

January 2015

## Does wilderness therapy reduce recidivism in delinquent adolescents?: A narrative review

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### Recommended Citation

Clem, Jamie M.; Prost, Stephanie Grace; and Thyer, Bruce A. (2015) "Does wilderness therapy reduce recidivism in delinquent adolescents?: A narrative review," *Journal of Adolescent and Family Health*: Vol. 7 : Iss. 1 , Article 2.

Available at: <https://scholar.utc.edu/jafh/vol7/iss1/2>

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Juvenile delinquency is a critical and costly problem affecting American and international youth. Nearly 1.5 million adolescents were arrested in 2011 in the United States for a wide range of crimes including misdemeanor petty theft, sexual assault, and murder (Office of Juvenile Justice and Delinquency Prevention, OJJDP, 2013). Costs associated with juvenile delinquency are numerous and include both monetary and societal impacts. One retrospective study estimated the financial costs of juvenile crime in Pennsylvania at nearly 5.5 billion dollars in 1993 alone (Miller, Fisher, & Cohen, 2001). Additional impacts include lost or damaged property, mental health services for affected victims, decreased quality of life for victims and offenders, pain, suffering, and increased risk of secondary victimization via the criminal justice system (Doerner & Lab, 2014; Mendenhall, 2008).

Recidivism rates remain high despite OJJDP reports of an overall decline in juvenile crime since the 1990s. Recidivism can include any number of repeated criminal behaviors such as re-offense, novel convictions, correctional sentences, or criminal status changes. It has been estimated that 60% to 80% of juvenile offenders are re-arrested within two years of their initial conviction though variability in state reporting and juvenile justice system standards does not allow for the calculation of a national recidivism rate (Jensen & Howard, 1998; OJJDP, 2006). The most recent national report indicated the average juvenile re-arrest rate across studies for Florida, New York, and Virginia was 55% in 2006 (OJJDP, 2006). Studies conducted in Colorado and Maryland reported roughly 45% of juveniles released from state incarceration were later re-referred to court within 12 months of release (OJJDP, 2006). Further, average re-incarceration and re-adjudication rates for several states including Florida, Georgia, and Arkansas were above 30% in 2006 (OJJDP, 2006). These and other measures of recidivism place an emotional, physical, and fiscal burden on the public, political stakeholders, clinicians, and youth offenders and their families.

### **Interventions for Juvenile Delinquency**

The causes and subsequent interventions for youth in the juvenile justice system are widely heterogeneous. It is proposed that the most significant variable in predicting whether or not an individual will commit an offense is *youthfulness*, or age (Zamble & Quinsey, 1997). Antisocial behaviors and criminal antecedents are a common developmental experience for adolescents, though the vast majority of youth offenders will desist from future offenses (Moffitt, 1993). The long-term trajectory of adolescent criminal behaviors is shaped by a wide variety of factors including genetics, family and peer systems (e.g. gangs), schools and communities, and the larger social environment. Understanding this multisystemic etiology of juvenile offending requires targeted, innovative, and sustained interventions aimed at reducing recidivism including re-offense, re-arrest, and re-conviction.

### **Wilderness Therapy**

Common interventions for youth within the juvenile justice system typically (a) utilize traditional talk-therapy approaches and (b) focus on exploring and modifying maladaptive behaviors. Wilderness therapy (WT), however, has emerged as an alternative treatment modality for adolescents involved in the juvenile justice system. Wilson and Lipsey (2000) indicated that two goals differentiate WT from other similar interventions: (a) WT attempts to change youth behavior through *experience-based activities* involving challenging, outdoor experiences, and (b) WT provides a group orientation and structure that allows for self-disclosure in a supportive environment where the focus is on *enhancing efficacy and self-empowerment*, instead of changing or “fixing” negative behaviors.

Many structural variations exist related to WT program implementation. Gass (1993) distinguishes between three common formats including: single-session challenge or ropes courses, contained and continuous flow programs (static and rolling admissions, respectively), and long-term residential camping programs. Programs may include short- or long-term enrollment requirements. These may range from a three-day white-water rafting expedition to a three-year residential program (Gillis, Gass, & Russell, 2008).

The common goal of many wilderness therapy programs is to reduce antisocial behaviors (i.e., recidivism) and rehabilitate youth (Wilson & Lipsey, 2000). Early findings indicated WT was associated with reduced recidivism as well as enhanced self-perception and social adjustment (Bandoroff, 1989). Cason and Gillis (1994) found WT programs may improve self-concept and clinical functioning while simultaneously reducing problem behaviors. However, Russell (2006) indicated that few recent published studies focused on recidivism effects of WT and other adventure programs. Most studies, in contrast, examined socio-emotional functioning (e.g., self-efficacy, anti/pro-social behaviors). Recently WT has received considerable attention as a potentially effective rehabilitative and preventative intervention and an increasing number of studies have been published regarding program impacts (Berman & Davis-Berman, 2013; Davis-Berman & Berman, 1994; Wilson & Lipsey, 2000).

