DOCUMENT RESUME

ED 398 020 RC 020 676

AUTHOR Liddle, Jeff, Ed.; Storck, Steve, Ed.
TITLE Adventure Program Risk Management Report: 1995 Edition. Narratives and Data from 1989-1990.
INSTITUTION Association for Experiential Education, Boulder, CO.
PUB DATE 95
NOTE 64p.
PUB TYPE Reports - Evaluative/Feasibility (142) -- Reference Materials - General (130)

EDRS PRICE MF01/PC03 Plus Postage.
DESCRIPTORS Accident Prevention; *Accidents; *Adventure Education; Camping; *Databases; Documentation; Elementary Secondary Education; Higher Education; *Injuries; Models; Outdoor Education; Questionnaires; Risk; *Risk Management; Safety; *Trend Analysis
IDENTIFIERS *Incident Reporting

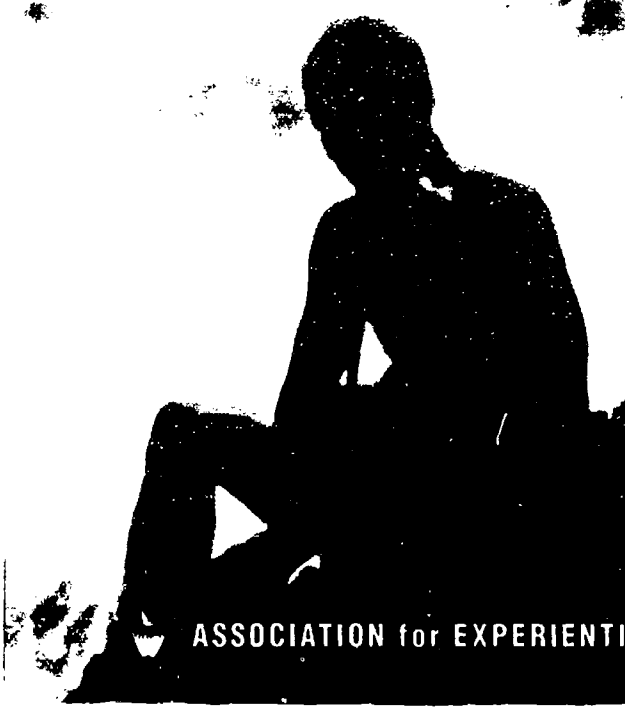
ABSTRACT

This report presents data collected during 1989-90 for the Adventure Program Incident Reporting Project, a joint project between the Wilderness Risk Managers Committee and the Association for Experiential Education. The project provides a means to educate interested parties about the risk management implications of different adventure activities, a comprehensive incident database for use in statistical analysis and trend analysis, and a central reporting forum for incidents in adventure programming. Programs were asked to estimate actual hours of participation by clients and staff for specific activities and for client groupings. The report also requested detailed information on each incident including a brief narrative. The first section of the report includes definitions of terms and models that were used for analyzing data. Section 2 provides descriptive statistics on incidents reported in the database. The 55 programs providing data included private and public instructional organizations, psychiatric hospitals, universities, county parks and recreation departments, camps, schools, 4-H programs, and court service programs. A total of 832 injuries and illnesses were reported, of which 433 were deemed serious injuries. Other data describe clients, activities, types of injury or illness, primary causes of injury or illness, injury rates, injury by time of day, and reinjury profiles. The last section includes narratives describing both near-miss situations and injury-producing incidents during games and initiatives, ropes courses, rock climbing, caving, cycling, snow skiing, canoeing, whitewater paddlesports, hiking, camping, backpacking, and transportation. The appendix includes information on the incident reporting project and a copy of the incident report form. (LP)

Adventure Program Risk Management Report

1995 Edition

Incident Data & Narratives from 1989-1990



ASSOCIATION for EXPERIENTIAL EDUCATION

ADVENTURE PROGRAM RISK MANAGEMENT REPORT:

1995 Edition

NARRATIVES AND DATA
From
1989-1990

ADVENTURE PROGRAM RISK MANAGEMENT REPORT:

1995 Edition

NARRATIVES AND DATA From 1989-1990

Edited by

Jeff Liddle
&
Steve Storck

Published by
The Association for Experiential Education
2885 Aurora Avenue, Suite #28
Boulder, CO 80303

Cover Illustration:
Kayaker Dan Sarich contemplating life as he gazes into the froth of Lava Falls on the Colorado River through Grand Canyon. Photograph by Jeff Liddle.

ACKNOWLEDGEMENTS

This publication would not have been possible without the encouragement, enthusiasm, support, and a lot of "computering" on the part of a lot of folks. Certainly there would be no report without the data from the participating programs. To those programs we say thanks for openly sharing information that ultimately allows the field of adventure-based programming to better manage risk.

A special thanks goes to those people that have had a direct impact on this project: Tod Schimelpfenig and the NOLS staff for entering the raw data into the computer, Dr. Michael Gass and staff--especially Heather Carver of the University of New Hampshire for speed typing all 1,159 narratives into the computer, Alan Hale for the years of dedication and work he put into developing the National Safety Network, and finally, our partners, Nannette Chisholm and Cindy Storck who herded our kids while we spent long hours huddled over the computers. To all of you a heartfelt THANKS!

TABLE OF CONTENTS

INTRODUCTION

In 1984, Alan Hale established the National Safety Network (NSN) to address safety issues in adventure-based education programs. Of particular interest was the development of what was then called a "common injury database." The goal of that early effort was to "speed the development and circulation of vital accident and injury data to raise safety consciousness, demonstrate insurability, develop a tool for staff training, and contribute to the maturing of the adventure education industry."[1]

After producing 5 *Reviews*, Hale, having graduated from law school, was ready to hand over the project to an interested and committed party. In 1992, the Association for Experiential Education (AEE) and the Wilderness Risk Managers Committee (WRMC) agreed to take over the work of the NSN. In making the transition, Hale not only turned over the project but also handed over all of the 1989 and 1990 data that had been collected. With the help of National Outdoor Leadership School and University of New Hampshire staff, the data was entered into a computerized database system where it could be analyzed.

This particular report serves as a transitional step between the reporting format used by the NSN and the new reporting format used by AEE and the WRMC. The hope is that as this project takes hold, it will continue to evolve in a way that encourages more accurate reporting as well as provide more usable information.

This is the first edition of the annual *Risk Management Report* that the AEE will publish as a result of the Adventure Program Incident Reporting Project. In this edition readers will find data collected from 1989 and 1990. There will be a lapse in reported data from the years 1991-1993 as there was no data collection mechanism in place during this time period. The next publication will include 1994 and 1995 data. Following the '94 - 95 report, the goal is to publish the prior year's data on an annual basis. Both backcountry/wilderness-based and facility-based (i.e., ropes courses, climbing towers, etc.) programming incidents are currently and will continue to be included. The goals of the database and publication are:

- To provide a tool to educate interested parties (insurance industry, program managers, public land custodians, participants, etc.) about the risk management implications of different adventure activities.
- To provide a significant and comprehensive incident database upon which statistical analysis can be done to provide a collective knowledge base and reliable information source for the field of adventure programming.

[1] A. Hale (1984). *Annual Review - 1984*. National Safety Network.

(Goals Continued:)

- To provide the central reporting forum for incidents in adventure programming.

- To enhance the collective judgment of the field of adventure programming by examining trends within it.

METHODOLOGY

Throughout 1989 and 1990, NSN data-reporting forms were sent to those programs requesting the forms and those who had previously reported to the NSN. Submitting data to the project was strictly on a self-reporting, voluntary basis. As this is not a random sample of outdoor programs, results are only generalizable to the contributing organizations.

For reports to be included in the database, each program had to submit incident data on the NSN report form as well as submit annual participation data. Programs were asked to estimate actual hours of participation by clients and staff for specific activity categories and for client groupings. The report forms included detailed information on each incident including a brief narrative. Data was to be submitted no later than March 1 of the subsequent year.

Once the data was collected in raw form, it was boxed up, sent to AEE, entered into the computer, and analyzed. Each case was reviewed and classified as a near miss, minor injury, or serious injury based on the NSN criteria. Once classified, the incidents were analyzed and presented in the form of this report. To ensure confidentiality, none of the programs who submitted data are listed in this document (a difference from the NSN of listing the participating programs).

SECTION 1: THEORETICAL FOUNDATIONS

(This section is reprinted from the 1989 National Safety Network Review with permission of the author, Alan N. Hale. These terms and models were used as the basis for analyzing the 1989 and 1990 data. Future data analysis will utilize terms and procedures found in Appendix 1: Adventure program incident reporting guidelines.)

Throughout the late 1980s Alan Hale and the National Safety Network (NSN) offered Safety Management Workshops across the U.S.. These workshops focused on training outdoor professionals to manage activities and participants for the safest possible experience. The following terms and models formed the theoretical framework for NSN workshops. To date, these models remain as the basic foundation of many risk management strategies utilized in the field of adventure programming.

Definition of Terms

Accident: An unplanned, potentially dangerous occurrence that results in injury, property damage, or a close call (near miss). (Caution: Never equate the word accident with injury.)

Close call (called a ***near miss*** in this review): The result of an accident where no injury and no property damage occurs, but the potential for serious injury to persons is clearly evident.

Safety Management: Managing every organizational activity and interaction with the goal of reducing accident potential. *(Editor's Note: Safety management is used for consistency with NSN terminology. Future reference will be termed "Risk Management"-- the management of risk factors surrounding an activity to reduce accident potential.)*

Accident Potential: An intangible variable produced by the interaction of Human and Environmental Hazards. Also, a conceptualization of the result of people interacting with environments that indicates increasing or decreasing danger or risk of injury.

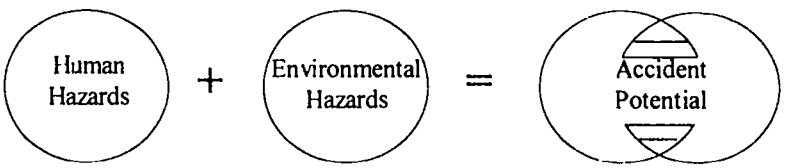
Participant Hours: A measure of program size. The product of multiplying the number of hours a program is responsible for participants by the number of participants. Example: In a day-long, school adventure program, 20 students participate in a team challenge course for 5 hours; 5 hours x 20 participants 100 participant hours.

Serious Injury: All injuries reported in this database. Criteria for inclusion: either (a) person is removed from the program or activity for a half-day or more because of the injury, (b) injury requires treatment by a physician other than routine inspection (*Note: this condition for serious injury needs further clarification for future reporting as many organizations require medical examination for even minor injuries*), or (c) the injury indicates long-term complications or consequences. (The last category includes injuries like broken or missing teeth or reinjury of a minor, but chronic, condition.)

The Accident Equation

The approach used for this review and those conducted by the National Safety Network focuses on the principles of risk management. This approach is characterized by a simple formula relating human hazards, environmental hazards, and accident potential. The Accident Equation, shown in Figure 1, indicates that human hazards can combine with environmental hazards with the resulting accident potential. The equation does not indicate that accidents and possibly injuries will result, just that a potential exists.

Figure 1: Accident Equation



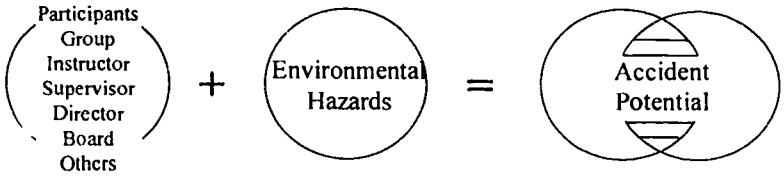
When hazardous behavior increases or hazards of the environment increase, and especially when they increase together, the potential for an accident increases. Recall that the definition of risk management is: "to guide every action and interaction so as to reduce accident potential."

Human hazards are of three types: attitudes, behaviors, and skills (or lack of) that can be considered hazardous in the context of the activity. Ignorance of an environmental hazard, thin ice for instance, is a human hazard. So too is the inability or unwillingness of a participant to speak up about foot pain in a backpacking program. Therefore, one of the most important immediate tasks of any instructor is to assess the presenting behaviors, attitudes, and skill levels of participants in his or her care. Almost simultaneously, the instructor must impart knowledge of and respect for the obvious environmental hazards participants will encounter; the thin ice mentioned above, for instance. Human hazards insinuate into activities from persons other than participants. Remembering that human hazards are attitudes, behaviors, or skill deficits

introduced into a program that increase accident potential, these hazards can be introduced by the participant, the group, the instructor, a supervisor, the program director, the governance body (board of trustees, etc.), program helpers, such as maintenance workers, and others, such as parents and persons who recommend or send clients.

The equation in Figure 2 reflects this broader understanding of human hazards and portrays how many persons can contribute to increasing or decreasing accident potential.

