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Avoiding Catastrophic Accidents in LOAs: Nurturing High-Quality K-12 Programming

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The risk management recommendations in this chapter would apply equally to all non-sport school programming in natural environments. These general recommendations are supplemented by an additional focus those programs that contain an "adventure" component, which can incur additional risk. Consequently, for this chapter, the led outdoor activity (LOA) is defined as:

a self-propelled physical pursuit that is harmoniously undertaken in natural settings with adventurous and purposeful intent, where a leader has the competence and legal, moral, and supervisory responsibility for the shared safety, risk management, change, learning or enjoyment with one or more participants (Priest, Ritchie & St-Denis, 2022).

LOAs for children and youth are a safety paradox. In general, these have an excellent safety record with an injury rate that is far lower than that of

team sports, driving, or other publicly accepted activities (Cooley, 2000; Higgins, 1981; Furlong et al, 1995; Meyer, 1979; Project Adventure, 1987) and is on par with the risks of daily living (Gass & Javorski, 2013; Gookin & Swisher, 2015). However, despite this factual evidence, very rare accidents have resulted in youth fatalities on LOAs, where a school teacher was in charge, and, unfortunately, these have been highly publicized.

Two infamous examples come to mind. One classic example that made national headlines was the deaths of seven Grade 10 students from Alberta who had been buried by an enormous avalanche near Rogers Pass, BC. They were a group of 14 students and three adults on a backcountry ski trip in a known avalanche area (Cloutier, 2003). Another more recent example involved "a 15 year-old student, [who] drowned while swimming with his classmates at a remote canoe trip campsite in Algonquin Park [ON].... The supervising teacher was charged with criminal negligence causing death, and upon public trial was

acquitted (Jackson et al, 2023, p.140). Challenging students physically and psychologically are worthy pedagogical objectives that can be fully achieved without exposure to actual dangers and real risk of injury. Misunderstanding this key point was a major factor in both these accidents (Heshka, 2006).

As a result of these highly publicized incidents, educational institution's risk managers and administrators may become generally uncomfortable with and refuse to sponsor or support LOAs. Although these positions may not be supported by the injury records, they are justified by the sensationalization in the media and the perceived court of public opinion. Serious injuries or deaths in LOAs are likely to result in far greater reputational and financial penalties for the educational institution, than the equivalent injury on a playing field. Equally problematic is that institutional risk managers are aware, or should be aware, that traditional strategies that rely on administrative control and rule-based protocols for addressing risks are neither an efficient use of resources, nor reliably effective in preventing serious accidents on LOAs.

Unfortunately, the factors that have historically resulted in serious accidents are endemic to many programs today, and it is only a matter of time before another fatal incident occurs on a school trip. A strong argument can easily be made that quality outdoor adventure programming should be part of every child's education, but for this to become possible the administrative burden needs to be minimized and risk managers need to be assured that students will be safe. To make both these things possible, we have a pressing need to solve the LOA safety paradox.

This chapter focuses specifically on avoiding serious accidents on LOAs, which actually tend toward the low end of a risk exposure continuum for outdoor programs. While the chapter may be directed at teachers working with children and youth, its articulated principles are equally applicable for all age groups and those activities positioned at the high end of risk exposure, such as backcountry heli-skiing.

Definitions

Risk management is the collection of procedures put in place to reduce the likelihood of an accident (Priest & Gass, 2018). These procedures can be proactive or primary (completed before the LOA), active or secondary (in effect during the LOA), and reactive or tertiary (carried out after the LOA). This chapter examines the before and during procedures. Managing risks is arguably the oldest human activity, since it is how the species has survived and evolved. Risk management in the evolutionary sense is achieved through behavioural responses to perceived risk that depend on sound judgement about what is happening now and what to do next. Risk management as a professional activity is a recent innovation arising from the discovery that bad things don't happen by good luck, but are the outcome of causal processes that we can understand in theory and control through practice.

To begin, clarifying risk management terms is essential to comprehending systems used in LOAs and outdoor adventure programming. Here are some definitions that have been accepted since the 1980s, but the outdoor learning profession remains open to alternative interpretations (Priest & Gass, 2018).

