ranged from a few to 1,300 individuals. Typically, samples were 40-60 individuals. 	
Populations studied	
<ul style="list-style-type: none"> ○ About half of the studies analyzed participants who were clinically diagnosed with disorders like depression, anxiety, attention deficit hyperactivity disorder, oppositional defiant disorder, obsessive-compulsive disorder, disruptive behavioral disorder, and/or substance use. ○ Other studies focused on youth exhibiting signs of withdrawal in school or families, low academic performance, youth from low-income backgrounds, or individuals that had experienced traumatic events. ○ Several studies focused on general populations or didn’t describe participants in enough detail to determine characteristics. ○ Participant ages ranged from 6 to 22 years old, but most studies evaluated individuals 13-18 years old. ○ Of the studies reporting information, there was a mix of male and female participants, though there were more male participants (60%) than female participants (40%) on average.* 	
Reported outcomes	
<ul style="list-style-type: none"> ○ About half of the studies reported self-esteem or self-efficacy outcomes ○ About half of the studies reported behavioral and/or emotional functioning measures ○ One-third of studies reported clinical outcomes like depression, anxiety, and locus of control ○ One-third reported social development outcomes like social skills, connectedness to family and/or peers, and communication skills ○ About 10% of studies reported substance use outcomes, academic-related outcomes, family development outcomes (e.g., family functioning), and resilience and/or hope outcomes ○ Most studies included a mix of the outcomes described above 	

Note:

* Four studies focused on female participants only. Three studies focused on male participants only.

Exhibit A4 summarizes wilderness therapy program information for the 48 studies reviewed.

Exhibit A4
Programmatic Information

Program length
<ul style="list-style-type: none"> ○ Range: minimum of two days to a maximum of ten months ○ 30% of studies evaluated programs that operated for a week or less ○ 24% of studies assessed programs that operated for several weeks to a month ○ 35% of studies focused on programs that operated for two to three months*
Program location
<ul style="list-style-type: none"> ○ 28 studies focused on wilderness therapy programs in the United States (none in Washington) ○ 14 studies were conducted in other countries (often in Australia) ○ 6 studies did not report locations
Outdoor activities described in programs
<ul style="list-style-type: none"> ○ Most programs included camping, hiking, and backpacking along with experiential learning components which taught individuals how to organize camps, prep meals, and navigate in remote locations ○ Some programs embedded adventure activities like rock climbing, spelunking, and rope courses ○ About 20% of studies included a solo component where participants hiked or camped alone for one or several days (usually in close proximity to program staff)
Therapeutic activities described in programs
<ul style="list-style-type: none"> ○ 14 studies described programs with well-established clinical models. The programs employed mental health professionals who used treatment models like cognitive behavioral therapy (CBT) and/or family therapy to guide individual or group therapy sessions at least once a week. Therapists often created treatment plans, monitored participants' progress, and created aftercare plans to help individuals transition out of the program. These therapeutic practices were embedded into daily programming, which included outdoor activities. Generally, clinical staff lived in wilderness settings with participants, but in some programs, staff traveled to camps once or twice a week to facilitate therapy sessions. ○ 10 studies described programs that embedded individual and group therapy sessions in daily outdoor activities. These therapy sessions were facilitated by licensed clinical staff,[^] but there was no description of the therapy models used (e.g., CBT, family therapy). About half of these studies also described the use of treatment plans and/or monitoring participants' progress during the program. ○ 24 studies reported a range of therapeutic practices. These programs did not employ licensed therapists, include therapy sessions, or use treatment models like CBT. Typically, participants in these programs were given time to process daily activities and reflect on their growth. Often, participants were given a journal to document their experiences. Some programs included solo excursions to practice skills they learned, reflect on their development, and set goals. Often, after daily activities or solo excursions, individuals gathered in groups to debrief. Staff often guided individuals in mindfulness, anger management, communication, and conflict resolution strategies. Staff used therapeutic elements like reflection, relaxation, goal setting, and emotional and behavioral regulation to teach participants how to navigate challenging personal and social situations.

Notes:

* Figures do not sum to 100% because not all studies reported information about program length.

[^] Two studies did not report the presence of mental health professionals.

Exhibit A6 describes three studies that provide examples of the therapeutic styles summarized above.

Exhibit A5 summarizes the overall results described in the 48 studies we reviewed.

