ENVIRONMENTAL EDUCATION IN MID-MISSOURI: NEEDS AND
CONSTRAINTS INFLUENCING FIELD TRIP PARTICIPATION OF K-8 TEACHERS

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by

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The undersigned, appointed by the dean of the Graduate School, have examined the thesis entitled

ENVIRONMENTAL EDUCATION IN MID-MISSOURI: NEEDS AND CONSTRAINTS INFLUENCING FIELD TRIP PARTICIPATION OF K-8 TEACHERS

Presented by John Swain,

A candidate for the degree of a Master of Science

And hereby certify that, in their opinion, it is worthy of acceptance.

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"Twenty years from now you will be

more disappointed by the things that

you didn't do than by the ones you

did do. So throw off the bowlines.

Sail away from the safe harbor.

Catch the trade winds in your sails.

Explore, Dream, Discover."

-Mark Twain-

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ABSTRACT

This study examined barriers and constraints facing mid-Missouri school teachers involving field trips, such as the need for environmental education (EE) services and training opportunities. The primary objective was to focus on rural school teachers who live near Prairie Fork Conservation Area (PFCA), an underutilized educational resource near Williamsburg, Missouri. A questionnaire was distributed to 401 public school teachers in seven counties of Mid-Missouri, yielding a response rate of 64%. The majority of respondents were well-educated females that taught kindergarten through second grade. Their overall attitude regarding field trips was positive. Teachers participated in about 1.5 field trips per year, but only 5.7% of respondents had used PFCA as a field trip destination. Structural constraints were found to be important and might limit field trip participation at PFCA. However, some of the constraints facing teachers could be negotiated with the Missouri Department of Conservation (MDC). Some management implications are discussed.

CHAPTER 1

Introduction

Although concern for the environment in developed countries has grown in recent years, most people remain oblivious to nature's interactions and functions (Latosi-Sawin, 2004). In other words, many individuals are disconnected to the environment, despite being dependent on it. Richard Louv (2003) describes this phenomenon as the "Third Frontier", "a severance of the public and private mind from our food's origins; a disappearing line between machines, humans, and other animals; an increased intellectual understanding of our relationship with other animals; the invasion of our cities by wild animals; and the rise of a new kind of suburban form" (p.19). This issue deserves immediate attention.

One solution for restoring the human/nature relationship is through education, but despite the efforts of school teachers, knowledge about the environment continues to be low (Falk, 1982). Palmberg and Kuru (2000) noted that field trips and adventure activities can promote environmental understanding because these programs usually combine education and fun. Oftentimes field trips promote environmentally responsible behavior (ERB) among students and teachers (Zint, Kraemer, Northway & Lim, 2002). Moreover, informal learning situations allow many people to experience nature who otherwise might not have the opportunity or motivation to do so in another setting. Much has been written about environmental, outdoor, and conservation education programs, especially involving student interactions (Disinger, 1983; Palmberg and Kuru, 2000;

Parkin, 1998; Zint et al., 2002). Despite the advantages and benefits of field trips, Ham and Sewing (1987) found that some teachers failed to implement these programs and services due to various constraints.

Simmons (1996) noted the important role that teachers play in helping students overcome perceived barriers and constraints associated with field trips. If the benefits of environmental education (EE) are understood and teachers have a positive attitude about field trips, then it can be a worthwhile experience. Perhaps this type of learning can be promoted in mid-Missouri, however, a better understanding of constraints is needed in relation to school field trips.

Prairie Fork Conservation Area (PFCA) is a 711 acre site located near Williamsburg, Missouri, which is presently being underutilized as an educational resource. PFCA was donated by Hilda (Pat) Jones to the Missouri Department of Conservation (MDC). The Prairie Fork Trust provides oversight and additional funding for activities related to natural resource education, restoration, management, and research that are conducted on site. PFCA is cooperatively managed by the School of Natural Resources at the University of Missouri, MDC, and the Missouri Prairie Foundation (MPF). This site is managed according to four broad directives: 1) To provide educational experiences related to forestry, fisheries, wildlife, soils, and environmental conservation for all citizens, especially for youth in pre-school through eighth grade; 2) To restore and maintain natural communities and their processes and functions; and 3) To develop techniques that promote both wise use and sustainability of natural resources; and 4) To encourage research from diverse disciplines in the implementation of the above

objectives and provide students cross-disciplinary experiences in research and educational programs (MDC, 2004).

Need For Study

Many studies have examined the effect of EE programs and services by measuring the affective, cognitive and/or behavioral changes that occur in students (Simmons, 1987). Although dated, the model developed by Ham and Sewing (1987) has been used as the basis for several studies that evaluated barriers and constraints of EE programs, field trips, or outdoor classrooms. Fewer studies have used the EE model adapted by Bixler and Floyd (1999), which suggested that constraints are impediments, but can be overcome through negotiation strategies. Furthermore, there is a scarce amount of literature on teacher perceptions of barriers and constraints that effect student participation on field trips, and information on the services and training (for teachers) associated with EE field trips.

Prairie Fork Conservation Area offers a unique opportunity to address some of these issues for students and teachers living in mid-Missouri. Although the site has enormous potential, it is currently being underutilized as an educational resource. After studying this issue, a strategy can be formulated to ensure the long-term success of education opportunities at PFCA.

Purpose of Study

This study examined the needs and constraints of teachers in mid-Missouri that might influence participation in school-sponsored field trips to PFCA.

Subproblems:

A. To explore teachers' perceived needs for services.

B. To explore teachers' perceived needs for services training.

C. To examine teachers' perceptions of constraints influencing non-participation in EE field trips.

D. To examine teachers' perceptions of *student* constraints influencing non-participation in EE field trips.

E. To evaluate the utility of Prairie Fork Conservation Area for teachers.

Hypotheses

H_o1:   There is no significant difference between the grade classification of teachers and their need for EE services.

H_o2:   There is no significant difference between the grade classification of teachers and their need for EE training.

H_o3:   There is no significant difference between the grade classification of teachers and their perceived constraints of field trips.

H_o4:   There is no significant difference between length of service and teachers need for EE services.

H_o5:   There is no significant difference between length of service and teachers need for EE training.

H_o6:   There is no significant difference between length of service and teachers perceived constraints related to field trips.

H_o7:   There is no significant difference between teachers who have taken fewer field trips vs. those who have taken more in relation to the need for EE services.

H$_o$8: There is no significant difference between teachers who have taken fewer field trips vs. those who have taken more in relation to the need for EE training.

H$_o$9: There is no significant difference between teachers who have taken fewer field trips vs. those who have taken more in relation to perceived constraints.

Delimitations

This study will be delimited to kindergarten through eighth grade public school teachers in the seven county region, inclusive of, and adjacent to, PFCA (Callaway, Audrain, Montgomery, Boone, Cole, Osage and Gasconade).

Limitations

It was not possible to gain consent from all principals in the seven county region to conduct the study. School administrators from Columbia and Jefferson City declined to participate. Although this action excluded every school within these two districts (larger and urban), it made the sample more homogeneous (smaller and rural). Teachers who did not participate in the study were assumed to have similar issues and concerns about field trips as compared to those who completed the questionnaire. These results cannot be generalized to another population of school teachers (i.e., those outside the boundaries established in this study). The sample did not include any teachers from private schools or those affiliated with home-school programs.

The questionnaire was assumed to be a valid measure of the needs, services, barriers, and constraints for this population. However, it was possible that some important variables were overlooked or stated ambiguously. For example, the zip code question was meant to reveal the school location, but it may have indicated the teachers actual residence instead (38 were reported from Columbia or Jefferson City).

Definitions

Barriers- Impossible obstacles to overcome, the presence or absence of these issues will determine participation in environmental education field trips (Jackson, 2005).

Conservation Education- The primary goal is to educate citizens on the wise use of natural resources for future generations (Disinger, 1983).

Environmental Education- defined by the National Environmental Education Advisory Council as: "a learning process that increases people's knowledge and awareness about the environment and associated challenges, develops the necessary skills and expertise to address these challenges, and fosters attitudes, motivations, and commitments to make informed decisions and take responsible action (Disinger, p.30)."

Intrapersonal Constraints to EE- Cognitive and attitudinal barriers held by educators and students (Bixler & Floyd, 1999).

Interpersonal Constraints to EE- Interpersonal constraints are defined as disagreements between teachers in an organization (school), concerning the philosophy and pedagogy of EE (Bixler & Floyd, 1999).

Outdoor Education- an educational approach that can and usually does take place in nature (Swan, 1975; cited by Disinger, 1983).

Structural Constraints to EE- External forces such as time, money and transportation that reduce the ability of students and educators to engage in EE activities or field trips (Bixler & Floyd, 1999).

CHAPTER 2

Literature Review

The terms outdoor, conservation, and environmental education will be used interchangeably in this study because the goals of these learning processes can be achieved on school field trips. Outdoor education is defined simply as an educational approach that usually takes place in nature (Swan, 1975; cited by Disinger, 1983). The primary goal of conservation education is teaching about the wise use of natural resources (Disinger, 1983). In 1996, EE was defined by the National Environmental Education Advisory Council as: "a learning process that increases people's knowledge and awareness about the environment and associated challenges, develops the necessary skills and expertise to address these challenges, and fosters attitudes, motivations, and commitments to make informed decisions and take responsible action" (Disinger, p.30).

Environmental education was derived from the overlapping definitions of outdoor education and conservation education (Disinger, 1983). Kirk (1977) stated that this emergence may have begun in the 1960's when society became more aware of environmental issues such as "air pollution, water pollution, noise pollution, landscape pollution, overpopulation, and excess energy demands (p. 34)." These societal pressures began to force leaders in both outdoor education and conservation education to adjust their philosophies to meet the changing needs and demands from society. This merger is recognized as the starting point for the environmental education movement in the United States (Kirk, 1977).

Field Trips

Until the early 1980's, not much research had been conducted on the importance of field trips for students or teachers. According to Falk and Balling, success was defined largely by anecdotal evidence, common sense, or informal evaluations, thus making it hard to discern the actual pros and cons of field trips. This may have caused some teachers to believe that field trips were fun outings, but left them uncertain about their educational value (Falk and Balling, 1980). Since teachers play an important role in facilitating EE field trip experiences, it is important to understand their motivations and barriers when using outdoor settings for educational purposes (Simmons, 1998).

Teachers decide how EE goals will be met through the use of outdoor resources (Simmons, 1998). Commitment and planning are necessary for field trips and EE programs to be successful. Students need exposure to a variety of outdoor settings so that meaningful learning experiences can occur. However, teachers may fail to implement some of these educational activities if barriers and constraints are significant (Simmons, 1998).

Simmons (1998) investigated elementary school teachers perceived benefits and barriers of four outdoor settings: 1) rivers, ponds, and marshes; 2) deep woods; 3) county parks; and 4) urban nature. Results indicated that teachers viewed some natural settings, such as rivers and deep woods, as a more appropriate field trip destination than parks and urban nature areas, despite the barriers with these locations. Teachers identified class size, safety, lesson plans, background, skills, and other resources, such as maps as major obstacles (Simmons, 1998).