Despite these findings, WT is still not considered a research supported intervention. Meaning, governing bodies of clinicians do not recognize WT as having enough empirical support because studies often lack the necessary methodological rigor to be considered effective (Bandoroff, 1989; Cason & Gillis, 1994; Jones, Lowe, & Risler, 2004). This is primarily a result of lacking randomized assignment to treatment. Establishing effectiveness over time is difficult with the lack of controlled quantitative studies and randomized trials in WT (Gillis, Gass, & Russell, 2008). It is important, therefore, to evaluate whether or not WT programs positively impact recidivism rates so as to build a foundation

in the literature and whether or not these programs are able to demonstrate adequate methodological strength. This foundation, therefore, will serve as initial evidence for the use of WT in the reduction of juvenile recidivism (e.g. re-offense, re-arrest) and will allow community stakeholders and practitioners the ability to make informed decisions about how to serve their clients.

It is for these reasons that this review seeks to answer the following research questions: (1) Do WT programs reduce adolescent recidivism? and (2) How can the methodological rigor of the included studies be described? This review seeks to (a) locate and synthesize outcome studies related to the effects of WT programs on juvenile arrest rates, (b) assess the methodological rigor of the included studies, (c) present the associated study characteristics in an organized form, and (4) analyze included study results regarding juvenile recidivism rates.

## **Methods**

### **Study Selection**

Studies were eligible for inclusion in the present review if they met the following criteria: (a) evaluated a WT intervention, (b) utilized an adolescent population, (c) included a measure of recidivism as an outcome variable, and (d) were published in English between 1990 and June of 2010 in a peer-reviewed journal. Recidivism is defined as any repeated criminal behavior (e.g. re-offense, re-arrest, re-incarceration) for the present review. Studies were excluded from the present review if they: (a) only evaluated personal, emotional, or cognitive-behavioral change, (b) did not include a measure of recidivism, or (c) were purely qualitative in nature. Articles were located using several electronic databases, including JSTOR, PsycINFO, and the ISI Web of Science. Efforts to contact known authorities in the field to identify additional studies were also made. Further, included study reference lists were searched to identify additional studies for inclusion. This review did not attempt to capture unpublished studies, theses, dissertations, or reports. This decision was made to assure included studies demonstrated the necessary rigor to be published in peer-reviewed journals and to ease review replication.

The following terms were identified as relevant in the literature and utilized to search databases: “Wilderness Therapy” OR “Adventure Therapy” OR “Recreation Therapy” AND “Outcome” OR “Evaluation” OR “Effects” AND “Delinquency” OR “Recidivism” OR “Arrest” AND “Juvenile” OR “Youth”. Specific verbiage and word ordering were altered to improve search comprehensiveness based on specific database search strategies. Terms were searched first in titles, followed by abstracts and keywords, then finally by anywhere within the document.

A total of 784 studies were initially identified relevant per the search criteria. Of these, 728 were excluded via title review for the following reasons: (a) not a WT outcome study, (b) no measure of recidivism, (c) non-adolescent

population, and (d) duplicate articles. The remaining studies ( $n = 56$ ) were considered to be potentially relevant based on abstract review. Abstracts and full-text were then further examined to assure study eligibility. Five of these 56 were found to meet the pre-determined inclusion and exclusion criteria. However, one study was eliminated after recommendation via personal communication with an authority in the field. Two additional studies were identified through reference lists, while another study was identified at the 2010 Research and Evaluation of Adventure Programming professional conference. Final study attrition resulted in a total of seven peer-reviewed studies ( $n = 7$ ) to be included in the present review.

### Results

The studies included in the present review vary in sample, design, methodology, intervention characteristics, and outcome measures. The review includes experimental, quasi-experimental, and non-experimental designs in addition to studies with and without pre-test measures and/or comparison groups. Of the seven identified articles, one was a randomized controlled trial, four were quasi-experimental designs, and two were pre-experimental designs without comparison groups.

Studies included in the narrative review are Burke (2010), Castellano and Soderstrom (1992), Elrod and Minor (1992), Gillis, Gass, and Russell (2008), Jones, Lowe, and Risler (2004), Lambie et al. (2000), and Russell (2006). Study results are presented below according to methodological rigor, where the randomized control trial is presented first, followed by the quasi-experimental designs, and finally the pre-experimental designs. Studies are presented alphabetically in Table 1.

#### Description of Study Characteristics

**Elrod and Minor, (1992).** Researchers evaluated *Project Explore*, a multi-faceted intervention for adolescents involved in the juvenile court probation system, and compared the effects of an intervention with a WT component on recidivism rates among youth probationers in Michigan. The aim of *Project Explore* was to reduce risk of re-offense by providing a social skills program and a wilderness experience for adjudicated youth. Parents were also provided a skill program. Trainings were led by court staff with a Baccalaureate or Master's degree who had at least five years of professional experience.