Exhibit A5

Results Reported for Youth Populations

Results

- In 37 studies, authors report improved outcomes including:
 - Self-concept and behavioral outcomes (17 studies)
 - Clinical outcomes like depression or anxiety (13 studies)
 - Social development outcomes (11 studies)
 - Substance use, resilience, and family development (5 studies)
 - About 60% of studies reporting improvements were focused on wilderness therapy programs with well-established clinical models
- In 8 studies, authors report mixed results (e.g., researchers observed improvements in outcomes like self-concept but did not observe changes in outcomes like social or family connectedness)
 - About half of these studies were focused on wilderness therapy programs with well-established clinical models or at least employed mental health professionals
- In 3 studies, researchers did not observe changes in outcomes like self-concept, behavior, and social-development skills
 - All of these studies assess wilderness therapy programs that implemented a range of therapeutic practices but did not use clinical models or mental health professionals.

Exhibit A6

Examples of Therapy Models in Youth Wilderness Therapy Literature

Study	Population	Outcomes	Outdoor activities	Therapists involved	Therapeutic model	Treatment plans/ monitoring
DeMille et al. (2018)	12 - 17 years old; male (66%), female (34%); African American (3%), Asian (5%), White (85%), Hispanic (2%), Native American (2%)	Intrapersonal distress, mental health symptoms, interpersonal relationships, social problems, behavior	Backpacking, camping, continuous trekking 11 weeks on average	Licensed mental health providers (psychologist, social worker, mental health counselor)	Participants received mental health, substance use, and health care services Therapists provided individual and group therapy weekly Participants received Narrative Family Therapy.	The treatment team met weekly to coordinate services and develop discharge plans for each participant
Russell (2007)	16 - 17 years old; male (68%), female (32%); White (81%); mental health diagnosis (21%), substance use disorder (25%), or diagnosed with both (50%)	Motivation to change, substance use	Camping, backpacking, camp setup, fire-making, and meal prep 7 weeks on average	Licensed health professionals Credentials not reported	Participants generally received individual and group therapy Some programs embedded journaling and/or reflection exercises	Clinicians generally developed treatment and aftercare plans for individuals
Dobud (2016)	Adolescents with emotional and/or behavioral issues	Family relationship, academic performance, peer relationships, self-concept, coping, behavior	Hiking, camping, fire-making, building shelter, navigation 2 weeks on average	Not reported	Participants communicate with caregivers via letters and make a solo trip to demonstrate skills, reflect, and set goals Parents receive a workbook	Program staff create plans for parents to support youth after the program and strategies for responding to potential relapses

IV. Information from Research on Wilderness Therapy Programs for Adults

Exhibit A7 summarizes information from the 40 studies we reviewed focused on wilderness therapy programs serving adult populations.

Exhibit A7

Information Reported in Adult Wilderness Therapy Studies

Terminology used to describe wilderness therapy programs for adults	
<ul style="list-style-type: none"> ○ Wilderness therapy ○ Wilderness adventure therapy ○ Adventure therapy ○ Outdoor behavioral health programs 	
Methods used in studies	
<ul style="list-style-type: none"> ○ None of the 40 studies met WSIPP's methodological standards for inclusion in a meta-analysis <ul style="list-style-type: none"> ○ Most studies employed a pre-post design without a comparison group ○ Three studies were case studies ○ 11 studies included comparison groups, but did not control for pre-treatment characteristics (e.g., demographic information) between treated and control participants ▪ Comparison conditions consisted of no treatment (e.g., participants did not receive any services). Some studies employed a treatment-as-usual condition. 	
Populations studied	
<ul style="list-style-type: none"> ○ Most studies (approximately 30) analyzed diverse populations of adults with: <ul style="list-style-type: none"> ○ Behavioral health disorders, ○ Psychological health disorders, or ○ Substance use disorders ○ Other populations included general populations; veterans; and survivors of domestic violence, abuse, and sexual assault ○ Participant ages ranged between 18 and 60 years old. Most studies focused on adults ages 18 to 25 ○ Most studies evaluated male participants (over 70% of participants on average) 	
Reported outcomes	
<ul style="list-style-type: none"> ○ Self-esteem ○ Self-confidence ○ Self-efficacy ○ Behavioral or emotional functioning ○ Recidivism ○ Hospitalization ○ Stress ○ PTSD symptoms ○ Resilience 	<ul style="list-style-type: none"> ○ Depression symptoms ○ Anxiety symptoms ○ Suicidal ideation ○ Locus of control ○ Psychosocial functioning ○ Communication ○ Substance use disorder ○ Social avoidant behavior

Exhibit A8 summarizes wilderness therapy program information for the adult studies reviewed.