Falk and Balling (1982) conducted a series of studies that examined settings and psychological aspects of field trips, primarily focusing on the effects of novelty on student learning. Using pre and post-tests, it was found that the setting played an important role in effecting student behavior, for grades 3 and 5, which influenced the amount of learning that actually took place. Results varied depending on the developmental level of the students. Typically, young students (3rd graders) tended to have more positive scores for shorter field trips in a semi-familiar area. Older students (5th graders) showed more positive scores after completing all day field trips to a "novel" location. Younger students may have been uncomfortable or felt distracted on all day trips in a completely new setting, thus interfering with learning. In contrast, older students may have become bored and distracted at a site that is familiar (Falk and Balling, 1982).

Data collected in the Falk and Balling study supported the notion that single day field trips can promote learning. This underscores the importance of choosing an appropriate site based on the developmental level of students. Farmer and Wott (1995) took a different approach and examined the effects of field trips on 4th graders who visited an arboretum. Results demonstrated that pre and post-visit activities may also enhance short term learning and retention among 4th grade students. This finding indicates that staff located on site may want to provide teachers with lesson plans and follow up activities that promote learning and retention among field trip participants (Farmer and Wott, 1995).

The Benefits of Learning in Nature

There is a large body of literature that addresses the ways in which school aged children learn about nature and the potential benefits (individual, social and environmental) that may accrue from outdoor experiences (Lindemann-Matthies, 2006; Palmberg and Kuru, 2000; Zint et al., 2002). A study conducted by Farnham and Mutrie (1997) used both qualitative and quantitative methods to determine the benefits of outdoor learning for 19 volunteers having emotional and/or behavioral problems. Results indicated significant improvements in anxiety reduction and increased group cohesion, but self perception remained low. Farnham and Mutrie concluded that low self perception may have been due to a design flaw in their study and the objectives of the activities that were chosen.

Stern, Powell and Ardoin (2008) examined short and long term influences of three and five day outdoor programs on fourth through seventh grade students. Although the results indicated an increase in environmentally responsible behavior (ERB), they speculated that these findings may be exaggerated due to self reporting. Specifically, they found that student learning showed positive increases in stewardship, discovery, and awareness. Although teachers may perceive that large classes are a barrier to conducting field trips, the results of this study showed just the opposite. Students in large groups increased both short and long term changes in awareness, as well as interest in learning and discovery (Stern, Powell and Ardoin, 2008).

A study by Zint et al. (2002) investigated the effectiveness of the Chesapeake Bay Foundation's (CBF) conservation education program in promoting and maintaining ERB. Results of this study determined that some, but not all, CBF programs improved issues

such as, knowledge, skill in actions, knowledge of ecology, group locus of control, intention to act, environmental sensitivity, personal responsibility, and individual locus of control of students (Zint et al, 2002). Intention to act, a characteristic thought to be a strong predictor of ERB, was of particular interest to the CBF. However, students in CBF programs which only displayed one or two characteristics had a stronger behavioral intention, in contrast to programs that influenced all other ERB characteristics. Surprisingly, CBF programs that focused on few ERB traits seemed to influence behavioral intentions more than CBF programs that targeted many ERB characteristics. It was thought that programs which focused on multiple ERB characteristics would exert more influence on behavioral intentions. Their findings did show, however, that one day and three day field trips were very effective in improving ERB characteristics, as compared to lengthier programs (Zint et al., 2002).

Palmberg and Kuru (2000) also investigated the effects of outdoor activities in promoting ERB among youth. Their study was conducted in Finland involving 11 and 12 year old students. A mixed method approach was used which combined case studies, questionnaires, interviews, drawings, photographs, and observations. Students were separated into those who had previous experience with various types of outdoor experiences and those who had not. Results of the Palmberg and Kuru (2000) study indicated that student experiences in nature provide individual, social, and environmental benefits. They noted that students had increased self confidence and feelings of security. It is also stated that adventure education helped to confirm group feelings through problem solving activities. When students who were more experienced in nature were compared to those less experienced, the former displayed improved social behavior,

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higher moral judgments and a "clearly definable empathetic relationship to nature" (Palmburg and Kuru, p.34).

Students in the Palmburg and Kuru study demonstrated increased knowledge and positive attitudes toward the environment, but lacked the motivation and/or problem solving skills to take action. Most likely this was due to the choice of activities in the study - outdoor/adventure education oriented, as compared to conservation education programs that were examined by Zint et al. (2002). The Zint et al. and Palmburg and Kuru studies illustrate the benefits associated with nature oriented programs, regardless of the approach. Moreover, it was demonstrated that programs should be tailored for specific objectives for which they aim to achieve (Zint et al. 2002).

Barriers and Constraints

In one of the early studies examining EE barriers, Ham and Sewing (1987) described: 1) conceptual barriers result from misconceptions about the scope of EE; 2) logistical barriers such as lack of time, money, resources and class size; 3) educational barriers included a perceived lack of knowledge in teaching EE; and 4) attitudinal barriers of teachers, not students, toward EE. Eighty nine percent of the teachers in this sample were female, with an average of 13.8 years of teaching experience. Although attitudes toward teaching EE were positive, the most significant barrier to conducting EE was lack of time in the school day and time for preparation. Teachers did not believe that EE would be useful, unless for teaching about science. Other significant barriers noted were lack of funding, teaching materials and knowledge about teaching EE (Ham and Sewing, 1987).

A study by Ko and Lee (2003) examined teacher perceptions of environmental issues using Ham and Sewing's (1987) construct of logistical and personal barriers related to environmental education. Perceived logistical barriers such as lack of class time and class size were more of an impediment than personal barriers. This study also found that if teachers had positive attitudes toward EE, they were more likely to teach it. Other barriers noted in this study were inadequate knowledge about EE, training, teaching materials, and safety of students (Ko and Lee, 2003).

Jackson (2005) suggested that barriers were impossible obstacles to overcome and that the presence or absence of constraints would determine participation. He also stated that structural constraints, otherwise known as "barriers," were mostly studied because they were easily quantifiable. Use of the term "constraints" is more inclusive because it does not rule out the possibility of participation, despite some impediments (Jackson, 2005). From a recreation perspective, constraints are subdivided into three groups: 1) interpersonal, which arise from social factors that influence leisure preferences; 2) intrapersonal, which are psychological conditions internal to the individual which may influence leisure preferences; and 3) structural, which are environmental factors that occur after leisure preferences have been formed, but before participation occurs, thus creating an obstacle (Mannell and Kleiber, 1997).

Constraints in Environmental Education

The barriers and constraints model originally developed in the outdoor recreation literature has been adopted to describe situations related to EE (Bixler and Floyd, 1999). They defined structural constraints as external forces that reduce the ability of students and educators to engage in EE activities or field trips. Interpersonal constraints are

defined as disagreements between teachers in an organization (school), concerning the philosophy and pedagogy of EE. Intrapersonal constraints were defined as cognitive and attitudinal barriers held by educators and students (Bixler and Floyd, 1999).

Simmons (1987) described the important role that teachers play in EE programs and activities, since they are responsible for implementing them. The needs of teachers were also investigated in relation to administration, training and educational support. Simmons verified the benefits of EE participation, such as nature enjoyment, personal and social growth, and overcoming challenges. Perceived drawbacks to participation included the hassle of being away from home and their normal environment, anxiety associated with teaching in the outdoors (new environment), teaching ability, losing control of the students, and vulnerability (looking foolish in front of students). Areas of need consisted of having more input in the program, lesson plan support, in-service training, learning how to use the site or the school to integrate the program into the classroom, and extra compensation for field trip participation. Another notable finding was that there was an overall positive attitude toward EE, but a lack of personal responsibility for teaching it (Simmons, 1987).

Keown (1986) surveyed U.S. science teachers on their use of natural areas for teaching purposes, including impediments to outdoor learning. Among the top barriers were conflicting class schedules and time allotments for field trips, as well as liability issues. Travel costs and large class sizes were other important barriers found in the survey. Interestingly, only a small portion of science teachers reported using nature study sites (Keown, 1986).

While investigating attitudes and responses to an environmental program in Switzerland, Lindemann-Matthies (2006) noted barriers such as teacher enthusiasm and lack of pre-service training. Since lack of experience is a major barrier for teachers wanting to implement outdoor learning in the curriculum, Lindemann-Matthies (2006) suggested that future studies ought to investigate this phenomenon. Brewer (2002) pointed out that schools should form partnerships with local conservation agencies to promote outdoor learning. Fear of science and suspicion of scientists were also listed as significant constraints (Brewer, 2002), thus making some teachers insecure about their ability to teach science properly. These findings support Simmons (1997) who indicated that anxiety about teaching outdoors was a barrier. Other barriers mentioned by Brewer (2002) included cost of transportation, the ability to control their students, and the low value placed on partnerships with EE groups.

Kim and Fortner (2006) conducted a survey at numerous conferences in 2003 which asked teachers to comment on barriers that had been previously identified in the literature. It was generally found that teachers perceived structural or logistical barriers to be more of an impediment than intrapersonal barriers. Major barriers noted were lack of time and pursuit of curriculum standards, as opposed to minor barriers such as perceived lack of relevance to subject taught and personal interest.

Other studies have investigated specific barriers, such as fear and disgust sensitivity associated with outdoor learning experiences (Bixler and Floyd, 1999; Ewert, 1986). Bixler and Floyd (1999) suggested that high levels of disgust, coupled with contamination sensitivity, could be stunting the progress of environmental understanding.

The four most highly rated "disgust" items in this survey were; ticks, roaches, animal droppings, and slugs.

   Ewert (1986) discussed how overcoming fear and anxiety may be both a barrier and a motivator for outdoor learning. By overcoming fear, students would gain personal meaning from the experience. However, educators must control the amount of fear and anxiety experienced by students because it could cross the threshold of motivation and become a barrier (Ewert, 1986). Findings from Bixler and Carlisle (1994) on fears and discomforts for urban students in the outdoors support this notion since fear and anxiety were significant barriers to outdoor learning. They suggested that a series of field trips over at least a two year period throughout pre-school and kindergarten may help to desensitize young children to the outdoors, thus limiting the amount of fear experienced in the outdoors.

   Despite student fears, past studies have shown that the most prevalent barriers experienced by teachers using outdoor areas are structural, such as time or money (Brewer, 2002; Keown, 1986; Kim and Fortner, 2006). A poor economic climate may place an additional strain on the system, thus increasing the importance of these barriers. Since barriers and constraints for taking field trips may vary depending on the geographic, economic, and social elements among schools, it is important to investigate these issues on a local level.

CHAPTER 3

Methodology

This study examined the responses of public school teachers in mid-Missouri on topics such as, the need for environmental education training and services, and constraints that might influence participation on field trips. A five page questionnaire was used to collect data from respondents. Research design, sampling, questionnaire, data collection, and statistical analyses are presented in this section.

Sampling Strategy

Every primary and secondary school within a seven-county region in mid-Missouri was identified using the Missouri School Directory website. This geographic area consisted of the following counties: Callaway, Audrain, Montgomery, Boone, Cole, Osage, and Gasconade and was chosen because of proximity to PFCA (located in Callaway County). A description of the intended study was submitted to the Institutional Review Board (IRB) and was reviewed and approved. A script (Appendix A) was developed by the researchers for requesting permission to conduct the study. The researcher phoned an administrator at each school on the list from October 1, 2008 until December 14, 2008. If permission was granted, emails were sent which asked for a complete list of teachers (first and last names), as well as subjects and grade levels taught. The list was adjusted slightly because some teachers (i.e., vocational education) were not relevant to this investigation.