Adventures are learning opportunities with uncertain outcomes. The uncertainty is created from dangers, some inherent to the outdoors, which give rise to risk: the potential to lose something of value that may lead to physical, mental, social, or financial harm. Dangers can originate in the leader, group (both human dangers), or the group's surroundings (environmental dangers). Accidents (losses, injuries or fatalities) may occur when human and environmental dangers combine at the same moment (Brackenreg, 1999; Haddock, 1993; Hale, 1983). For example, horseplay and submerged rocks in river paddling can combine to cause an accident, while horseplay without rocks and/or rocks without horseplay are not necessarily accidents waiting to happen. Dangers can also be classified as perils (the source of a potential loss), such as a lightning strike, or hazards (conditions or circum-

stances that influence the likelihood of a loss occurring), such as a storm that creates more lightning strikes.

Perils and hazards are managed differently by removing, avoiding or altering these. For example, when climbing a glaciated mountain, with the danger of ice movement opening hidden crevasses or collapsing serac pillars and blocks, climbers can select a route to avoid these perils and, when avoidance is impossible, they may choose less hazardous times to climb, like when temperatures are lower at night than those under the midday sun (Priest & Gass, 2018).

The educational benefit, the interpersonal development, and the intrapersonal understanding that comes from participating in LOAs and outdoor adventure programming is achieved by responding to the challenges, overcoming the risks, and resolving the uncertainty. This is accomplished through the judicious use of perceived risk and perceived competence. Competence combines skills, knowledge, attitudes, values, and behaviors to complete tasks and maintain relationships (Priest & Gass, 2018).

First, ethical teachers and leaders keep the actual dangers, perils, and hazards as low as possible, while allowing students to perceive risks as being high. By applying their competence to meet those perceived risks, they come to understand the nature of challenges, learn about themselves, and change the way they work with others. Failure to manage the real risks accordingly, can lead to injury and loss (see the rest of this chapter for how to avoid such accidents).

Second, students perceive the risks as high, because their human fear response to heights, dark caves, fast water, and slippery slopes creates a cognitive dissonance or competing disagreement in their minds: "I know I'm safe, but (at the same time) I'm going to die!" The deliberate use of this dissonance is what makes LOAs and outdoor adventure programming a unique learning opportunity. So, ethical teachers and leaders are sensitive to enabling and processing these feelings from students. Failure to do so can result in

physical or psycho-social harm (see the chapter on competence effectiveness to help avoid this).

Third, once the students have responded to the challenge, overcome the risk or resolved the uncertainty, ethical teachers and leaders guide reflective processes to enhance students' self-learning and interpersonal changes. Failure to do so correctly can create lasting psychological trauma (see the chapter on reflection and facilitation techniques to help avoid this).

Fourth, the three points above require teachers and leaders to make decisions and solve problems unlike any they have encountered before. Being in the outdoors, engaged in adventures defined by uncertainty, means important information for decision making and problem solving will be missing, vague, or unknown. Sound judgement is needed to draw on past experience and estimate, guess, and substitute for that absent critical information. Therefore, sound judgement remains one of the most important talents for teachers and leaders to have and hone, even though it is also the most elusive (Priest & Gass, 2018).

Common Accident Factors

Nevertheless, despite one's best intentions, accidents can and do happen. Post-accident investigations for fatalities are either public, or enough information is made public, to recognize common factors among incidents. Here are some from past fatal accidents (Raffan, 2002; Cloutier, 2003; Deloitte, 2018):

- teachers/leaders lacked the expertise to supervise adequately;
- administrators (and/or parents) did not understand what was going on in the field;
- teachers/leaders over-estimated their abilities to control risk, and/or rejected the mandated safety protocols;
- the program was poorly aligned with the learning outcomes that it was intended to deliver;
- neither students nor teachers/leaders were prepared to manage the dangers they would encounter;

- program evaluation and reflective processes, that might have alerted teachers/leaders and/or risk managers/administrators to critical issues, were absent and routinely putting students at great risk.

In the case of many accidents, the cause is not one of these factors coincidentally, but several factors in interaction, because the presence of one problem tends to increase the likelihood that other problems will develop. Unfortunately, these vulnerabilities remain common across the Canadian school system because the go-to regional policies for managing risk are not very effective in controlling risks in an outdoor context. Understanding that all the risk control measures in a risk management 'system' are related in this way is central to designing a risk management system that is reliably robust.

Fatality Prevention Beyond Risk Management

Ritchie et al. (2023) conducted an environmental scan of fatal accidents with Canadian minors in LOAs. From a relatively low 37 incidents over 100 years resulting in 84 deaths (some associated adults), they reinforced the need for Brooke's (2018) three principles of fatality prevention.