Figure 2: Accident Equation with human hazard expanded



Environmental hazards are of four types: the places where programs operate, the activities undertaken, the equipment used, and the program philosophy. Most programs adequately identify the obvious place hazards (i.e., where activities occur), including the hazards of the lakes, rivers, mountains, forests, oceans, and snow fields. This step in risk management must not be overlooked or underestimated. One of the most frequent contributing factors to accidents is lack of knowledge of an environmental hazard, or a lack of appreciation of its danger.

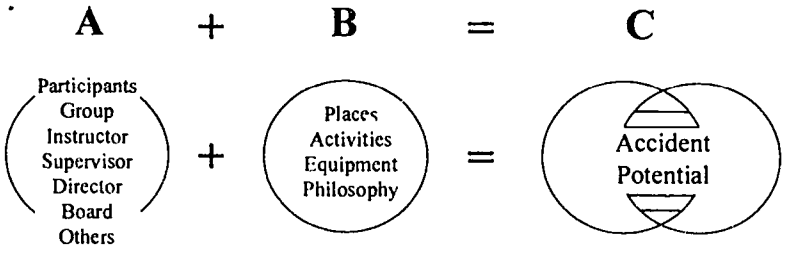
Next, there are the hazards introduced through the activities designed by the program leaders. Rock climbing, rappelling, whitewater rafting or canoeing, winter camping, and challenge course activities have inherent environmental hazards, many of which are obvious. Beyond these hazards, the activity in that environment can increase accident potential. For instance, in whitewater canoeing programs, participants are taught how to swim a rapid for practice. The accident potential is increased by this activity if the site, timing, and other human hazards are not carefully assessed and addressed by instructors.

There are many equipment environments personnel are exposed to during camping or adventure programs, including vehicles, camping stoves, fuel, knives, saws, chemicals, tools, and sporting equipment. One under-appreciated equipment environment that contains high accident potential is a typical camp cabin with metal bunk beds. The hard and often sharp edges of the beds and hard floors have been involved in numerous injuries where the behavior of the

participants was not appreciated as being hazardous and was not carefully supervised.

Finally, program philosophy can be misinterpreted by a participant or instructor with resulting increased accident potential. One of the most serious hazards of program philosophy involves lack of appreciation that risk management is an integral component and consideration of every activity, including the drafting of the organizational statement of purpose. The fully developed accident equation appears in Figure 3. The equation has important qualities and uses.

Figure 3: Fully developed accident equation



As a **planning tool**, the equation can guide an instructor's thinking far beyond surface considerations before undertaking an activity with participants. In addition, entire programs can be designed with specific clientele, educational purposes, and possible environments in mind to keep accident potential low.

As a **teaching tool**, the equation can be simplified to A + B = C and explained effec ly to children and adults alike. The concept is easily understood and people are equipped with words and a language allowing them to express their concerns, fears, plans, and expectations in terms that impact on their safety. Staff members need this language for accurate communication of safety concerns. Participants benefit enormously by being introduced to this language as well. Having all personnel conversant with risk management language at their level of readiness creates a high degree of safety consciousness.

As an **analysis tool**, after an accident or near miss, the equation guides thinking to identify "contributing factors" from all levels of program responsibility, rather than the much narrower approach of looking for fault behind an accident. Finding the cause or fault often implies error or guilt and can stifles communication and openness while continuing to generate and reinforce the frequently negative atmosphere surrounding an accident with injuries. Using the accident equation to uncover contributing behaviors and contributing hazards is more likely to solve an accident potential problem while encouraging

communication and openness. And finally, this approach often develops positive and creative solutions to problems that are realistic and effective.

SECTION 2: DATABASE PROFILES

The following section provides descriptive statistics on various aspects of the 433 serious injuries reported in this database. These profiles are intended to illustrate trends in the data collected and not definitive patterns observed in the outdoor recreation industry as a whole. These profiles may serve as a platform for conducting risk management assessments within one's own program as they do account for a considerable amount of programming and participant hours.

Respondent Profile

A total of 832 injuries and illnesses were reported in the period from January 1989 through January 1991. From these, 433 cases were deemed serious injuries as defined in the previous section. Fifty-five programs provided injury/illness reports and activity participation data for the 1989-1990 database. Of these, 13 programs provided data for both years. A total of 30 programs reported in 1989 and 39 in 1990, down from 58 in 1988. Programs submitting data for this review cover a broad spectrum of program types, client groups, and geographic regions.

* Programs from 24 states and the District of Columbia submitted data
* 1 Australian, 1 New Zealand, and 3 Canadian organizations provided data
* Data was submitted by private and public instructional organizations, psychiatric hospitals, universities, county parks and recreation departments, camps, schools, 4-H programs, and court service programs.

Program Client Profile

The respondents in this review provide an excellent representation of the variety of client groups and the multitude of settings in which adventure and experiential education programs operate. Table 1 provides the breakdown of which client groups are represented in this review and at what levels. Adolescents are by far the largest client population of the reporting organizations. Favored outdoor activities of these groups were backpacking, boating, climbing and skiing. Some ambiguity in the client types is present making it difficult to ascertain the nature of the programming age versus population characteristic (i.e., 10- to 12-year-olds versus "Youth at Risk"). Many of the programs did separate their programming hours based on the focus of the program (i.e., therapeutic vs. recreational themes).

Table 1: Client groups represented in data set

	1989		1990	
Client Type	**Hours**	**% of Total**	**Hours**	**% of Total**
Adolescents	1,620,527	68.10%	1,158,024	41.02%
School	482,119	20.26	536,723	19.01
Youth at Risk	39,862	1.68	497,303	17.61
College	111,677	4.69	230,582	8.17
Adults	83,832	3.52	191,572	6.79
Business	6,622	0.28	168,386	5.96
Mental Health	33,949	1.43	38,168	1.35
Special Populations	983	0.04	2,515	0.09
Total Hours	2,379,571		2,823,273	

Activity Profile

At the end of each year, participating programs were asked to submit detailed descriptions of activities for that year with participant and staff hours for each. A total of 28 activities were identified, and participant hours ranged from 1,500 to 1.8 million for an individual activity. Only one activity, snowboarding, appears to warrant an additional category due to the number of related accidents, although it may be difficult to separate this from downhill ski participation data.

Table 2 lists each activity with the associated participant hours and percentage of total participation for each year. Activities are listed in descending order by the percentage of total participation time over the two-year period (1989 - 1990). Little variation in total participant hours exists between 1989 and 1990. There are considerable differences in hours for individual activities, such as Initiatives Team Challenge activities, which had 684,260 participant hours in 1989 and 1,031,561 hours in 1990. These variations are the product of both change of programming levels within the 13 programs which reported in both years and the difference in programming focus of the other organizations. Initiative activities, backpacking, high ropes, and camping are the top adventure/experiential education venues utilized by the reporting organizations. These activities represent 46% of the total participant hours in the database. Non-activity and classroom time represent 35% of the database, with the remaining 19% divided among a variety of other outdoor-oriented activities.

Table 2: Profile of activity participant hours

	1989		1990	
Activity	**Hours**	**%**	**Hours**	**%**
Non-activity (sleeping, eating, etc.)	1,027,970	32.34 %	741,262	23.33
Initiatives Team Challenges	684,260	21.53	1,031,561	32.46
Backpacking	441,067	13.88	200,431	6.31
Classes (lecture, study)	289,570	9.11	193,050	6.07
Ropes Course (high element)	101,487	3.19	213,117	6.71
Camping (general)	123,550	3.89	131,817	4.15
Climbing (rock, ice, walls)	45,558	1.43	118,822	3.74
Boating (power, row)	141,366	4.45	2,992	0.09
Sports and Recreational Games	40,984	1.29	64,008	2.01
Transportation (to activity)	38,917	1.22	59,980	1.89
Skiing (touring)	10,224	0.32	81,769	2.57
Water (swim, wade, snorkel)	55,145	1.74	34,832	1.10
Skiing (downhill)	36,147	1.14	40,679	1.28
Canoe (flatwater)	2,248	0.07	73,099	2.30
Other	14,574	0.46	45,081	1.42
Hiking (day, orienteering)	27,730	0.87	26,188	0.82
Work Projects	22,000	0.69	25,613	0.81
Kayaking (whitewater and sea)	24,868	0.78	12,235	0.39
Biking (touring)	21,258	0.67	8,365	0.26
Sailing	2,271	0.07	21,494	0.68
Canoeing (whitewater)	3,990	0.13	14,296	0.45
Rafting	6,878	0.22	10,455	0.33
Biking (mountain)	6,702	0.21	8,065	0.25
Cave	2,111	0.07	7,762	0.24
Travel/Study	5,208	0.16	4,352	0.14
Mountaineering	2,072	0.07	3,048	0.10
SCUBA	0	0.00	1,920	0.06
Snow Shoeing	0	0.00	1,528	0.05
Total Hours	3,178,155		3,177,821	

Injury/Illness Profile

As stated previously, the data includes 433 serious cases. Table 3 categorizes these injuries into 17 types of injury or illness. Athletic injuries included sprains, strains, and bruises; a large percentage of these injuries occurred to the knee (29%), ankle (25%) and back (17%). The "Other" category consists of a

number of undiagnosed ailments, allergic reactions, cardiac problems, and a suicide attempt. These could not be classified more precisely without additional information. Three program-related fatalities were reported -- one was caused by an individual being struck by a car during a backpacking trip, and the other two occurred during corporate training programs involving climbing towers. (One non-program-related fatality is included in the narrative section of this report but not reported here.)

Table 3: Injury and illness profile

		1989		1990	
Injury/Illness	**Total**	**Participant**	**Staff**	**Participant**	**Staff**
athletic	220	104	5	105	6
soft tissue	82	42	3	34	3
fracture	49	25	2	17	5
other	38	14	0	17	7
dislocation	14	7	1	5	1
head w/o loss of consciousness	9	2	0	7	0
burn	4	1	0	2	1
allergy	2	0	0	1	1
fatality	3	1	0	2	0
Other labeled injuries with single cases*	8	4	1	3	0
Totals	429	200	12	193	24

* Injuries/illnesses listed in this row have only one case reported in database. They include: anaphylaxis, dehydration, dental, head w/loss of consciousness, hypoglycemia, near drowning/submersion, respiratory and skin infection.

Primary Cause Profile

The primary cause identifies the most immediate action which led to the injury or illness. Additional contributory-cause data were collected but are not reported here. Twenty actions were identified accounting for 59% of the cases. The remaining cases fall in the "other" category (30%), or were listed as "unknown" (11%). The other category includes a number of incidents that are difficult to classify, including: bumping into objects or individuals, jumping, self-inflicted injuries, or those inflicted by others. The animal/insect/plant category includes a number of bee stings, snake bites, and cases of poison ivy. The data are fairly consistent between the two years.

Table 4: Primary cause of injury profile

Primary Cause	Total	1989	1990
fall/slip	153	80	73
other	128	55	73
unknown	48	23	25
overuse	22	9	13
previous history	21	12	9
animal/insect/plant	13	3	10
carelessness	13	11	2
poor technique	6	5	1
failed to follow instructions	4	2	2
rope system failure	4	4	0
wet, slippery terrain	4	1	3
altitude	3	3	0
fatigue	2	1	1
medications/drugs	2	0	2
weather	2	0	2
exceeded ability	2	2	0
haste	1	1	0
hit by car	1	1	0
lack of fitness	1	0	1
poor judgment/inexperience	1	0	1
psychological	1	0	1
inadequate supervision	1	0	1
Totals	433	213	220

These causes could be separated into environmental and human hazards as in the accident equation. Each factor contributes something to the accident potential for the given program activity. In these cases, the primary cause increased the accident potential to an unacceptable level for the participant, resulting in the serious injury. Upon examining the factors leading to a serious injury caused by a fall/slip, the leadership team might see the need to restructure the activity to avoid certain locations or to re-examine the placement of spotters for the activity. Looking at the contributing causes is additionally important (i.e., did the individual fall due to improper spotting?). Developing an objective narrative of the accident and approaching it from a team risk management perspective strengthens future policy decision making and can refocus staff on potential hazards of an activity.

Injury Rates

The following table presents the number of injuries which occurred during a given activity divided by the number of participant hours reported for that activity. The numbers represent injuries per 1,000,000 hours of participation. Injury rates were only calculated for those program activities which had 30,000 or more participant hours in a given year, or 75,000 over the two-year period. To put this in perspective, 30,000 participant hours is approximately equal to ten participants, 8 hours a day for an entire year. Activities are listed in descending order according to the overall participant injury rate for the two-year period, 1989 - 1990.