A total of 99 administrators were contacted of which, 27 (27%) agreed to participate in the study. Of those declining, two were from the largest school districts

(Columbia and Jefferson City). This action eliminated a large percentage of schools (41%) within the designated region. However, permission was granted from at least one school in each of the seven counties.

A survey was sent to each qualified teacher (n=401) on the list of participating schools (n=27). One survey was undeliverable, but 256 teachers completed and returned their questionnaires for a response rate of 64%. Of those returned, eight questionnaires were unusable due to insufficient responses. The adjusted sample size (n=400) accounted for the one survey which was undeliverable.

Survey Protocol

Mailing procedures followed a slightly modified version of the Tailored Design Method (Dillman, 2007). Four mailings were sent from January 16 until February 20, 2009 (401 on January 16, 2009; 401 on January 23, 2009; 301 on February 6, 2009; and 227 on February 20, 2009). See Table 1.

Table 1

Mailing Timeline for Survey

Date	Mailing order	Type	# of items mailed
Jan 16	1	Pre-notification post cards	401
Jan 23	2	Coded questionnaires	401
Feb 6	3	Reminder post cards	301
Feb 20	4	Un-coded questionnaires	227

Data Collection / Entry

Each questionnaire was addressed to a specific teacher, but sent to the generic school address to simplify the mailing process. The pre-notification post card (Appendix B) served two important purposes: 1) to inform teachers that they would be receiving a survey soon; and 2) to verify the mailing list. After the first mail-out, no post-cards were returned so it was assumed that all of the addresses were correct. However, after the questionnaires were sent (second mailing) one of those was returned.

Numbered questionnaires were used to determine which respondents had replied and those who had not. As the questionnaires were returned, teacher contact information was removed from the mailing list. The second mail-out included a cover letter (Appendix C) which explained the purpose and importance of the study, and a questionnaire containing pre-paid return postage (business reply only). Each mailing was tracked and if a response was not received in about two weeks, then a reminder postcard (Appendix D) was sent to the same address. Approximately two weeks after the reminder post card was mailed, non-respondents received a final package that consisted of a signed cover letter (Appendix E) and an un-numbered questionnaire to ensure anonymity.

In addition to the multiple mailings and reminders, various methods were used to enhance the response rate for this study. Personal touches were added such as hand addressing the envelopes, researcher and project leader signatures on the cover letters, and the use of postage stamps. Questionnaire design was tailored to increase response rate as well as ensure confidentiality. For example, the cover page featured a clip-art design of some flowers and a meandering stream, as well as official logos from the

sponsors.   A brief description of PFCA was located on the inside front cover providing some basic information about the site, along with contact information. Lastly, questionnaires were distributed in the winter (during the second half of the school year). Presumably, this had a positive effect on response rate due to a more sedentary lifestyle during colder temperatures. The five page questionnaire was sub-divided into six easy to understand sections. It took about 15-20 minutes to complete the survey.

Questionnaire

The questionnaire was adapted from a combination of pre-tested survey instruments used by other researchers in the Dept. of Parks, Recreation and Tourism at the University of Missouri. The questionnaire was 5 pages long and consisted of 79 items (Appendix F). Sections included demographics/characteristics; need for EE services; need for EE training; barriers and constraints influencing teacher non-participation in EE; perceived barriers and constraints that might influence student non-participation in EE; and how can PFCA be useful to teachers. Lastly, there was a space for some open-ended comments (Appendix G).

Section 1, *Tell us about yourself*, consisted of 13 questions, most of which were short answer or multiple choice items. One question measured teachers overall attitude about field trips using a 10 point Likert scale (1=poor, 10=excellent). Multiple choice and free response questions included frequency of field trips taken (lifetime / past 12 months), "have you received pre-service training in EE?" and "what grade do you teach?"

Section 2, *Need for EE services* asked teachers to evaluate their need for various EE services using a 5 point Likert scale (1=lowest need, 5=highest need). This section consisted of 11 items pertaining to need for EE services, such as: an outdoor classroom

at my school, live animals for my classroom, funding for activities and transportation, EE mailings, and field trip ideas.

Section 3, *Need for EE training* asked teachers to evaluate their need for EE training using a 5 point scale (1=lowest need, 5=highest need). This section consisted of 10 items related to the need for EE training, such as, the definition of EE, increase knowledge about the environment, EE teaching strategies and integrating EE with other subjects.

Section 4, *Constraints related to non-participation in EE* asked teachers to evaluate 18 perceived constraints that might influence non-participation in EE using a 5 point Likert scale (1 =strong constraint, 5= weak constraint). Example items included: lack of awareness of sites and facilities, EE will not meet curriculum standards, lack funding, unpleasant experiences with prior EE trips and concerns about student safety.

Section 5, *Teacher perceptions of constraints related to student non-participation in EE* asked teachers to evaluate 15 constraints that might influence the average student regarding non-participation in EE using a 5 point Likert scale (1=strong constraint, 5=weak constraint). Some items included: outdoor areas are unsafe, the bus ride is too long, my parents think it is a waste of time, fearful of getting lost, and the bathrooms are nasty.

Section 6, *Usefulness of PFCA* consisted of 13 items each measured on a 5 point Likert scale (1= not useful, 5=very useful), concerning how PFCA can be useful to teachers. Example items consisted of: reinforcing science, reinforcing math, reinforcing English, offering long-term EE programs and developing social skills such as teamwork

and leadership. The multiple choice question asked teachers what venues would be most appropriate for informing teachers about PFCA.

Statistical Analysis of Data

Survey responses were coded, entered by computer, and analyzed using the Statistical Package for Social Sciences (SPSS) 16.0. Coded numbers used to identify respondents were deleted from the mailing list to ensure that no duplicate responses existed. Returned questionnaires were re-coded as they were entered into SPSS to ensure confidentiality of respondents and to allow for easy auditing of the data. Twenty percent of the questionnaires were selected at random and checked for errors by the researcher. After performing some initial descriptive statistics, the data was cleaned before performing further analyses.

This study used both descriptive and inferential statistics on the hypotheses and other variables in the survey. Descriptive statistics were used to calculate the means, frequencies, percentages, standard deviations, central tendencies, and variations in the data. Inferential statistics such as independent samples t-test was used to analyze hypotheses 4-9, and ANOVA was used to test hypotheses 1-3. The alpha level for all statistical tests was set at .05, thus creating only a 5% chance of committing a Type I error (rejection of the null hypothesis when it should be accepted). Reliability was measured using Cronbach's alpha, a coefficient used to measure internal consistency of the scale items.

CHAPTER 4

Results

This chapter reports on the results obtained from a survey of mid-Missouri school teachers near PFCA. A total of 401 teachers, minus one undeliverable (n=400), were asked to complete a questionnaire and 256 complied with the request (64% response rate). Descriptive statistics were calculated on the need for services and training, perceived barriers of field trips for teachers and students, and the utility of PFCA as an educational resource for teachers. Independent variables included grade classifications, length of service, and number of field trips. Dependent variables were the need for services, training and perceived constraints.

Demographic Characteristics

Teachers in the sample were predominately females (90.3%) who were well educated (50.2% had a graduate degree). Prior to receiving the survey, less than a quarter of teachers (22.3%) had heard of PFCA, and only a few of them (5.7%) had taken students on a field trip to PFCA (Table 2). Some teachers (19.8%) were aware that the Missouri Department of Conservation (MDC) managed PFCA. Relatively few teachers (17.0%) had received any pre-service training for environmental education (EE). The majority of teachers in this survey (41.7%) taught kindergarten through second grade. Most teachers (87.9%) taught more than one subject. Only 5 teachers had read *Last Child in the Woods* by Richard Louv (Table 3).

Respondents were experienced teachers, having taught slightly more than 12 years (*M*=12.1, SD=9.1). The average teacher took approximately 1.5 field trips per year,

and about 15.6 field trips throughout their teaching career (Table 4). The overall attitude

about field trips among teachers was high (*M*=8.3 out of 10, SD=1.7; Table 5).

Table 2

Mid-Missouri school teachers awareness and knowledge of PFCA

Question	Attribute	n	%
Heard of PFCA	Yes	55	22.3
	No	189	76.5
Taken field trip to PFCA	Yes	14	5.7
	No	233	94.3
PFCA is managed by			
MDC	Yes	49	19.8
	No	195	78.9

Table 3

Profile of Mid-Missouri school teachers

Question	Attribute	n	%
Gender	Male	24	9.7
	Female	223	90.3
Education Level	Bachelors	123	49.8
	Masters	124	50.2
Received pre-service	Yes	42	17.0
training in EE	No	202	81.8
Grade taught	Kindergarten	36	14.6
	First grade	37	15.0
	Second grade	30	12.1
	Third grade	25	10.1
	Fourth grade	24	9.7
	Fifth grade	22	8.9
	Sixth grade	23	9.3
	Seventh grade	13	5.3
	Eighth grade	12	4.9
	Multiple grades	25	10.1
Subject taught	Social Studies	13	5.3
	Science	16	6.5
	All	217	87.9

Read *Last Child in the*	Yes	5	2.0
Woods	No	239	96.8

Table 4

Teaching and field trip experience

Attribute	n	*M*	SD
Years teaching	246	12.1	9.1
Field trips/year	234	1.5	1.2
Field trips/lifetime	225	15.6	16.8

Table 5

Teachers attitude toward field trips*

Attribute	n	*M*	SD
Overall attitude toward field trips	246	8.3	1.7

*Coded 1= negative to 10= positive attitude

Need for Environmental Education Services

The next section of the questionnaire examined the needs of teachers for EE

services. It contained 11 items. The overall mean for EE services was (*M*=2.9, SD=0.7;

Table 6). The highest rated attribute was funding for activities and transportation

(*M*=4.1, SD=1.0), followed by speakers for your classroom (*M*=3.4, SD=1.0), and field

trip ideas (*M*=3.3, SD=1.1). The lowest rated attributes were use of local non-formal EE

sites (*M*=2.5, SD=1.1) and live animals for the classroom (*M*=2.2, SD=1.2).

Table 6

The need for environmental education services*

Attribute	n	*M*	SD
Funding for activities and transportation	244	4.1	1.0
Speakers in your classroom	244	3.4	1.0
Field trip ideas	246	3.3	1.1
Curriculum/lesson plans	245	3.0	1.1
EE mailings (workshops, fact sheets, etc.)	243	2.8	1.1
Teachers networking opportunities	245	2.8	1.1
Pre/post visit activities	245	2.8	1.0
An outdoor classroom at my school	241	2.7	1.2
Student clubs at your school	246	2.5	1.1
Use of local non-formal EE sites	243	2.5	1.1
Live animals for my classroom	245	2.2	1.2
Total ($\alpha = 0.84$)	246	2.9	0.7

*Coded 1 = lowest to 5 = highest

Need for Environmental Education Training

This section examined the need for EE training. The overall mean for training was (M=3.1, SD=0.8; Table 7). The highest rated attribute was alignment of EE with educational standards (M=3.3, SD=1.1), followed by integrating EE with other subjects (M=3.2, SD=1.0), and teaching about environmental issues (M=3.2, SD=1.0). The lowest rated attributes were EE teaching strategies (M=3.0, SD=1.0) and definition of EE (M=2.8, SD=1.1).