First, strict aversion to risk was clearly not followed in many of the incidents. ...Second, better knowledge of environmental hazards and conditions could have prevented some of the incidents identified, and this included knowledge of weather, storms, river hazards, waves, terrain, and avalanches that were all highlighted as contributory causes in the cases analyzed. Third, knowledge of patterns and contributory causes from reviewing past fatal incidents could have prevented some of these incidents if the information had been available and accessed (Ritchie et al., 2023, p. 15 of 19).

They concluded with the recommendation that teachers and leaders of LOAs in Canada should apply these three principles (hold a strict risk aversion, obtain knowledge of environment and conditions, and review case-based analyses of

past fatalities outdoors) in addition to their risk management practices.

The Importance of Context

Every activity takes place in its own unique social and physical context, and risk management strategies, if they are to work efficiently and effectively, must be precisely tailored to fit that unique context. Unfortunately, the risk management strategies applied to LOAs are often aligned with the indoor school context and this poor alignment promotes systemic weaknesses.

The big success stories for systematic and rational management of risks are those designed for complex and potentially lethal industrial systems, like nuclear power generation and aviation safety. For each of these industries, human behaviour has been recognized as the weak link. Consequently, safety improvements focus on minimizing the role of potentially faulty judgments by individuals.

These success stories focus on controlling behaviour rather than supporting people to develop and exercise sound judgement. Their success has encouraged similar controlling strategies elsewhere, even when the operational context is radically different as in the outdoors. For example, these five factors are affirmative and supported in the aviation industry, while not present or inappropriate for the outdoor profession:

1. considerable financial resources available for safety;
2. catastrophic failure likely without rigid controls;
3. rigid control of front-line staff behaviour possible;
4. ability to monitor safety measure compliance in real-time;
5. dehumanized work compatible with industry objectives.

From this list, two key preconditions for controlling risk in commercial aviation, and many other industrial contexts, are neither available nor advisable in the K-12 education context.

These are (3) rigid control of front-line staff behaviour, and (4) ability to monitor safety measure compliance in real-time.

These two contextual realities mean that the **only reliable risk management strategy is one that both motivates and empowers teachers and leaders to develop and apply sound judgement.** However, external constraints will still be needed, but if properly designed, these will be seen as necessary or even helpful by teachers and leaders.

On the other hand, strategies designed to control and limit individual decision-making and problem-solving typically require complex, formulaic, and time-consuming protocols in the form of “if this occurs, then you must do that.” From the teachers’ and leaders’ perspectives, diligent observance of these protocols often appears to be a waste of time that is poorly aligned with the planning and execution of LOAs, and which can encourage oppositional and possibly poor leadership in the field. Furthermore, reliance on formulaic protocols as the principal strategy for controlling injury and risk removes the scope for teachers and leaders to make their own decisions which undermines their opportunities to develop sound judgement based on intensive and extensive experiences.

The Problem is in Here, Not Out There

A quality decision-making process is one that efficiently and reliably defines the correct objective and then achieves it. This means that the strategies that promote quality outcomes are essentially the same as those that promote safety. This observation aligns well with ‘outcomes-based’ or ‘backwards design’ education (MIT, 2023; Spady, 1994). This requires a fundamental shift in how risk management is conceptualized. Risk management should be transformed from simplistically preventing bad things to maximizing the overall quality of making decisions.

Canada is a world leader in supporting quality decision-making in high-risk outdoor activities for both professional leaders, where guides must

exercise the highest levels of judgement, and recreationalists, where compliance to quality decision-making is completely voluntary (Jackson, 2020). For example, Avalanche Canada’s public safety program has enjoyed extraordinary success in reducing the fatality rate amongst recreationalists despite zero ability to real-time monitor or control decision-making by participants.

Additionally, the activities required for delivering quality educational experiences are also well understood, even if curriculum content and design remain diverse. The strategies promoted here draw on these two streams of expertise to create a unified model for planning and executing LOAs that can create the cultural environment, where teachers are most likely to develop and exercise sound judgement. In general, these strategies follow those advocated by the Outdoor Council of Canada (OCC) through their field leader training program (Outdoor Council of Canada, 2023a). Importantly, these strategies must be viewed as elements within a system whereby the utility of one strategy is limited unless the others are also being practiced.