Researchers randomly assigned participants ( $n = 43$ ) to the treatment group or to standard probation services. Participants were most often from middle to low socioeconomic backgrounds and had been placed on probation for non-violent offenses. Official criminal offenses were obtained from local law enforcement agencies and recidivism was assessed by examining the participants' criminal activity and recidivism (as a dichotomous variable), as well as frequency of offenses both pre- and post-intervention. Criminal activity was divided into two broad categories: (a) status and (b) criminal offenses. Status offenses are those

offenses that only apply to persons under the age of 18 (e.g. truancy, curfew violations). Researchers collected data at year one and again at year two. Findings at first and second wave evaluations did not differ significantly.

At the two-year follow-up, analyses revealed participants in the treatment group were statistically less likely to commit a status offense than the comparison group, but there were no significant differences in number of criminal offenses. Researchers also analyzed frequency of criminal activity and found that participants in the treatment group displayed a higher reduction in number of both status and criminal offenses than the comparison group.

This is the only identified study that utilized an experimental design, thus enhancing its methodological rigor and presumably the trustworthiness of the study's results. The next four studies evaluated for this review employed quasi-experimental designs. While random assignment to group—the feature lacking in quasi-experimental designs—allows us to attribute post-intervention differences to the intervention alone, studies that fail to randomly assign subjects are limited in their ability to ascribe changes to the treatment. In this next section, results are presented with caution.

**Burke, (2010).** This study evaluated the *Marimed Foundation's Kailana Model*, a multi-dimensional drug treatment program for native Hawaiian youth. Researchers examined re-arrest rates as a measure of recidivism. *Kailana* was designed to provide culturally-sensitive, residential drug rehabilitation by combining individual, group, and family therapy with land and ocean-based therapeutic activities (i.e. WT). Utilization of the natural environment and a focus on historical and cultural appreciation of the adolescent's own heritage were key components in the therapeutic process.

Participants were classified into two groups prior to the intervention: (a) clinically discharged and (b) non-clinically discharged ( $n = 139$ ). Adolescents in the treatment group were considered clinically discharged if they met at least 85% of their treatment goals. Adolescents in the comparison group were non-clinically discharged, meaning they did not meet their goals or they left the program before graduation. Adolescents were matched to ensure there were no significant differences between groups in age, age of first arrest, total number of prior arrests, or ethnicity.

Researchers collected data from Hawai'i's Juvenile Justice Information Committee on the following variables: (a) ethnicity, (b) age of first arrest, (c) total number of arrests pre-intervention, (d) severity of offense pre-intervention, (e) re-arrest record at 1-year follow-up (dichotomous variable), (f) total number of arrests post-intervention, and (g) severity of offense post-intervention. These variables allowed researchers to determine the differences in arrest rates, severity of crime, and number of days until re-arrest in both groups.

Post-intervention analyses revealed there were no significant differences between groups in the severity of offenses committed. However, there were significant differences in three other variables: re-arrest (yes/no), total number of re-arrests, and days until re-arrest. Adolescents in the treatment and comparison groups differed significantly in total number of arrests. Similarly, adolescents in the treatment group experienced lower re-arrest rates post-intervention than those in the comparison group. Post-hoc analyses further revealed that adolescents in the treatment group were re-arrested less often than would be expected. Finally, there were significant differences between groups regarding days between discharge and re-arrest. The number of days until re-arrest in the treatment group was almost four times greater than the number of days until re-arrest in the comparison group.

**Gillis, Gass, and Russell, (2008).** Researchers evaluated the effectiveness of *Project Adventure*, a residential treatment program for juvenile offenders. The aim of *Project Adventure* was to change delinquent behavior through a behavior management model called Behavior Management through Adventure (BMtA). The BMtA model utilized group processing and experiential learning to incrementally build trust among group members. Researchers collected data from the Georgia Department of Juvenile Justice on youth in the system between July 1989 and May 2002 ( $n = 1,675$ ). Participants in the BMtA group were compared to those who received an outdoor therapeutic camping program (OTP) and to those who received the State of Georgia's Youth Development Center's 90-day specialized treatment program (YDC). Pre-intervention analyses indicated significant differences in ethnicity between the BMtA and the YDC groups; the BMtA group contained more African-American adolescents than expected and the YDC group contained more Caucasian adolescents than expected. Similarly, groups differed in age at first offense, age of admittance to the state system, age at release, and number of days in treatment.

Researchers examined recidivism post-intervention via: (a) re-arrest rates and (b) number of days between release and re-arrest. Data were collected from computer-based archival records. Results reveal participants in the treatment group (BMtA) experienced significantly lower re-arrest rates and longer time between discharge and re-arrest at one, two, and three years. Post hoc analyses at years two and three revealed that the treatment group experienced a greater reduction in recidivism than expected. The YDC group, however, experienced more re-arrests than expected, while the OTP group maintained expected levels of re-arrests at all four time periods. Between group differences regarding re-arrest were also statistically significant. The treatment group maintained the longest time between discharge and re-arrest whereas average time until re-arrest in the OTP and the YDC groups was significantly less.

**Jones, Lowe, and Risler, (2004).** Researchers employed a quasi-experimental design to assess the effectiveness of a WT program on adolescents in the Georgia juvenile justice system. The program utilized a group therapy model with outdoor recreational and experiential activities to teach alternatives for negative and criminal behavior. Adolescents in this treatment group were compared to those living in a group home during the same time period.