Exhibit A8
Programmatic Information

Program length
<ul style="list-style-type: none">○ Range: one day to one year○ On average, participants were in programs for one week
Outdoor activities described in programs
<ul style="list-style-type: none">○ Hiking, backpacking, mountaineering, whitewater rafting, canoeing, kayaking, sailing, skiing, rock climbing, rappelling, spelunking, fly-fishing, and dog sledding○ Experiential learning activities like fire-making, meal prep, building shelter, and navigation○ Trainings in travel safety, leave-no-trace, first aid, risk management, and adventure sports
Therapeutic activities described in programs
<ul style="list-style-type: none">○ 5 studies described programs with well-established clinical models including CBT, experiential therapy, and direct individual and group therapy. These programs employed therapists, psychologists, or other trained mental health professionals. Mental health staff created treatment plans and monitored participants' progress. Mental health staff lived in wilderness settings with participants in some programs or traveled periodically to base camps in other studies.○ 14 studies described programs with individual and group therapy but no specific clinical models. These therapy sessions were often facilitated by licensed clinical staff. Fewer than half of the studies described the use of individual treatment plans or progress monitoring.○ 21 studies reported a range of therapeutic practices like mindfulness training, role-playing, group processing and debriefs, and journaling. Most of these studies did not describe the qualifications of program staff in detail or mention using established treatment models like CBT.

Note:

Exhibit A9 describes three studies that provide examples of the therapeutic styles summarized above.

Exhibit A9

Examples of Therapy Models in Adult Wilderness Therapy Literature

Study	Population	Outcomes	Outdoor activities	Therapists Involved	Therapeutic model	Treatment plans/monitoring
Roberts et al. (2016)	Adults with mood, substance use, or anxiety disorders	Mental health (e.g., psychological distress, symptom change)	Backpacking, fire-making, building shelters, Leave No Trace camping, and self-care	Therapists mentioned, but level and training not described	Individual and group therapy	Treatment plans were individualized based on participant need. Plans were periodically updated to reflect completed therapy sessions (both individual and group)
Bettmann et al. (2017)	Young adults (ages 18 to 24) with mental health diagnoses	Mental health (e.g., symptoms, general mental health function, psychological individuation)	Living in the wilderness, includes hiking, pack-building, fire-making, and meal preparation 7-week treatment	Master and Doctoral-level clinicians; additionally, staff received 10-day training in the program	Participants received individual and group therapy weekly Family therapy was incorporated near the end of the experience	Clinicians created individualized treatment plans for each client and worked with each family to ensure appropriate aftercare
Bettmann et al. (2021)	U.S. military veterans in Sierra Club Military Outdoors programs	Mental health (e.g., depression, anxiety, stress, PTSD, suicidal behaviors)	White-water rafting, back-packing, kayaking, canyoneering, and rock climbing 3-days and 2-nights	None	Peer leaders (i.e., trained Sierra Club military veterans previously exposed to the program) lead wilderness experiences, mindfulness interventions, and process groups	None Staff do not engage in treatment plans or monitoring