Table 7

The need for environmental education training*

Attribute	n	*M*	SD
Alignment of EE with educational standards	246	3.3	1.1
Integrating EE with other subjects	246	3.2	1.0
Teaching about environmental issues	246	3.2	1.0
Technology use relating to EE	245	3.2	1.2
Grant writing skills	246	3.2	1.3
Increase knowledge about the environment	246	3.1	1.1
Availability and use of curriculum resources	246	3.1	1.0
Development and use of outdoor EE sites	246	3.1	1.1
EE teaching strategies	243	3.0	1.0
Definition of Environmental Education	245	2.8	1.1
Total ($\alpha = 0.92$)	246	3.1	0.8

*Coded 1= lowest to 5 = highest

Perceived Constraints for Teachers Conducting EE Field Trips

Perceived constraints that prevent teachers from conducting EE field trips were examined. This section consisted of 18 items sub-divided into three constraint groupings: intrapersonal (*M*=2.7, SD=0.6); structural (*M*=3.3, SD=0.7), and interpersonal (*M*=2.7, SD=0.7). The overall mean for this section was (*M*=2.9, SD=0.6; Table 8). The highest rated teacher constraints were lack of funding (*M*=4.3, SD=0.9), followed by lack of awareness of sites and facilities (*M*=4.1, SD=0.9), cannot afford to leave the classroom for a day (*M*=3.4, SD=1.2), and EE will not meet curriculum standards (*M*=3.2, SD=1.1). The lowest rated constraints consisted of students not being mature enough for field trips (*M*=2.3, SD=1.0) and unpleasant experiences with prior EE trips (*M*=2.1, SD=1.0).

Table 8

Perceived constraints for teachers conducting EE field trips*

Teacher Constraints	n	M	SD
Intrapersonal (α = 0.69)	246	2.7	0.6
Lack of awareness of sites and facilities	246	4.1	0.9
Concern about quality of EE programming	244	2.6	1.0
Concern about food/beverage service	246	2.6	1.0
Concern about student safety	244	2.5	1.1
Concern about proper gear/clothing for students	246	2.5	1.0
Most students are not mature enough for field trips	246	2.3	1.0
Unpleasant experiences with prior EE trips	244	2.1	1.0
Structural (α = 0.73)	246	3.3	0.7
Lack of funding	232	4.3	0.9
I cannot afford to leave the classroom for a day	246	3.4	1.2
Difficulty in arranging suitable transportation	246	3.0	1.2
Poor access for those with physical disabilities	246	3.0	1.0
Inadequate bathroom/hand-washing facilities	245	2.9	1.1
Poor accommodations for special education	246	2.9	1.1
Interpersonal (α = 0.71)	246	2.7	0.7
EE will not meet the curriculum standards	243	3.2	1.1
Liability issues and concerns	246	3.0	1.2
Lack of support from school administrators	245	2.5	1.1
Lack of parental support	246	2.4	1.0
Not enough chaperones for supervision	245	2.4	1.1
Total (α=0.87)	246	2.9	0.6

*Coded 1 = weakest constraint to 5 = strongest constraint

Teachers Perceived Constraints for Student Non-Participation in Field Trips

This section examined teachers' perceptions of constraints that might prevent

students from participating in EE field trips. It consisted of 15 items, the overall mean

was (*M*=3.6, SD=0.6; Table 9). The highest rated constraint was outdoor areas are unsafe

(*M*=4.3, SD=0.8), followed by fearful of getting lost (*M*=4.3, SD=0.8), and scared of germs (*M*=3.9, SD=0.9), and fearful of strangers at the site (*M*=3.9, SD=1.0). The lowest rated constraints were weather conditions (*M*=3.1, SD=1.1), followed by bathrooms are nasty (*M*=2.8, SD=1.2).

Table 9

Teachers perceived constraints for student non-participation in EE field trips*

Student Constraints	n	*M*	SD
Outdoor areas are unsafe	243	4.3	0.8
Fearful of getting lost	245	3.9	0.9
Scared of "germs" (getting sick)	245	3.9	0.9
Fearful of strangers at the site	246	3.9	1.0
Lack of appropriate clothing or shoes	246	3.8	0.9
Eating a bag/sack lunch	246	3.8	1.1
My parents think it is a waste of time	245	3.7	0.9
Not physically fit for outdoor activities	246	3.7	1.0
Getting dirty, hot, or sweaty	246	3.6	1.1
The bus ride is too long	246	3.4	1.2
Scared of animals (insects, spiders & snakes)	246	3.4	1.0
These kinds of places are too boring	246	3.3	1.2
Some plants are irritating (weeds, poison ivy)	246	3.2	1.0
Weather conditions such as wind and rain	246	3.1	1.1
The bathrooms are nasty	246	2.8	1.2
Total (α = 0.89)	246	3.6	0.6

*Coded 1= weakest constraint to 5 = strongest constraint

Utility of PFCA as an educational resource for teachers

This section of the survey was designed to understand the ways in which PFCA can be useful to teachers, consisting of 12 items. The overall mean for this section was (*M*=3.4, SD=0.8; Table 10). According to teachers, reinforcing science was the most

useful item (*M*=4.3, SD=0.9), followed by developing social skills (*M*=4.0, SD=0.9).

The lowest rated item was providing overnight stays (*M*=1.6, SD=1.0).

Table 10

*Usefulness of PFCA for teachers***

PFCA Usefulness	n	*M*	SD
Reinforcing science	242	4.3	0.9
Developing social skills (i.e., teamwork & leadership)	241	4.0	1.0
Providing speakers for your classroom	242	4.0	1.0
Exposing students to research and the scientific method	239	3.9	1.1
Reinforcing math	239	3.6	1.2
Reinforcing social studies	242	3.6	1.1
Reinforcing history	239	3.5	1.1
Reinforcing English	241	3.3	1.2
Teaching of outdoor skills such as fishing, boating, etc.	241	3.2	1.3
Reinforcing art/music	240	3.0	1.3
Offering long-term EE programs	237	2.8	1.2
Providing overnight stays	235	1.6	1.0
Total ($\alpha = 0.88$)	244	3.4	0.8

*Coded 1 = not useful to 5 = most useful

Most appropriate venue for informing teachers about PFCA

The final portion of the questionnaire asked teachers what venue would be most useful for communicating about PFCA. This section consisted of one multiple choice item. Most teachers thought that workshops (31.2%) would be the most useful, while board meetings were perceived to be the least effective (1.6%). See Table 11.

Table 11

Most useful venue for informing teachers about PFCA

Communication channel	n	%
Workshops	77	31.2
Self-defined	22	8.9
Conferences	14	5.7
PTA meetings	8	3.2
School board meetings	4	1.6
Multiple	106	42.9
Total	231	93.5

Hypotheses Testing

H_o1: There is no significant difference between teachers grade classifications (K-2) (3-5) (6-8) and their total need for EE services score.

H_o1: Rejected

This hypothesis was tested using a one way ANOVA procedure which compared teachers grade classifications (K-2) (3-5) (6-8) with their total need for EE services (Table 12). Results of this test produced a significant difference between the groups. A Student Newman Keuls post hoc multiple comparison test showed significant differences between (K-2) teachers and (3-5) and (6-8) teachers, but grades 3-5 and 6-8 were similar (Table 13). Live animals for the classroom ($p=0.001$), funding for activities and transport ($p=0.046$), field trip ideas ($p=0.001$), and speakers for the classroom ($p=0.008$) were found to be significantly different at a 0.05 level.

Table 12

One way ANOVA test comparing grade groupings and need for EE services

Attribute	Grades	*n*	*M*	df	*F*	*p*
Need for outdoor classroom	K-2	102	2.85	2	1.73	0.180
	3-5	67	2.79			
	6-8	47	2.47			
Need for live animals in the classroom	K-2	103	2.53	2	6.88	0.001
	3-5	69	2.00			
	6-8	48	1.88			
Need for funding for activities and transport	K-2	102	4.28	2	3.12	0.046
	3-5	69	3.91			
	6-8	48	4.00			
Need for EE mailings (workshops, fact sheets)	K-2	102	2.96	2	1.07	0.344
	3-5	68	2.79			
	6-8	48	2.71			
Need for curriculum/lesson plans	K-2	103	3.12	2	1.37	0.257
	3-5	70	3.01			
	6-8	47	2.81			
Need for field trip ideas	K-2	103	3.65	2	7.07	0.001
	3-5	70	3.11			
	6-8	48	3.13			
Need for teacher networking opportunities	K-2	103	2.87	2	0.48	0.622
	3-5	70	2.73			
	6-8	47	2.74			
Need for pre/post activities	K-2	103	2.91	2	0.96	0.384
	3-5	69	2.71			
	6-8	48	2.77			
Need for speakers in the classroom	K-2	103	3.65	2	5.00	0.008
	3-5	70	3.49			
	6-8	48	3.10			
Need for student clubs at your school	K-2	103	2.37	2	2.38	0.095
	3-5	70	2.47			
	6-8	48	2.77			
Need for use of local non-formal EE sites	K-2	100	2.74	2	1.02	0.163
	3-5	70	2.44			
	6-8	48	2.52			
Total	K-2	103	3.09	2	3.96	0.021
	3-5	70	2.86			
	6-8	48	2.81			

Table 13

Post Hoc Student-Newman-Keuls (grade groupings and total need for EE services)

Grade Level Grouping	n	1	2
6-8	48	2.81	
3-5	70	2.86	
K-2	103		3.09
Sig.		.64	1.00

H_o2: There is no significant difference between teachers grade classifications (K-2) (3-5) (6-8) and their total need for EE training.

H_o 2: Accepted

This hypothesis was tested using a one way ANOVA procedure which compared teachers grade classifications (K-2) (3-5) (6-8) against their need for EE training (Table 14). Results of this test demonstrated no significant difference between the groups and total need for EE training. No individual attributes were found to be significantly different at the 0.05 level.

Table 14

One way ANOVA test comparing grade groupings and need for training

Attribute	Grades	n	M	df	F	p
Need for definition of EE	K-2	102	2.68	2	1.304	0.274
	3-5	70	2.91			
	6-8	48	2.90			
Need for increased knowledge of the environment	K-2	103	3.17	2	0.334	0.716
	3-5	70	3.19			
	6-8	48	3.04			
Need for EE teaching strategies	K-2	102	3.09	2	0.428	0.653
	3-5	68	3.01			
	6-8	48	2.94			
Need for availability and use of curriculum resources	K-2	103	3.25	2	0.440	0.645
	3-5	70	3.14			
	6-8	48	3.10			
Integrating EE with other subjects	K-2	103	3.22	2	0.107	0.899
	3-5	70	3.16			
	6-8	48	3.23			
Need for teaching about environmental issues	K-2	103	3.25	2	0.011	0.989
	3-5	70	3.27			
	6-8	48	3.27			
Need for alignment of EE with educational standards	K-2	103	3.29	2	1.225	0.296
	3-5	70	3.53			
	6-8	48	3.27			
Need for technology use relating to EE	K-2	102	3.15	2	0.397	0.673
	3-5	70	3.24			
	6-8	48	3.31			
Need for development and use of outdoor EE sites	K-2	103	3.18	2	0.243	0.784
	3-5	70	3.11			
	6-8	48	3.06			
Need for grant writing skills	K-2	103	3.28	2	0.370	0.691
	3-5	70	3.11			
	6-8	48	3.19			
Total	K-2	103	3.16	2	0.031	0.969
	3-5	70	3.17			
	6-8	48	3.13			

H$_o$3: There is no significant difference between teachers grade classifications (K-2) (3-5) (6-8) and their total perceived constraints.