Table 5: Participant injury rates by activity

Activity	1988	1989	1990	89 - 90 Combined
Sports and Recreational Games	319.0	609.99	406.20	485.75
Skiing (downhill)	87.5	359.64	196.66	273.34
Climbing (rock, ice, walls)	73.0	109.75	92.58	97.34
Skiing (touring)	99.7	**	73.38	76.09
Initiatives and Team Challenges	6.0	77.46	53.32	62.94
Backpacking	54.4	47.61	49.89	48.32
Ropes Course (high element)	5.5	78.83	32.85	47.68
Water (swim, wade, snorkel)	na	18.13	86.13	44.46
Non-activity (sleeping, eating, etc.)	1.5	14.59	24.28	18.65
Camping (general)	na	16.19	15.17	15.66
Classes (lecture, study)	na	17.27	5.18	12.43
Boating (power, row)	na	7.07	**	6.93
Canoeing (flatwater)	29.0	**	0.00	0.00
Transportation (to activity)	na	0.00	0.00	0.00
Total Injury rates by grouping *				
Participant Injury Rate	10.1	62.93	60.42	61.67
Staff Injury Rate	17.3	26.77	51.73	39.46
Overall Injury Rate	10.8	58.73	60.41	59.57

* All injury rates are given in injuries/million participant hours

** Less that 30,000 participant hours were reported for this activity in specified year.

In comparing the 1988 data with the current analysis, a vast discrepancy in the injury rates for all categories is apparent. On closer investigation, a calculation error was detected in the 1988 rates; actual rates are listed in Table 5. Still, despite this error there are large differences in the injury rates. In the overall participant injury rate there is a 628% increase from 1988 to 1989. Other

differences range from a 100% reduction in flatwater canoeing to an increase of 14 times the 1988 value, as in the ropes course high elements. Although it is possible that injury rates are fluctuating this much in the real world, it is highly unlikely.

Two primary sources of possible error are apparent in these analyses: 1) the operational definition of "serious injury," and 2) reporting of participant hours. Although the same definition for "serious injury" is used for both the 1988 NSN review and this analysis, determination of each case is left to the researcher and must be based on the limited information provided by the reporting agency. The criterion "treatment by a physician other than *routine inspection*," is very difficult to determine from the "treated by physician" check box on the report form.

Of greater importance to this discussion is the vast variation in reported participant hours. In 1988, 58 programs reported over 17 million participant hours with a total of 190 serious injuries. In 1989, 30 programs reported 3,178,155 participant hours with 213 serious injuries, and in 1990, 39 programs reported 3,177,821 participant hours with 220 serious injuries. The actual number of serious injuries is similar for all three years. The difference is that there were 14 million more participant hours reported in 1988 than in either 1989 or 1990. The consistency in 1989 and 1990 data would suggest that this is a more realistic measure of actual participation and injury rates than that given in 1988. Future reports may confirm this assumption.

The injury rates for challenge course activities are of particular concern as these numbers are seven hundred times greater than 1988 data and they are a common component in many outdoor programs. A recently published 20-year safety study conducted by Project Adventure (PA) indicates similar rates to those in the 1988 NSN Review.[2] The participant times of the PA report indicate an average of 20.5 hours of participation per participant. This would indicate more long term contact with participants than is seen by most day-use programs, possibly resulting in lower injury rates. The PA analysis uses a "lost time" definition of injuries included in the analysis which is very similar to the serious injury definition of this report.

The PA report seems to support the 1988 findings, but further consensus on calculation of participant hours is greatly needed. As these calculations are often used in making generalizations about the safety of specific activities and the field in general, accuracy in the future is paramount. Consistency and dedication in building and maintaining this database is needed by the entire industry.

---

[2] L. Furlong, A. Jillings, M. LaRhette, and B. Ryan (1995). *20-Year Safety Study*. Project Adventure, Inc.

These variations raise some question of reliability of this data, yet the trends of given activities are consistent across all three years. Injuries and illnesses are far more common as a result of participation in sports and recreational activities than because of any other activity. Many of the activities in this category are organized sports, but it appears that a considerable percentage are open recreation or unstructured down-time. Downhill skiing, which includes snowboarding, accounts for a large percentage of the serious injuries. Snowboarding and ski racing were the most common ski activities resulting in injury.

Rock climbing, which has one of the highest levels of perceived risk of traditional adventure activities, also has the highest actual risk for these data. Eleven of the 20 serious injuries related to climbing were on artificial climbing walls. This high percentage of climbing injuries may be the result of a lack of appreciation for the hazards due to the familiar/comfortable controlled settings. In the future, separation of climbing activities into artificial and natural settings would be desirable.

Injury By Time Of Day

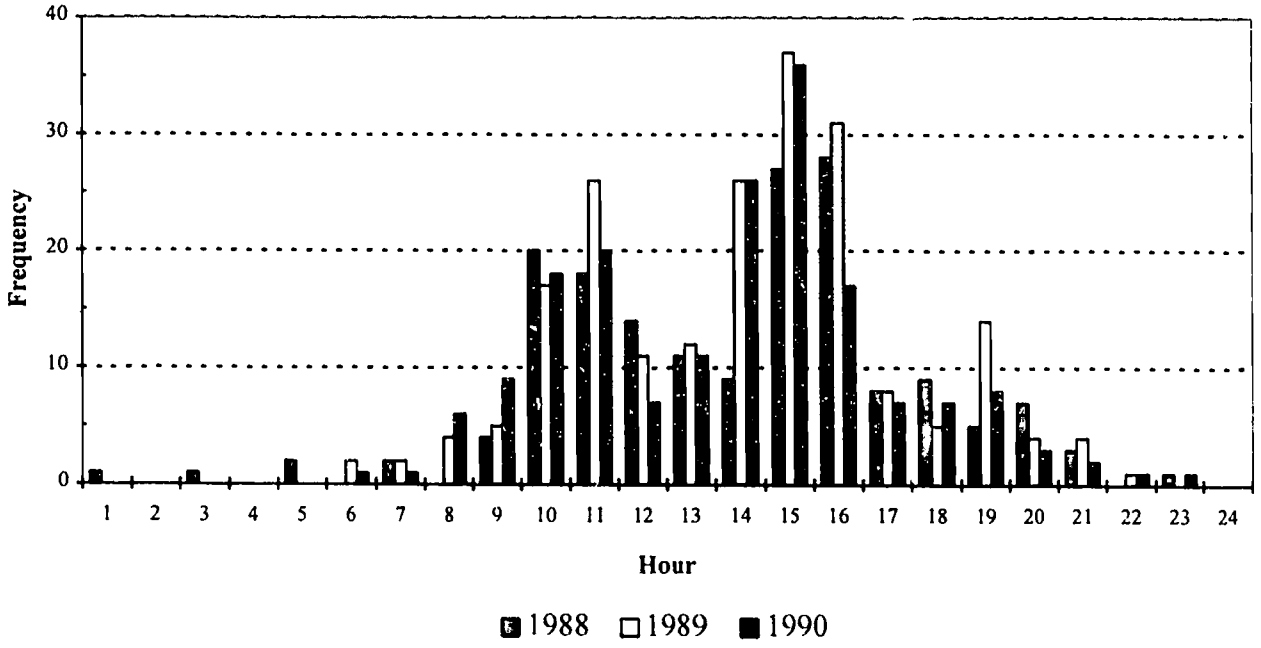
In keeping with the National Safety Network tradition, frequencies for the time of day an incident occurred are presented here. To help illustrate the overwhelming consistency in these data, the three years are plotted side-by-side in Figure 4. The number of reported injuries increase dramatically during the hours of 10 a.m.-12 p.m. and 2 p.m. - 5 p.m.. As stated in the 1988 NSN Review, these time frames probably coincide with the highest levels of participation, but the large spike of injuries from 3 p.m. to 4 p.m. cannot be written off as a coincidence. Further research is needed to make broader generalizations about this phenomenon, but the facts do call for added precautions during these peak hours.

Reinjury Profile

For the program administrator another important item to consider is the types of injuries which are related to previous injuries and medical conditions of participants. Table 6 lists the injury/illness location or type for the 90 cases that listed reinjury or previous medical condition as the primary or secondary cause. The rate for reinjury in this database is 17.2 injuries per million hours of participation. Joint injuries are by far the most common -- it is interesting to note that 8 out of 9 shoulder reinjuries were dislocations.

The fact that over 20 % of all injuries in this database are linked to a previous history calls for an increased sensitivity to medical history information for all

Figure 4: Injuries/Illnesses by Time of Day



17

administrators and field staff. Although this is a substantial amount, it is difficult to draw conclusions without having comparitive data on the number of participants with previous medical conditions who participated without incident. Still, this is an area where program managers have some control. Through careful screening of participants, many of these conditions can be identified, and with appropriate precautions and advisement, reinjury might be avoided. Specifically stating on Acknowledgment of Risk forms that previous injuries and medicalconditions of the type listed in Table 6 would also be prudent. If participants are unwilling to disclose previous medical history, they should at least be aware that previous injury or illness does increase their risk for injury during the activities.

Table 6: Reinjury profile by injury location/type

Injury Location/Type	Total	Reinjury	% Reinjured
cardiac	4	3	75.0 %
back (lower and upper)	40	21	52.5
asthma/allergy	13	6	46.2
shoulder	25	9	36.0
knee	73	22	30.1
hand/wrist	25	6	24.0
ankle	64	12	18.8
foot	30	5	16.7
other	159	6*	3.8
Total	433	90	20.8

*Reinjuries listed under other include: psychological, bruised ribs, and diabetes.

SECTION 3: NARRATIVES

Theoretical Foundation of Near Misses

(Editor's Note: The Theoretical Foundations, Documenting and Analyzing Near Miss Sections are reprinted from the 1989 National Safety Network Review with permission of the author, Alan H. Hale. They are reproduced in their entirety as they are a fine representation of how near misses can be used to improve risk management practices.)

> "While cooking the evening meal, two campers knocked over a backpacking stove and mess kit containing boiling water. After restarting the stove and bringing the water to boil, a participant from another group knocked it over again."

This is a near miss. No injury occurred, no property was damaged; but certainly, there was the potential for injury. Program staff have the opportunity to know about this incident and examine its circumstances because an instructor alertly identified the incident and described it in writing for his or her program leader.

The definition of accident suggests there is a connection between near misses and injuries. The following example will clarify the connection and shed further light on the phenomenon of the near miss.

> Soon after beginning an outdoor adventure program called Hawaii Bound, a canoeing expedition group returned to base camp telling stories about how one of the group's four-person, outrigger canoes had been blown away from the landing site by a strong, gusty wind that suddenly swept down from the mountain. Several local fishermen aided the paddlers and towed them back to shore with a handline. The paddlers had been blown about 300 feet from the landing site.
>
> Within the group, there was obvious excitement about this experience. There had been a few anxious moments while the paddlers struggled against the wind, but now, safe at base camp, there was much laughter and bravado about the incident. Neither the participants nor the instructors wrote a description of the experience. Awareness spread by word-of-mouth.
>
> Over the course of that summer, several instructors returned from canoeing and told about how careful they had to be near the take-out location because of frequent and sudden offshore winds.
>
> During the second summer, I was leading a canoeing expedition north along this coast. On a calm morning, we decided to paddle across a long, narrow bay, at times up to a half-mile offshore. I instructed participants to stay very close and to follow my leads at all times.

As we progressed across the bay, I continually eyed the mountains looking for any sign of wind development. At a point halfway across the bay and a quarter mile from land, I saw a whirlwind and dust cloud develop at the 10,000 ft. level on the mountain. It began descending the slope. I called to paddlers to immediately alter direction, to head for shore, and to paddle as if this was a race. The students were surprised, since the immediate shore was not our destination and the sea was a glassy calm. However, they noted my vocal tone and the energy I was demanding of the other three paddlers in my canoe.

The three canoes were soon in a race to the shore. Within seconds a wind developed in our faces. Soon a sun visor blew off someone's head and they asked to turn the canoe around to retrieve it. I instructed them to leave the cap. One hundred feet from shore, full white caps developed and the paddlers lungs and arms were burning with the flush of such a sudden burst of paddling energy. We landed, beached the canoes, and within minutes, the palm tree tops were bent parallel to the ground, a dust cloud enveloped us, and the sea was a maelstrom of wind-whipped water. This wind blew unabated for three days. This was a near miss!!!

Program leaders altered the program immediately. We restricted our canoeing to protected bays while we searched elsewhere on the island for a more hospitable coastline. We located a coastline far to the south that had never been known to experience high winds, but it would require a year's work to find launch and landing sites and obtain land permissions to use the isolated beaches.

Late that summer, the staff organized a two-day instructor's training trip to the ocean. Our plan was to launch at a public beach and paddle a half-mile around a point to an isolated beach and to remain there for training. The entire distance could be paddled while remaining a few feet from shore.

The launch site was a long, gleaming, white sand beach, backed by a thick growth of palm trees with several miles of barren, black lava behind the trees. The three canoes were launched, mine being last in the water. As I stepped into the canoe, a wind blasted through the palms, blowing toward the ocean, and instantly the three canoes were drifting quickly away from land. I managed to steer my canoe, going with the wind, to rocks where we were able to beach it. The others, paddling as strongly as possible, were being steadily swept to sea. From this isolated beach, it took hours to raise help, but help finally arrived. The two canoes were located at dusk, by helicopter, five miles to sea. The paddlers were picked up by power boat, but the sea was too turbulent to save the canoes. All equipment and canoes were set adrift. No piece of equipment has ever been found.