V. Citations

48 Studies Evaluating Wilderness Therapy Programs for Youth Populations

- Autry, C.E. (2001). Adventure therapy with girls at-risk: responses to outdoor experiential activities. *Therapeutic Recreation Journal*, 35(4), 289-306.
- Bandoroff, S., & Scherer, D.G. (1994). Wilderness family therapy: an innovative treatment approach for problem youth. *Journal of Child and Family Studies*, 3(2), 175-191.
- Berman, D.S., & Anton, M.T. (1998). A wilderness therapy program as an alternative to adolescent psychiatric hospitalization. *Residential Treatment for Children & Youth*, 5(3), 41-54.
- Bettmann J.E., & Tucker, A.R. (2011). Shifts in attachment relationships: a study of adolescents in wilderness treatment. *Child & Youth Care Forum*, 40, 499-519.
- Bettmann J.E., Russell, K.C., & Parry, K.J. (2013). How substance abuse recovery skills, readiness to change and symptom reduction impact change processes in wilderness therapy participants. *Journal of Child and Family Studies*, 22, 1039-1050.
- Boccaro, J. (1995). *An examination of the efficacy of an adventure-based counseling program on at-risk youth*. Dalhousie University.
- Bowen, D.J., & Neill, J.T. (2016). Effects of the PCYC catalyst outdoor adventure intervention program on youths' life skills, mental health, and delinquent behaviour. *International Journal of Adolescence and Youth*, 21(1), 34-55.
- Bowen, D.J., Neill, J.T., & Crisp, S.J.R. (2016). Wilderness adventure therapy effects on the mental health of youth participants. *Evaluation and Program Planning*, 58, 49-59.
- Brand, D. (1998). *A longitudinal study of behaviour-disordered adolescents and the effects on them of a wilderness-enhanced program*. University of Wollongong.
- Caulkins, M.C., White, D.D., & Russell, K.C. (2006). The role of physical exercise in wilderness therapy for troubled adolescent women. *Journal of Experiential Education*, 29(1), 18-37.
- Clark, J.P. (2002). *The effects of wilderness therapy on the perceived psychosocial stressors, defense styles, dysfunctional personality patterns, clinical syndrome, and maladaptive behaviors of troubled adolescents*. George Gox University.
- Combs, K.M., Hoag, M.J., Roberts, S.D., & Javorski, S. (2015). A multilevel model to examine adolescent outcomes in outdoor behavioral healthcare: the parent perspective. *Child Youth Care Forum*, 45, 353-365.
- Cross, R. (2002). The effects of an adventure education program on perceptions of alienation and personal control among at-risk adolescents. *The Journal of Experiential Education*, 25(1), 247-254.
- Davis-Berman, J., & Berman, D. (1989). The wilderness therapy program: an empirical study of its effects with adolescents in an outpatient setting. *Journal of Contemporary Psychotherapy*, 19(4), 271-281.
- DeMille, S., Tucker, A.R., Gass, M.A., Javorski, S., VanKanegan, C., Talbot, B., & Karoff, M. (2018). The effectiveness of outdoor behavioral healthcare with struggling adolescents: a comparison group study a contribution for the special issues: Social innovation in child and youth services. *Children and Youth Services Review*, 88, 241-248.
- Dobud, W. (2016). Exploring adventure therapy as an early intervention for struggling adolescents. *Journal of Outdoor and Environmental Education*, 19(1), 33-41.
- Dolgin, R. (2014). Into the wild: a group wilderness intervention to build coping strategies and high school youth through collaboration and shared experience. *Journal of Creativity in Mental Health*, 9, 83-98.
- Farber, M.L.Z., & Sabatino, C.A. (2007). A therapeutic summer weekend camp for grieving children: supporting clinical practice through empirical evaluation. *Child Adolescent Social Work Journal*, 24, 385-402.
- Fischer, R.L., & Attah, E.B. (2001). City kids in the wilderness: a pilot-test of outward bound for foster care group home youth. *The Journal of Experiential Education*, 24(2), 109-117.