H$_o$ 3: Accepted

This hypothesis was tested using a one way ANOVA procedure which compared teachers grade classifications (K-2) (3-5) (6-8) with their perceived constraints for conducting EE field trips (Table 15). Results of this test demonstrated no significant difference between the groups. Therefore, overall perceived constraints of teachers conducting EE field trips is relatively similar across grade levels.

Table 15

One way ANOVA test comparing grade groupings and constraints for teachers

Attribute	Grades	n	*M*	df	*F*	*p*
Structural Constraints						
Lack of Funding	K-2	97	4.37	2	0.038	0.963
	3-5	65	4.35			
	6-8	45	4.40			
Cannot afford to take an entire day out of the classroom	K-2	103	3.20	2	2.474	0.087
	3-5	70	3.54			
	6-8	48	3.60			
Difficulty in arranging suitable transportation	K-2	103	3.06	2	0.518	0.597
	3-5	70	2.89			
	6-8	48	3.08			
Poor access for those with physical disabilities	K-2	102	3.16	2	2.503	0.084
	3-5	70	2.80			
	6-8	48	3.04			
Inadequate bathroom/hand washing facilities	K-2	103	3.10	2	0.868	0.421
	3-5	70	2.87			
	6-8	48	2.98			
Poor accommodations for those with learning/behavioral issues	K-2	103	3.02	2	1.006	0.367
	3-5	70	2.80			
	6-8	48	2.85			
Personal Constraints (Inter/Intra)						
Lack of support from school administrators	K-2	103	2.60	2	1.448	0.237
	3-5	69	2.32			
	6-8	48	2.44			
Lack of parental support	K-2	103	2.34	2	0.730	0.483
	3-5	70	2.27			
	6-8	48	2.50			
Concern about the quality of EE programming	K-2	103	2.69	2	0.243	0.785
	3-5	69	2.58			
	6-8	48	2.65			
Not enough chaperones for supervision	K-2	103	2.40	2	1.510	0.223
	3-5	70	2.26			
	6-8	48	2.60			
Concern about proper gear/clothing for students	K-2	103	2.52	2	1.422	0.244
	3-5	70	2.44			
	6-8	48	2.75			
Liability issues and concerns	K-2	103	3.12	2	2.381	0.095
	3-5	70	2.76			
	6-8	48	3.17			
Concern about food and beverage service	K-2	103	2.67	2	0.100	0.905
	3-5	70	2.69			
	6-8	48	2.60			
Total	K-2	103	2.90	2	1.571	0.210
	3-5	70	2.79			
	6-8	48	2.98			

H$_o$4: There is no significant difference between years of teaching and the need for

EE services.

H$_o$ 4: Accepted

This hypothesis was tested using an independent samples t-test on the overall

need for EE services against the median score of teaching experience (those who have

taught for more than nine years were classified as "higher" experience while teachers

who have taught nine or less years were classified as "lower" experience). The overall

mean scores of teachers who taught below the median ($M = 2.90$) and above ($M = 2.92$)

were non-significant. Therefore, the amount of experience did not make a difference in

teachers need for EE services (Table 16). However there was a significant difference at

the 0.05 level between teaching experience and the need for student clubs ($p=0.008$).

Table 16

Independent samples t-test comparing length of service and need for EE services

Attribute	Career	n	*M*	*t*	*df*	*p*
Need for outdoor classroom	Lower Higher	123 117	2.63 2.78	-.952	238	0.342
Need for live animals in the classroom	Lower Higher	123 121	2.07 2.24	-1.128	242	0.260
Need for funding for activities and transport	Lower Higher	122 121	4.05 4.07	-.188	241	0.851
Need for EE mailings (workshops, fact sheets)	Lower Higher	123 119	2.74 2.87	-.896	240	0.371
Need for curriculum/lesson plans	Lower Higher	123 121	2.95 3.02	-.526	242	0.599
Need for field trip ideas	Lower Higher	123 122	3.30 3.30	-.018	243	0.986
Need for teacher networking opportunities	Lower Higher	123 121	2.82 2.71	.806	242	0.421
Need for pre/post activities	Lower Higher	122 122	2.76 2.80	-.322	242	0.748
Need for speakers in the classroom	Lower Higher	121 122	3.47 3.39	.643	241	0.521
Need for student clubs at your school	Lower Higher	123 122	2.67 2.30	2.692	243	0.008
Need for use of local non-formal EE sites	Lower Higher	123 119	2.45 2.64	-1.415	240	0.158
Total	Lower Higher	123 122	2.90 2.92	-.292	243	0.771

H$_o$5: There is no significant difference between years of teaching and the overall need for EE training.

H$_o$5: Accepted

This hypothesis was tested using an independent samples t-test which compared the overall need for EE training against the years of teaching experience. Teachers who have taught more than the median (9) were classified as "more experienced" and teachers who have taught nine or less years were classified as "less experienced." The overall mean scores of teachers below ($M = 3.08$) and above ($M = 3.12$) the median were non-significant. The amount of teaching experience did not make a difference in their need for EE training (Table 17). However, development and use of outdoor EE sites ($p=0.044$) and grant writing skills ($p=0.011$) were significant at the 0.05 level.

Table 17

Independent samples t-test comparing length of service and need for EE training

Attribute	Career	n	*M*	*t*	*df*	*p*
Need for definition of EE	Short	123	2.79	0.626	242	0.532
	Long	121	2.70			
Need for increased knowledge of the environment	Short	123	3.08	-0.431	243	0.667
	Long	122	3.14			
Need for EE teaching strategies	Short	123	2.98	0.073	240	0.941
	Long	119	2.97			
Need for availability and use of curriculum resources	Short	123	3.07	-0.559	243	0.577
	Long	122	3.15			
Integrating EE with other subjects	Short	123	3.13	-0.499	243	0.618
	Long	122	3.20			
Need for teaching about environmental issues	Short	123	3.10	-1.517	243	0.131
	Long	122	3.29			
Need for alignment of EE with educational standards	Short	123	3.26	-0.469	243	0.640
	Long	122	3.33			
Need for technology use relating to EE	Short	122	3.16	-0.055	242	0.956
	Long	122	3.16			
Need for development and use of outdoor EE sites	Short	123	2.92	-2.025	243	0.044
	Long	122	3.20			
Need for grant writing skills	Short	123	3.35	2.550	243	0.011
	Long	122	2.93			
Total	Short	123	3.08	-0.219	243	0.827
	Long	122	3.12			

H_o6: There is no significant difference between years of teaching and the overall

perceived constraints related to field trips.

H_o6: Accepted

This hypothesis was tested using an independent samples t-test which compared

the overall constraints against the median years (9) of teaching experience. Those who

had taught for more than nine years were classified as high experience and teachers who

have taught nine or less years were classified as low experience. The overall mean score

of teachers who taught below ($M = 2.91$) and above ($M = 2.83$) the median were non-

significant. The amount of years teaching did not seem to make a difference in the total

amount of perceived constraints for conducting field trips (Table 18). However, time out

of classroom ($p=0.020$), and lack of parental support ($p=0.041$) were significant at the

0.05 level.

Table 18

Independent samples t-test comparing length of service and total constraints for teachers

Attribute	Career	n	*M*	*t*	*df*	*p*
Structural Constraints						
Lack of Funding						
	Short	118	4.30	-0.336	229	0.737
	Long	113	4.34			
Cannot afford to take an entire day out of the classroom	Short	123	3.62	2.345	243	0.020
	Long	122	3.25			
Difficulty in arranging suitable transportation	Short	123	3.12	1.828	243	0.069
	Long	122	2.84			
Poor access for those with physical disabilities	Short	122	2.94	-0.372	242	0.710
	Long	122	2.99			
Inadequate bathroom/hand washing facilities	Short	123	2.85	-1.324	243	0.187
	Long	122	3.03			
Poor accommodations for those with learning/behavioral issues	Short	123	2.94	0.852	243	0.395
	Long	122	2.83			
Personal Constraints (Inter/Intra)						
Lack of parental support	Short	123	2.51	2.057	243	0.041
	Long	122	2.25			
Concern about the quality of EE programming	Short	122	2.65	0.212	241	0.832
	Long	121	2.62			
Not enough chaperones for supervision	Short	123	2.52	1.697	242	0.091
	Long	121	2.29			
Concern about proper gear/clothing for students	Short	123	2.66	1.831	243	0.068
	Long	122	2.43			
Liability issues and concerns	Short	123	3.04	0.636	243	0.525
	Long	122	2.94			
Concern about food and beverage service	Short	123	2.66	0.149	243	0.882
	Long	122	2.64			
Total	Short	123	2.91	1.072	243	0.285
	Long	122	2.83			

H$_o$7: There is no significant difference between teachers who had taken fewer

field trips   versus those who had taken more in relation to their overall need

for EE services.

H$_o$7: Rejected

This hypothesis was tested using an independent samples t-test which compared

the overall need for EE services from teachers taking fewer field trips against those who

had conducted more outings in their lifetime. Teachers who had conducted more than

nine field trips were classified as the experienced or (high) group, whereas teachers who

had conducted nine or less were classified as the less experienced (low) group. The

overall mean score of teachers who took a high number of field trips compared with those

taking a fewer number were significantly different (M=3.02 vs. M=2.82, respectively).

The total amount of field trips conducted by a teacher in their lifetime seemed to

influence their overall need for EE services (Table 19). Specifically, live animals for the

classroom (p=0.040) and use of local non-formal EE sites (p=0.005) were significant at

the 0.05 level.

Table 19

Independent samples t-test comparing life-time field trips and need for EE services

Attribute	Field trips	n	M	t	df	p
Need for outdoor classroom	Low	106	2.54	-1.894	217	0.060
	High	113	2.86			
Need for live animals in the classroom	Low	107	1.99	-2.062	221	0.040
	High	116	2.33			
Need for funding for activities and transport	Low	106	4.08	-0.393	220	0.695
	High	116	4.13			
Need for EE mailings (workshops, fact sheets)	Low	106	2.69	-1.458	220	0.146
	High	116	2.91			
Need for curriculum/lesson plans	Low	106	2.89	-1.507	221	0.133
	High	117	3.11			
Need for field trip ideas	Low	107	3.24	-1.273	222	0.204
	High	117	3.43			
Need for teacher networking opportunities	Low	107	2.74	-0.707	222	0.480
	High	117	2.84			
Need for pre/post activities	Low	107	2.73	-1.006	222	0.315
	High	117	2.86			
Need for speakers in the classroom	Low	106	3.37	-1.122	220	0.263
	High	116	3.53			
Need for student clubs at your school	Low	107	2.49	-0.008	222	0.993
	High	117	2.49			
Need for use of local non-formal EE sites	Low	107	2.34	-2.858	220	0.005
	High	115	2.74			
Total	Low	107	2.82	-2.194	222	0.029
	High	117	3.02			

H$_o$8: There is no significant difference between teachers who had taken fewer field trips versus those who had taken more in relation to their need for EE training.