The final accident with property loss was a sobering experience for instructors. The entire episode demonstrates themes that are typical of near miss situations.

First, recall the laughter surrounding the participants' description of first being swept away from the landing site. When especially frightening experiences end without harm, laughter and light-hearted joking usually occur. This seems a natural emotional outlet and reaction to the potentially disastrous results that were apparent, but were too unpleasant to brood over. This avoidance of a serious consideration of potential danger is responsible, I believe, for the second common theme in near miss situations, namely, failure to report them.

Amid the laughter, stories, and good feelings, it is easy to ignore or forget the writing of a near miss report. The reluctance, or inability, to identify and report near misses is certainly not true with injuries.

A third theme that accompanies near misses is the lack of analysis they receive. A careful and probing analysis can reveal underlying themes in accident situations that portend further accidents. Analysis often uncovers ways to reduce accident potential, creating safer activities.

The fourth theme accompanying near misses is that without identification, description, and analysis, they tend to recur, often as accidents with injuries. I have observed that in a program where near misses are unappreciated or ignored, those same situations escalate in number and lead to injuries, sometimes serious ones.

These four themes are the important indices of a near miss.

1. Those involved express relief when a potential accident situation ends without harm. The individuals and the group often express this relief through avoidance or humor.

2. Those involved sometimes don't identify the situation as an accident and do not report it in a formal way.

3. There being no description of the event, no analysis is made.

4. Without analysis there is frequently no intervention to stop or alter the accident potential. This inattention portends reoccurrence, sometimes with escalating seriousness.

After the loss of canoes in Hawaii, the program leaders shifted the entire water program to another area of the islands. This required major logistical and financial support, but there were no further accidents involving wind in the ocean program or accidents with any serious consequences.

Documenting Near Misses

Because a near miss is an accident, some type of accident report form can be used. In practice, however, many of the questions asked on injury forms are not relevant to near misses. The best practice is to provide instructional staff with two types of accident report forms, one for injuries and one for near misses.

On the Near Miss form, a few questions can guide the instructor in gathering important information that will assist analysis. Information gathered may include date, time of day of the accident, location of the group, and a description of the activities. Provide plenty of space for a narrative description. It is a good practice to gather and read near miss and injury reports as soon as possible after the incident.

Analyzing Near Misses

An advantage of analyzing near miss situations with staff is that defensiveness is less likely to develop in discussing the incident because no injury occurred. Instructors learn that reporting these situations helps everyone understand the dynamics of accidents and increases the chance of avoiding future injury.

The discussion can begin with identification of the important elements interacting in the near miss situation. Using the elements of the accident equation is an excellent guide in this process. Was there a danger in the environment? Was there a danger in the environment only because of the behavior or attitudes of the participants? How serious could the incident have become? How frequently are participants or staff exposed to a like situation?

Keeping track of near misses in an individual program is an excellent way to reduce accident potential and is also an excellent training device for instructors. More can be learned collectively, however, if information is shared with other programs. This is why the near miss and injury narratives are included in the *Risk Management Report.*

A Word About The Narratives In This Report

The narratives presented in this report represent those submissions that seem, in the estimation of the editors, to indicate trends or risk management implications for specific activities. The reader is cautioned to realize that all of the narratives are presented out of context (i.e., there is minimal information on group characteristics, events leading up to the incident, etc.) and, therefore, should not be broadly generalized beyond the scope of the programs that submitted data. The selected narratives were chosen out of a total of 1,159 reported incidents.

The reader is encouraged to use these narratives in the following manner:

1. As case studies to be used during staff trainings;

2. As a catalyst to revisit risk management practices in light of trends identified within this report; and

3. As models for how to document and review accidents and near misses within individual programs.

NEW GAMES & INITIATIVES

(Editor's Note: There were a multitude of minor injuries sustained as a result of participation in games and initiatives. There were 23 reported injuries from slipping, 21 minor injuries from running into things including people, 14 minor back strains, 30 minor joint injuries, 9 cuts and scrapes, and 3 muscle pulls.)

LOW ROPES COURSE ELEMENTS

Nitro Crossing

A 15-year-old female let go of rope and fell backward landing on her shoulder while participating on the nitro crossing. As a result of the fall she fractured her collarbone.

(Editor's Note: There were 5 "dragging knees/feet," 3 "rope burns," 4 "poor spotting, swinger dropped," and 3 "foot stuck in loop" incidents reported on the nitro crossing.)

Wall

1) A 12-year-old female participant fell while climbing up the wall, landed on her knees and snapped her neck backwards. She sustained whiplash while attempting the 12-foot wall. The group was not spotting properly and didn't break her fall.

(Editor's Note: There 5 additional joint injuries sustained as a result of falls due to improper spotting.)

2) A 44-year-old, heavy-set, male participant rolled over the top edge of wall so that much of his weight was concentrated on his side. He sustained one cracked rib while attempting the wall.

(Editor's Note: There were 5 additional rib injuries reported on the wall)

3) A male ropes course trainee, age 40, attempting to go over wall, straddled the top of wall. Upon doing this he showed and expressed acute discomfort in his groin. The trainee then climbed down the back of the wall. He saw a doctor immediately and described the doctor's diagnosis as "scrotum trauma." The trainee was instructed by the doctor not to physically participate for the remainder of training.

4) An 11-year-old male participant was on top leaning over the 12-foot wall, helping to pull people up. During one of the pulls he started choking and couldn't speak or breathe. A staff member did the Heimlich maneuver which relieved discomfort, although no food or foreign object was coughed up.

Program's Analysis: We now question whether maybe he was chewing gum (not allowed at camp) and swallowed it immediately after Heimlich.

Trust Fall

A 39-year-old male staff member sustained a broken nose when a client unlocked fingers and threw an elbow out striking the staff member. The staff member was spotting at the time of the injury.

(Editor's Note: There were 27 incidents reported where the faller struck a spotter in the face with a hand, elbow, or arm.)

A 12-year-old male was participating in the "Table Fall". The spotters failed to stop his fall allowing the him to fall to the ground. Spotters expected him to be heavy and gave in before he completed his fall. Initially, the participant was okay but the next morning his back ached and he had an upset stomach and diarrhea. He was instructed to seek medical attention if needed.

(Editor's Note: There were 11 incidents reported where the faller was dropped by the spotters.)

Mohawk Walk

The group had just finished participating in the Mohawk Walk. A participant was running and instead of going around the cable she tried to jump over it, caught her left shin on the cable, and causing a 6" long scrape. The participant was then escorted back to the unit where she was examined by the R.N.

(Editor's Note: There were a number of near misses reported as a result of participants walking or running into foot cables.)

Tension Traverse

A 48-year-old male participant was running backward on the tension traverse cable (a technique he was instructed not to use. The participant fell through spotters and landed on his shoulder. The fall resulted in a broken left humerus. His arm was immobilized and he was transported to the hospital.

(Editor's Note: There were 5 incidents as a result of poor spotting and 4 as a result of participants running on cables.)

Spider Web (Cardiac Incident)

During the spider web initiative, a 60-year-old male participant complained of feeling light headed and dizzy. The facilitator instructed the participant to sit down in a shaded area. In route to the location the participant lost consciousness. The primary survey indicated no obstruction of breathing. The staff nurse attended the participant until an ambulance arrived and transported him

to the hospital. Medical tests identified a previously undiagnosed cardiac problem. His injury was not related to participation and did not result in a fatality.

Tire Traverse

1) A 37-year-old female participant lost her hold on the rope while attempting to swing onto the first tire from the lead rope. Her hand then slid down and hit a knot in the rope fracturing her index finger.

(Editor's Note: There were 13 incidents involving rope burn and/or finger injuries reported.)

2) A patient slipped off the rope while swinging to the next tire. She landed on her buttocks. The patient stated that she was not hurt. The group processed the incident and decided to have 2 spotters at the rope.

(Editor's Note: There were 15 incidents involving falls reported. No major injuries were reported.)

3) A female participant was swinging from tire to tire when her left ankle became lodged in the inner tire. The participants ankle was slightly twisted. Ice was applied to reduce swelling.

(Editor's Note: There were 6 twisted ankles reported as a result of feet getting wedged in tires.)

Beam

The "beam" on our course is a 12-inch in diameter log attached 8-feet off the ground between two trees. A student exiting from the beam was not able to hold on and control her descent. She could not continue to hold on. Spotters were unprepared and the student fell to ground on her back. This element was being supervised by a student who had insufficient training while the chief supervisor was with another group on another element.

Program's Analysis: We no longer allow students with minimum training to assist in situations where they might be on their own at a "dangerous" element.

Course Construction Related Incidents

1) Adult patients were participating on the tire traverse. The group had been on the tires for about 25 minutes. A patient was ready to start the first tire when the tire came off in her hands. No injury resulted from the equipment failure. The group stopped, processed what happened and went on to another element.

Program's Analysis: On review and after discussion with the builder, we added lock washers to the tires. We also stressed with staff the importance of inspecting equipment before the start of the program and being alert during initiatives.

2) A client was participating in the tire traverse initiative. He was going from the first tire to the second tire with spotters using hands on spotting. When the participant put his weight on the second tire and grabbed the rope, the cable came out of the strand vise and the tire and participant fell 4-6 inches to the ground. The participant's fall was broken by the spotters but the participant stated that his head hurt and he didn't feel very well. Nurses were brought out to the course and examined participant. He was then walked into the unit where the nurses examined him further. No lumps or bumps were found on his head.

(Editor's Note: Strand vices have been known to slip on occasion. The reader is encouraged to contact the Association for Challenge Course Technologies for further information on course construction issues.)

3) Rusted cable broke while a student was on the wild woozy. The program was not aware that the cable under the hosing was worn. Luckily no injuries occurred.

Program's Analysis: We were aware that covering support cables with rubber hose was not suggested but failed to act on this recommendation. Cable with similar coverings have been inspected and removed from the course.

(Editor's Note: It is unclear what kind of cable was used for this particular element. Courses have been know to be built out of all sorts of materials. Working with a professional builder is the best way to chose appropriate materials and therefore minimize the chances of equipment failure occurring.)

4) During an adolescent workshop with about 18 participants the swinging log cable attachment failed. The group was standing on the log when one end fell to the ground. Everyone was able to clear out of the path of the log. No injuries occurred. The element was closed. The element was inspected and the u-bolt was found to be loose allowing the cable to slip through.

Program's Analysis: We had our builder review inspection techniques and assist us in developing an internal inspection procedure.

HIGH ROPES COURSE ELEMENTS

High Risk Restraint and Rescue

On 12/13/90 at 2:20 p.m., facilitators John and Jim had completed their inspection of the nitro crossing and tire traverse. After putting away the equipment used to inspect the two initiatives, John happened to look down toward the other end of the course near the climbing tower. John saw someone

climbing around the right side of the tower from behind onto a few mahogany blocks. By this time the other facilitator, Jim, also noticed the person. After a few seconds both facilitators realized that the climber, who was a patient, was continuing to climb the face of the tower.

Upon realizing the urgency of the situation, John and Jim began yelling to the patient. The patient did not stop climbing even after both facilitators had yelled at him to come down. John and Jim then ran down to the tower continuing to try and talk the patient down. At that time the patient was out of the facilitators' reach. John ran and got the 20 foot ladder and placed it on the front of the tower only to find the ladder would not reach the patient. Jim climbed up the ladder, continuing to try and talk the patient down. The patient continued climbing up the face of the tower. Jim climbed down the ladder and got underneath the climber in the spotting position. At that point, John had returned with another facilitator, Ed, who was out walking with patients. Ed ran down to the course, put on his swiss seat, grabbed a set of crab claws, and proceeded to climb up the side of the tower. The patient was continuing to climb during this time. Jim was in constant verbal contact with the patient. The patient verbally refused to come down.

Ed called the operator prior to climbing the tower to put emergency procedures into process. The operator called the hospital's medical alert system into action as well as called the fire and police departments. After putting on his swiss seat, Ed crab clawed up the side of the tower. Upon reaching the top of the tower, Ed found the patient sitting at the edge of the tower with his feet dangling over the front wall. Ed verbally instructed the patient to move back from the edge. The patient did comply with his command. Ed proceeded to talk with the patient about the patient's reasons for climbing the tower. The patient stated, "I did it and I didn't need any help." Ed told the patient that he was not safe. Ed then proceeded to review all the rules used about climbing the tower. The patient stated he didn't need all that and that he was "going to either climb down or jump." Ed proceeded to unhook one crab claw carabiner. Ed now had the patient by the wrist. Ed then stated to the patient that he was going to "hook" the patient in. The patient attempted to dive off the rappel side of the tower. The patient was screaming, "Ed, let me go." Ed continued to hold the patient by the wrist and arm while hooking the crab claw around the patient's waist.