- Gabrielsen, L.E., Eskedal, L.T., Mesel, T., Aasen, G.O., Hirte, M., Kerlefsen, R.E., . . . Fernee, C.R. (2019). The effectiveness of wilderness therapy as mental health treatment for adolescents in Norway: a mixed methods evaluation. *International Journal of Adolescents and Youth, 24*(3), 282-296.
- Garst, B., Scheider, I., & Baker, D. (2013). Outdoor adventure program participation impacts on adolescent self-perception. *The Journal of Experiential Education, 24*(1), 41-49.
- Gillespie, E., & Allen-Craig, S. (2009). The enhancement of resilience via a wilderness therapy program: a preliminary investigation. *Australian Journal of Outdoor Education, 13*(1), 39-49.
- Greenberg, L. (2009). *A multi-informant evaluation of a summer therapeutic camp for children with special needs: parent and counselor ratings and child self-report*. Alliant International University.
- Griffin, W. (1981). *Evaluation of a residential therapeutic camping program for disturbed children*. Educational Research and Development Center, West Florida University.
- Hagan, J.D. (2002). *An alternative therapy for behaviorally challenged youth: the efficacy of wilderness therapy programs*. University of Toledo.
- Harper, N.J., Russell, K.C., Cooley, R., & Cupples, J. (2007). Catherine freer wilderness therapy expeditions: an exploratory case study of adolescent wilderness therapy, family functioning, and the maintenance of change. *Child Youth Care Forum, 36*, 111-129.
- Herrity, G.C. (2009). *A follow-up study exploring the transformative effects of wilderness therapy on adolescents with histories of trauma: a project based upon investigation at Catherine freer wilderness therapy programs*. Albany, Oregon. Smith College.
- Hoag, M.J., Massey, K., Roberts, S., & Logan, P. (2016). *Pushing beyond outcome: what else changes in wilderness therapy?* Second Nature Programs, Santa Clara, Utah.
- Husted, S. (1998). *The role of challenge as a motivating force in academic engagement for at-risk youth: outward bound revisited*. University of Nebraska.
- Johnson, E.G., Davis, E.B., Pressley, J.D., Sawyer, S., & Spinazzola, J. (2020). The effectiveness of trauma-informed wilderness therapy with adolescents: a pilot study. *Psychological Trauma: Theory, Research, Practice, and Policy, 12*(8), 878-887.
- Lan, P., Sveen, R., & Davidson, J. (2004). A project Hahn empirical replication study. *Australian Journal of Outdoor Education, 8*(1), 37-43.
- Larson, B.A. (2007). Adventure camp programs, self-concept, and their effects on behavioral problem adolescents. *Journal of Experiential Education, 29*(3), 313-330.
- Lewis, S.F. (2013). Examining changes in substance use and conduct problems among treatment-seeking adolescents. *Child and Adolescent Mental Health, 18*(1), 33-38.
- Mann, M.J. (2007). *The influence of project challenge on levels of psychosocial development and resilience in adolescent girls at risk for delinquency*. University of Florida.
- Margalit, D., & Ben-Ari, A. (2014). The effect of wilderness therapy on adolescents' cognitive autonomy and self-efficacy: Results of a non-randomized trial. *Child Youth Care Forum, 43*, 181-194.
- Marx, J.D. (1988). An outdoor adventure counseling program for adolescents. *Social Work, 33*(6), 517-520.
- Mossman, S.E. (2005). *What works with youth? An evaluation of the adventure development counseling programme*. University of Canterbury.
- Mutz, M., & Muller, J. (2016). Mental health benefits of outdoor adventures: results from two pilot studies. *Journal of Adolescence, 49*, 105-114.
- Neill, J. (2001). *The impact of outward bound challenges courses on disadvantaged youth*. University of Canberra.
- Norton, C. (2008). Understanding the impact of wilderness therapy on adolescent depression and psychosocial development. *Illinois Child Welfare, 4*(1), 166-178.

- Norton, C.L., Wisner, B.L., Krugh, M., & Penn, A. (2014). Helping youth transition into an alternative residential school setting: exploring the effects of a wilderness orientation program on youth purpose and identity complex. *Child Adolescent Social Work Journal*, 31, 475-493.
- Russell, K. (2003). An assessment of outcomes in outdoor behavioral healthcare treatment. *Child & Youth Care Forum*, 32(6), 355-381.
- Russell, K. (2007). Adolescent substance-use treatment: service delivery, research on effectiveness, and emerging treatment alternatives. *Journal of Groups in Addiction & Recovery*, 2(2-4), 68-96.
- Russell, K.C., Gillis, H.L., & Harvey, J.D. (2018). An evaluation of Alaska crossings: comparison of the client status review and the youth outcome questionnaire. *Journal of Therapeutic Schools and Programs*, 10, 127-154.
- Russell, K.C., Gillis, H.L., Law, L., & Couillard, J. (2018). A pilot study examining outcomes associated with the implementation of progress monitoring at a substance use disorder treatment program for adolescents. *Child Youth Care Forum*, 47, 403-419.
- Sachs, J.J., & Miller, S.R. (1992). The impact of a wilderness experience on the social interactions and social expectations of behaviorally disordered adolescents. *Behavioral Disorders*, 17(2) 89-98.
- Schell, L., Cotton, S., & Luxmoore, M. (2012). Outdoor adventure for young people with a mental illness. *Early Intervention in Psychiatry*, 6(4), 407-414.
- Vissell, R. (2004). *Effects of wilderness therapy on youth at risk's concept of self and other: a deeper understanding of the journey*. Institute of Transpersonal Psychology.

