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The journal of Canada's avalanche community

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HOW TO TEACH SOMEONE TO FIND YOU—FAST

100 YEARS LATER

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Volume 91 Winter 2009-10
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Cover shot: Jeremy Hanke carves a turn on Turtle Mountain, just north of Revelstoke. Photo: Rob Alford

Tyler Riddell

Revelstoke Museum and Archives

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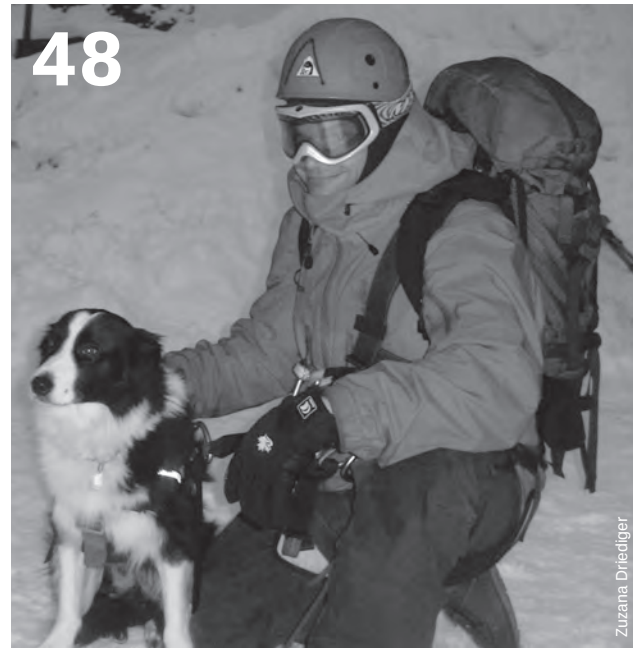

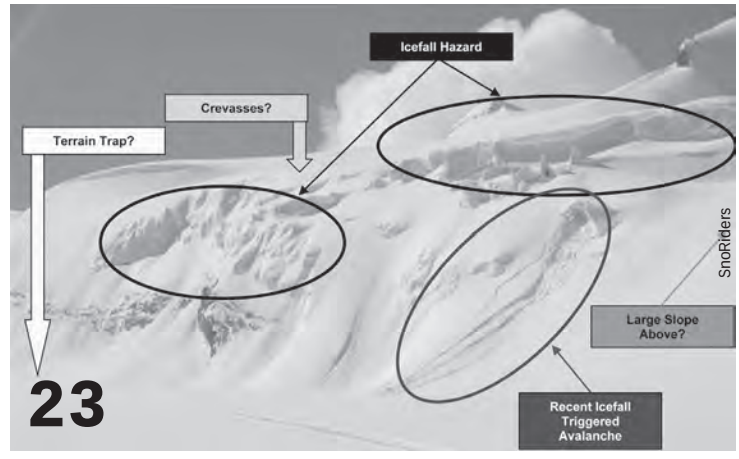

This journal is the official publication of the Canadian Avalanche Association (CAA), the Canadian Avalanche Centre (CAC) and the Canadian Avalanche Foundation (CAF). The CAA and CAC are non-profit societies based in Revelstoke, BC, serving as Canada's national organizations promoting avalanche safety. The CAF is a registered charity formed to provide a tax-deductible fundraising mechanism for the support of public avalanche safety initiatives. The CAF is based in Canmore, AB.

The goal of *avalanche.ca* is to keep readers current on avalanche-related events and issues in Canada. We foster knowledge transfer and informed debate by publishing submissions from our readers. Responsibility for content in articles submitted by our readers lies with the individual or organization producing that material. Submitted articles do not necessarily reflect the views or policies of the CAA, CAC or CAF.

We always welcomes your opinions, teaching tips, photos, research papers, survival stories, new product announcements, product reviews, book reviews, historical tales, event listings, job openings, humourous anecdotes and, really, anything interesting about avalanches or those people involved with them. Help us share what you have. Please send submissions to:

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Individual Action

One of the great pleasures of this job is connecting with the many different people and organizations who all have an investment in the work we do. Whether it's public avalanche safety, professional avalanche education, or any of the goals of the CAA and CAC, I'm always amazed by the number of individuals out there with great ideas and a willingness to dig in.

Individuals pitching in for the greater good is a bit of a theme in this issue. On the CAA side we have some reports from your colleagues who share their experiences in writing avalanche safety plans for WorkSafe BC. We're all feeling our way at this point in the interim process of these new workplace regulations and, as the winter progresses, we'll encounter challenges. Together, we'll figure it out. Read the reports from Professional Members Lee Usher and Steve Conger on page 20 and you'll see how they've handled their plans; maybe there's some insight there for you and your organization too.

There's been some tremendous input on the public safety side of things too. On page 23, read about a great initiative that came from one person and has grown to reach thousands. Writer Joni Krats approached us in late summer with an idea for avalanche education in the snowmobiling magazine she contributes to. Together we worked out a plan where the CAC contributed expertise to create an ongoing feature that is helping to build awareness with the magazine's readership, the exact audience the CAC needs to target.

We're also working closely with the Fernie Free Press in their "Prepare to Love Winter" campaign. This weekly series is scheduled to run throughout the season and will include articles on avalanche education and awareness. Again, the idea came from an individual—in this case Editor Rebecca Edwards—who approached us for guidance. With her inspiration and our help, we're making a difference.

You can read on page 30 about the efforts the CAC has made this past fall to make a difference with avalanche awareness and education for snowmobilers. Again, we're reaching out to individuals, to the grass roots, as we work on building relationships with this community. With the help of Amber Wood and Lori Zacaruk, the CAC's Snowmobile Outreach Team, we've made some inroads. We'll continue on this path, heartened by the many requests for our input and our expertise. We're working with people who want to help us make a difference, and that's a real achievement on its own.

Just as we were going to press with this issue we received the good news that Bombardier Recreational Products is coming on board as a Supporting Sponsor of the CAC. Previously, Yamaha was the only snowmobile manufacturer in that role. We hope Bombardier will be followed by others. We need each other to make a difference.

On a final note, in this issue we bid a last good bye to a stalwart of the avalanche community, Mike McKnight. Clair Israelson called Mike an "unsung hero," a man who contributed tremendously to the lives of many, who helped create a flourishing ski area and a thriving business, and who shared his wisdom freely. Mike was an individual in the truest sense of the word and we're going to miss him.

Have a safe winter.

Jordy Shepherd

Community Contributions

Public avalanche safety in Canada is a community effort. It's easy to take for granted the avalanche safety net we have in place in Canada today, especially in western regions of the country. It's been a long road; unfortunately, it took the profound loss of life in 2003 to provide the catalyst to bring our programs to where they are today.

We now find ourselves in the middle of an equally significant paradigm shift, though this one is more subtle. The past several editions of this journal have been full of articles on the challenges we face with avalanche safety and snowmobiling. We struggle with the answers, and, while making progress this year, a rash of early-season snowmobiling close calls indicates that we still have a long way to go. History is a good teacher, so let's take a moment to look back at some of the events that lead us to our current public avalanche safety programs and services. We may learn a few lessons that can help buck the trend in snowmobiling accidents.

Few remember back to a time when there was no public avalanche bulletin program. Prior to the winter of 1990/91, the Canadian Parks Service (as Parks Canada was called back then) and Kananaskis Country were the only agencies attempting to provide this important public service. The root issue was data, or rather the lack of it, and the absence of any central organization with the expertise to produce these bulletins outside of national and provincial parks.