Researchers addressed two issues: (a) to determine the differences in recidivism rates and severity of re-offenses between treatment and comparison groups, and (b) to determine if demographic variables influenced re-offending. Researchers collected descriptive data from the Georgia Department of Juvenile Justice as well as information on the following four variables: (a) re-offense within six months (dichotomous variable), (b) re-offense within a year (dichotomous variable), (c) number of re-offenses, and (d) the most serious re-offense.

Results revealed no statistically significant differences between the treatment and comparison group in re-arrests at six months or one year. There was no significant difference between groups in the number of new or re-offenses within 12 months. While the treatment group maintained slightly lower levels of offense severity, these differences were not significant. Overall, no significant findings for any of the four variables of recidivism were found when comparing WT youth to residential youth.

**Castellano and Soderstrom, (1992).** Researchers evaluated *Spectrum*, a 30-day WT residential program where participants engage in a variety of outdoor pursuits. The *Spectrum* program targeted at-risk youth and aimed at providing a venue for reflection on past negative behaviors. The majority of participants were referred from a probation department in northern Illinois by their probation officers who considered them to be at greater risk of re-offending than other youth. Participants were eligible for the study if they were on probation or under court supervision in 1987 or 1988. The treatment group was matched to a randomly selected group of youth who were eligible but did not attend the *Spectrum* program ( $n = 48$ ). Researchers collected records from local juvenile courts and police reports on participants' criminal activity to monitor recidivism via post-intervention arrests. Researchers collected data on the following variables: (a) overall recidivism, (b) crime-specific recidivism, (c) severity of re-arrest, (d) arrest rates, and (e) failure rates.

Results were mixed. No statistically significant differences emerged when comparing recidivism rates between treatment and comparison groups within the first year. Similarly, time until first arrest post-intervention was not statistically significant between groups. However, results indicated statistically significant differences between groups regarding severity of arrests. Severity was calculated by ranking and summing offense characteristics on an ordinal scale of one to four.

This total number of arrests was then divided by the number of treatment participants. Participants who successfully completed the intervention demonstrated reduced severity and frequency of re-offense at six months and one year. The treatment group experienced a significant reduction in number of arrests for violent crimes as well as reduced average severity. However, none of these relationships remained significant at year two.

The final two studies presented in this review employed pre- or non-experimental designs that lacked both a comparison group and post-intervention test. Without the use of a comparison group, it is very difficult to establish causation. A tremendous number of threats to internal validity are introduced in this instance, as it is unknown what would have happened in the absence of the intervention (Rubin & Babbie, 2010). As stated above, results should be interpreted with caution.

**Russell, (2006).** This study examined the effects of the *Wendigo Lake Expedition* (WLE) program on young offenders. Russell investigated youth perceptions of WLE, changes in well-being, and tracked recidivism via re-arrest rates post-intervention. The WLE was a WT program that utilized adventure activities with small groups of delinquent adolescents. The goal of WLE was to challenge negative behaviors and teach new, pro-social life skills in a safe environment. Participants spent roughly 40% of their time on expedition trips. The remaining time was spent completing other challenging activities, community service, or educational curricula. The majority of those in this study had a history of prior custody (82%) and averaged seven and one half prior convictions ( $n = 40$ ). Length of stay in the program ranged from 47 to 263 days, depending on sentencing. There was no comparison group.

Researchers collected data on adolescents between June 2002 and June 2003. Although the primary aim was to examine youth perceptions, well-being, and process evaluation, researchers did examine the presence or absence of re-arrest (i.e. dichotomous variable) roughly 16 months post-intervention by contacting parents and probation officers during July 2004. Of the 40 adolescents, 21 had been charged with a criminal offense at follow-up, and 19 had not. These results must be interpreted with caution as no comparison group was used. Authors do, however, note that only 53% of participants recidivated. This number is lower than other figures reported at 16 months post-treatment. These findings may indicate at least some intervention efficacy.

**Lambie et al. (2000).** This study assessed the outcomes associated with a residential WT program in treating adolescent sexual offenders. The goal of this study was to examine the adolescents' attitudes toward offending, change perceptions of their crime, and track recidivism via re-offense rates. The program utilized individual, group, and family therapy to decrease feelings of isolation and create a safe surrounding for youth to disclose and address their prior offense(s).

The outdoor component of the program incorporates 16 days of wilderness experiences (e.g. white water rafting, camping, rappelling) over three expeditions. The remainder of the program focused on the formation of positive social skills, trust building, and coping while integrating other challenge activities. Therapists leading the program were psychologists, family therapists, and psychotherapists with specialized training in outdoor pursuits.

Participants in the study included teenage male perpetrators of a sexual crime in New Zealand ( $n = 14$ ). Seventy-six percent of participants were referred to the program by statutory child welfare agencies and 24% were family-referred. Participants were eligible for the study if they met the criteria for the program and were from the greater Auckland area. There was no comparison group; therefore, results must be interpreted with caution. Limited conclusions can be drawn as no clearly stated predictive hypotheses were established and the sample size used in the study was small.