40 Studies Evaluating Wilderness Therapy Programs for Adult Populations

- Allsop, J. (2012). *Assessing the social effects of a therapeutic recreation summer camp for adolescents with chronic illness*. The University of Utah.
- Asher, S.J., Huffaker, G.Q., & McNally, M. (1994). Therapeutic considerations of wilderness experiences for incest and rape survivors. *Women & Therapy*, 15(3-4), 161-174.
- Banaka, W.H., & Young, D.W. (1985). Community coping skills enhanced by an adventure camp for adult chronic psychiatric patients. *Psychiatric Services*, 36(7), 746-748.
- Bettmann, J.E., Tucker, A., Behrens, E., & Vanderloo, M. (2017). Changes in late adolescents and young adults' attachment, separation, and mental health during wilderness therapy. *Journal of Child and Family Studies*, 26(2), 511-522.
- Bettmann, J.E., Anderson, I., Makouske, J., & Hanley, A. (2021). Mental health outcomes of peer-led therapeutic adventure for military veterans. *Journal of Experiential Education*.
- Bettmann, J.E., Kouris, G.M., Anderson, I.M., & Casselman, B. (2021). Wilderness as healing environment: Treating adolescent Substance misuse in wilderness therapy. *The Psychoanalytic Study of the Child*, 74(1), 249-264.
- Bettmann, J., Scheinfeld, D., Prince, K., Garland, E., & Ostrom, K. (2019). Changes in psychiatric symptoms and psychological processes among veterans participating in a therapeutic adventure program. *Psychological Services*, 16(4), 525-534.
- Cook, G., Knox, K., Brogden, M. C., & Hughes, A. (2020). *A current overview of Outdoor Behavioral Healthcare treatment at Enviros Shunda Creek*.
- Duvall & Kaplan. (2014). Enhancing the well-being of veterans using extended group-based nature recreation experiences. *JRRD*, 51(5), 685-696.
- Eikenæs, I., Gude, T., & Hoffart, A. (2006). Integrated wilderness therapy for avoidant personality disorder. *Nordic Journal of Psychiatry*, 60(4), 275-281.
- Ferneer, C.R., Gabrielsen, L.E., Andersen, A.J., & Mesel, T. (2021). Emerging stories of self: long-term outcomes of wilderness therapy in Norway. *Journal of Adventure Education and Outdoor Learning*, 21(1), 67-81.