While there was an extensive network of professional avalanche risk management programs operating during this time (heli-skiing, cat skiing, highways avalanche control, parks, etc.) there was no common communication link between them all to exchange their snow, weather and avalanche information on a meaningful timescale. No communication meant no information with which to produce a public bulletin.

The interest was clearly there to share information and ultimately produce public avalanche information, but resources were needed to maintain the data feed and to establish the forecasting program. The CAA's InfoEx program was struck in the fall of 1990 with 35 original subscribers paying $800/year for the program. It was a great start for improved safety for operators, but not enough to establish public bulletins.

Through the tireless efforts of the CAA Board of Directors at the time, led by then-President Chris Stethem and supported by numerous government and non-government organizations, a New Initiatives Grant was written (see sidebar). Approved on October 4, 1991, this SAR-NIF grant enabled the start of a Canadian Avalanche Centre, then the official office of the CAA, and in reality the start of public avalanche safety programming in Canada.

Alan Dennis was hired to be the first Managing Director for the CAA and he, along with a small complement of volunteers and part-time staff, took InfoEx on and started the first public avalanche bulletins in 1991-92. Now, some 19

Ian Tomm collection

"The concept of a daily information exchange, amongst operations affected by snow avalanches, was first proposed in 1979. This followed a BC Coroners Service investigation into an avalanche accident resulting in the death of 7 skiers near Golden, BC on February 14, 1979. A widespread avalanche cycle was observed on February 13 and 14. It was felt that an exchange of information amongst operations during this period might have helped to prevent the accident."
"An information exchange between all heli-ski companies should be encouraged. Avalanche conditions vary with space and time. As a result avalanche activity can begin in one area before another. The exchange of information on observed avalanche occurrences alerts others to the possibility of developing problems. Also, comparison of forecasts will substantiate, or encourage re-evaluation of each area's findings."
Excepts from BC Coroners Reports contained in NSS SAR-NIF Contribution Agreement, 1991

- **Price of an InfoEx subscription in 1990-91: $800**
- **Price of the 1990-91 subscription today, adjusted for inflation: $1560**
- **Price of an InfoEx subscription in 2009-10: $1000 (Class B)**

years later, we have an extensive network of data sharing and regular, high-quality avalanche bulletins produced by a stand-alone organization with both federal and provincial mandates to produce public avalanche safety programs and services.

The contribution by the InfoEx group to today's public avalanche bulletin is nothing short of astonishing. Nowhere in the world are professional avalanche risk management programs in such a collaborative partnership with a non-government organization in support of public safety as in Canada. Each subscriber helps contribute to the financial viability of the InfoEx program, managed by the CAA, and donates their data for the production of public bulletins by the CAC. The value of this contribution was estimated in 2004 to be in excess of $2 million annually.

When we look at the number of InfoEx subscribers today (93 as of Dec. 1, with more to come) virtually all are from the skiing industry; only one is from the snowmobiling sector. While we tend to see snowmobiling avalanche fatalities as a recent issue, I found the following quote in the SAR-NIF Application in 1991 rather interesting:

"Recently, the snowmobiler has become one of the snow avalanche most frequent victims. Since 1979 10 snowmobilers have died in avalanche accidents, nine of these in British Columbia. A single accident in March 1986 claimed the lives of 4 snowmobilers at Clemina Creek, BC. Widespread snow instability prevailed at the time of that accident, however, no regional public information on avalanche hazards was available."

The CAC is often criticized by the snowmobiling community for having skiing-centric programs and services. Taking a look at the history here, the establishment of the InfoEx program and subsequent public bulletin and the current makeup of InfoEx subscribers today, you can see how the skiing culture is in the DNA of both the CAA and CAC. However, before we go too far down that road, I think it's important we do a reality check.

Avalanche safety isn't any different for skiers than it is for snowmobilers. The fundamentals of safe travel in the backcountry are the same, the physics of triggering are the same (as snowmobiles may weigh more but don't alter the laws of nature) and observational tips and techniques required to safely enjoy the backcountry in winter are the same. The CAC has worked hard to refine the wording of the bulletins to be user neutral, focused other communication efforts on the snowmobiling community, and helped to foster the development of AST providers for snowmobilers.

We're seeing the effects of this now, but there is a lot more work to be done. Increasingly, we are encountering a mind set that perceives the current public avalanche safety resources offered by the CAC as too technical, too complicated, and not relevant to the snowmobiler. This attitude is a disservice to all of us who work and play in avalanche terrain. Avalanches are not simple things. The skill set required to navigate safely around them is, by necessity, complex.

The CAC has employed the very best in avalanche safety knowledge in Canada and internationally, to help develop and structure avalanche safety programs for all public backcountry users. This includes our course curriculum, our public avalanche bulletins, and basic, entry level tools such as the Avaluator. The development of this public safety net has involved adult and youth education specialists, decision-making experts, accident researchers, internationally recognized snow researchers, engineers, psychologists and, in many ways most importantly, the Canadian avalanche practitioner—those who spend their lives living and breathing avalanche safety in the field, where it matters most.

Are our programs perfect? Absolutely not. In many ways we've only just begun. When we look at the worrisome trend in avalanche fatalities in the snowmobiling sector over the past few years, it is evident there is a lot more work to be done.

The need in 1991 was a public avalanche bulletin. The InfoEx program enabled its existence then, as it continues to today. The need in 2003 was a centralized non-profit with a primary mandate for public avalanche safety. The incorporation of the CAC in 2004 and subsequent support by federal and provincial governments has enabled this to occur. Today in 2010, the CAC is facing yet another need—programs and services to buck the trend of rising fatalities in the snowmobiling user group. What are our options?

Public avalanche safety in Canada is a community effort.

executive director's report

Federal and provincial governments support the core programs and services of the CAC. In 2008, the District of North Vancouver became the first municipality to pledge support for the CAC with funding for the North Shore Avalanche Bulletin. We now find ourselves in discussions with other municipalities that are realizing they too have a role to play in public avalanche safety. Ideas range from supporting youth education initiatives in local schools to funding remote offices and smaller, more regional bulletins. This is a new era, and an indication of the subtle yet significant shift that is occurring as our support network broadens.

While the CAC is enjoying the full scope of government support—federal, provincial and municipal—sponsorship support remains, for the most part, skier-focused. Remarkably, sponsorship from organizations with a snowmobiling focus has actually decreased. Currently, Yamaha is the only CAC sponsor with a sole focus on snowmobiling. When we look at who is using CAC programs, we find that snowmobilers are less than ten percent of the total number of AST students trained in any given year. If public avalanche safety is a community effort, then we need to start talking about how the snowmobiling sector can better support the CAC's core programs and services, and become more involved in our programs.

Clearly, this is a substantial weakness in our operations. Without acknowledging and accepting this fact, there is little we can do to move forward. While we receive financial support from the Alberta Snowmobiling Association, we have only "support in concept" from the two main snowmobiling organizations in BC—the BC Snowmobile Federation and the Association of BC Snowmobile Clubs. Support in concept is markedly different than commitment to a cause or financial contributions for core programs and services.

There's more: a significant number of snowmobiling fatalities occur in the North Rockies, a region not covered by our public avalanche bulletin. While the recreational use there by snowmobilers is substantial, there is no reliable data collection. This is clearly a snowmobiling issue, one that cannot be addressed by the CAC without dedicated effort and commitment from that group.

Thankfully it seems, at the governmental level anyway, that funding in support of core programs and services remains stable for the CAC at this time. We are seeing the positive effects of the enhanced public avalanche safety net for backcountry skiers. While we are always only one or two bad accidents away from a 'worst year on record' in any user group, it is promising and heartening to see so many backcountry skiers take training and use the extensive suite of products for public avalanche safety offered by the CAC.