The OCC course material is pre-loaded with the requirement to read a course manual and then be explored through case studies. Anecdotal reports by instructors and post-course surveys indicate a high level of commitment by graduates to follow the prescribed activities post-course, which accords with the requirement for teachers to voluntarily comply with safety protocols. The OCC program encourages mentorship and the development of outdoor leadership skills through a reflective process that promotes growth.

Experienced teachers of LOAs often report that they are already practicing many required activities, but that they were unaware of the way these activities could be woven into an integrated system. They also reported that this new understanding would help them improve program delivery. While these positive effects are encouraging, positive outcomes are likely to be eroded or even eliminated unless the teacher is supported by a safety culture that re-enforces the required behaviours.

The Event Cycle

A key feature of OCC’s program is a description of the day-to-day activities of LOA delivery as the “Event Cycle” (Outdoor Council of Canada, 2023a). This choice of terminology intentionally implies that one part of the process leads to the next and that the end leads back to the beginning. However, each part of the cycle is also part of a greater system and the healthy functioning of the entire system requires good execution of each part.

1. **Outcome-based Design:** A high-quality and low-risk LOA requires the right objectives to be selected at the outset. Teachers must be clear in their understanding of what the students are expected to get out of the program and what the program can realistically be expected to deliver.
2. **Participant-centred Design:** The delivery of outcomes is constrained by the interactions of three factors: students’ unique particulars, terrain characteristics, and choice of activities intended to deliver learning outcomes. Participant-centred design endeavours to integrate these to achieve the intended benefits to the highest level permitted by the constraints.
3. **Activity Specific Planning:** More than just a lesson plan, this may involve a variety of stakeholders (teachers, students, parents, administrators, service providers, land managers, etc.) and is typically where legal and medical paperwork is completed, permissions secured, and so on. This is the place where traditional tools for danger evaluation and mitigation are integrated.
4. **Activity Delivery:** Effective management of students in the field is directly related to both the quality and the safety of the experience.
5. **Reflective Processes:** Quality programming is only made possible in a continuous learning environment, and continuous learning requires 360-degree reflection. The event cycle reflection will, at minimum, be practiced by and among the students, their teachers, and other staff. A broader process will be outlined below.

Safety Culture

Earlier discussion around the outdoor context stated “the only reliable risk management strategy is one that both motivates and empowers teachers and leaders to develop and apply sound judgement” (as noted on page 5). For this statement, no motivator is more persuasive or persistent than safety culture. Safety culture is the collection of beliefs, perceptions, and values that members of the school community hold for delivering high-quality LOAs. Building a strong safety culture is a whole community project. Teachers will conduct most of the tasks required to develop and maintain this culture, but some controls external to the teachers will be required.

One start to forming a safety culture can be found in the OCC’s course that delivers on motivation in the short term. However, for this motivation to continue as long-term behaviours, the teacher must be supported by a safety culture that rewards those behaviours required to deliver high-quality LOAs and punish non-compliant behaviours (see the non-compliant behaviour section on page 8 for exceptions). Rewards and punishments will be primarily social in nature, although formal discipline may be required where an individual or team fails to respond to social pressure.

In more industrial settings, safety culture is typically promoted by focussing on the beliefs, perceptions, and values toward risk as a bad thing, but fear is a very poor motivator when the negative outcomes are distant and unlikely, as they are for LOAs. Fortunately, the practices that promote quality also promote safety and most teachers are already motivated to provide quality experiences for their students.

Community of Practice

The teacher that operates alone is at great risk (Jackson et al., 2023). The complexities of managing a group are enormous and doing so in an outdoor environment introduces additional complexities. A teacher working alone will not have the opportunity to develop good outdoor

leadership skills. This issue has traditionally been managed through protocols designed by consulting experts and imposed from above. As noted, this is an inherently flawed strategy that has contributed to systemic failure.

Learning environments can be characterized as being either “kind” or “wicked” depending on the quality of environmental feedback (Hogarth, 2001). A kind learning structure is characterized by feedback that is both immediate and accurate. For example, skiing is a kind learning environment where each action by the skier results in immediate and accurate feedback. Wicked learning environments are characterized by misleading, and/or missing feedback that does not foster accurate and appropriate learning. For example, repeatedly skiing in avalanche terrain under good conditions reinforces that doing so is safe at all times. Outdoor leadership is a wicked learning environment, because poor judgement, subsequently placing people in danger, rarely results in serious injuries.