- Gillis, H.L., Jr., Kivlighan, D.M., Jr., & Russell, K.C. (2016). Between-client and within-client engagement and outcome in a residential wilderness treatment group: An actor partner interdependence analysis. *Psychotherapy, 53*(4), 413–423.
- Harris, P.M., Mealy, L., Matthews, H., Lucas, R., & Moczygemba, M. (1993). A wilderness challenge program as correctional treatment. *Journal of Offender Rehabilitation, 19*(3-4), 149-164.
- Harrison, C. (2016). *Screening program for wilderness therapy aimed at persons deemed high-risk for criminal recidivism*. California State University, Chico.
- Hawkins, B.L., Townsend, J.A., & Garst, B.A. (2016). Nature-based recreational therapy for military service members: A strengths approach. *Therapeutic Recreation Journal, 50*(1), 55.
- Herbert, J.T. (1998). Therapeutic effects of participating in an adventure therapy program. *Rehabilitation Counseling Bulletin, 41*(3), 201-214.
- Hoag, M.J., Massey, K.E., Roberts, S.D., & Logan, P. (2013). Efficacy of wilderness therapy for young adults: A first look. *Residential Treatment for Children & Youth, 30*(4), 294-305.
- Hoag, M.J., Massey, K.E., & Roberts, S.D. (2014). Dissecting the wilderness therapy client: Examining clinical trends, findings, and patterns. *Journal of Experiential Education, 37*(4), 382-396.
- Holman, T., & McAvoy, L. (2003). Outcomes-consequences-values of an integrated wilderness adventure program. *The Journal of Experiential Education, 25*(3), 353.
- Hyer, L., Boyd, S., Scurfield, R., Smith, D., & Burke, J. (1996). Effects of Outward Bound experience as an adjunct to inpatient PTSD treatment of war veterans. *Journal of clinical psychology, 52*(3), 263-278.
- Karoff, M.Q., Norton, C.L., Tucker, A.R., Gass, M.A., & Foerster, E. (2019). A qualitative gender analysis of women field guides' experiences in outdoor behavioral healthcare: A feminist social work perspective. *Affilia, 34*(1), 48-64.
- Kelley, M.P., Coursey, R.D., & Selby, P.M. (1997). Therapeutic adventures outdoors: A demonstration of benefits for people with mental illness. *Psychiatric Rehabilitation Journal*.
- Kelly, V.A. (2006). Women of Courage: A Personal Account of a Wilderness-Based Experiential Group for Survivors of Abuse. *The Journal for Specialists in Group Work, 31*(2), 99–111.
- Kirwin, M., Harper, N.J., Young, T., & Itzvan, I. (2019). Mindful adventures: a pilot study of the outward bound mindfulness program. *Journal of Outdoor and Environmental Education, 22*(1), 75-90.
- Levine, D. (1994). Breaking through barriers: Wilderness therapy for sexual assault survivors. *Women & therapy, 15*(3-4), 175-184.
- Mathis, J.E. (2018). *Comparing Treatment Outcomes of Young Adult Males and Females in Wilderness Therapy Programs through a Gender Schema Lens*. Northcentral University.
- McBride, D.L., & Korell, G. (2005). Wilderness Therapy for Abused Women. *Canadian Journal of Counselling, 39*(1), 3-14.
- Pawlowski, M., Holme, G., & Hafner, R.J. (1993). Wilderness therapy for psychiatric disorder. *Mental Health in Australia, 5*(1), 8–14.
- Powch, I.G. (1994). Wilderness therapy: What makes it empowering for women?. *Women & Therapy, 15*(3-4), 11-27.
- Ragsdale, K. G., Cox, R. D., Finn, P., & Eisler, R. M. (1996). Effectiveness of short-term specialized inpatient treatment for war-related posttraumatic stress disorder: A role for adventure-based counseling and psychodrama. *Journal of traumatic stress, 9*(2), 269-283.
- Roberts, S.D., Stroud, D., Hoag, M.J., & Combs, K.M. (2016). Outdoor behavioral health care: Client and treatment characteristics effects on young adult outcomes. *Journal of Experiential Education, 39*(3), 288-302.
- Roberts, S.D., Stroud, D., Hoag, M.J., & Massey, K.E. (2017). Outdoor behavioral health care: A longitudinal assessment of young adult outcomes. *Journal of Counseling & Development, 95*(1), 45-55.
- Roberts, S.D. (2015). *Outdoor behavioral healthcare outcomes for young adults*. Oregon State University.

Russell, K.C., Gillis, H.L.L., & Kivlighan, D.M., Jr. (2017). Process factors explaining psycho-social outcomes in adventure therapy. *Psychotherapy, 54*(3), 273–280.

Sáez, G., López-Nuñez, C., Carlos-Vivas, J., Barrios-Fernández, S., Rojo-Ramos, J., Adsuar, J. C., & Collado-Mateo, D. (2021). A multicomponent program to improve self-concept and self-esteem among intimate partner violence victims: A study protocol for a randomized controlled pilot trial. *International journal of environmental research and public health, 18*(9), 4930.

Sanford, V. (2018). *The Role of the Wilderness Therapy Process: An Interpretative Phenomenological Analysis*. University of Colorado, Denver.

Scheinfeld, D.E., Rochlen, A.B., & Buser, S.J. (2011). Adventure therapy: A supplementary group therapy approach for men. *Psychology of Men & Masculinity, 12*(2), 188–194.

Scheinfeld, D.E., Rochlen, A.B., & Russell, M.L. (2017). The impact of outward bound programming on psychosocial functioning for male military veterans. *Psychology of Men & Masculinity, 18*(4), 400.

Tucker, A.R. (2015). The impact of wilderness therapy on attachment, separation and mental health functioning in young adults. In *Society for Social Work and Research 19th Annual Conference: The Social and Behavioral Importance of Increased Longevity*.

Wood, D., & Carlson-Bancroft, G. (1991). Adventure-based therapy: recovery for adult children on a college campus. *Addiction & Recovery, 11*(2), 16-25.

Studies Evaluating Exposure to Nature

Andersen, L., Corazon, S.S., Stigsdotter, U.K. (2021). Nature exposure and its effects on immune system functioning: a systematic review. *International Journal of Environmental Research and Public Health, 18*, 1416.