The fundamental issue is that we need more funding to focus on snowmobiling. Currently, our only option is to cut other programs and divert money away from existing programs and services to this new, high priority user group. We have tried to do all we can to improve programming for the snowmobiling user group this year, to a point where we've over-extended our capacity, with the potential to negatively impact our financial picture of the CAC.

Public avalanche safety in Canada is a community effort. We know there is a need for improved snowmobiling programs and we know there is a programming and funding gap, so how can we, as a community, work together for change? If you are concerned about the rise in avalanche fatalities in the snowmobiling user group and would like to help our community buck this trend, then this is what you can do today:

- **Become a member of the CAC**
  - This will help support the production of the bulletin, delivery of AST programs, and other important programs and services: $20/year individuals; $200/year for clubs, groups, organizations and companies.
- **Get trained, and get your friends trained**
  - If you've taken the AST 1, take the AST 2. If you've taken the AST 2, hire a seasoned CAA professional member or mountain guide for a couple of days. Find a mentor who will help you look at terrain in a whole different light.
- **Send us your information**
  - Report all avalanche incidents, no matter how big or small, to the CAC through our incident reporting system or online discussion forums.
  - Report your field observations to the CAC's online discussion forums. We need snow, weather and avalanche occurrence information from the areas you ride in (and remember—pictures are worth a thousand words).
  - If you ride in an area without a public bulletin, this data is especially valuable to improved public safety services.
- **Help distribute our information**
  - All backcountry users need to be informed of the inherent risks of their activity, and how they must prepare to properly manage those risks.
- **Help the CAC raise funds for snowmobiling specific programs**
  - Work with your local community to fundraise for the CAC.
  - Tell your Mayor, MLA and MP that you value public avalanche safety programs and that more needs to be done for snowmobiling.
  - Chose to purchase equipment from retailers and organizations that support core programs and services offered through the CAC.
- **Give us your feedback**
  - The CAC's programs and services are your programs and services. If they are not working for you, or you have a suggestion for improvement, please let us know. Help us make programs that meet your needs better.

Making a Difference

Steve Blake collection

As my tenure is winding down, I had been planning a retrospective, a nice article written by me, highlighting the noteworthy accomplishments that have taken place in the past five years. You know, the things I could inappropriately take credit for. Before I had pen to paper I was already bored with the idea. This is not to say that we shouldn't learn from the past but I do think we shouldn't spend too much time on nostalgia.

So I'll start with an old story, one I've told before, which I realize is an apparent contradiction to my opening paragraph. I was a new avalanche forecaster working a section of highway along what was once affectionately known as the BJ. (Nowadays the Banff-Jasper highway is more commonly referred to as the Icefields Parkway; either way get your mind out of the ditch).

We were in the midst of an unprecedented mid-winter snowstorm that deposited more than two metres of snow in 48 hours. Quite early one morning we were called in to work to help out a colleague who had inadvertently parked his truck on a pile of avalanche debris that blocked the road. The operation was straightforward, a few minutes of shoveling and a quick tug with a towrope and the truck was free. I remember the intensity of the snowfall and how it was eerily juxtaposed to the sense of calm that seemed to exist at the valley bottom. As we headed home, I asked my boss, Gerry Israelson, a veteran of the program, what we could expect to happen next. His reply was simple yet profound, "I don't know, I've never seen a storm like this."

Gerry was not suggesting he had no idea of what the next steps were. He knew exactly what we needed to do; the road closure procedures, the notification protocols, the avalanche control techniques we would need to employ. He also knew we were about to experience an unprecedented avalanche cycle, he just didn't fully know what unprecedented meant in this particular case. To wrap up the story, the avalanches that followed were huge, overrunning the previously identified limits of all the paths that ran.

While I have never witnessed another avalanche cycle like that one, I have, and so have most of you, witnessed other unparalleled avalanches events. And we knew right away that these events were so significant that we couldn't fully appreciate what was to happen next.

What precedents were set following a winter with 29 avalanche fatalities, including a single accident that killed seven school children? Well societal change for one, but that is too big of a concept to tackle in this forum. A more bite-sized outcome was the production of Parks Canada's Backcountry Avalanche Risk Review, a comprehensive report that outlined 34 specific recommendations. The last remaining recommendation to be completed comes this winter, the roll-out of an updated avalanche danger scale.

This represents the culmination of years of effort by a diverse and very dedicated group of experts. The conversations that took place during the process of reforming the danger scale were deep, heated and internationally influenced. Some of the most experienced and highly regarded avalanche forecasters in the world butted heads with each other in an effort to get it right. While the final product may at first glance seem quite similar to the current version, the entire project forced us to look at the fundamental way decisions are made. It has a multi-tiered foundation that appreciates, integrates and blends the wisdom and experience of individual avalanche experts with the most contemporary risk management and communication concepts. After all this work, one may question, will the new avalanche danger scale even make a difference? I suggest it already has.

Avalanche fatalities are never insignificant to those affected but some seem to carry more weight, either because of media emphasis or because they hit close to home. An avalanche worker is killed while performing routine operations and it goes largely unnoticed in the news. However, accidents like this are the ones that have caught the eye of regulators. And the regulators have made the call; it's time to up the ante for worker safety. We're deep in the throes of realizing the implications of WorkSafe BC's new regulations and where we fit as an organization in the complex world of government regulation.

On the one hand we see the CAA formally and legally recognized as a body of expertise and a standard setting organization. We also see the divestiture of power; the model clearly puts worker safety in the hands of individuals, the Qualified Avalanche Professionals. By empowering others, such as in this example we get the opportunity to realize the full impact of our influence.

So what will the implications of last year be, an avalanche season that claimed the life 19 snowmobilers? One for sure is change. As I write this I wonder if I am having a conversation with myself, if I am simply preaching to the converted? I mean, if you are reading this, you likely are already in the choir.

The notion of conversing with the converted is interesting, in that we seem to look at this as some type of failing or shortcoming. Those that read avalanche bulletins and take training courses, those who are members of the CAA and the CAC, these individuals need no more convincing right?

I think in a way the opposite is true. We need to keep preaching to the choir. We care, we understand the issues, we are the community. It is the individuals in our community who can have an influence on the rest of society and create a movement. I often hear that the cultural differences between skiers (the establishment) and snowmobilers (the counter culture) are just too vast to bridge. I couldn't disagree more.

This is typically the time when I make my pitch to the membership to consider participating on the board of directors. While the need is there, let's look a little further. You are already an integral part of the Canadian avalanche community. This is the time to expand your leadership beyond the confines of our little club and take it to the broader community.

We're in the safety business but playing it safe is too risky. We need to be remarkable. We need to be noticed. We may be the recognized voice of avalanche expertise in Canada but we don't need one voice, we need a thousand voices.

Tell your stories, expand your community, lead on, and make a difference.

WorkSafeBC Update

By Ian Tomm

Qualified Avalanche Planner Registration

As previously reported to the membership, and in response to advice from legal and policy advisors working with the CAA Board of Directors, the CAA rolled out its interim Qualified Avalanche Planner registration process this past November. While the Occupational Health and Safety Regulations in BC allow for a phase-in period for the regulation until September 1, 2011, the CAA rolled out this registration process early, recognizing that we need the time to learn and understand the true implications of this new regulation before the 2011 deadline.