During the struggle on top of the tower, facilitators Bill and Mary were down on the ground tying their Swiss seats. Mary then instructed Jim to climb up the side of the tower to help Ed restrain the patient. Jim proceeded to climb the tower and upon reaching the top, helped Ed restrain the patient by standing and sandwiching the patient in between he and Ed. During the period of restraining, Mary had reached the top of the tower with an extra set of crab-claws. Mary anchored in by hooking her carabiner into the belay cable and locking it down. She then proceeded to help Ed and Jim wrap the patient in these crab-claws, further securing the patient to the belay cables. Mary then realized that Jim did not have a set of crab claws on. Mary provided Jim with support by securing him with one carabiner on the crab claws she was wearing. During this interaction, the patient was continuing to struggle and attempting to pull

himself over the side of the rappel tower. At that point, Mary asked for more support on top of the tower from the members of hospital that had assembled on the ground around the tower. Mary also asked Ginny, the Adult Program Director, to call for all ropes course staff to come to the course ASAP. After her request was made to persons on the ground, ropes course facilitator Steve joined Ed, Jim, and Mary on top of the tower. Due to the urgent nature of Mary's request and of the emergency situation, Steve climbed the tower without a set of crab-claws. In an attempt to secure Steve, Mary put her hands through the swiss seat at Steve's waist. Additional crab claws were provided after a second request was made by Mary for more support on top of the tower. After the second request, ropes therapists David and Fred climbed the side of the tower. Each was secured by tubular webbing with a carabiner.

During David and Fred's climb of the tower, a decision was made to restrain the patient by use of handcuffs, provided by a police officer and a hospital restraint wrap. Each item was belayed up by John, another ropes facilitator. After restraint wrap was laid out according to hospital policy, the patient was informed of what was going to happen next. At this time the patient began to struggle and curse. Handcuffs were then placed on patient's wrists by Jim. After handcuffs were in place, the patient stopped struggling and motions were made to restrain the patient by using the restraint wrap. The decision was made by Ed and Mary to request a ladder truck from the fire department. This request was denied due to the unstable ground around the tower. The fire department personnel were concerned that the truck would sink into the ground around the tower. A request was then made for a body basket from the fire and rescue personnel. The basket was available, however, fire and rescue personnel stated the basket was not suitable for a "rope rescue." Ed and Mary then discussed the possibility of belaying the patient and Ed, secured to one another, down to the ground. After weighing the pros and cons of this maneuver, the decision was made that it would not be safe. A decision was made to make a second request for a ladder truck. The second request for a ladder truck was granted. Fire and rescue personnel stated it would take approximately 10 minutes for the truck to arrive. During the aforementioned interaction, the patient was administered a sedative by EMS staff who had crab clawed up the side of the tower. The EMS staff was secured into the belay cable on top of the tower. An additional fire and rescue person crab clawed up to assist with the transfer of the patient from the top of the tower to the rescue platform on the ladder truck upon arrival. The patient was secured by Ed, Mary, and the belay rope by carabiners placed at strategic points on the restraint wrap. Jim and Fred were belayed down after ensuring that the patient was secured.

After arrival of the truck, the ladder was extended and the patient was placed on a rescue platform accompanied by Ed and David. No one was taken off the static belay until they were secured on the rescue platform. After the patient was on the ground, the rescue platform was then again raised to assist in taking Mary, Steve, the EMS staff, and the fire and rescue person down to the ground.

All personnel (ropes staff, EMS staff, and fire and rescue personnel) were unharmed during the restraint, the medication, and the lowering of the patient. A

debriefing was held with a hospital psychologist for all ropes course facilitators involved with the emergency rescue of the patient.

(Editor's Note: This incident is presented in its entirety. All of the names have been changed in this narrative. It raises a number of issues including access, attractive nuisance, managing psychological incidents, crisis response in a seemingly "safe" environment (i.e., hospital grounds), and integrating non-technically skilled personnel into the rescue. This is also a well documented incident that serves as a model for future narrative submissions to this project. Finally, this type of documentation serves as an invaluable staff training tool in the form of a case study.)

Zip Wire

1) A 48-year-old female participant struck her ankle on the platform or the zip wire element. As a result the participant sustained a broken leg. Upon investigation it was found that the zip wire brake was not set tightly enough.

(Editor's Note: There were 5 injuries that occurred as a result of participants running into the platform, tree, or pole at the end of the zip wire. Recent brake block technology and gravity brake systems should all but eliminate the chances of this particular type of incident from occurring.)

2) A participant was coming down the zip with a new zip wire pulley when he hit the brake and went sailing into the air almost hitting classmates. No injury occurred and the activity was stopped.

Program's Analysis: It was determined that new pulleys would not be used until the brake system was redesigned.

(Editor's Note: Though it is unclear as to how a participant would "sail through the air" and almost hit classmates, this incident illustrates what happens when one part of a system is changed without full consideration of its impact on the other parts. For example, a new, faster pulley will significantly impact the performance of the present braking system. For every action there will be a reaction!)

Inattentive Belayer

A 28-year-old female participant sustained a sore tailbone while participating in the Dangle Duo. The instructor was attempting to unjam a stitch belay plate and dropped the participant approximately 10-feet to the ground.

Research and Development "Backfires"

A participant on the "dyno-soar" (a cross between tyrolean traverse and bungie cord jumping) experienced difficulty due to her haul line snagging during the jump. She had a much more violent stop than normal and narrowly missed

striking the gorge wall. Analysis and assessment of the activity resulted in a change in protocol to ensure the free running of the haul cord.

Total Unclips

(Editor's Note: There were a total of 25 total unclips on high elements reported. Of the 25 unclips, 23 were as a result of participants unclipping both static belay lines while at transfer points on the high course. The other 2 unclips resulted from transfers between dynamic belays on the high course.)

Lobster Claw "Hanging"

An older participant on a high ropes course fell while attempting the hourglass. One lobster claw ended up on either side of her neck putting significant pressure on her. In addition - the lobster claw ropes were caught under the ear projections on her climbing helmet making it difficult to breath.

A staff member got to her quickly and pulled her to safety on a platform. Participant had rope burns on neck and was spooked by the experience.

Program's Analysis: Since the incident we have stressed to students the importance of keeping lobster claws together and to one side when on an element.

(Editor's Note: This type of incident has been known to occur on occasion. One practice is to have one claw be somewhat longer than the other. With this technique there is always one slack static rope should the participant fall off of the element.)

Pamper Pole Ropes Caught on Helmet

While climbing up a pamper pole a female participant lost her balance and fell off. During the fall the belay lines caught underneath her helmet and pulled the helmet up. This could have been potentially dangerous had the belay ropes caught her underneath her chin.

(Editor's Note: This type of incident occurs when certain double rope belay systems are used. There have been 4 such incidents reported for this report. Readers are referred to the Association for Challenge Course Technologies for more information on this issue.)

Harnesses Fall Off

1) We started using a new rock climbing harness for our ropes course in 1988. We find them to be much easier and quicker than tying swiss seat harnesses. However, in the Winter '89, we had a few participants who ran into trouble. On two separate occasions, we had kids get harnessed up over big bulky sweatshirts which, once the sweatshirts became untucked, made for a loose fitting harness.

The harness loosened up considerably while the kids were climbing and when they got to a transition point where a counselor was, the harness was around his/her thighs and slipping! Now when we harness kids we ask them if they want their sweatshirt in or out and tell them they have to keep it that way until finished climbing.

2) We have had a couple of close calls with harnesses on real overweight kids. We usually wrap the waist belt around kids between their waists and hips. The hips usually prevent the harness from sliding off. On real heavy kids, the width of their waist and hips are about the same, so the harness tends to slip down, (one harness slipped all the way down to the knees). Now we make sure to wrap the waist belts around real heavy kids' waists and pull them extra securely. We've had no further problems.

3) A hearing impaired 14 year old student with mild cerebral palsy and overweight was engaged in a high ropes course activity. After climbing a tree and proceeding part way across a two-line bridge the student peeled off. Due to his limited upper body control he tipped almost totally upside down. No injury resulted, but from observing the student a chest harness would have been safer than just a sit harness.

Program's Analysis: In the future students with limited upper body control will use a chest harness in conjunction with a sit harness.

4) Participant put climbing harness on improperly by putting their legs through the back loops rather than the front. The leaders were rushed with last minute sign ups and were not watching properly. Participant climbed up ladder and was preparing to climb when staff noticed the problem and had him climb down to put the harness on correctly.

Program's Analysis: Staff were instructed to take their time and not be rushed even if they have to turn some people away.

Staff Member Falls While Inspecting Course

A 24-year-old male staff member sustained a bruised spine (lumbar, thoracic and cervical) while taking down the high ropes course. The staff member was down climbing a tree when at 20-feet from the ground all his weight was placed on a 2" branch. The branch broke and the staff member fell the full 20-feet to the ground.

(Editor's Note: It is unclear whether the staff member was hooked into any safety system.)

Dropped Object Nearly Hits Ground Crew

During an inspection, turn-buckles were being sprayed with WD-40. The WD-40 can was dropped. Three people were standing on the ground within 15 feet of

where the can landed. Helmets were not being worn by the people on the ground and it was not established how far away from the "hazard" area to stand.

(Editor's Note: There were 3 similar incidents involving wrenches and other equipment being accidentally dropped and nearly missing individuals on the ground.)

Rescue on Cable Bridge Over Water

While crossing a cable bridge over a river, a static belayed participant lost his balance and fell into the river. A staff member went out to help him up but was not able to. The staff member unclipped the client from his belay system and they walked across the river to the bank. The potential for injury was quite high and discussed in detail at the staff debrief at the end of the day. It was decided to have more trainings in order to come up with a better and more successful rescue procedure for this kind of incident.

(Editor's Note: Two line bridges over running water are quite popular. Programs offering such experiences should strongly consider rescue procedures as this situation dictates a unique approach.)

Sudden Cardiac Death 5/1/90

A 60-year-old male participant suffered sudden cardiac death while participating on a high ropes course. The participant was approximately ten feet up the climbing tower when he collapsed. He was immediately lowered to the ground. Since this collapse was also witnessed by two staff paramedics, CPR was begun immediately followed by Advanced Life Support procedures. The patient was transported via helicopter to the receiving hospital where he was pronounced dead approximately 1.5 hours after the incident occurred.

Background: The patient was screened by the staff paramedic prior to the program. The participant reported no heart problems. He did report high blood pressure but was not concerned by it. The participant was a utility company lineman and was very comfortable with heights and strenuous activity. The autopsy revealed that the patient had severe arteriosclerosis and had suffered a previous and unreported "silent" myocardial infarction.

Program's Analysis: This incident was investigated by both the utility company and a separate independent investigative body hired by the program. Both found that the death was not related to the ropes course activity.

Sudden Cardiac Death 9/10/90

At approximately 1:40 pm EST, a 57 year old male suffered "sudden cardiac death" as a participant during a ropes course experience. The cardiac arrest was not related to an event, but occurred approximately 7-10 minutes after the participant had completed the climbing tower. Since this was a witnessed

collapse, CPR was begun immediately. (The event director and the course director were CPR certified). The staff paramedics continued care until the ambulance arrived and transported the patient to the receiving hospital. Forty-five minutes after arriving at the emergency room, the patient was pronounced dead at 3:09 pm EST.

Background: This participant was medically screened prior to the course by the staff paramedic. No cardiac history was mentioned by the participant. A full investigation was done by the client corporation and it's medical staff. The death was found not to be related to the ropes course activity.

ROCK CLIMBING

Hair Caught in Figure-eight Descender

While a 46-year-old female instructor trainee was rappelling off the trapezoid, a small portion of hair from her braid worked loose and became entangled in her figure-8 descender. As she was rappelling with a belay, the ground instructor was able to immediately halt her descent. Tension was created on the belay rope allowing slack on the rappel rope at which time she was able to free her own hair. The participant was able to continue the descent on her own and received no damage to her hair or scalp.

Program's Analysis: Instructors are to be reminded of the importance of having hair, clothing and other loose objects secured well away from equipment in which entanglement can occur.

(Editor's Note: There were three other "hair caught in figure-8 descender" incidents reported. All of the participants were on a separate belay and were able to rectify the situation without injury)

Improper Knots

A climber's seat harness was found to have an error after the climb was completed. A granny knot was tied where the second square knot should have been. The climber was checked twice prior to climbing by staff. The error was found by the third staff member on top of tower. The seat was retied on top of the tower.

(Editor's Note: There were 9 incidents reported where knots were improperly tied. None of these incidents resulted in an injury.)

Belayer Could Not Keep Up With Climber

A 15-year-old male, participating on indoor climbing wall activity was ascending faster than his belayer could keep up with. At the top of the climb the participant fell. Slack was still not taken up. The participant fell 4-5 feet but was not injured.