Researchers interviewed parents (when available) and the adolescents themselves about the program, perceptions toward the youth's offense, and perceived risk of re-offending. In addition, recidivism was measured using re-arrest rates for up to two years post-intervention. All participants and their parents were contacted for follow-up interviews at year two. Child protection agencies were also contacted to ensure the validity of reporting re-arrest rates. None of the 14 participants had been re-arrested at the follow-up interview. While restricted by sample size and lack of a comparison group, authors note that 0% recidivism appears lower than rates obtained in other studies.

### **Summary of Study Strengths and Limitations**

**Design.** When evaluating WT outcome studies focused on recidivism, only *one* study utilized random assignment procedures. The *Project Explore* evaluation (Elrod & Minor, 1992) employed random assignment for participants to either the multi-faceted intervention with a WT component or probationary services as usual. Although the results of the study revealed non-significant results between groups, randomized control trials are known to decrease threats to internal validity and provide stronger evidence to assume causality (Singleton & Straits, 2005).

Four of the seven studies utilized a quasi-experimental design, employing pre- and post-tests and comparison groups without random assignment. Quasi-experimental designs lack the added rigor of true experiments and fail to reduce bias and most threats to internal validity (Thyer, 2012). The use of comparison groups, however, facilitates causal inference when compared to studies without such control groups. Burke (2010) examined differences in re-arrest rates pre- and post-intervention in a treatment and comparison group. Results at one year indicate those who completed the program experienced lower re-arrest rates. Authors note, however, that differences in pre-test measures could increase the

likelihood of initial selection bias (Shadish, Cook, & Campbell, 2002). Gillis, Gass, and Russell (2008) utilized a quasi-experimental design when exploring the effects of Project Adventure as compared to two other matched groups. Results indicated significant differences in re-arrest rates favoring the treatment group and findings were replicated at one, two, and three years post-intervention. Use of multiple comparison groups provides additional strength when demonstrating linkages between WT and recidivism and allows researchers to explore improving causal inference. Castellano and Soderstrom (1992) also employed a quasi-experimental design where researchers examined the effects of a wilderness program compared to treatment as usual. Strong positive effects favoring the WT intervention were found at year one, but were not sustained at the end of the second year. Authors of this study noted that uncontrolled pre-intervention differences may have influenced outcomes.

The final two studies utilized a pre-experimental design. Russell (2006) examined effects of Wendigo Lake Expedition on a single group by using participant interviews. Russell also tracked recidivism rates before, during, and after the intervention. Forty-seven percent of the group did not recidivate at the 16 month follow-up, a figure that previous research demonstrates as less than expected. Without the use of comparison groups, however, it is impossible to draw causal inferences. Lambie et al. (2000) also employed a non-experimental design without a comparison group. While pre-test measures of recidivism are not reported in this study, none of the participants were re-arrested post-intervention. Unfortunately, these results may be difficult to interpret as the study designs and methodological rigor vary widely between outcome studies.

In summary, the one randomized control trial produced non-significant results at 18 months follow-up. Two of the quasi-experimental studies demonstrated positive effects at multiple time points post-intervention. Another study demonstrated positive effects at one year follow-up, but no significant differences between the experimental and comparison group at two years. The remaining study revealed non-significant findings at six months or one year post-intervention. Finally, both non-experimental studies purport positive findings at follow-up, but the absence of control groups effects the credibility of the results.

**Intervention.** In addition to study design, outcome evaluations differed greatly in terms of program characteristics. Four of the seven studies evaluated programs that employed primarily WT activities and strategies. The remaining three studies examined programs that have a WT component, but used other types of therapeutic models. One utilized a control theory orientation to incorporate social skills and parent skills training (Elrod & Minor, 1992). Another program employed group, individual, family, and multi-family group therapy sessions with three wilderness expeditions (Lambie et al., 2000). The final study evaluated a program with an integrated approach to treatment, incorporating wilderness

expeditions, challenge activities, community service, and an educational curriculum (Russell, 2006). These combined interventions make it impossible to isolate the potential effects of WT itself.

The length of treatment also varied between studies. In one of the studies, adolescents participated in treatment for up to two years, with the average length of stay being roughly 18 months (Lambie et al., 2000). Another study evaluated the effects of a 6 month treatment program (Burke, 2010). Other studies looked at short-term interventions. For example, Castellano and Soderstrom (1992) evaluated a 30-day WT treatment while Elrod and Minor (1992) assessed an 8-week treatment with only three days of wilderness expeditions. Unlike any of these, Gillis, Gass, and Russell (2008) evaluated a program in which treatment length varied between 30 and 366 days.

Finally, the sustainability of WT interventions differs greatly across studies. While this is not a new discovery, results of this synthesis indicate that although some studies revealed positive effects up to three years after the intervention, others fail to find significant results at six months. Research has previously demonstrated decreased sustainability in the reduction of recidivism associated with longer post-intervention follow-ups.