I am happy to report that several applications have already been received and most are of high quality. We have already identified areas which need further attention and we will be working on them throughout the course of the winter and leading into our Annual General Meeting in May. If you haven't already done so, please contact us to get your name on the list if you perform a planning role in your organization.

QAP Scope of Practice

In the lead-up to the spring Annual General Meeting and in further preparation for the September 1, 2011 implementation of the QAP standards, the CAA is actively soliciting feedback from the membership and community on its draft Scope of Practice document for Qualified Avalanche Planners. You can find this document posted online under Members and Qualified Avalanche Planners. Deadline for feedback will be March 15, 2010 in preparation for the AGM.

Avalanche Safety Plans

There was much discussion this fall on Avalanche Safety Plans, both from the membership and from avalanche-affected employers throughout the province, ranging from government to independent power projects. As previously reported in this journal, the diversity of employers affected is astonishing. Keeping up with inquiries from industry, government and other stakeholders has been a time-consuming and resource-depleting exercise, to say the least.

Some interesting challenges have come up, such as the definitions and procedures of ski cutting, lone workers in the context of an avalanche safety plan, and the obligations of employers with respect to the provision of personal safety equipment. A lot of learning is going on right now. The open, collaborative approach by both WorkSafeBC and avalanche-affected employers, and the CAA' s role in facilitating communication and collaboration is going a long way to help everyone understand the needs of this new era of government regulation of avalanche work in BC.

Teaching Experts

A report from the first Level 3 – Applied Avalanche Risk Management Course

By James Blench

Finally it became real. After a few false starts the beta version of Applied Avalanche Risk Management got underway at the Canmore Nordic Centre on October 19-23, 2009, and what a crew! Twenty experienced and highly regarded avalanche professionals made up the student body. There was representation from many sectors of the avalanche field, including heli-skiing, ski areas, transportation, education, snowmobile guiding, public safety and public bulletin forecasting. It was with anticipation and (a little) uncertainty that the five instructors began the course—we were confident that lively and productive discussion would ensue, but were we totally prepared to deliver a course at this level?

Once underway however, things unfolded as they should. Chris Stethem was steering the ship as course leader and supported by Grant Statham, Larry Stanier, Dave Smith, Rowan Harper and me. Theory sessions focused on decision making challenges and principles of hazard and risk management. Far from being training just in avalanche forecasting, this program took a more holistic perspective of deconstructing the problem at hand—determination of what was at risk and strategies for managing that risk.

In order to meet that goal, new terms and concepts needed to be learned to establish a common framework. Much effort was made to utilize the hazard analysis framework developed by the Danger Scale Working group. In order to keep it real, theory was applied by case study analysis. Each day, three to four hours of class time was devoted to case studies designed to highlight problems of a particular sector and practice with the concepts learned on the course.

Case studies included examples from the ski area, mechanized skiing, public safety and highways sectors. In-depth discussion and analysis followed the case studies, and the opportunity to connect with other skilled colleagues became a significant benefit of the course.

The program wrapped up with discussion of the evaluation procedure. A template was provided for the written component, which takes the form of a year-end report on the student's operation for the 2009/10 winter. Oral defense will take place the following spring to complete the Level 3 program. All in all, it was a successful start and the instructors are looking forward to the next program.

>>James Blench is a Curriculum Specialist for the CAA's Industry Training Program

Dave Smith

Some of the key lecture topics of the CAA's first Level 3 course

- Principles in Hazard and Risk
- Scale in Hazard and Risk
- Uncertainty and Confidence
- Avalanche Hazard Evidence, Weighting and Data Stream
- Avalanche Risk Management
- Communicating Avalanche Hazard and Risk.

Training Video for Avalanche Control Blasting Course

Marmot Basin patrol

For many years, explosives manufacturer CIL/Orion has made a generous contribution to the CAA to support avalanche control training and initiatives. Half of that annual donation has always gone towards delivery of the avalanche control blasting course, while the other half was put into a fund to pay for a training video. Now, that video is going to be made.

Francois Desrosiers, a Revelstoke-based videographer and filmmaker, won the competition for the contract. His specialty is corporate films but he has also completed a number of feature films that have been included in the film festival circuit, and he has worked for major production companies throughout Canada.

Francois has a special interest in avalanche safety and education. In 1999, a huge slide off the west shoulder of Mt Macdonald in Rogers Pass claimed the life of Francois' good friend, Shane Block. The avalanche also caused a lot of damage to Francois, breaking his legs, arms, hips, ligaments, muscles and spirit. During his long rehabilitation, Francois began to explore some more creative outlets, and found a new direction for his life in filmmaking.

The training video will be shot over the coming winter and will reflect the many changes to tools and techniques in this field. Francois will work closely with the CAA's Curriculum Specialist for this course, Marc Deschenes, as well as the CAA Explosives Committee, to ensure that best practices and current technologies are highlighted. The video is scheduled to be completed by April, 2010, just in time for screening at this year's AGM.

Francois Desrosiers collection

A Report on the ICAR Avalanche Commission Meeting

Article and photos by Ian Tomm

Working with the Llama for a demonstration of the Daisy Bell.

Ian Tomm

The annual meeting of the ICAR Avalanche Commission was held in Zermatt, Switzerland this fall from, September 23 – 26. This was my first year as a representative to the ICAR meetings, and I'd like to thank to Marc Ledwidge of Parks Canada for naming me as their representative to the Avalanche Commission. This article is a summary of the meeting's key discussions and presentations from my perspective and experiences as a new ICAR representative. It is by no means a comprehensive record.

ICAR Avalanche Commission Field Day, September 23

Over 160 people from 61 countries took part in the field day, high above the town of Zermatt. We were transported by gondola and two tram rides to 3883m, where we spent the day visiting a series of eight stations, ranging from beacon demos to the latest in helicopter-based search and avalanche control technology. The weather was clear, calm and in general a spectacular day up high in the Swiss Alps looking across to the mighty Matterhorn.

The eight stations of the field day were:

- ARVA – transceiver demo
- Barryvox – transceiver demo
- Ortovox – transceiver demo
- ABS – floatation bag demo and presentation of new remote activation technology
- SnowPulse – floatation bag demo
- Hepkie – a new search technology working off GSM cell phone signals
- Manuel Genswein – shoveling strategy and medical triage of avalanche victims
- Tri-Pod Crevasse Technology – equipment demo, Kong rescue equipment

Avalanche Commission Meeting, September 24

After introductions and general business, we quickly moved to a country-by-country review of avalanche fatalities from last season. While western Canada was plagued with a low snowpack year and many persistent weaknesses, Europe

was blessed with record snowfalls in almost all regions. Some areas of the European Alps logged record snowfalls monthly, starting as early as October with some snowpacks in the as deep as two metres by the end of November.

Each member country presented a review of the seasons avalanche accidents and highlighted key incidents and/or events. Below are a few of the more notable reports:

Germany

With last season's significant snowpack, Germany saw an increase in avalanche accidents, including avalanches involving residences. One high profile incident saw a mountain hut completely buried in an avalanche, trapping the custodian. When rescuers finally reached the hut and dug it out they were greeted with beers from the very appreciative custodian.

France

The record snowfall brought the third-worst year on record for avalanche fatalities in France. Most of the accidents involved out of bounds skiers. This year marked a departure from the statistics in that more out of bounds skiers were killed than any other user group.

Italy

Italy recorded the highest number of avalanche fatalities since 1930. There were record snowpacks here as well, although the precipitation was concentrated around four major storm cycles. The extreme nature of these weather events created conditions where avalanches were affecting the general public. Numerous residences were damaged or destroyed, and 18% of the year's avalanche fatalities involved general public on public highways. Italian avalanche practitioners submitted several papers to the ISSW 2010 proceedings on the 2008-09 winter. Check those out for some incredible stories from Italy.