Participant Belayers Drop Climbers

1) As the climber, a 12-year-old girl, was being lowered by ner belayer, she gained speed and fell 15-feet, narrowly missing a ledge. The instructor grabbed the rope and arrested her fall approximately 8-feet from the floor.

(Editor's Note: It is unclear from the report whether the primary belayer was backed-up by another participant and/or staff member.)

2) The belayer, a 13-year-old boy, was a very competent and practiced belayer. However, on this occasion, he backed-up as the climber ascended rather than pulling rope through the stitch plate. The gym floor was slick and he was pulled across the floor toward the wall as the climber descended.

Program's Analysis: As a result of this incident, all belayers stand in one position & have backups when lowering a climber.

Holds Break Off Artificial Climbing Wall

A block cracked off the climbing tower when the third climber of the day stood on it. A piece of the block fell to the ground. The piece "narrowly" missed a participant on the ground.

(Editor's Note: There were 3 other "artificial holds falling off walls" reported. With the proliferation of artificial walls look for this trend to continue. Although most commercially manufactured holds are quite durable, home-made blocks will continue to be used and will continue to break.)

Belayer Anchors into Beltloop

In the spring of 1990, date unknown, at approximately 10:00 a.m. a group of youth were beginning a rappel and rock climbing activity in a canyon. Anchors and ropes were in place, instructors were ready and the participants were ready to begin. It was a cloudy day and rain was threatening. The program director was at the site checking conditions. An instructor, wearing a rain coat, was anchored ready to belay youth climbing from the bottom of the canyon. As a precaution the director asked the instructor to raise the back of his rain coat to check the anchor secured to his climbing harness. An inspection revealed that the instructor had fastened the anchor carabiner around his pants belt and not around his harness. Had the climbing student fallen and the belt buckle failed, both the instructor and student would have been at risk of falling.

Program's Analysis: Our training teaches instructors to check the work of each other. We now use this incident as a teaching point to make sure our anchors are properly secured and that we check each other's work. We are reminded to be humble enough to check and double check our own work and the work of our co-workers.

Rock Fall Misses Participants

Rock dislodged by climbing rope lands between two participants.

(Editor's Note: There were 6 incidents involving rock fall at natural rock climbing sites. None of these incidents resulted in an injury.)

Non-Program Climbing Fatality

A 16-year-old male was a participant on a wilderness program beginning July 8, 1990 and ending July 20, 1990. Exactly one week following the end of the program, on Friday, July 27, 1990, he and several friends returned to a canyon which our program uses for rappelling and rock climbing. These young people, without equipment or adult supervision proceeded to climb the walls of the canyon. The 16-year-old male fell from near the top of the canyon some 40+ feet. He was evacuated that evening and air transported 135 miles for emergency care. He died the Tuesday, July 31, 1990 as a result of his injuries.

Program's Analysis: C program was in no way held responsible for the incident. However, our program feels a serious responsibility for having initiated these activities with this young man and all other youth for which we provide adventure-based activities. As a result of this incident we remind our instructors that they are to inform participants of the following:

> "We are providing an experience or experiences that help you learn about yourselves and each other. We are not teaching a skill to be used at a later date. All climbing activities shall be done with proper, adult, trained supervision and proper equipment. We discourage you from trying any climbing activities on your own."

(Editor's Note: This is a clear illustration of the "illusion" of safety that participants often take away from organized adventure experiences. This incident also reinforces the notion of providing accurate feedback to participants on skill level as well as where to go for additional training.)

CAVING

Hypothermia Avoided

On a caving trip, at the evening campsite inside the cave, a student demonstrated symptoms of mild hypothermia. As it turned out the student had not brought a change of clothes into cave. Spare clothes were solicited from other participants and staff to get the student into dry clothes.

CYCLING

Novice Cyclist Exceeds Ability

An 18-year-old female participant fell off her bike while touring. She suffered a chipped tooth, bruised left hip, lacerations to both knees and a bruised left eye. She was riding a new bike of inferior quality. The participant was not use to riding a bike, especially a heavily loaded one while using toe clips. As a result she ran off the pavement and onto the shoulder of the road. She tried to get back on the road but "bounced" off an asphalt ridge and fell.

(Editor's Note: There were numerous cycling related incidents reported. The most common causes of injuries were riding into lose rock/gravel, exceeding ability given the terrain, and using unfamiliar and/or new equipment.)

SNOW SKIING

(Editor's Note: With the exception of two soft tissue facial injuries and a strained lower back all reported skiing incidents were ankle and knee injuries including cartilage and ligament tears, and strains. The majority of reported incidents were from alpine skiing, with snow boarding second in number and a few nordic incidents being reported.)

CANOEING

Canoe Pins Between Trees

While canoeing Cedar Creek one of our canoes became pinned between two trees in a strong currant. While dislodging the canoe, the top plate of the canoe ripped completely off the boat.

Program's Analysis: We now give summer staff instruction in unpinning canoes.

Twisted Ankle on Portage

A 23-year-old female participant stepped on a root while carrying a pack on a canoe portage. The student sustained a twisted ankle.

WHITEWATER PADDLESPORTS

Wet Exit Incidents

While in a kayaking pool clinic, students were practicing wet exits. On a second attempt, with spray skirt attached, one older, physically inflexible student was not able to release his spray skirt. He panicked and tried to swim out of the boat, to no avail. One staff member provided the bow of her boat to the waving hands of the up-side-down student. The other staff member jumped in the pool

to help. The student was helped up gasping and coughing having swallowed water. Without staff intervention, the student may have drowned.

Program's Analysis: The necessity of close supervision for students learning to wet exit was reinforced.

(Editor's Note: Other whitewater paddlesports injuries included: knee sprains and torn ligaments from wet exits (2), hitting nose on a rock doing wet exits (2), sprained ankle while chasing a kayak after a wet exit, bumps and bruises from a bad swim, bruised knees from "jumping" into the river to assist another kayaker, dislocated shoulders (2), and the top two incisor teeth knocked out when a participant hit his face on a rock while attempting to roll.)

HIKING

Impending Night Fall/Exceeding Ability

The group was too slow doing a technical canyon descent and was forced to do the final rappel and remaining boulder problems in the dark. Instructors were briefed prior to the descent as to the safety problems and the need for an early start. This was a difficult group that had many problems.

(Editor's Note: There were 4 other "hiking unprepared in the dark" incidents reported. Reasons for unplanned night hiking included being off route and over estimating the speed at which the group could travel.)

Too Much Faith in Chaperones

Due to the late hour, program staff decided to send participants to the van with the adult chaperones. The staff stayed behind to pack up the rock gear. Staff, upon returning to the van realized that the participants had not shown up. While organizing a hasty search, (approximately 45 minutes from the time last scene) the chaperones and participants arrived at the van. The chaperones had lead the participants down the wrong trail.

Program's Analysis: Instructors put too much faith in chaperones to get the participants back to the van unescorted by our staff.

(Editor's Note: The greater issue beyond a simple wrong turn is the practice of considering chaperones as part of the staff side of activity ratios. Programs that rely on non-program staff, adult supervision can (as illustrated above) raise their accident potential significantly. In many cases, chaperones are more aligned with participants than staff with regard to behavior and skills. Often, because of the ambiguous role they play, chaperones can even become a liability that is more dangerous than the youth they accompany.)

Staff Complacency

Participants reported a snake to instructors and were guided past it. The instructors returned for personal packs, forgot where the snake was and narrowly missed being struck on the return trip.

Fall in Frigid Water Attracts Parent's Attention

In January 1989, we had a group walking on the frozen pond with their group leader. The group leader made it clear where it was safe to walk and where it wasn't. One student stepped (on purpose?) in an unsafe area and fell in, getting wet up to mid thigh. He was immediately brought back to his cabin where he dried off and put on dry clothes. His group continued with their lesson plan for the day in the outdoors. The counselor told the program coordinator of the incident but neither a close call nor accident report was written. A week later we received a very angry letter from the child's father who felt that our safety practices were inadequate and indirectly threatened to contact a lawyer about the incident.

Program's Analysis: After reviewing this incident among all staff members, we decided to increase the visibility of all accidents and close calls to all staff members by doing the following:

1. Every Friday at the staff "debriefing" meeting, we review every accident and close call report with all staff. This makes all staff aware on a weekly basis of where and when our accidents/close calls are happening. It also decreases the uneasiness that group leaders might feel about mentioning an incident. It ensures documentation of all incidents as an administrative person at the meeting (usually our camp nurse) is responsible for following up with each incident to make sure it's documented.

2. We circulate each accident/close call reports among all permanent and administrative staff and have each person initial it after reading it.

3. We now are very aware of looking at every accident no matter how minor, from the injured person's perspective. If a child perceives the situation as a major incident, we notify the parents before the child goes home to prevent an "overblown" story from being the first notice parents get.

Cold Swim

We have a raft bridge which crosses the slow-moving, shallow river on camp property. In May, 1989, a camper who was crossing over the river lost her balance and fell in the water, getting wet up to mid-torso. She walked the one mile walk back to the dorm and changed clothes, and was checked at health center

for any signs of hypothermia. The participant sustained no injuries from the incident.

Program's Analysis: Now we use the same weather standard for raft bridge and cable bridge crossing as for canoeing (i.e., water temperature plus air temperature must equal 100° Fahrenheit).

Hiker Jumps to Miss Mud

Male participant sustained twisted ankle while orienteering. He attempted to miss a mud puddle by jumping over it. Instead of clearing the puddle he slipped and fell right in the middle of the mud.

(Editor's Note: This practice probably accounts for more ankle, knee and back injuries than we'll ever realize. In fact, the nature of most of the reported hiking injuries were sprains, strains, and minor injuries resulting from slipping, tripping and stepping on roots.)

CAMPING

Student Cooks with Poisonous Leaves

Students cooking on a survival class were to prepare hamburgers without using any utensils. One girl decided to wrap her meat in leaves. For this she used May apple leaves which are poisonous. The instructor identified this error immediately and stopped her. The meat and leaves were discarded.

Camp Stoves

While a student was attempting to light a camp stove, she allowed a lot of gas to run into the spirit cup. The student lit the stove while her face was over it, singing her hair, eyelashes, and eyebrows.

Program's Analysis: Cooking and stove dangers have been emphasized in staff trainings. All staff are asked to present their teaching techniques on stove operation prior to each course. We are experimenting with different stoves and emphasizing lighting procedures in safety briefings. Students must now be signed off by the instructor before they can light the stove independently.

Stove Modification Backfires

A student disabled the safety stop on the stove's flame adjustment knob. He unscrewed the knob of the stove in an attempt to get the partially clogged stove to burn hotter. The result was that the o-ring seal which keeps liquid gas from escaping around the knob came out causing a 4-foot spray of gas and flame. The spray hit the student's knee in liquid form and was soon ignited by the stove along with about 2 square feet of wet leaves. The student quickly rolled and extinguished his knee. I was close enough to observe the blaze and myself and

another student extinguished the fire with wet leaves and a fireproof blanket. No damage was done to the student or rain gear. The stove pump was melted slightly. It seemed as though it would function but I retired it anyway thinking there may be some unseen flaw.

Dehydration

On a winter camping trip, a participant did not drink enough liquids despite the group being informed of the danger of dehydration. The student reported severe shivering and a black-out during the night with headaches the next morning. Drinking lots of water solved the headache problem.

Program's Analysis: As a result of this incident staff discussed the need not just to inform students about these kinds of issues but to monitor their actions.

Bee Sting

A 16 year old female participant sustained an allergic reaction to insect bites while backpacking. Several bites from unknown insects were the mechanism of injury. An anaphylactic type reaction ensued which required adrenaline injections.

(Editor's Note: There were 3 other reported cases of allergic reactions to insect bites. None of the other cases required injections.)

BACKPACKING

Fatality

An 18 year old male participant was killed in a hit and run accident while crossing a road backpacking. The hit and run involved two cars.

(Editor's Note: It is difficult to draw any conclusions about the circumstances of this incident. There are no further details in the documentation.)

Falls

1) A 16-year-old female participant sustained a bruised head, pulled neck muscles and lacerated knee while backpacking. She fell down a steep, 15-foot stream bank while walking.

2) A 15-year-old female participant sustained a lower back injury while backpacking. She tripped on a root on the trail and fell 5-7 feet, landing on her pack. A helicopter evacuation was required given the nature of the injury.

(Editor's Note: The following is a list of reported incidents for backpacking: Twisted/sprained ankles (6), knees (8), overuse knees & ankles and soft tissue damage (9), lower back (1), sprain to wrist/hand (4), severe blisters, both

attributed to new boots (2), and one dislocated shoulder from wearing a pack while rock climbing.)

Altitude

(Editor's Note: There was one reported case of altitude sickness and two cases of pulmonary edema. None of the cases indicated what was done to treat the illnesses. The altitude at which symptoms occurred was not reported.)

Participant is Unprepared - No Food

On a 5 day backpacking trip one of the participants had severe leg cramps and fatigue the third day out. The leaders realized that he had brought no stove or food and was only eating lunch meat and bread. He was dehydrated. He was given a hot meal, drink, and some rest. He was shaky but was able to finish the hike.