H$_o$8: Rejected

This hypothesis was tested using an independent samples t-test which compared the overall need for EE training with the number of field trips taken by teachers in their lifetime. Teachers who had conducted more than nine field trips were classified as the "high" group, whereas teachers who had conducted nine or less were classified as taking a low number of field trips. The overall mean of teachers who took a high number of field trips ($M = 3.24$) was significantly different from those conducting a higher amount ($M = 2.99$). The total amount of field trips conducted by teachers in their lifetime seemed to influence their overall need for EE training (Table 20). Specifically, increased knowledge of the environment ($p=0.026$), use of curriculum resources ($p=0.016$), teaching about environmental issues ($p=0.001$), and development and use of outdoor EE sites ($p=0.000$) were significant at the 0.050 level.

Table 20

Independent samples t-test comparing life-time field trips and need for EE training

Attribute	Field trips	n	*M*	*t*	*df*	*p*
Need for definition of EE	Low High	107 116	2.70 2.75	-0.345	221	0.730
Need for increased knowledge of the environment	Low High	107 117	2.96 3.27	-2.240	222	0.026
Need for EE teaching strategies	Low High	107 114	2.87 3.09	-1.677	219	0.095
Need for availability and use of curriculum resources	Low High	107 114	2.95 3.28	-2.423	222	0.016
Integrating EE with other subjects	Low High	107 117	3.04 3.31	-1.957	222	0.052
Need for teaching about environmental issues	Low High	107 117	2.99 3.40	-3.261	2222	0.001
Need for alignment of EE with educational standards	Low High	107 117	3.19 3.45	-1.800	222	0.073
Need for technology use relating to EE	Low High	106 117	3.12 3.31	-1.217	221	0.225
Need for development and use of outdoor EE sites	Low High	107 117	2.81 3.32	-3.577	222	0.000
Need for grant writing skills	Low High	107 117	3.21 3.18	0.207	222	0.863
Total	Low High	107 117	2.99 3.24	-2.327	222	0.021

H$_o$9: There is no significant difference between teachers who had taken fewer

field trips versus those who had taken more of them in relation to their overall

perceived constraints.

H$_o$9: Accepted

This hypothesis was tested using an independent samples t-test which compared

the overall score of constraints associated with field trips using the median number of

outings (9) that teachers conducted in their lifetime. Teachers who had conducted more

than nine field trips were classified as the high group and teachers who had conducted

nine or less in their lifetime were considered to be in the low category. The overall mean

score of teachers who were classified in the high group ($M = 2.85$) was similar to those

reported in the low category ($M = 2.87$). The total amount of field trips conducted by

teachers in their lifetime did not influence their constraints in conducting field trips

(Table 21). However, not enough chaperones ($p=0.044$), was significant at the 0.05 level.

Table 21

Independent samples t-test comparing life-time field trips constraints for teachers

Attribute	Field Trips	n	*M*	*t*	*df*	*p*
Structural Constraints						
Lack of Funding	Low	102	4.32	-0.226	211	0.821
	High	111	4.35			
Cannot afford to take an entire day out of the classroom	Low	107	3.54	1.107	222	0.270
	High	117	3.36			
Difficulty in arranging suitable transportation	Low	107	3.10	1.511	222	0.132
	High	117	2.85			
Poor access for those with physical disabilities	Low	107	2.87	-1.017	221	0.310
	High	116	3.01			
Inadequate bathroom/hand washing facilities	Low	107	2.76	-1.957	222	0.052
	High	117	3.04			
Personal Constraints (Inter/Intra)						
EE will not meet the curriculum standards	Low	107	3.10	-0.723	221	0.470
	High	116	3.21			
Most students are not ready/mature enough for field trips	Low	107	2.38	1.832	222	0.068
	High	117	2.13			
Unpleasant experiences with prior EE trips	Low	107	2.15	0.994	220	0.346
	High	115	2.03			
Concerns about student safety	Low	107	2.55	0.478	220	0.633
	High	115	2.48			
Lack of support from school administrators	Low	107	2.36	-1.452	221	0.148
	High	116	2.58			
Lack of parental support	Low	107	2.40	0.697	222	0.487
	High	117	2.31			
Concern about the quality of EE programming	Low	106	2.58	-0.507	220	0.613
	High	116	2.66			
Not enough chaperones for supervision	Low	107	2.54	2.025	222	0.044
	High	117	2.26			
Concern about proper gear/clothing for students	Low	107	2.61	1.340	222	0.182
	High	117	2.43			
Liability issues and concerns	Low	107	2.94	-0.189	222	0.850
	High	117	2.97			
Concern about food and	Low	107	2.63	0.208	222	0.836

beverage service	High	117	2.60			
Total	Low	107	2.87	0.203	222	0.839
	High	117	2.85			

CHAPTER 5

Discussion

This chapter summarizes and discusses the results gathered from teachers who responded to a survey on EE services, training, constraints to conducting field trips, and usefulness of PFCA as a teaching resource. It will also discuss the findings from the hypotheses. This section highlights specific areas of need for teachers wanting to conduct EE field trips to PFCA, as well as identifying the strongest constraints that contribute to non-participation. Two outcomes of this section are to list some managerial implications for PFCA and generate possible ideas for future research.

Generally speaking, teachers in the sample were females (90%), similar to an earlier finding by Ham and Sewing (1987) who reported that 89% of teachers were females. Over 70% of the respondents taught kindergarten through fifth grade, while 88% taught different subjects. Only 17% of respondents had received any pre-service EE training, indicating that many of these school teachers are relatively inexperienced in EE programming (prior to becoming full time teachers). PFCA could remedy this situation by sponsoring some teacher workshops so they can become familiar with the area and its resources.

On average, teachers in the sample took less than 2 field trips per year and fewer than 16 trips in their career. The average length of teaching for those in the sample (M =12.1) was similar to the Ham and Sewing (1987) study ($M = 13.8$). Ko and Lee (2003) highlighted the importance of positive attitudes towards EE in order motivate teachers. Teachers' attitudes toward EE field trips in this survey was relatively high ($M = 8.3$ out

of 10). Findings from other studies have also noted positive attitudes toward EE or field

trips (Ham and Sewing, 1987; and Simmons, 1998). However, less than 6% of teachers

had used PFCA as a field trip destination. Perhaps rural school teachers in mid-Missouri

would be interested in visiting PFCA after they discover the benefits of having an

educational resource in the local area. Although respondents taught in school districts

that are adjacent to PFCA, only 22% of them had heard about the site prior to taking the

survey. About 20% of teachers knew that PFCA was managed by Missouri Department

of Conservation (MDC). These findings reveal an overall lack of awareness about PFCA

– something that can be corrected easily with marketing strategies and off-site programs.

Need for EE services

The overall need for EE services was 2.9 (5-point scale), and the range of scores

was between 2.2 and 4.1. Funding for activities and transportation were the highest need

($M = 4.1$), followed by classroom speakers (3.4). Some other, less important needs

included: field trip ideas, curriculum and lesson plans, pre/post visit activities, and

teacher networking opportunities. Brewer (2002) also found funding for transportation to

be an issue. Simmons (1987) found that lesson plan support and in-service training were

significant needs for teachers conducting EE programs. Collectively, these findings

represent a good opportunity for PFCA staff to interact with local school teachers, either

on or off-site.

Need for EE training

The overall need for EE training was slightly higher than the need for services

(3.1 vs. 2.9, respectively). However the range of training needs was fairly narrow, from

2.8 to 3.3. The five highest ranking needs were: alignment of EE with educational

standards, grant writing skills, technology use related to EE, teaching about environmental issues, and integrating EE with other subjects. Simmons (1987) also found a strong need for teachers to integrate EE field trips or programs into the classroom. Although there is not an acute need for training, it is important for PFCA to align their educational programs with the appropriate Grade Level Expectations (GLE's) and advertise this educational benefit to teachers and administrators.

Constraints Influencing EE field Trip Participation

Two sections of the survey measured constraints associated with non-participation in EE activities, programs, or services. The first portion dealt with teachers and the next section examined teacher perceptions of student non- participation in EE field trips.

Overall, results for teacher constraints are closely aligned with other surveys. Similar to past studies (Ko and Lee, 2003; Kim and Fortner, 2006), structural or logistical barriers ($M = 3.3$) were more significant than interpersonal ($M = 2.7$) or intrapersonal ones ($M = 2.7$).   Overall, lack of funding ($M = 4.3$) and awareness of sites and facilities ($M = 4.1$) were the most significant constraints that influenced teachers non-attendance of field trips at this location. Lack of funding was found to be an important barrier in other studies (Brewer, 2002; Ham and Sewing, 1987; and Keown, 1986). Other significant barriers included too much time out of the classroom, EE not meeting curriculum standards, poor access with physical disabilities, liability, and difficulty in arranging suitable transportation. Research conducted by Ko and Lee (2003); Keown (1986); Kim and Fortner (2006); and Simmons (1998) have also shown these barriers to be significant. PFCA should address these constraints and to inform teachers about the options available to them.

The next section examined teacher perceptions of constraints that might influence student non-participation in EE field trips. It resulted in an average score of 3.6. This is an interesting finding because the total score of teacher constraints was much less (M = 2.9). The range for this section was between 2.8 and 4.3. Unsafe outdoor areas was the most significant constraint, followed by fear of strangers, scared of germs, getting lost, eating a bag lunch, and lack of appropriate clothing. Education and outreach efforts should keep these perceived constraints in mind when marketing PFCA to students (including their teachers and parents).

Prairie Fork Conservation Area

The next two sections are site specific to PFCA. They examine how PFCA can be used by teachers as an educational resource, as well as the most appropriate ways in which to inform teachers about the site.

The usefulness of PFCA as an educational facility was *M*=3.4 (range consisting of 1.6 to 4.3). This score is quite high, considering that less than 6% of the teachers have been to the site. Reinforcing science received the highest rating. The five next highest areas of importance were: providing speakers for the classroom, developing social skills (i.e., teamwork and leadership), exposing students to the scientific method, reinforcing social studies, and reinforcing math. It is important to note that all the items in this section were rated above average, except for providing overnight stays. This is a positive finding because it indicates that PFCA can be useful for teachers in many different ways.

The last section of the survey asked teachers to comment on appropriate venues for informing others about PFCA. Responses revealed a variety of methods that could be used such as workshops, conferences, PTA meetings, school board meetings, and other.

Although workshops were rated highly (31%), 43% of the teachers recommended using more than one method to inform others about PFCA.

Hypotheses

Hypotheses one through three focused upon sub-dividing teachers into three groups based on grade levels (K-2) (3-5) (6-8). No significant difference was found between these groupings and the need for training or teacher constraints. However, there was a significant difference ($p = .02$) between (K-2) teachers and both (3-5) and (6-8) grades concerning need for services. This indicates that K-2 teachers may require more services than teachers in other grades to effectively participate in field trips. Four areas of need that were of special interest to K-2 teachers were; 1) live animals for the classroom; 2) funding for activities and transport; 3) field trip ideas; and 4) classroom speakers.

Hypotheses four through six were tested by splitting career length into "short" or "long" based on the median number of years taught (9). This was done to examine whether teachers with shorter teaching careers would have different perceptions of the need for services, training, and constraints as compared with those teaching for a longer period of time. There was no significant difference found between teachers with longer or shorter teaching careers in those three categories. However, some individual attributes within the categories were found to be significant. Need for student clubs ($p = .008$), and grant writing skills ($p = .011$) were more important for teachers with shorter careers, while teachers with longer careers found the need for development and use of outdoor EE sites ($p = .044$) as more important. Two particular constraints; time out of classroom ($p =$

.02) and parental support ($p = .041$) were statistically significant for those with shorter teaching careers.