A crevasse rescue demonstration using a new rescue tripod from Kong.

Switzerland

The 2008-09 winter was relatively average in this country, but the patterns of accidents and the user groups affected were different. While in Canada we are dealing increasingly with snowmobiling accidents, Switzerland has increasing concerns with accidents involving snowshoers, a significant growth sport in that country.

Switzerland also had a large-scale response where over 80 rescuers responded to a single burial accident. Hans-Jurg Etter from the SLF was presenting the Swiss avalanche statistics, and he commented on the importance of rescuers not becoming judges of behaviour. There has been a noticeable decrease in the number of reported incidents and he noted that perhaps this might be a reason.

Andre Bardill, of Alpine Rescue Switzerland, did a short presentation on rescues which prompted a discussion on who is the legal entity responsible for covering the costs of organized avalanche rescue in Switzerland. Limits of rescue capacity, cost recovery, the lack of a legal body to determine who pays, and the standards of SAR organizations nationally were all discussed. There was also a heli-skiing fatality where a guided group skied onto a steep (40 degree) alpine moraine

and triggered a very large slide, killing one person. This will be going to court, which is an interesting development.

Important News on the European Airbag Front

There was a precedent-setting case in France last season where a ski patroller was killed while on a morning avalanche control route. The employee was following proper procedure and protocol and had the standard safety equipment of a shovel, beacon and probe. The government, after investigating the accident, ruled the employer should have provided the worker with an avalanche airbag and fined the ski area a total of $40,000 EUROS (approx $64,000 CDN). In his closing address to the general assembly, ICAR President Toni Grab referred to the incident as a "sharp reminder to us all" of the importance and value of avalanche airbags.

Snowbird Utah Case Study

There were three in-bounds avalanche fatalities at different resorts in the western US last year. Representatives from the Snowbird Ski Patrol made a presentation to the Avalanche Commission on an accident and subsequent response at their area. Several crusts had developed in the Wasatch snowpack through the month of November. Combined with a record 323 cm snowfall, this complex situation had ski patrollers on their toes from opening day.

After extensive explosives control, the Mt. Baldy area was opened up. After approximately 300 skiers had skied the slope, a large avalanche was triggered. Remarkably only one person was buried. However the subsequent search and rescue mission was unlike anything I have heard of.

While still in motion, the avalanche was reported by a member of the public via cell phone. Ski patrollers responded immediately and were on scene very quickly. Despite the swift response, by the time the patrollers arrived on scene there were over 150 people running around on the debris, some panic stricken, frantically searching for anyone buried in the incident. This greatly affected the rescue and it took some time to control the crowd, remove them from the debris field and organize a structured and methodical response. Search dogs were eventually able to search the debris field but due to the significant contamination were not very effective.

A probe line was established using every person on site. It stretched the entire width of the debris field (over 65m wide). With the use of loud speakers and a long rescue rope,

CAA Professional Member Bob Sayer (centre) tries out the new prototype Hepkie System, that searches using the signal emitted from a GSM cell phone. Range is up to 30 km and it works under snow. For more information, www.hepkie.com.

this single probe line found the victim, unfortunately dead. The official cause of death was reported as trauma. The elapsed time between callout to recovery was only 58 minutes, remarkable given the chaos when responders arrived on scene. A legal suit was launched as a result of this fatality, which was settled out of court this summer with the deceased's family.

In a rather stark example of the differences between European and North American cultural norms and attitudes towards risk, a member of the Austrian SAR organization asked why it went to a suit. The response was that in the US inbounds, open ski runs are deemed to be safe from avalanches. That concept doesn't exist in Europe and it was noticeably difficult for those in attendance to comprehend the legal ramifications of in-bounds avalanche accidents.

ICAR Avalanche Rescue Commission Recommendations

The following three recommendations are now finished and ratified: Standardization of Avalanche Rescue Terminology; Best Practices for Public Avalanche Safety; and Recommendations for the Reporting of Effective Range for Beacon Manufacturers.

Urban Avalanche SAR (UASAR)

Urban avalanche rescue is a relatively infrequent issue in Canada; the last event was January 1, 1999, in Quebec. However, it is a significant issue in other countries due to urban developments in run out zones of large avalanche paths. Arni Jonsson from Iceland presented some thoughts on UASAR and the differences between companion and organized avalanche rescue in backcountry settings. Some of the issues brought up included the inadequacy of traditional organized avalanche rescue equipment in UASAR response and the various unique issues that are encountered when avalanches hit, bury and destroy buildings, such as live electrical wires, gas line breaks and the hindrance of transportation routes due to inclement weather and/or extreme avalanche danger.

The presentation was so well done that the working group requested that it be made available to delegates on ICAR's website, along with referenced resources. I felt the presentation has value for our country. A central point of the UASAR presentation was the utility of the United Nations International Search and Rescue Advisory Group (INSARAG) Guidelines. Iceland and most of the European countries in attendance strongly encouraged all members to use the INSARAG resources.

Several delegates commented on climate change and subsequent extreme weather events, and their effect on historical run out zones of avalanche paths. With that came a general warning from many delegates that those countries and organizations not used to UASAR should take heed and prepare, even if the history of significant urban avalanche incidents is low.

Italian Legal Reform—Mandatory Avalanche Safety Equipment

In a particularly stimulating presentation and discussion late in the day, a representative of the Italian Mountain SAR team made a presentation on a series of national and provincial laws that have come into effect over the past couple of years defining the mandatory use of avalanche safety equipment.

On December 24, 2003, the first law dictating the mandatory use of a shovel, beacon and probe came into effect on a national level. Unfortunately the wording was very vague, saying only users must have proper equipment when the avalanche danger dictated, but little detail beyond that. This law was further defined at a provincial level in 2009. The law for the province of Piedmonte states that ski mountaineering, out of bounds skiing, hiking and snowshoeing activities must be done with a shovel, beacon and probe when the avalanche danger dictates. Unfortunately, the law does not define what is "safe" or "dangerous" in terms of avalanche danger.

Initial reaction, especially from North Americans, was skepticism for the law's efficacy. However, during the resulting discussion, several relevant points were raised. Firstly, hundreds of fines are being handed out annually via random spot checks at trailheads and out of bounds areas by the local police. The potential also exists, although it has not yet been used, that compensation for the families of avalanche victims could be greatly reduced if the victim had not used proper equipment.

Secondly, it would seem the Italian government has approached the issue of poorly equipped backcountry travelers in much the same way governments all over the world approached seat belts and automobile safety. It wasn't that long ago when wearing seat belts was voluntary. Few used them and soon the government brought laws into effect making seat belts mandatory. Many people resisted and many fines were given out around the world. (In Canada seat belt laws are a provincial matter; Alberta was the last province to institute the legislation in 1987). Now, some 20 years later, attitudes have changed and seat belts have become essential safety equipment when in a vehicle.

Regardless of personal opinion, it is certain the Italian government is set on driving social change towards attitudes on avalanche safety equipment and its use. While the law doesn't address issues of training and ability to use the equipment, it appears certain that in Italy over the next 10 or 20 years, shovels, beacons and probes will come to be as ubiquitous in the backcountry as seat belts are in vehicles.

ICAR General Meetings and Assembly of Delegates September 25-26, 2009

The Assembly of Delegates is a formal meeting to discuss big picture issues facing ICAR as an organizations and hear summary reports from the chairs of the various working commissions. Below is a summary of some of the more salient topics.