TRANSPORTATION

Van Swerves, Cuts Off Car

A program van was involved in an accident while following another van down the highway. The lead van almost missed the exit but made the quick turn off the exit. The second van cut over but did not see the car already in the exit lane. The car swerved to avoid being hit and hit the bridge embankment. No individuals were injured as a result of the accident.

Program's Analysis: Correct lane changing as well as following procedures were put into staff training.

(Editor's Note: This incident speaks volumes to the need for outdoor programs to develop and use a sound driver training and check out procedure.)

Complaint Results in Improved Risk Management

On September 28, 1989, the outdoor program received a letter of complaint from a concerned citizen alleging that one of our vehicles was speeding with a load of students on August 3, 1989. An investigation was unable to determine the validity of the complaint.

Program's Analysis: Several issues came to the surface as a result of this complaint resulting in changes for our summer 1990 program. They are as follows:

1. Instructors are being reminded to obey posted speed limits. This issue is being more completely addressed in the Instructor's Handbook.

2. More driving time was allowed for the 1990 summer program.

3. Wilderness locations were used that are closer to base for most 1990 summer wilderness experiences. Greater driving time will be allowed for the more distant locations.

4. Drivers are to rotate driving every 2 hours or less.

Van Seat Improperly Installed

While boarding a program van a student noticed the seat in the van needed repairs. It was inspected and proved to be installed incorrectly after being removed earlier that week. Fortunately nothing happened but if a sudden stop had been necessary...

OTHER

Student Bites Thermometer

A student bit a thermometer while it was in his mouth as his temperature was being taken. The student was talking and had a history of being the "class clown."

Program's Analysis: We have looked into other types of thermometers (like rubber ones) with no success. We are currently using rectal thermometers that are a little stronger. We've also realized that by removing the student from the rest of the group we may have avoided this incident.

Trail and Road Running Incidents

(Editor's Note: There were 14 reported incidents of twisted ankles and knees from structured running programming. The majority of these incidents resulted from participants running on uneven surfaces such as unimproved trails.)

Non-activity Staff Incident

A 26-year-old male staff member twisted his right knee while jogging to the bus to leave the hospital after dropping off a participant. He stepped off a high curb onto a down slope which caused the knee to twist badly. The twist fully severed the anterior cruciate ligament and tore the medial meniscus.

Participant Threatens Suicide

A 21-year-old male participant ran from the group and climbed onto the catwalk high element. The participant then pulled the nitro crossing rope up from under the catwalk, made a noose, and put it around his neck threatening suicide. Hospital staff talked with the participant for 1 1/2 hours before he decided to descend from the element.

SECTION 4: CONCLUSIONS

It is important to realize, as was reported in the introduction to this report, that this is not a random sample of outdoor programs and therefore, results are only generalizable to the contributing organizations. Given this limitation, the statistics were interpreted and reported in the spirit of sharing what was reported rather than what is representative of the entire field. The narrative section is also presented in this spirit. Though an attempt was made to objectively select narratives, the editors' bias is certainly reflected in the process. Narratives were selected that the editors felt would provide valuable information to be used in staff trainings and risk management planning.

There are a number of pieces of this reporting process that should be closely considered in order to improve future reports. One significant area of improvement from an industry standpoint is simply to increase the quantity of participating programs. It is interesting to note that this report represented 6,300,000 participant hours operated by 53 organizations over a two-year period. By comparison, a rough estimate of the total participant hours of AEE organizational members (this does not account for AEE individual members and non-AEE adventure-based programs) is approximately 35,000,000 in any single year, with 400 organizational members at any given time. Increasing representation in this project is badly needed. With more reporting, this project will move toward providing a truly representative database from which to draw conclusions and build legitimacy.

Throughout the course of analyzing data for this report, it has become apparent that there are two significant inconsistencies that warrant further attention. If the outdoor adventure industry is going to utilize accident rates as a measure of safety, then there needs to be a clearer definition of how participant hours are calculated. Secondly, specifying the difference between a serious and reportable injury and those that are not reportable warrants more attention. Work is being done to address some of these inconsistencies (see Appendix 1), but additional feedback and dialog with practitioners is needed. Only through this type of partnership can this project continue to improve.

Reviving this report is one key step toward developing a global perspective of risk management in adventure programming. Additional elements including accreditation, wilderness risk manager training, sharing of "best management practices," and peer review all play a part in carrying the vision of improving risk management practices in the industry. Partnerships, open communication, and commitment at all levels will bring this vision to reality.

APPENDIX 1

ADVENTURE PROGRAM INCIDENT REPORTING PROJECT

The Project

The incident reporting project is a joint endeavor between the Wilderness Risk Managers Committee and the Association for Experiential Education. The project is also endorsed by the Association for Challenge Course Technologies. Goals of the project are:

- To provide a tool to educate interested parties (insurance industry, program managers, public land custodians, participants) about risk management implications of adventure programming;
- To provide a significant and comprehensive database upon which statistical analysis can be done to provide a collective knowledge base and reliable information source for the field of adventure programming;
- To provide a central reporting forum for incidents; and
- To enhance the collective judgment of the field by examining trends within it.

In addition to being a central reporting database, the project will produce an annual publication of data and narratives from the prior year's reported incidents. Deadline for submission is February 15 for the prior year's data. The publication can be ordered through the Association for Experiential Education (303/440-8844).

Who Should Submit Data?

All organized programs offering adventure-based experiences to clients are invited to participate. Guidance about appropriate activities that the database tracks can be found on the Demographics Cover Sheet. The project seeks data from adventure related businesses, adventure-based summer camps, colleges and universities, public and private schools, adventure-based counseling programs, corporate training programs and other similar organized adventure-based programs.

What Does It Cost to Participate?

There is no cost to submit data to the project. Programs submitting data will receive the annual publication at the direct production cost.

A Word About Confidentiality

Information on programs reporting data will be kept confidential. Programs submitting data will in no way be identified in connection with their incidents.

END OF YEAR DATA SUBMISSION

Demographics Cover Sheet

With the goal of creating a comprehensive data base, it is important that programs submit a demographics cover sheet regardless of whether they have had any reportable incidents.

Time Frame for Submissions

Deadline for prior year data submission is February 15. Complete the attached demographics cover sheet and send it to the address listed below.

Individual Incident Reports

Along with the demographics cover sheet, submit individual incident report forms for any reportable injury, illness or near miss that meets the criteria listed below.

Computer Submission of Data

Computer submission of data is possible. For details on appropriate software and program set-up contact Tod Schimelpfenig at 307/332-1256 or email at: TDS@NOLS.EDU.

Data should be submitted to:

Association for Experiential Education
Adventure Program Incident Reporting Project
2885 Aurora Ave, Ste #28
Boulder, CO 80303
303-440-8844
303-440-9581 (fax)

COMPLETING INDIVIDUAL INCIDENT REPORTS

This report is designed with the intent that it be useful for program records and documentation as well as the incident data gathering needs of this project. The form can be used both to record pertinent incident data, and essential patient information. As a reminder, statements from witness are recommended information for a program to obtain in the event of an incident, but are **not** necessary to submit to this database.

Accurate and complete reports are essential to the strength of this database. The following instructions are provided for completing the Incident Report Form. Questions about completing the incident report should be directed to Tod Schimelpfenig at NOLS (307-332-1256) or Jeff Liddle at AEE (303-440-8844 ext 3).

For the purposes of this project, an incident (also known as an accident) is anything that we had hoped would not happen.

A reportable injury or illness meets one or more of the following criteria:

- Requires more than simple first aid
- Requires more than cursory staff attention
- Requires follow-up care by staff in the field
- Requires use of prescription medications
- Interferes with the participant's participation
- Results in an evacuation
- Results in a lost program day.

Program Name

Include the name of the adventure program here. It will be only be used to confirm unclear data and will be kept confidential.

Program Type

This should be a brief description of the participant population on the course, (i.e., university students, psychiatric inpatients, adjudicated youth, corporate managers, etc.).

Name

The name of the person involved in the incident. This is included for completeness of the program's records. **The name should be omitted or blacked out on the forms submitted to AEE.**

Age, Gender, Staff or Participant, Incident Date, and Time

Self Explanatory

Day of Course Incident Occurred

The number of days the participant was in the field prior to this incident.

Program/Course Area

This should be a geographical description of the program area, (e.g., Wyoming, Bighorn Mountains, Mt. Baldy, or Vermont, Green Mountains, Long Trail, etc.).

Type of Incident

An incident may be categorized as an injury, illness, motivation/behavioral, damage, or a near miss. Check each applicable category.

Lost Day Cases
A lost day case occurs if a participant missed one or more days of activity beginning with the day following the incident, or if it causes loss of more than half of the day of the incident for morning mishaps.

Near Miss Incidents
A "close call," a potentially dangerous situation where safety was compromised but that did not result in a reportable injury, i.e., an unplanned and unforeseen event. This rules out situations such as routine top rope falls, failure to roll a kayak for a beginning student, or a fall on the trail with no injury. Near misses are situations where those involved express relief when the incident ends without harm.

Motivational or Behavioral Incidents
Examples are unwillingness to participate, running away, alcohol or drug use, assaultive behavior, suicidal ideation, or an emotional or psychological situation that compromises the student's ability to participate in the program.

Evacuations
Evacuations are occasions in which the person leaves the field as a result of the incident. There are several levels of definition that aid in determining the seriousness of the incident:

- Participants who leave the field
- Participants who seek medical care upon leaving the field
- The type of evacuation (assisted by litter, helicopter, etc. or the patient was able to walk out unassisted).
- If hospitalization was needed
- If the participant returns to the field.

Property Damage
This is included to make the program's records complete for insurance purposes. Circle if property, equipment, or vehicle damage occurred.

Type of Injury/Illness/Damage
All the applicable categories should be checked. Please specify the injury if the "other" category is checked

Anatomical Location of the Injury
All applicable categories should be checked

Type of Illness
All applicable categories should be checked. Please specify the illness if the "other" category is checked.

Activity at Incident
All applicable categories should be checked describing the program activity the person was engaged in at the time of the incident.

Immediate Cause of Incident

This is a list of common incident causes in outdoor programming. Prioritize the applicable categories 1,2,3, etc. It is understood that due to legal advice, some programs may chose to omit this section.

Narrative

Describe the incident. What, how, and when it happened, any medical treatment, and the final medical outcome or diagnosis.

Analysis

Include any observations, recommendations, or suggestions regarding prevention. It is understood that due to legal advice, some programs may choose to omit this section.

Modifying the Incident Report Form

Some programs will feel the need to track additional information not found on this form. Certain aspects of the form can be deleted and additional sections added to suit the needs of the program. In order to maintain the integrity of the database the following sections **cannot** be deleted:

- Program Name & Type
- Incident Date & Time
- Geographic Local
- Weather
- Type of Incident
- Type of Injury
- Anatomical Location of Injury
- Type of Illness
- Program Activity
- Narrative

Programs may **add** to the categories in these sections for their use.

About the Association for Experiential Education

The Association for Experiential Education (AEE) is a not-for-profit, international, professional organization with roots in adventure education, committed to the development, practice, and evaluation of experiential learning in all settings.

AEE sponsors local, regional, and international conferences, projects, seminars, and institutes, and publishes the ***Journal of Experiential Education***, the ***Jobs Clearinghouse***, directories of programs and services, and a wide variety of books and periodicals to support educators, trainers, practitioners, students, and advocates. The AEE demonstrates its committed to the enhancement of guality and risk management in adventure programming by offering the opportunity for programs to conduct peer reviews and pursue AEE's Adventure Program Accreditation.

AEE's diverse membership consists of individuals and organizations with affiliations in education, recreation, outdoor adventure programming, mental health, youth service, physical education, management development training, corrections, programming for people with disabilities, and environmental education.