If the challenge for the teacher is that they must develop their leadership expertise in a ‘wicked’ learning environment, then the solution is to pool the experiences of many teachers. This is best achieved through participation in a community of practice where they can learn from peers and mentors, achieve collective insights, and forge the community’s beliefs, perceptions, and values toward their practice, aka their safety culture. The activities of a community of practice include a range of formal and informal discussions, but periodic face-to face debriefing exercises are required with a formal agenda, rules of engagement, and record keeping. The size of the group needs to be large enough to encompass diverse experiences, but small enough that every participant has both the opportunity and obligation to share input and feedback (Outdoor Council of Canada, 2023b).

Role of Administration

An obvious feature of the risk management strategies proposed is a significant devolution of roles and responsibilities from administration

to teachers. This promotes both efficiency and efficacy. However, there remain critically important roles and responsibilities for administrators, which if not fulfilled could expose the system to failure. Jackson et al. (2023) examined three fatal Canadian accidents (the two mentioned earlier and the 1978 “Tamiskaming Tragedy” analysed by Raffan, 2002) in relation to school and board administration policies and procedures. They found common factors such as risk tolerance for extreme dangers, and risk creep (unnoticeable increases in dangers as trip progress or programs grow), lacking parental understanding or consent, and lacking direction for program development or delivery.

Administrators must provide this much needed direction and essential resources for teachers. Their support should include the time required for scheduled community practice meetings, site inspections, and any required formal training. They also should monitor to ensure that safety cultures remain intact.

Avoiding Risky Shift

With the various activities advocated here, a community of practice will normally be successful in managing injury risk. However, the community of practice by itself could become a closed society that fails to later comprehend it is providing highly dangerous LOAs. This phenomenon is known as “the risky shift.” For the three accidents profiled above, considerable evidence was present that a risky shift was taking place. This dangerous process would have been identified had the program been formally evaluated by the external community of practice. This can be done in one or all of the following ways:

1. Hire a qualified external auditor with talents in outdoor risk management;
2. Ask someone strongly connected to the external community. This could be a professional guide, who has both the technical competence to lead in higher risk settings and the responsibility to complete regular continuing education in order to remain up-to-date;

3. Monitor safety and quality issues through a rigorous incident reporting system. A program undergoing the risky shift will exhibit quality and safety failures that include near misses being ignored, excursions that are easily disrupted by predictable events, like adverse weather, and poorly equipped students as evidenced by frequent hyper- or hypothermia;
4. Review and analyze past cases of fatal incidents to identify patterns leading to prevention strategies (see Jackson et al., 2023; Ritchie et al., 2023), especially since fatalities are such rare events. They need to be examined over-time and across activities and jurisdictions.

Non-compliant Behaviour

Non-compliant behaviours are when teacher or leaders choose to act with omission (forgetting to do something required as correct) or commission (actively doing something incorrectly against requirements). Their failure to comply typically has its origins in a lack of trust, personality issues, or both. Effective collaboration requires trust. The risk management strategies outlined herein, if implemented in entirety, will go a long way to ensuring that the required levels of trust are in place. If non-compliant behaviour is seen amongst several members of the community of practice, this would be a sign of systemic problems within the community. If most people exhibit compliant behaviour, but one does not, then the likely cause could be a personality issue.

Leading LOAs, and developing the sound judgement to do so, is a demanding process requiring a great deal of dedication. This is not something everyone can do. Ideally, somebody unsuited to the task will self-select out of the program. However, unfortunately, some do not. The community of practice and administration have a joint responsibility to recognize such individuals and ensure that they are removed from leadership responsibility and assigned to other duties. Failure to do so puts students at risk and undermines the safety culture.

Leadership Competency

A common misperception is that hiring leaders whose technical expertise has been validated by a certifying body automatically provides enhanced safety. Unfortunately, the relationship between safety and technical certification is complex. Certification does not by itself provide improved safety for two main reasons:

1. Judgement is best assessed through demonstrated performance in the outdoors over time. Examiners cannot reliably assess judgement when the context is atypical and time is limited.
2. Increased technical certification tends to boost the leader's intuitive feelings about their ability to manage risk. This in turn can result in greater comfort in making riskier decisions. This process of "risk compensation" can result in higher certification not increasing safety as expected (Hedlund, 2006, Sole, 2010).