ICAR Dog Handler Sub-Commission

Coming from numerous requests by the Terrestrial

and Avalanche Commissions there was a motion to form a sub-committee to focus on search dogs. Supported by each commission and its membership, the concept was presented in front of the ICAR board of directors and the congress of delegates on Saturday and approved. This has now enabled an international body for the sharing of search and rescue dogs in terrestrial and avalanche SAR.

Honourary Member Awards

There were two honourary member awards given to long standing ICAR representatives. Dr. Hermann Brugger was recognized for his long service on the Medical Commission and over 40 papers published with ICAR. Canada's Dr. Michael Swangard, the Canadian Ski Patrol's representative to the Medical Commission, was also recognized for his more than 25 years of service. Congratulations to both.

Patterns of Death Presentation, Dr. Jeff Boyd

Dr. Boyd presented his and Dr. Pascal Haegeli's work on avalanche fatality statistics in Canada. Dr. Boyd has presented this material in Canada, and his paper is available on the CMAJ website (Canadian Medical Association Journal). At the end of the presentation, Dr. Hermann Brugger, chair of the Medical Committee stood up to discuss this work and European avalanche fatality research.

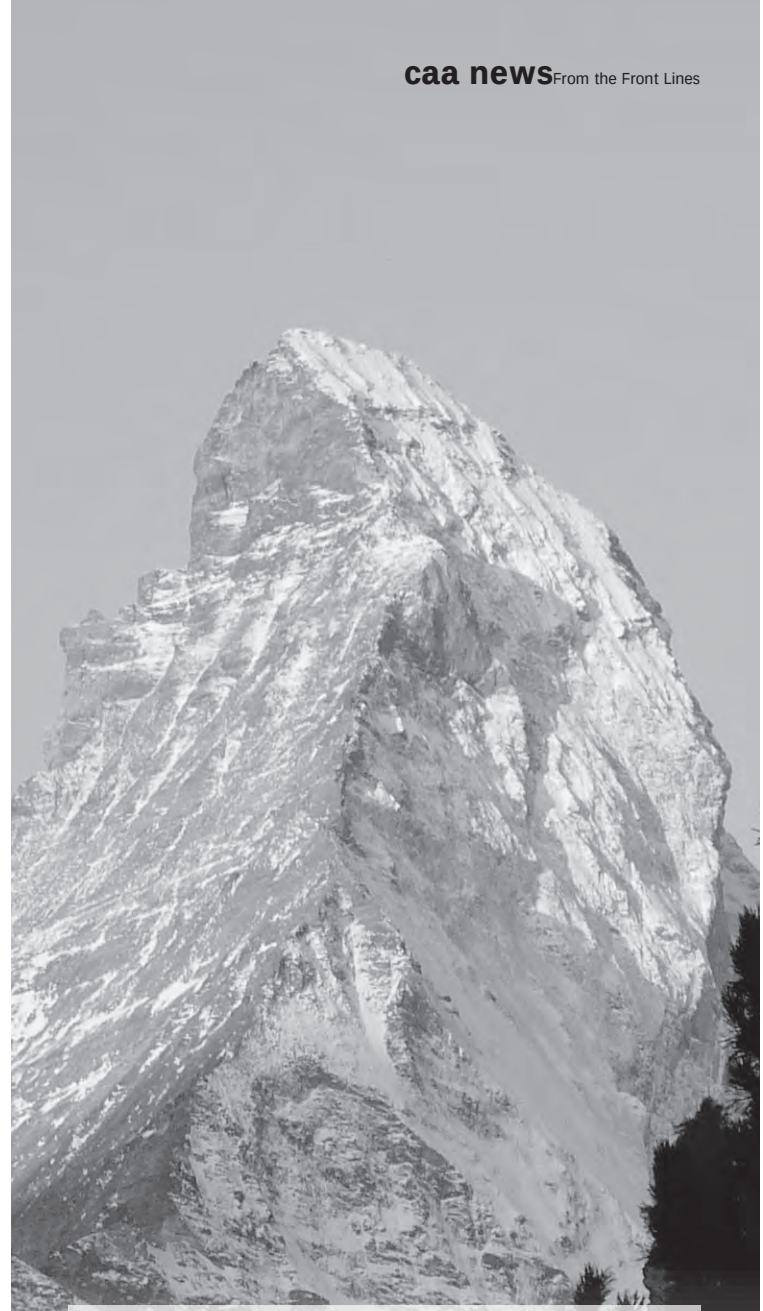
Using the methodology of Boyd/Haegeli, Dr. Brugger performed a high-level review of previously published avalanche fatality statistics. He concluded that trauma may have played a greater role than previously thought. He recommended further investigation into this question and stated the methodology by Boyd/Haegeli be considered the gold standard for future avalanche fatality research.

Harness Standards for Air Rescue in Europe

New regulations in Europe threaten the use of standard CE-certified harnesses for air rescue. These new standards require all harnesses used for air rescue to have what's called a P/N number (this number can be considered similar to a Canadian CSA certification number). Despite not a single incident involving a CE-certified harness over the past 40+ yrs in Europe, the regulations were changed last winter with little input from the mountain rescue organizations. This decision threatens immediate response by SAR professionals by disallowing resources present at the scene (e.g. hoisting climbers with their own harnesses). ICAR and all affected member organizations are very concerned and are actively engaging the regulatory bodies to try and educate them on the negative effect of this regulation on safe, effective mountain rescue in Europe.

Future ICAR Meetings

- ICAR 2010 – Oct 5-8, 2010 Smokovec, Slovakia
- ICAR 2011 – Are, Sweden



Canada has two official member organization of ICAR—Parks Canada, and the Canadian Ski Guide Association in partnership with the Canadian Ski Patrol System.

Parks Canada's representatives to the working commissions:

- Marc Ledwidge—Official ICAR Delegate and Air Commission representative
- Kirk Mauthner—Terrestrial Commission representative
- Dr. Jeff Boyd—Medical Commission representative
- Ian Tomm—Avalanche Commission representative

CSGA/CSPS representatives:

- Dr. Michael Swangard—Official ICAR Delegate and Medical Commission representative
- Bob Sayer—Avalanche Commission representative
- Mike Wiegele—Medical Commission representative
- Dr. Dave Watson—Medical Commission representative

Writing an Avalanche Safety Plan

David Bryan

Avalanche professionals share their experiences in fulfilling the new operational requirement from WorkSafe BC

Lee Usher
Operations Manager
TLH Heliskiing Ltd.

Writing a WorkSafe BC Avalanche Safety Plan (ASP) for TLH Heliskiing has been an interesting process. It comes at a time of considerable change and adjustment to market conditions, as well as the Olympic influences affecting our operation.

The process started with the seasonal review of our guidelines for mountain safety and helicopter skiing and our Incident Action Plan. These were edited to reflect the context of the 2010 season and to incorporate the Incident Command System (ICS). Once this was done, the ASP was built around the framework of the HeliCat Canada template.

Eight years of experience in the terrain and with this company has provided me with the intimate knowledge of the operation that is required to write a comprehensive ASP without having to spend time and money researching the company details. I can imagine that this aspect would be the most expensive part if one had to outsource the process.

Writing the ASP was straightforward enough. It seemed like I was producing an executive summary, and it required me to objectively look at our program from the perspective of a WSBC officer looking in. The officer's review of the document will be the test to see how it stands up to the WSBC mandate and the apparent "no tolerance" attitude towards employee exposure to hazard. The promise of an "educative" attitude to initial reviews will do a lot to support the development of this ASP as a useful document.