### **Conclusions & Directions for Future Research**

Although results are mixed, we have some evidence enabling us to answer our research question: do WT programs reduce adolescent recidivism? Evidence from this review indicates that WT programs can reduce adolescent recidivism. Wilderness therapy may be associated with reduced re-arrest rates, a reduction in the amount of time between arrests, and severity of crime; however, these results appear to have little lasting effects with time. Shorter programs seem to produce less significant results, as demonstrated by Elrod and Minor (1992) and Castellano and Soderstrom (1994). Longer programs, however, tend to produce stronger positive results as evidenced by Burke (2010) and Gillis, Gass, and Russell (2008). Because many of the included studies remain methodologically limited, however, these results must be interpreted with caution. It is concluded, therefore, that there is little empirical support to definitively determine the effectiveness of WT programs in reducing adolescent recidivism.

Future studies may benefit from manipulating time as an independent variable to determine dosage effects on recidivism. Similarly, since previous research demonstrates that the effects of interventions aimed to reduce delinquency fade around roughly two years (Castellano & Soderstrom, 1994), additional studies ought to examine recidivism rates longitudinally to provide more insight related to sustainability.

The relative paucity of recidivism outcome studies in the field of WT is surprising given the large number of such programs. There is a National Association of Wilderness Therapy Camps with over 50 members (see

<http://safepassagetransport.com/national-association-of-therapeutic-wilderness-camps-natwc/>). The Outdoor Behavioral Healthcare Research Cooperative is dedicated to promoting research on WT (see <http://www.obhrc.org/>), yet few peer-reviewed studies have emerged from this initiative. Additionally, the Association of Experiential Education (see <http://www.aee.org/>) offers Masters and Doctoral degrees in WT. Over 12 years ago, Bruyere offered the following recommendation:

“Leaders of outdoor programs for adjudicated youth must regularly evaluate their programs to ensure that intended benefits are being acquired. Doing so will also help more firmly establish the field of outdoor education and adventure therapy as a bona fide and legitimate intervention for at-risk youth and juvenile offenders...the outdoor industry would be well served by the investment of time and resources to determine empirically if programs are actually meeting the needs of juvenile offenders” (Bruyere, 2002, pp. 211-212).

Based on the apparent limited research, we offer the following recommendations to advance outcomes research in the field of WT:

- Each WT program should administer one or more reliable and valid measures of adolescent functioning and recidivism post-discharge. These same measures should be administered many times post-discharge in order to identify sustainability effects of WT.
- Each cohort of youth embarking on a WT regimen should be evaluated using appropriate inferential statistics applied to these pre- and post-test measures.
- If cohorts are small, then data from several cohorts could be combined every few months.
- Annual data should be aggregated and reported across cohorts.
- If admissions to a WT experience are ‘rolling’ and not using a cohort model, the aggregated data for all individuals entering and completing the program should be analyzed periodically (e.g. every three months), and at least annually.
- WT program should publish pre- and post-test data in their promotional materials and online websites. If possible, independent evaluators should be hired to aid in the selection of outcome measures, the analysis of the data, and the submission of evaluation reports to appropriate peer-reviewed journals.

- If numbers permit, analyses should be conducted of the WT completers versus non-completers (e.g. drop-outs), and by selected demographic measures such as gender, race, or socio-economic status.

Undertaking the above simple steps would enable individual WT program to answer the questions: *Do youth who complete our WT program obtain and maintain positive adolescent functioning? Do youth who complete our WT program improve over the course of the program, as assessed by our selected outcome measure(s)?* This would greatly enhance the knowledge base of the effects of WT programs. In selected instances, it may be possible to compare the outcomes of WT youth versus youth treated via other modalities, but such comparative studies often require outside funding and advanced evaluation expertise. However, by building upon a foundation of positive pre-experimental study findings, it may become easier to obtain external funding for more expensive quasi-experiments and randomized controlled trials.

Social workers, counselors, and teachers are often on the frontline of the juvenile justice system. Recent convergence of child welfare and juvenile justice will increase the presence of professionals involved with these youth (Peters, 2011). The use of wilderness therapy and other alternative sanctions are likely to increase as we begin to break away from mainstream corrections and advocate the reduction of authoritarian punitive actions. Peters (2011) further indicates that by reengaging the juvenile justice field, we can better serve vulnerable populations with a professional skill set and history rich in advocating the needs of the undesirable.