Hossain, M., Sultana, A., Ma, P., Fan, Q., Sharma, R., Purohit, N., & Sharmin, D.F. (2020). *Effects of natural environment on mental health: an umbrella review of systematic reviews and meta-analyses*. Texas A&M School of Public Health.

Jimenez, M.P., DeVille, N.V., Elliot, E.G., Schiff, J.E., Wilt, G.E., Hart, J.E., & James, P. (2021). Associations between nature exposure and health: a review of the evidence. *International Journal of Environmental Research and Public Health, 18*, 4790.

Li, D., Menotti, T., Ding, Y., & Wells, N. (2021). Life course nature exposure and mental health outcomes: a systematic review and future directions. *International Journal of Environmental Research and Public Health, 18*(10), 5146.

Meta-analyses of Wilderness Therapy Programs (Section II in Report)

Beck, N., & Wong, J. (2022). A meta-analysis of the effects of wilderness therapy on delinquent behaviors among youth. *Criminal Justice and Behavior, 49*(5).

Bettmann, J., Gillis, H.L., Speelman, E., Parry, K., & Case, J. (2016). A meta-analysis of wilderness therapy outcomes for private pay clients. *Journal of Child and Family Studies, 25*, 2659-2673.

Bowen, D., & Neill, J. (2013). A meta-analysis of adventure therapy outcomes and moderators. *The Open Psychology Journal, 6*, 28-53.

Fleischer, C., Doebler, P., Burkner, P., & Holling, H. (2017). *Adventure therapy effects on self-concept - a meta-analysis*.

Gillis, H.L., Speelman, E., Linville, N., Bailey, E., Kalle, A., Oglesbee, N., Sandlin, J., Thompson, L., & Jensen, J. (2016). Meta-analysis of treatment outcomes measured by the Y-OQ and Y-OQ-SR comparing wilderness and non-wilderness treatment programs. *Child Youth Care Forum, 45*, 851-863.

Meta-analyses of Adventure Programs and Wilderness Therapy Programs (Appendix I)

Bedard, R. (2004). *Wilderness therapy programs for juvenile delinquents: a meta-analysis*. Colorado State University.

Cason, D., & Gillis, H.L. (1994). A meta-analysis of outdoor adventure programming with adolescents. *The Journal of Experiential Education*, 17(1), 40-47.

Fang, B., Lu, F., Gill, D., Liu, S., Chyi, T., & Chen, B. (2021). A systematic review and meta-analysis of the effects of outdoor education programs on adolescents' self-efficacy. *Perceptual and Motor Skills*, 0(0), 1-27.

Hattie, J., Marsh, H., Neill, J., & Richards, G. (1997). Adventure education and outward bound: out-of-class experiences that make a lasting difference. *Review of Educational Research*, 67(1), 43-87.

Wilson, S.J., & Lipsey, M. (2000). Wilderness challenge programs for delinquent youth: a meta-analysis of outcome evaluations. *Evaluation and Program Planning*, 23, 1-12.

Acknowledgments

The authors would like to thank researchers at the University of Washington's Evidence Based Practice Institute (EBPI), the Washington State University's Impact Lab, and Western Washington University for their assistance during our literature review and in finalizing this report.

We are particularly grateful to Dr. Sarah Walker at EBPI and Dr. Elizabeth Weybright at the Impact Lab for the time they spent discussing the scope of this review, sharing their ideas, helping to identify context experts to contact, and providing feedback on a draft of this report. We are also very grateful for the time and expertise that Dr. Keith Russell shared with us as we conducted the review and were learning about wilderness therapy programs, as well as his review of this report.

We thank Dr. Jaymie Vandagriff, Prevention System Manager at the Division of Behavioral Health and Recovery (SUD Prevention and Mental Health Promotion Section), for her comments on a draft of this report.

We also thank WSIPP researchers Colin Gibson, Katelyn Kelley, and Kara Krnacik for assisting with the literature review.

For further information, contact: Julia Cramer
Name at 360.664.9073, julia.cramer@wsipp.wa.gov

Document No. 22-06-1901



Washington State Institute for Public Policy

The Washington State Legislature created the Washington State Institute for Public Policy in 1983. A Board of Directors—representing the legislature, the governor, and public universities—governs WSIPP and guides the development of all activities. WSIPP’s mission is to carry out practical research, at legislative direction, on issues of importance to Washington State.