Steve Conger
Senior Avalanche Technician
Ava Terra Services, Inc.

I write this combining two perspectives. The first, more personal, perspective comes from developing an ASP for a backcountry lodge as their "CAA Professional Member responsible for quality and accuracy of shared snow, weather, and avalanche related information." The second, a third party perspective, comes from participating in the team development of ASPs for various industrial and recreational clients.

One thing that has stood out since the beginning of the WSBC/ASP initiative is the support the CAA has provided on behalf of the professional avalanche community. Key personnel from the CAA have and continue to explore the boundary between the principles and practices of our craft and the policy and perspective of provincial regulation. Their effort to stay on top of this and communicate with the membership has been outstanding, regardless of whether what they had to communicate only added more interpretations to the complexity and uncertainty of knowledge gained thus far. For that reason alone, I feel that for those workplaces where avalanches are a primary component of the job, we are ahead of the game, due to a relatively long time horizon allowing us to thoughtfully develop, review, re-write, and reach a first workable draft.

We have been able to apply our experience as avalanche risk managers and collaborative knowledge to truly apply Reason's risk model (1997) to our operations, thereby advancing our state of best practices. Completing an ASP for one's self really assists in clarifying its purpose to a client questioning their need for one. At the end of the day, the need for an ASP must be clearly relevant within an operation. Relevancy involves developing and implementing effective and efficient safety measures that optimize the working environment, in a manner that ensures their application.

It has been an interesting challenge matching the terminology and concepts of formal risk management to the practice of our craft. Fortunately, McClung and Schaerer (2006) have provided the link between applied avalanche forecasting and formal risk assessment, along with describing the concept of an Operational Risk Band for avalanche operations.

There remains a fair amount of uncertainty about the true role of an ASP. I have clarified this through an interpretation of classic risk management framework (CSA 1997), concluding that two distinct types of ASPs potentially exist:

- An ASP is a planning and/or program recommendation/specification document meant for supervisors and managers of a company.
- An ASP is a risk communication document meant to be read and understood by all staff employed by a company.

How detailed the ASP needs to be depends on the nature of the operation, the focus of the ASP (as described above), and how much of each step has already been accomplished in other work. The inclusion of broad and/or specific operational procedures also depends on whether or not such a document already exists for the company in question.

Like other high-risk endeavours, one item that stands out is our industry's acknowledgement—in our literature and our actions—of ever-present residual risk and uncertainty. Practical application of this, regardless of whether one is an avalanche professional, worker, or recreationist, is seen in the universally accepted safety measures outlined here from McClung and Schaerer (2006):

- Know the nature of avalanche hazards;
- Have a safety and rescue plan;
- Maintain, carry, and practice use of safety equipment;
- Form an opinion regarding avalanche likelihood when in avalanche terrain;
- Be alert and mentally prepared for an avalanche encounter; and
- Know how to react in an emergency.

We still have "limited obs" and this initiative continues to unfold in many ways.

References:

Canadian Standards Association (1997), *Risk Management: Guideline for Decision-Makers – A National Standard of Canada*. Canadian Standards Association (1997 reaffirmed 2002) CAN/CSA-Q850-97, 62 pp.

McClung, D. and P. Schaerer (2006), *The Avalanche Handbook*, Mountaineers, Seattle, Wash., 342 pp.

Reason, J.T. (1997), *Managing the Risks of Organizational Accidents*, Ashgate Publishing, 266 pp.

Hitting the Highway

Avalanche awareness signs aimed at sledders go up en route to their favourite playgrounds

By Jennifer George

At the last snowmobile stakeholders meeting held at the CAA/CAC May AGM, we solicited ideas on new programs and enhancements to existing programs that would have the greatest impact on snowmobile avalanche fatalities. From feedback at our events and through communications with the stakeholders group, we know that many snowmobilers are not aware of, or are not accessing our programs and services, specifically the public avalanche bulletins. The snowmobile outreach team has done a great job of getting the word out to the folks they see at their events. However, we need another means to communicate our website to this group.

In his article "Snowmobile Action Plan Part 2" (vol 90, page 42), CAC Operations Manager John Kelly mentioned that one of the many ideas that gained support from key stakeholders was highway billboard signs. We contacted a major outdoor media company and priced three or four of these signs to be located on routes that access the more popular snowmobile areas. As expected, the price was way out of our budget but we hoped we might be able to share costs by sharing the ad space. Unfortunately we weren't able to obtain a cooperative advertising agreement with a third party, so, without knowing whether these signs would have the significant impact required to justify their high cost, we could not move forward. We needed a way to test the idea with a smaller investment.

Up stepped the BC Ministry of Transportation and Infrastructure (MoTI) with a potential solution. The Rocky Mountain District of MoTI agreed to permit our avalanche safety signs, providing us with a very cost effective option and giving us a great opportunity to test this idea. We decided on 4' x 8' aluminum signs with diamond-grade reflective coating so the signs would be visible at night with headlight reflection. Brent Strand designed the signs in-house, with a clear message directing snowmobilers to our website and 800 number.

Once the CAC had finalized the design and purchased the signs, MoTI agreed to install the signs in the following areas within BC: the westbound lane of the TransCanada Highway leaving Golden, Highway 3 heading westbound in the Crowsnest Pass, and on the westbound lane of Highway 16 in the Tête Jaune area. After inquiring with Alberta Transportation regarding these signs, we received their commitment to install a sign on the westbound side of Highway 16 in the Hinton area. In southern Alberta, they recommended locating the sign westbound on secondary route 744, a well-known access to the Flathead, Corbin and Castle Mountain areas. Essentially, we're trying to hit sledders on their way to the most popular mountain riding areas.

With this combination of highway signage in BC and Alberta, we hope to increase snowmobilers' use of our website and public avalanche bulletins. Special thanks to Jack Bennetto and Gord Chudleigh from MoTI and Rick Lemiere from Alberta Transportation for helping to make this happen!

>>Jennifer George is the CAC's Sponsorship Coordinator

Rob Buchanan

Magazine Messages

A regular series on assessing avalanche terrain gets high marks from the readers of a leading snowmobiling magazine

For writer Joni Krats, it was a gut decision to focus on avalanche safety. Back in January, 2009 she was a new reporter for SnoRiders, western Canada's premier snowmobiling magazine. One of her first assignments was to interview the head of Fernie's Search and Rescue team about the Harvey Pass accident that killed eight sledders in December, 2008.

"I got a lot of detailed information on the body recovery," Joni recalls, "and I was so moved by the story. Then, as the season progressed, I became more concerned. Creating this feature was an emotional decision after all the terrible accidents of last winter. I wanted to offer something more useful for our readers, something that could address some of the safety concerns present in this community."

Joni approached the CAC this fall with a proposal for a regular feature on avalanche safety. Different approaches were discussed but one idea rose above the others. Readers would submit photos of terrain and the CAC provides a detailed analysis—an expert's eye view.

The expert eye belongs to Karl Klassen, the CAC's Public Avalanche Bulletin Manager. "I enjoy doing this kind of work," he explains. "After 30 years in the avalanche business, terrain analysis is second nature—I look at a slope and almost immediately know how I'd handle it. The challenge is effectively communicating my thoughts and concerns about the terrain to an invisible audience."

According to Joni, Karl's efforts have paid off. "We've been getting rave reviews," she says. "It's so important to get safety information out in a way that's palatable to the audience. Karl comes across as someone who understands the sport. Instead of saying, 'you guys better smarten up,' he's got empathy for our readers, and it shows."