Table 1

*Primary findings of included studies, arranged alphabetically by first author*

<b>Author</b>	<b>Location</b>	<b>Population/Groups</b>	<b>Intervention</b>	<b>Recidivism Outcomes</b>
Burke (2010)	Hawaii, United States	Male youth ages 14- 18 w/ conduct/ substance abuse disorders ( <i>n</i> = 139)  G1: Treatment ( <i>n</i> = 47) G2: Comparison ( <i>n</i> = 92)	Description: Marimed Drug Treatment Program, Kailana Model – multi- dimensional drug rehabilitation w/WT component  Duration: 180 days	Data collected: 12 months post- discharge Re-arrest (yes/no): 59% G1 & 89% G2 obtained status offense btwn group differences <i>p</i> <.05 Days until re-arrest: G1 <i>M</i> = 234, G2 <i>M</i> = 81; btwn group differences <i>p</i> <.05 Total # of re-arrests: G1 <i>M</i> = 4.2, G2 <i>M</i> = 6.8; btwn group differences <i>p</i> <.05 Crime severity: btwn group differences <i>NS</i>
Castellano & Soderstrom (1992)	Illinois, United States	Male & female juvenile probationers ages 10-18 ( <i>n</i> = 60)  G1: Treatment ( <i>n</i> = 48) G2: Comparison ( <i>n</i> = 48)	Description: Spectrum – residential outdoor therapeutic community for at-risk youth  Duration: 30 days	Data collected: 6, 12, & 24 months post- discharge Re-arrest (yes/no): 12 mo.: btwn group differences <i>NS</i> Days until re-arrest: 12 mo.: btwn group differences <i>NS</i> Crime severity: 6 mo., 12 mo.: G1 <i>NR</i> , G2 <i>NR</i> ; 24 mo.: btwn group differences <i>NS</i>
Elrod & Minor (1992)	Michigan, United States	Male & female juvenile court probationers ages 12-	Description: Project Explore - social skills building for youth &	Data collected: 12 & 24 months post- discharge Re-arrest (yes/no): 24 mo.: btwn group

Author	Location	Population/Groups	Intervention	Recidivism Outcomes
		16 (n = 43) G1: Treatment (n = 22) G2: TAU (n = 21)	parents w/brief WT component  Duration: 8 weeks, 3 days of WT	differences <i>NS</i> Status v. criminal offense: 24 mo.: 45% G1 & 61% G2 obtained status offense btwn group differences <i>p</i> <.05
Gillis, Gass, & Russell (2008)	Georgia, United States	Male, juvenile offenders ages 8-17 (n = 1,675)  G1: Treatment (n = 347) G2: OTP (n = 661) G3: YDC (n = 667)	Description: Project Adventure (BMtA) – bhx change through adventure using experiential learning and group exercises to build trust  Duration: 30-366 days	Data collected: 6, 12, 24, & 36 months post-discharge Re-arrest at 36 months (yes/no): 49% G1, 68% G2, & 63 G3 btwn group differences <i>p</i> <.05 Days until re-arrest: G1 <i>M</i> = 23 months, G2 <i>M</i> = 20, & G3 <i>M</i> = 18 btwn group differences <i>p</i> <.05
Jones, Lowe, & Risler (2004)	Georgia, United States	Male, juvenile offenders ages 11-16 (n = 35) G1: Treatment (n = 24) G2: Comparison (n = 11)	Description: Wilderness adventure therapy – group therapy model w/outdoor & experiential learning  Duration: <i>NR</i>	Data collected: 6 & 12 months post- discharge Re-arrest (yes/no): btwn group differences <i>NS</i> Total # of re-arrests: btwn group differences <i>NS</i> Crime severity: btwn group differences <i>NS</i>

<b>Author</b>	<b>Location</b>	<b>Population/Groups</b>	<b>Intervention</b>	<b>Recidivism Outcomes</b>
Lambie et al. (2000)	New Zealand	Male, juvenile sexual offenders ages 13-19 (n = 14) G1: Treatment (n = 14)	Description: Residential treatment program for building trust, social, and coping skills; 16 days of WT  Duration: 1-2 years	Data collected: 24 months post-discharge Re-arrest (yes/no): G1 0% recidivated
Russell, K. (2006)	Ontario, Canada	Male & female juvenile offenders ages 12 to 18 (n = 57)  G1: Treatment (n = 57)	Description: Ontario Wendigo Lake Expedition Program – aimed at challenging negative bhx & teaching pro-social skills  Duration: 120 days	Data collected: 16 months post-discharge Re-arrest (yes/no): G1 53% recidivated

*Note:* bhx=behavior; btwn=between; G1=group one; G2=group two; G3=group three; NR=not reported; NS=non-significant; OTP=outdoor therapeutic camping program; TAU=treatment as usual; YDC= Youth Development Center; WT=wilderness therapy