Hypotheses seven through nine were tested by splitting teacher responses by the amount of field trips taken in their career into low (nine or below) or high (above nine). This was done by using the median number (9) of field trips taken per career. These hypotheses were created to determine if there were differences between teachers who had taken more or less field trips and their need for services, training, and constraints. There was a significant difference in total number of needs for services ($p = .029$) and need for training ($p = .021$) between teachers taking low and high amounts of field trips. Needs for services from less experienced teachers were: local non-formal EE sites ($p = .005$) and live animals in the classroom ($p = .040$) as compared to their more experienced colleagues. Teachers with more field trip experience had several areas of needs for training when compared to less experienced teachers: 1) increased knowledge of the environment ($p = .026$); 2) availability and use of curriculum resources; 3) teaching about environmental issues ($p = .001$); and 4) development and use of outdoor EE sites ($p = .000$). Although there was no significant difference between teachers who were more or less experienced with conducting field trips, teachers with less experience indicated that chaperones for supervision ($p = .044$) was a significant barrier to conducting field trips.

Managerial Implications

Anecdotal evidence suggests that PFCA is an important, but under-utilized teaching facility for students to learn about resource management practices and ecological processes in mid-Missouri. This survey represents a starting point for PFCA

to improve on existing programs and services. Recommendations based on these results will hopefully create some new educational opportunities.

PFCA could identify a target market, including distance parameters, grade ranges, and affiliation (i.e., 60 mile radius / 5th & 6th graders / public schools). Other classifications may be considered as secondary or tertiary markets. After the target market has been identified, PFCA could describe the type of programs, services and activities that can be provided. A partnership may be developed with the University of Missouri to create, implement, and evaluate curriculum materials used in the teaching/learning process at PFCA. This suggestion is consistent with the goals / objectives established at PFCA.

It is important to make teachers aware that PFCA is an ideal field trip destination in mid-Missouri, especially among those in the target audience. This can be accomplished through website design and direct mailings to the schools. Outreach to schools in the target market will be very helpful for teachers to negotiate perceived constraints. It is ironic that some of the perceived constraints (i.e., transportation, money, etc.) are not constraints at all. PFCA and MDC have supplemental money available for field trip purposes. However, many teachers are not aware of it. Advertising this service should extend beyond readership of the *Missouri Conservationist*.

A marketing strategy should be designed to use a variety of methods such as classroom speakers, workshops, and flyers etc. Guest speakers (from PFCA) can be a good source of public relations and they could use this opportunity to showcase the diversity of programs and services that are available. Teachers should be invited to

PFCA for "on-site" workshops and training opportunities that qualify for continuing education credit. This is one useful technique for education outreach.

Developing lesson plans that meet (or exceed) the appropriate GLE's is crucial to educational success. Lessons can focus on science, but should incorporate subjects that would appeal to "other" teachers as well (i.e., arts & literature, math, physical education, etc.). This should dispel the myth that field trips are only for science classes, thus broadening the range of possible classes that would be interested in using PFCA as a field trip destination.

Outreach efforts should also stress the importance of non-curricular benefits associated with field trip participation (e.g., teamwork, leadership, group initiatives, etc.). PFCA staff will need to broaden their definition as a service provider in order to accommodate these objectives. In other words, not every program has to be educational in nature – some can be recreational. Some unique benefits can be derived from such activities.

In conclusion, PFCA should work closely with school principals to mitigate the most significant constraints that typically prevent teachers from participating in field trips (awareness, funding, curriculum, transportation, etc.). Lastly, by making teachers aware of the reasons that students are likely to give for non-participation in field trips, they should be able to diminish concerns and generate enthusiasm for these activities when announced in class. Following these basic guidelines should help to ensure the success of youth education at PFCA

Future Research

Future studies may use this information for refining the constraints negotiation model as it applies to EE. Although not studied, voluntary groups such as Boy Scouts, Girl Scouts, and 4-H should be included in the mix of educational/recreational opportunities. Other studies may use these results for developing different methods of inquiry, such as interviews or focus groups. In other words, there is more than one way to measure and address constraints. Few studies have used focus groups or interviews to determine needs or services, training, barriers, and constraints that influence teacher non-participation in EE field trips.

In relation to PFCA, it would be useful to conduct student and/or teacher surveys to examine the effectiveness of PFCA's education outreach efforts. Periodic surveys on surrounding school teachers would also keep PFCA and MDC familiar with the current trends and constraints that teachers face. Although these impediments will change over time, it is important to ensure success into the future.

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APPENDIX A

Request for Permission Script

Introduction:

Hello my name is John Swain. I'm a graduate student in the Department of Parks, Recreation and Tourism at the University of Missouri.

Purpose:

I'm involved in a joint research project between the University of Missouri, Missouri Department of Conservation, and Prairie Fork Conservation Area (located near Williamsburg, Missouri). Prairie Fork Conservation area is a 700 acre tract of land that was donated to (MDC) by Pat Jones in 1997. It is used for habitat restoration, environmental education, and research.

I am investigating the use of Prairie Fork Conservation Area as a destination for school field trips by K-8 teachers. Your school (NAME) has been selected to participate in this study.

This information will be used for my master's thesis, but also for developing an education and outreach plan at the site. MDC needs the results so they can implement an educational strategy. After our conversation, I'll send you an email that will provide some more information about Prairie Fork Conservation Area. If you would like to participate in the study, please reply to my email. A simple YES or NO will work. If you agree, then I will need to get a list of all kindergarten through 8th grade teachers at your school. Since this is a mail-back survey, all questionnaires will be delivered to the school. Perhaps your secretary can provide me with an updated teacher list. Thanks for talking with me about this project. I'm looking forward to your response.

Why are you important?

We are only sampling a small group of teachers in the surrounding counties. By doing so, our results should reflect the needs of teachers in Mid-Missouri.

APPENDIX B

First Mailing (Pre-notification Post Card)

Dear Teacher,

Next week you will be receiving a mail survey which is intended to measure teacher perceptions of barriers and constraints regarding environmental education. I am only sampling a small number of teachers in mid-Missouri, comparing those who have AND have not taken students on field trips. Your response is needed to develop an education / outreach plan for the MO Dept. of Conservation. Also, I need the data to complete my Master's Thesis. ☺

Sincerely,

John R. Swain, Graduate Student
University of Missouri-Columbia

APPENDIX C

Second Mailing (Cover Letter)

Date

Teacher Name
Address
CSZ

Dear XXX:

Prairie Fork Conservation Area (PFCA), located near Williamsburg, Missouri is co-managed by the Missouri Department of Conservation and the University of Missouri-Columbia. Although environmental education at PFCA is a priority, attendance by school groups is rather low. Our purpose is to find out why this is occurring. Therefore, we want to determine the barriers and constraints of field trips. School teachers who have NOT been to PFCA are our target audience. However, if you have taken students to this site we need your opinions for comparison purposes.

Your school administrators have given us permission to conduct the study. We want you to participate, but compliance is voluntary. It is important that each questionnaire is completed because you represent a larger group of teachers that are within a short driving distance of PFCA. Results of the study will be used by researchers from the University of Missouri-Columbia and the Missouri Department of Conservation to improve environmental education programs and services at PFCA. It will only take about 15 minutes to complete the questionnaire.

You can be assured that any information obtained through the survey will remain completely confidential. Each questionnaire is numbered, but it is for mailing purposes only. Once your survey is returned, your name will be deleted from the mailing list. Your contact information will be destroyed after the project has been completed and it will not be shared with anyone else.

This study is a joint research project between the Department of Parks, Recreation, and Tourism at the University of Missouri-Columbia, Missouri Department of Conservation, and Prairie Fork Conservation Area. We would be glad to answer any questions you may have about this project. You may contact us at the letterhead address above for more information.

Please complete the enclosed questionnaire, seal with the sticker, and place in any U.S. Postal Service mail box at your earliest convenience. We sincerely appreciate your time and assistance.

Sincerely,

Dr. Mark Morgan, Associate Professor   John Swain, Graduate Student
Dept. of Parks, Recreation & Tourism   Dept. of Parks, Recreation & Tourism
University of Missouri-Columbia   University of Missouri-Columbia
markmorgan@missouri.edu   jrsxt8@mizzou.edu

APPENDIX D

Third Mailing (Reminder Post Card)

Dear Teacher,

Recently, you were asked to complete a survey about environmental education. This information is needed to develop a management plan for Prairie Fork Conservation Area. Your response is very important. If you have already returned the questionnaire, please accept my sincere thanks. If not, please finish it as soon as possible.

If it got misplaced, contact me at (573) 882-7086 and I will send you another copy.

Sincerely,

John R. Swain, Graduate Student
University of Missouri-Columbia

APPENDIX E

Fourth Mailing (Cover Letter)

date

Mr./Ms. XXXX
Address
Dear Mr./Ms. XXXX

Several weeks ago you received a needs assessment survey which asked about underutilization of Prairie Fork Conservation Area (PFCA) as a destination for school field trips. To the best of my knowledge, it hasn't been returned. Please forgive us if our letters happen to cross in the mail.

The comments of teachers who have responded include a variety of barriers and constraints associated with non-participation. Staff at the Missouri Department of Conservation, University of Missouri-Columbia, and Prairie Fork Conservation Area will find these results very useful in updating and modifying their Environmental Education programs.

We are writing again because of the importance that each questionnaire has for obtaining accurate results. These surveys were distributed to a small number of teachers in our local area. Therefore, it is important that everyone in the sample return their questionnaire to ensure that the results truly represent the opinions of Mid-Missouri school teachers.

We would like to point an important fact about the survey procedure. Once your survey has been returned, your name will be deleted from the list. Responses will not be linked with individual names and you will not be contacted again. Protecting the anonymity of respondents is of utmost importance.

We hope that you will complete and return the questionnaire soon. However, if you prefer not to answer it, then please let me know by returning the survey unanswered. In case your questionnaire was lost, a replacement is enclosed.