Despite this paradox, demonstrated skill and knowledge competence is required. What this looks like depends on the terrain in which activity takes place, the expertise of the leader(s), and the scope of the program. The OCC has created matrices for hiking and paddling activities that take into account these three factors (Outdoor Council of Canada, 2023b). These were developed as three-season templates for local LOAs of one-day or less in duration. When the LOA is extended remotely, overnight, or into winter, then additional resources or assistance and teachers or leaders with increased skill and judgement are required. Ensuring these assets are in place may require formal training, but this training needs to be supplemented by demonstrated performance at the required level.

Prior Planning Prevents Poor Performance

It is important to draft a risk management plan for each trip or LOA. A good risk management plan includes, but is not limited to, the following:

- A rationale (philosophy statement, program goals, learning objectives, methods to evaluate behavioral outcomes and an explanation of how these relate to risk management).
- Activity descriptions (arranged in a sequence and taking into account students' competence level to participate safely).
- The location travelled to (including a travel map with ample rest breaks and nearby landline phones and/or medical facilities indicated).
- A route map with potential escape routes and tentative schedule (recognizing that rushed dedication to keeping up with time limits can cause accidents).
- A student list of names and emergency contacts, along with copies of their medical and legal paperwork (keep these forms secure for staff eyes only).
- A list of staff with their qualifications and the same information as students (this includes parents and volunteers in addition to designated teachers and leaders).
- A list of who is assigned to which groups including staff responsible for each group.
- Three equipment lists: individual gear, group gear, and specialized safety gear.
- A food inventory (by group or for all depending on the trip design) and menu plan.
- Accommodation details (not just tenting reservations, but any hotels, huts or shelters used along the way).
- Transportation arrangements (who is driving and what is being driven, with descriptions and license details).
- Communication arrangements and battery backups (what is being used to communicate for outside help and coordinate among groups).
- A budget for anticipated expenses on the trip.
- Instructions for what to do (accident response procedures) and what not to do (speak to the media) in the event of an emergency or crisis.

Such a plan can be useful for peer feedback and improvement. It is important to take a copy on

the excursion and leave a copy with a responsible emergency contact for the program, perhaps an administrator or other teacher. Emergency contacts must know the circumstances under which they should contact the police or search and rescue authorities should they be concerned (Priest & Dixon, 1990).

Priest and Baillie (1987) suggested a ten-step method for analysing dangers and judging accident potentials in the field. The first five steps are mechanical and known, but the last five are unknown and require the use of sound judgement to assess, estimate, justify, and respond (Priest & Gass, 2018).

1. Accidents can happen to you, so plan for them: instead of thinking if, think when!
2. Identify the dangers by maintaining a constant vigil for dangers and asking "What if?"
3. Draw attention to the dangers by pointing them out so they cannot be combined.
4. Remove perils, only if doing so does not increase risks or place anyone in new danger.
5. Avoid hazards: if you cannot remove a danger, then attempt to avoid related hazards.
6. Encounter non-removable perils, when related hazards are at a minimum level.
7. Assess accident potential: estimate the chance of environmental and human dangers combining.
8. Estimate probability of loss from the strengths of dangers and the likelihood they will combine.
9. Justify the loss and then modify your plans if the loss is unacceptable or unrecoverable.
10. Proceed with caution and if an accident ensues, then respond appropriately.

Conclusion

Quality outdoor education delivers valuable benefits that cannot be easily duplicated in indoor settings. Arguably, all students in Canada would benefit from making outdoor learning programs an integral part of every child's education. However, numerous barriers have restricted such opportunities to only a relatively few students. The

rare fatal accident on teacher LOAs has played an important role in reducing access to all outdoor learning. Schools, boards, and departments of education are naturally alarmed by these accidents and have sought to eliminate their liability exposure with strategies that include banning field trips and programs, contracting-out programming, and formulaic risk management protocols that may not work in an outdoor context. In their own way, each of these strategies results in the exclusion of most students.

For these reasons alone, everyone has a compelling interest in schools adopting the kind of risk management and fatality prevention strategies suggested here that will radically reduce the chance of another fatal accident occurring on a school trip. However, perhaps an even greater reason than injury reduction may be that adoption of these strategies can be expected to support enhanced quality programming generally.

The strategies that can promote efficient and effective risk management for injury reduction and those for delivering quality educational experiences are essentially the same. Given that serious injury accidents are very rare on LOAs, the successful delivery of quality education might be the greatest benefit of adopting the recommended procedures. A final benefit of this risk management approach is the potential for making outdoor education affordable, even when school resources are scarce, since the recommended strategies open significant opportunities for reducing the administrative costs of outdoor adventure programming.

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