### References

- Bandoroff, S. (1989). Wilderness-adventure therapy for delinquent and pre-delinquent youth: A review of the literature. ED377428. Retrieved from <http://eric.ed.gov/?id=ED377428>
- Berman, D., & Davis-Berman, J. (2013). The role of therapeutic adventure in meeting the mental health needs of children and adolescents: Finding a niche in the health care systems of the United States and the United Kingdom. *Journal of Experiential Education*, 36, 51-64. doi: 10.1177/1053825913481581
- Bruyere, B. L. (2002). Appropriate benefits for outdoor programs targeting juvenile male offenders. *Journal of Experiential Education*, 25, 207-213. doi: 10.1177/105382590202500104
- \*Burke, J. N., Ganes, D. Z., Mayeda, D. T., & Gass, M. A. (2010). Impact of culturally relevant residential treatment program on post-discharge outcomes for Hawai'i youth. *Journal of Therapeutic Schools and Programs*, 4, 7-23.
- Cason, D., & Gillis, H. L. (1994). A meta-analysis of outdoor adventure programming with adolescents. *The Journal of Experimental Education*, 17, 40-47. doi: 10.1177/105382599401700109
- \*Castellano, T. C., & Soderstrom, I. R. (1992). Therapeutic wilderness programs and juvenile recidivism: A program evaluation. *Journal of Offender Rehabilitation*, 17, 19-46. doi: 10.1300/J076v17n03\_02
- Davis-Berman, J., & Berman, D. S. (1994). *Wilderness therapy: Foundations, theories and research*. Dubuque: IA: Kendall/Hunt Publishing Co.
- Doerner, W. G., & Lab, S. P. (2014). *Victimology* (7th ed). New York, NY: Routledge Taylor & Francis.
- \*Elrod, H. P., & Minor, K. I. (1992). Second wave evaluation of a multi-faceted intervention for juvenile court probationers. *International Journal of Offender Therapy and Comparative Criminology*, 36, 247-262. doi: 10.1177/0306624X9203600308
- Gass, M. A. (1993). Foundations of adventure therapy. In: M. A. Gass, *Adventure Therapy: Therapeutic applications of adventure programming* (pp.3-10). Dubuque: IA: Kendall/Hunt Publishing Co.
- \*Gillis, L., Gass, M., & Russel, K. C. (2008). The effectiveness of Project Adventure's behavior management program for male offenders in residential treatment. *Residential Treatment for Family and Youth*, 25, 227-247. doi: 10.1080/08865710802429689
- Jensen, J. M., & Howard, M. O. (1998). Youth crime, public policy, and practice in the juvenile justice system: Recent trends and needed reforms. *Social Work*, 43, 324-335. doi: 10.1093/sw/43.4.324

- \*Jones, C., Lowe, A., & Risler, E. (2004). The effectiveness of wilderness adventure therapy programs for young people involved in the juvenile justice system. *Residential Treatment for Children & Youth, 22*, 53-62. doi: 10.1300/J007v22n02\_04
- \*Lambie, I., Hickling, L., Seymour, F., Simmonds, L., Robson, M., & Houlahan, C. (2000). Using wilderness therapy in treating adolescent sexual offenders. *Journal of Sexual Aggression, 5*, 99-117. doi: 10.1080/13552600008413302
- Levitt, S. D., & Lochner, L. (2001). The determinants of juvenile crime. In J. Gruber (Ed.), *Risky behavior among youths: An economic analysis* (pp. 327-374). Chicago, IL: University of Chicago Press.
- Mendenhall, M. (2008). A radical approach to delinquency Reform. *ReVision, 30*(1/2), 71-76. doi: 10.4298/REVN.30.1/2.71-76
- Miller, T. R., Fisher, D. A., & Cohen, M. A. (2001). Costs of juvenile violence: Policy and implications. *Pediatrics, 107*(1), 1-7. doi: 10.1542/peds.107.1.e3
- Moffitt, T. E. (1993). Adolescence-limited and life-course-persistent antisocial behavior: a developmental taxonomy. *Psychological Review, 100*(4), 674-701. doi: 10.1037/0033-295X.100.4.674
- Office of Juvenile Justice and Delinquency Prevention (2013). *Juvenile Arrests 2011*. Retrieved November, 18 2014 from <http://www.ojjdp.gov/ojstatbb/nr2006/index.html>
- Office of Juvenile Justice and Delinquency Prevention (2006). *Juvenile Offenders and Victims: 2006 National Report*. NCJ 212906. Retrived from <http://www.ojjdp.gov/ojstatbb/nr2006/downloads/NR2006.pdf>
- Peters, C. M. (2011). Social work and juvenile probation: Historical tensions and contemporary convergences. *Social Work, 56*(4), 355-365. doi: 10.1093/sw/56.4.355
- \*Russell, K. C. (2006). Evaluating the effects of the Wendigo Lake Expedition Program on young offenders. *Youth Violence and Juvenile Justice, 4*, 185-203. doi: 10.1177/1541204006286317
- Singleton Jr, R. A. & Straits, B. C. (2005). *Approaches to social research* (4th ed). New York, NY: Oxford University Press.
- Shadish, W. R., Cook, T. D., & Campbell, D. T. (2002). *Experimental and quasi-experimental designs for generalized causal inference*. New York, NY: Houghton Mifflin Company.
- Thyer, B. A. (2012). *Quasi-experimental research designs*. New York, NY: Oxford University Press.
- Wilson, S. J., & Lipsey, M. W. (2000). Wilderness challenge programs for delinquent youth: A meta-analysis of outcome evaluations. *Evaluation and Program Planning, 23*, 1-12. doi: 10.1016/S0149-7189(99)00040-3

Zamble, E., & Quinsey, V. (1997). *The criminal recidivism process*. Cambridge, UK: Cambridge University Press.

\*Studies included in review