Sincerely,

Dr. Mark Morgan, Associate Professor   John Swain, Graduate Student
Dept. of Parks, Recreation & Tourism   Dept. of Parks, Recreation &Tourism
University of Missouri-Columbia   University of Missouri-Columbia
markmorgan@missouri.edu   jrsxt8@mizzou.edu

APPENDIX F

Questionnaire

TELL US ABOUT YOURSELF

(*Please circle or fill in the answers that best describe you*)

1. How often have you taken students on any field trips?

    _____ times (past 12 months)

    _____ times (teaching career)

2. What is your overall attitude about taking students on field trips?

    Poor 1   2   3   4   5   6   7   8   9   10 Excellent

3. Before today, have you heard of Prairie Fork Conservation Area (PFCA)? ___yes or ___no

4. Have you taken students on a field trip to PFCA? ___yes or ___no

5. Were you aware that PFCA is managed by the Missouri Dept. of Conservation (MDC)?

    ___yes or ___no

    1. Have you received pre-service training in Environmental Education (EE)? ___yes or

        ___no

    2. What grade do you presently teach? _____ grade

    3. Which subject(s) do you teach? ___Science only or ___ Social Studies only or ___All

    4. How long have you been teaching? ___ years (teaching career)

    5. What is your highest degree completed?

        ___ Bachelors _____ (Major)

        ___ Masters   _____ (Major)

        ___ Ph. D   _____ (Major)

11. Your Gender? ___male or ___ female

12. Your Zip Code? _____

13. Have you read the book *Last Child in the Woods* by Richard Louv? ___yes or ___no

Need for Environmental Education Services

(*Please check one box for each item*)

	Lowest Need		Medium Need		Highest Need
An outdoor classroom at my school	( )	( )	( )	( )	( )
Live animals for my classroom	( )	( )	( )	( )	( )
Funding for activities and transportation	( )	( )	( )	( )	( )
EE mailings (workshops, fact sheets, etc)	( )	( )	( )	( )	( )
Curriculum / lesson plans	( )	( )	( )	( )	( )
Field trip ideas	( )	( )	( )	( )	( )
Teacher networking opportunities	( )	( )	( )	( )	( )
Pre / post visit activities	( )	( )	( )	( )	( )
Speakers in your classroom	( )	( )	( )	( )	( )
Student clubs at your school	( )	( )	( )	( )	( )
Use of local non-formal EE sites	( )	( )	( )	( )	( )

Need for Environmental Education Training

(*Please check one box for each item*)

	Lowest Need		Medium		Highest Need
Definition of Environmental Education	( )	( )	( )	( )	( )
Increase knowledge about the environment	( )	( )	( )	( )	( )
EE teaching strategies	( )	( )	( )	( )	( )
Availability and use of curriculum resources	( )	( )	( )	( )	( )
Integrating EE with other subjects	( )	( )	( )	( )	( )
Teaching about environmental issues	( )	( )	( )	( )	( )
Alignment of EE with educational standards	( )	( )	( )	( )	( )
Technology use relating to EE	( )	( )	( )	( )	( )
Development and use of outdoor EE sites	( )	( )	( )	( )	( )
Grant writing skills	( )	( )	( )	( )	( )

What do you think the average TEACHER would say about each of these barriers and constraints related to non-participation in EE?

(*Please check one box for each item*)

Barriers/Constraints	Strongly Yes	Yes	Neutral	No	Strongly No
Lack of awareness of sites and facilities	( )	( )	( )	( )	( )
EE will not meet the curriculum standards	( )	( )	( )	( )	( )
Lack of funding	( )	( )	( )	( )	( )
I cannot afford to take an entire day out of the classroom	( )	( )	( )	( )	( )
Most students are not ready/mature enough for field trips	( )	( )	( )	( )	( )
Unpleasant experiences with prior EE trips	( )	( )	( )	( )	( )
Concerns about student safety	( )	( )	( )	( )	( )
Lack of support from school administrators	( )	( )	( )	( )	( )
Lack of parental support	( )	( )	( )	( )	( )
Concern about the quality of EE programming	( )	( )	( )	( )	( )
Not enough chaperones for supervision	( )	( )	( )	( )	( )
Difficulty in arranging suitable transportation	( )	( )	( )	( )	( )
Concern about proper gear/clothing for students	( )	( )	( )	( )	( )
Liability issues and concerns	( )	( )	( )	( )	( )
Inadequate bathroom / hand-washing facilities	( )	( )	( )	( )	( )
Poor access for those with physical disabilities	( )	( )	( )	( )	( )
Poor accommodations for those with learning / behavioral issues	( )	( )	( )	( )	( )
Concern about food/beverage service	( )	( )	( )	( )	( )

What do you think the average STUDENT would say about each of these barriers and constraints related to non-participation in EE?

(*How do the following factors affect your students desire to participate in outdoor EE field trips. Please check one box for each item.*)

	Strongly Yes	Weakly Yes	Neutral	Weakly No	Strongly No
Outdoor areas are unsafe	( )	( )	( )	( )	( )
The bus ride is too long	( )	( )	( )	( )	( )
These kinds of places are too boring	( )	( )	( )	( )	( )
My parents think it is a waste of time	( )	( )	( )	( )	( )
Lack of appropriate clothing or shoes	( )	( )	( )	( )	( )
Fearful of getting lost	( )	( )	( )	( )	( )
Weather conditions such as wind and rain	( )	( )	( )	( )	( )
The bathrooms are nasty	( )	( )	( )	( )	( )
Eating a bag/sack lunch	( )	( )	( )	( )	( )
Scared of animals (insects, spiders & snakes)	( )	( )	( )	( )	( )
Scared of "germs" (getting sick)	( )	( )	( )	( )	( )
Getting dirty, hot, or sweaty	( )	( )	( )	( )	( )
Not physically fit for outdoor activities	( )	( )	( )	( )	( )
Some plants are irritating (weeds, poison ivy).	( )	( )	( )	( )	( )
Fear of strangers at the site	( )	( )	( )	( )	( )

How can PFCA be useful to you as a teacher?

(*Please tell us how we might be of service*)

	Not Useful		Moderately		Very Useful
Reinforcing science	( )	( )	( )	( )	( )
Reinforcing math	( )	( )	( )	( )	( )
Reinforcing english	( )	( )	( )	( )	( )
Reinforcing social studies	( )	( )	( )	( )	( )
Reinforcing history	( )	( )	( )	( )	( )
Reinforcing art/music	( )	( )	( )	( )	( )
Providing overnight stays	( )	( )	( )	( )	( )
Offering long-term EE programs	( )	( )	( )	( )	( )
Teaching of outdoor skills such as fishing, boating, etc.	( )	( )	( )	( )	( )
Developing social skills such as teamwork and leadership	( )	( )	( )	( )	( )
Providing speakers for your classroom	( )	( )	( )	( )	( )
Exposing students to research projects and the scientific method	( )	( )	( )	( )	( )

What venue do you think would be most appropriate for informing teachers about PFCA?
( ) Workshops, ( ) Conferences, ( ) PTA meetings, ( ) School Board meetings,
( ) Other:_____

Other comments and suggestions are welcome

Thanks For Your Cooperation!
Seal with the sticker provided and drop in any U.S. mailbox
The postage has been prepaid

APPENDIX G

Open-ended Comments

- I schedule one trip during the summer to the Mark Twain/Clarence Cannon Dam Area. I didn't realize PFCA was so close.
- We do have an Earth's Classroom venue that 2nd grade has visited for many years. It has awesome learning opportunities. It is within 10 minutes of Owensville. We also find that the schools closest to the Earth's Classroom are the ones that don't visit. I have annually dedicated a day long event to Earth Day. My first year at St. Patrick's Catholic School in Rolla, MO provided this example for me and I've continued it. I'm thinking that the main factor that would keep us away is distance/time on the bus.
- It's difficult to plan field trips that are close enough to school so that students will have an opportunity to learn/see everything at the site because we must return to school before the school day ends so students can ride the buses home. Time is against us. We take trips by grade level-usually 80 students. (Travel time to and from, restroom breaks, lunch break). Usually not enough time to see everything available.
- A field trip must fit into one of our GLE's (Grade Level expectations) set by DESE.
- Our staff enjoys the Dept. of Conservation teacher workshops and would love to attend one that was so close to Centralia! If we get actual ideas on how to best use your park we would definitely come to PFCA.
- Most teachers are unaware of Prairie Fork C.A. Also, it would help if the coordinator would stay the same for more than 2 years. When I take my students to P.F. and there is a new coordinator, I don't know if the trip will be as educational and fun as it was with the previous coordinator.
- Our school district usually allows only 1 field trip in a school year and many teachers repeat the same one every year that goes along with curriculum. I, personally love Prairie Fork and speak very highly of its beauty.
- I'm glad I got this survey. We are always looking for better, more educational field trips at our school.
- With everything that is required of teachers at this point in time – it's hard to schedule things and plan everything.
- Our school permits us 1 field trip – mostly because of cost. Our whole grade level usually goes at once- which is about 80 kids. We look for a quality experience that will be educational yet fun and safe. The kindergarten classes usually attend the Runge Nature Center in J.C., so we have usually looked for something a bit different. We will however be looking for a new activity next year and will consider your site If you send us some info. –Nancy LaBoube Hermann Elem.
- Just sending an email with your website might be good. If you do this survey again, you may want to word the question for non-participation differently. For example, "Why might STUDENTS not want to participate in EE?"

- Thanks for updating me on this sight. I looked it up on the web. I think I will take time and see if we can use this sight for our science program.
- We have visited in the past but do not have the funds to do so now.
- I love this program. I take classes all the time. We (the teacher in my building took 6 hours.
- I work in a rural area – I feel conservation and environmental education is very important, enjoy programs offered by JC Runge Nature Center and MU extension!
- Our school loves field trips. We try to take 2-3/year; we try to vary what each grade does so the children have a wide variety of experiences when they leave our building.
- I knew there was a Conservation Area near Williamsburg, but didn't know the name of it (husband rabbit hunts!) Didn't know programs were available @ Conservation Area or that speakers could be provided.
- I don't know about your facilities or programming having never been there, so answering was difficult. Unless it is directly related to a grade's GLE's – we can't take much time for it.
- Related to quality of programming – I always look for something that is safe for second graders, but allows them opportunities to explore.
- This seems like it could be a very beneficial experience. It should be "advertised" more.
- Thank you for your commitment to Environmental Education. I feel there is a lack of resources for teachers (or I haven't found them).
- I teach kindergarten – some areas are not appropriate.
- Being new to E. MO, I've never heard of PFCA – sounds interesting. Tell us more! I love getting kids out in nature and getting them more familiar with our world.
- I have used PFCA for my after school fishing club. We fished, hiked, ate lunch, and had a wonderful time. I was impressed with the site. Our school unfortunately, does not allow field trips during the school day unless the whole class (60-80) kids go. Otherwise, we must take our field trips after school or on Saturdays.
- I don't know about this program.
  Our budget is limited as is our time. Walking distance is best for us.
- Send school pamphlets with pictures of the place and an idea or two of how it hits GLE –Grade Level Expectations. These are listed on the Department of Ele. and sec. site. (also called Dese)
- Students love field trips. The distance to get there is the problem for us. I would love to take more field trips, but we are very limited w/ time and funding. P.S. Sorry it took so long to return!

- I'm aware of PFCA in fact our 6th grade team has recently discussed a field trip there – we plan to work out funding through a local Kiwanis Grant. Last years plan for a day at Marshall-Diggs became a day for speakers on campus a terrible t-storm threat cancelled.
- We just haven't had funding for field trips.
- We are often limited to 1 field trip or 2 per year due to funding, some years none, buses aren't air conditioned so long trips aren't as desired. Try to write books for Scholastic- leveled reading ones. All our field trips must be tied to our curriculum. All tied to state standards or GLE's. No Child Left Behind drives most everything now days! Everything must be in our state curriculum. Lots of schools are doing book studies now. Try getting book on page 1 in book studies or offer to lead one in some schools. We take close to 100 students on field trips at one time. We take a whole grade level of 4-5 classes some years. We need places to have sack lunches and lots of bathrooms/water fountains. We can only go so far due to limits of buses that are shared with other schools/sites. One thing that gets cut are field trips when finances drop. We like sites where teachers have full view of children due to liability and also like shelters if it rains or to move to shaded areas when hot. We also like shelters during tornado season close to us.
- Sorry I lost this the first time.
- This is my first year teaching my own classroom. I moved to Missouri from Ohio for this position. I would like any opportunity/information to help me learn about Missouri and what's available to me as an educator.