To receive additional information about the Association for Experiential Education call or write to:

AEE
2885 Aurora Avenue #28
Boulder, CO USA 80303-2252
(303) 440-8844
(303) 440-9581 (fax)

Additional Publications from
the Association for Experiential Education
2885 Aurora Avenue #28, Boulder, CO USA 80303-2252
(303) 440-8844 (ph), (303) 440-9581 (fax)

BOOKS

MANUAL OF ACCREDITATION STANDARDS FOR ADVENTURE PROGRAMS 1995

ISBN #0-9293-61-13-X
The most recent issue of the guidelines used to review and accredit programs through AEE's Program Accreditation Services. The *Manual of Accreditation Standards* represents the collective experience of program professionals who have designed and run the activities presented in this book.
Member $17.50 / Non Member $20.00

ADVENTURE THERAPY: Therapeutic Applications of Adventure Programming *

Michael A. Gass, Ph.D.
ISBN #0-8403-8272-3
This valuable resource book contains writings by Dr. Gass and other respected practitioners in the growing field of therapeutic adventure programming. AEE Member price $23.95 / Non Member $29.95

BOOK OF METAPHORS, VOLUME II *

Michael A. Gass, Ph.D.
ISBN #0-7872-0306-8
The use of metaphors in adventure programming often serves as a key for producing lasting functional change for clients. Topics covered include steps for framing experiences, verbal introductions, debriefing, and methods for facilitating adventure experiences.
Member $23.00 / Non Member $28.95

ETHICAL ISSUES IN EXPERIENTIAL EDUCATION, SECOND EDITION *

Jasper S. Hunt, Jr.
ISBN #0-8403-9038-6
An examination of the current ethical issues in the field of adventure programming and experiential education. Examples of topics include ethical theory, informed consent, sexual issues, student rights, environmental concerns, and programming practices. Member $16.00 / Non Member $23.00

THE THEORY OF EXPERIENTIAL EDUCATION, THIRD EDITION *

Karen Warren, Mitchell Sakofs and Jasper S. Hunt, Jr., editors
ISBN #0-7872-0262-2
The third edition of this groundbreaking book looks at the theoretical foundations of experiential education from a philosophical, historical, psychological, social, and ethical perspective. The aim of the book is to encourage readers to think about *why* they are doing *what* they are doing.
Member $30.00 / Non Member $38.95

EXPERIENTIAL LEARNING IN SCHOOLS AND HIGHER EDUCATION *
Richard J. Kraft and James Kielsmeier, editors
ISBN #0-7872-0183-9
This updated and expanded anthology addresses the role of experiential education at all levels of schooling. This book is a must for educators, school board members, administrators, professors, and researchers who are still striving to improve education for all our children, young people, and adults.
Member $30.00 / Non Member $38.95

EXPERIENCE AND THE CURRICULUM*
Bert Horwood, editor
ISBN #0-7872-1596-1
An anthology where teachers' voices, raised out of hard-won experience and filtered through thoughtful, critical perspectives, provide insiders' views of practice. Unlike the restricted notion that the "experience" in experiential education must comprise some kind of physical adventure, in these stories active experience includes reading and writing, families, the community and classroom work, as well as out-of-school events.
Member $24.00 / Non-member $29.95

** You may order these books directly through Kendall/Hunt Publishing by calling (800) 228-0810. When calling, please reference AEE and have your member # ready.*

EXPERIENTIAL EDUCATION IN HIGH SCHOOL: Life in the Walkabout Program
Bert Horwood, with a foreword by Maurice Gibbons
ISBN #0-9293-6104-0
This book is a stirring ethnography of Jefferson County Open High School, an institution based on the revolutionary idea of high school as a right of passage from adolescence to adulthood.
Member $9.00 / Non Member $13.50

DIRECTORIES

1995 AEE MEMBERSHIP DIRECTORY AND HANDBOOK: The Complete Association Resource
An 85-page index that lists AEE's Corporate & Organizational Members, Family & Individual Members, Professional Groups, Special Interest Groups, Regional Groups, International Liaisons, and more. Indexed geographically for easy reference.
Free with Membership / Non Member $25.00

ANNOTATED BIBLIOGRAPHY OF ADVENTURE THERAPY AND RELATED PROGRAMS: 1980-1994
compiled by Lee Gillis, Ph.D. and April Babb, B.S.
Member $5.00 / Non Member $7.00

DIRECTORY OF EXPERIENTIAL THERAPY AND ADVENTURE-BASED COUNSELING PROGRAMS
edited by Jackie Gerstein, Ed.D.
Member $12.50 / Non Member $15.00

EXPERIENCE-BASED TRAINING AND DEVELOPMENT: Directory of Programs
edited by David Agran, Dan Garvey, Todd Miner, and Simon Priest
Member $12.50 / Non Member $15.00

JOBS CLEARINGHOUSE
One of the most comprehensive and widely used monthly listings of full-time, part-time, and seasonal job and internship opportunities in the experiential/adventure education field.
Member or Non Member (single issue) $7.00
Member (12 issues) $30.00
Non Member (12 issues) $60.00
*Shipping and handling included in subscription rates for delivery in the United States only.

CONFERENCE PROCEEDINGS MANUALS: 1990-1995
A collection of abstracts from the workshops presented at each International AEE Conference.
1993 Manual: Member $12.50 / Non Member $15.00
All others: Member $20.00 ea. / Non Member $25.00 ea.

THE JOURNAL OF EXPERIENTIAL EDUCATION
A professional journal for people in the field of experiential education and adventure education. Three issues per year. (Also available: back issues and multi-volume sets.)
Free to Members / $25.00 yr. Non Members (CO residents add 7.01% sales tax)
*Shipping and handling included for subscriptions in the United States

AEE JOURNAL INDEX
Includes all volumes from 1978-1994, classified by subject, title, and author.
Member $8.00 / Non Member $10.00

WRMC & AEE ADVENTURE PROGRAM INCIDENT REPORT FORM

Program/Course Name _____

Program Type _____

Name _____ (circle) Male/Female, Staff/Student Age ____

Incident Date _____ Time __:__ AM/PM Day of course incident occurred ___

Geographical Location of Incident _____

WEATHER at Time of Incident:

Temp (°F) _____ Precipitation (circle) Rain or Snow or None
Wind (mph) _____ Visibility _____ (ft or miles)
Surface Condition (circle) wet, dry, snow, ice, trail, rock, uneven, flat, sloped

TYPE OF INCIDENT: Check each applicable category:

Injury _____ Illness _____ Motivation/Behavior _____
Near Miss ____ Fatality _____ Damage _____

Is this a Lost-Day case? ___NO ___YES If Yes, # of Days Lost _____

Did the victim leave the field? ___NO ___YES If Yes, on what date _____

Evacuation method (circle) walk unassisted, litter, vehicle, helicopter, other _____

Did the victim visit a medical facility? ___NO ___YES If Yes, length of stay in days ___

Did the victim return to the course? ___NO ___YES If Yes, on what date _____

Was there damage to (circle) vehicle, equipment, or property?

TYPE OF INJURY/ILLNESS,DAMAGE (check all that apply)

_____bruise, contusion or similar soft-tissue trauma
_____ligament sprain
_____muscle strain
_____frostbite
_____fracture
_____dislocation
_____head injury without loss of consciousness
_____head injury with loss of consciousness
_____near drowning or other submersion problem
_____immersion foot
_____tendinitis
_____eye injury
_____dental or tooth-related
_____burn
_____blister(s)
_____laceration
_____skin abrasions
_____sunburn
_____other _____
_____If damage to property, describe: _____

ANATOMICAL LOCATION OF INJURY

_____Head	_____Forearm	_____Pelvis
_____Face	_____Wrist	_____Hip
_____Eye	_____Hand/Fingers	_____Thigh
_____Neck	_____Chest	_____Knee
_____Shoulder	_____Abdomen	_____Lower Leg
_____Upper Arm	_____Upper Back	_____Foot
_____Elbow	_____Lower back	_____Ankle
		_____Toe

TYPE OF ILLNESS (check all that apply)

_____allergic reaction
  _____mild or localized
  _____severe, generalized or anaphylaxis
_____altitude illness
  _____acute mountain sickness
  _____pulmonary edema
  _____cerebral edema
_____hypothermia (specify core temperature if known __°F/__°C)
_____heat illness (specify core temperature if known __°F/__°C)
  _____heat exhaustion
  _____heat cramps
  _____heat stroke
_____chest pain or cardiac condition
_____upper respiratory illness (runny nose, congestion, "cold")
_____upper respiratory illness (other) _____
_____abdominal or other gastrointestinal problem without diarrhea
_____diarrhea
_____apparent food-related illness
_____nonspecific fever illness
_____urinary tract infection
_____skin infection
_____eye infection
_____other _____

PROGRAM ACTIVITY (activity at the time of the incident)

_____Backpacking	_____Horse	_____Ropes course (high)
_____Camp	_____InitiativeGame	_____Ropes course (low)
_____Canoe	_____Kayak (WW)	_____Run
_____Caving	_____Mountaineering	_____Sail
_____Portage	_____Service	_____Swim/Dip
_____Cycle	_____Rafting	_____Ski w pack
_____Dog sledding	_____River crossing	_____Ski w light pack
_____Glacier travel	_____Rappel	_____Sea Kayak
_____Hike no pack	_____Snow Climb	_____Snowshoeing
_____Solo	_____Sportyak	_____Cooking
_____Vehicle/Van	_____Urban activity	_____UnaccmpTravel
_____Rock climbing(artificial wall)		
_____Rock climbing (real rock)		
_____Other(explain) _____		

MEDIATE CAUSE (prioritize major applicable categories 1, 2, 3, etc.)

___Altitude
___Avalanche
___Carelessness
___Dark/poor visibility
___Dehydration
___Inadequate Equipment
___Exceeded ability
___Exhaustion
___Fall/Slip on trail;
___Fall on snow
___Fall on rock
___Falling rock
___Failure to follow instructions
___Psychological
___Falling tree/branch
___Technical System Failed
___Unknown
___Hazardous animal/insect (specify)_____
___judgment / intoxication (alcohol/drugs)
___Other(explain)_____

___Immersion/submersion
___Inexperience/poor
___Inadequate Instruction
___Improper Screening
___Inadequate Supervision
___Lightning
___Missing/Lost
___Misbehavior
___Overuse injury
___Poor camp/personal hygiene
___Preexist. medical condition
___Plant poisoning/toxicity
___Poor Technique
___Cold Exposure
___Sunburn
___Unfit
___Weather

NARRATIVE: Describe the incident. What, how and when it happened, any medical treatment, and the final medical outcome or diagnosis.

ANALYSIS: Include any observations, recommendations or suggestions regarding prevention.

Report prepared by:_____ Position:_____ Date:_____

Signature:_____ Date:_____

ADVENTURE PROGRAM INCIDENT REPORTING PROJECT
DEMOGRAPHICS COVER SHEET

Instructions

In order to develop incident rates by activity it is necessary to gather accurate participant hours for staff and participants, students, and clients. For the programs represented in the incident data sheets you are submitting, please include the pertinent activity, participant, and staff information.

Tracking participant and staff hours by activity is an ongoing process beginning with the leader's end of course evaluation. Following every trip, the leader should complete a form that gathers the data by activity and submit this to the program director. With ongoing tallying throughout the year, the end of the year report becomes a simple process. Without diligent ongoing reporting, the end of year report is an overwhelming task.

1. Program Name _____
   Address _____
   Contact Person _____
   Contact Person's Phone Number _____

2. Choose an activity description from this list, or if you choose "other," please specify the activity.

Activity

Backpacking	Kayaking (whitewater)	Solos
Biking (mountain)	Kayaking (sea)	Snoeshoeing
Biking (touring)	Rafting	Sports & Recreational Games
Camping (general camp time)	Mountaineering	Transportation (vehicles to and from activities)
Canoeing (flatwater)	Initiatives	
Climbing (rock)	Ropes Course (low elements)	Water (swim, wade, snorkel)
Climbing (artificial wall)	Ropes Course (high elements)	Work Projects
Climbing (ice)	Sailing	Non-activity (sleeping, eating, etc.)
SCUBA	Skiing (alpine)	Other (specify)
Caving	Skiing (nordic)	

3. For each pertinent program activity, please submit the following information.

Example 1 *Hiking (day)*

Activity *Hiking (day)*

Participants 20, multiply by # hours 40, equals the participant hours = 800.
Staff 4, multiply by # hours 40, equals the staff hours = 160.

Add participant & staff hours to get total activity hours = 960.

Example 2 *Climbing (rock)*

Activity *Climbing (rock)*

Participants 10, multiply by # hours 16, equals the participant hours = 160.
Staff 4, multiply by # hours 16, equals the staff hours = 64.

Add participant & staff hours to get total activity hours = 224.

Activity ________________

Participants ________ multiply by # hours________equals the participant hours = __________
Staff ________ multiply by # hours________ equals the staff hours = __________

Add participant & staff hours to get total activity hours = __________

Activity ________________

Participants ________ multiply by # hours________equals the participant hours = __________
Staff ________ multiply by # hours________ equals the staff hours = __________

Add participant & staff hours to get total activity hours = __________

Activity ________________

Participants ________ multiply by # hours________equals the participant hours = __________
Staff ________ multiply by # hours________ equals the staff hours = __________

Add participant & staff hours to get total activity hours = __________

Activity ________________

Participants ________ multiply by # hours________equals the participant hours = __________
Staff ________ multiply by # hours________ equals the staff hours = __________

Add participant & staff hours to get total activity hours = __________

Activity ________________

Participants ________ multiply by # hours________equals the participant hours = __________
Staff ________ multiply by # hours________ equals the staff hours = __________

Add participant & staff hours to get total activity hours = __________

Activity ________________

Participants ________ multiply by # hours________equals the participant hours = __________
Staff ________ multiply by # hours________ equals the staff hours = __________

Add participant & staff hours to get total activity hours = __________