In addition to this column on avalanche safety, SnoRiders has launched an online contest to encourage their readers to take an Avalanche Safety Training course. Readers e-mail in a photo of themselves with their AST certificate or with their instructor, and are entered into a monthly draw. Prizes include a beacon and shovel, SPOT locators, and a specialized floatation jacket. This sort of support for avalanche education and awareness is always great news for the CAC, and even more so when it comes from snowmobilers.

SnoRiders Magazine covers snowmobiling in BC, Alberta, Saskatchewan and Manitoba. The focus is on destinations, family-friendly sledding, and peer-to-peer information. The Fall 2009 issue celebrated 20 years of publishing. Congratulations!
128,000 readers per issue
672,000 readers a year

A New Resource for Avalanche Education

By Doug Latimer

A Canmore-based video production company is working in association with the CAC to produce new tools for improving public education in avalanche safety. The project has two objectives. The first is to produce new video vignettes for educators and avalanche safety instructors. These files are online and available for download to anyone seeking visual aids for an avalanche course. The second objective is to create an online resource for individuals planning to attend an avalanche safety course, or for those who have completed a course and want additional information.

A common concern with weekend courses is that the volume of information presented can be somewhat overwhelming to people new to the mountain environment. Time constraints also limit the amount of content that can be presented. This new website will help better prepare students and will encourage the general public to take a professionally taught avalanche safety course. As well, after completing their course, the additional information and exercises on the website will assist with expanding avalanche knowledge.

With the video production skills of Shadow Light Productions, technical assistance from the CAC and funding sponsorship from Mountain Equipment Coop, the Canadian Avalanche Foundation and Hostelling International, the project is underway. The first installment of content has been loaded onto Shadow Light's website and new material will be added regularly as the season progresses. Public input into the project is encouraged and will be used in developing content over the winter. In spring, when the site is complete, it will be moved to a new home and linked with the Canadian Avalanche Centre's website to serve as a public resource.

To view the web site, offer comments on the project, submit avalanche images or video to the project, or contribute to the project with a relevant story or interview, please go to www.shadowlightproductions.ca and click on Avalanche Project.

>>Doug Latimer is a Ski Guide based in Canmore, Alberta, and the owner of Shadow Light Productions

Teaching the Teachers

A report from the CAC's Youth Education Coordinator

By Bridget Daughney

We all envy teachers their winter breaks, spring breaks and summer vacations. Well, it turns out they envy the rest of us for our availability in the winter to take avalanche courses! The CAC polled teachers earlier this school year on their interest in an educator's CAA Level 1 course. Response from teachers was very enthusiastic and they were excited to be able to choose dates that suited them. The result is the CAC is offering, for the first time ever, a Level 1 operations course with an educators' slant.

Scheduled for February 14 – 20, 2010, the course will cover the regular programming and curriculum so all participants will ski/snowboard/snowshoe away with a new depth of winter knowledge. What will be different from a regular course is the focus on youth-group management in the backcountry. Scenarios will be specifically youth focused, giving educators an opportunity to learn from the professionals how to handle situations safely in avalanche terrain.

All students of the course will be educators themselves, so this will also provide a great forum for them to discuss tactics and share experiences among themselves. One of the most important parts in educating youth is to make sure the educator has the right knowledge, and the CAC is excited to be taking a big step in this direction this year.

On another front, the CAC has been working hard on promoting mentorship for younger backcountry users. To this end the CAC hosted a "Family Night" in Golden, in conjunction with Parks Canada, Kicking Horse Mountain, the Golden Snowmobile Club and the Columbia Forest District. The aim was to reach out to the broader community, in order to foster youth education. The evening was a great success with around 40 people of various ages attending.

One high school fellow was so enthusiastic that he rushed home after school, made dinner for his family (it was his turn) and then apologetically arrived late after a mad dash to get to the talks. Also, honourable mentions go out to our two youngest participants, who knew all the answers to the questions posed for prizes. Nice work!

Thanks to all the presenters who shared their knowledge on a wide variety of topics. Lots of great questions were asked and the broad experience of the presenters meant a wide variety of topics were covered—from snowpack to permit use, snowmobiling to ski touring. Thanks to the Golden High School for providing the venue; thanks also to Marmot and Backcountry Access for donating prizes. The CAC is aiming to make "Family Night" an annual event and encourages others to do so as well.

School avalanche awareness programs are under way in many communities across Canada right now. The aim is to reach youth before the winter break so that everyone can begin their winter fun on a good safe note. This year shows growth again in the interest of professionals and educators wanting to reach out to their communities. The CAC is working in partnership with these new programs, supporting with ideas and materials when needed.

November saw the first pre-season meeting of larger programs to share ideas and knowledge. It was great to learn of new initiatives such as Whitewater's free AST for youth program and also some tips from established programs like Adventure Smart which provides free programs on a first-come, first-served booking system. For more information, all of these programs have links on the youth page of our website. If you have a program that you think should be on there, we'd love to hear from you.

Over the winter and spring, the CAC will be working hard to collect all the ideas shared from this meeting and others, and provide them for all to see on the CAC's website. The CAC is excited to be broadening our role as the hub for winter program information. It is empowering to see a great basis of knowledge only getting bigger and stronger in the educator community.

The final news from the youth front is that we have had a great response to our call for used beacons and other safety equipment, and we are setting up two boxes of gear to be used by school groups this winter. These "Tool Boxes" will be loaned out to schools for field use, to teach students how to use backcountry equipment. We could still use some more probes and shovels so if you know of any languishing in basements, please pass them along!

Enjoy your winter and please make sure you are sharing with youth the benefits of a great, safe winter.

Snow safety lessons at Fernie Alpine Resort.

Steve Ruskay


RIGHT NOW THE VIEW IS SPECTACULAR.
Kokanee
GLACIER FRESH BEER
*TM/MC Columbia Brewery
IT'S ALL ABOUT NOW.

Backcountry Avalanche Workshops '09

By Cam Campbell

Once again we can say our annual Backcountry Avalanche Workshops were a huge success. We offered six events this year, including two new communities—Prince George and Grande Prairie. For the first time we had different target audiences in mind at different venues. In Vancouver and Calgary, we ran events with a ski and board focus; in Fernie and Whitehorse we tried to have a split focus; and in Prince George and Grande Prairie we focused on sledders. Nancy Geismar provided logistical support for all the events, and I coordinated the speakers.

Vancouver – Nov 7

We almost doubled last year's total, with over 230 people enjoying a full day of presentations from a star-studded line-up. Tony Daffern, Peter Schaerer and David Thompson were also on hand to promote and sell Tony's new book as a fundraiser for the Canadian Avalanche Foundation. Marmot had a very popular booth in the lobby and kindly donated some great door prizes.

Host: Cam Campbell

Speakers: Colin Zacharias, Mitch Sulkers, Matt Gunn, Brian Gould, John Baldwin, Scott Aitken and Cora Shea.

Whitehorse – Nov. 14

A good turnout for the second year in a row, with about 145 people attending either the day or the evening sessions, or both! We managed to pull in a few sledders and the local Yamaha dealer Jason Adams did a presentation on sledding in White Pass. There were great booths set up by local retailers, including door prizes courtesy of Up North Adventures. A big thanks to Kirstie Simpson for once again going the extra mile ensuring the day was a success.

Host: Ilya Storm

Speakers: Mike Smith, Mike Koppang, Johann Slam, Kirstie Simpson, Hector MacKenzie and Andrew Lawrence.

Calgary – Nov. 14

Approximately 150 people showed up at the University of Calgary for this event. Both the Canadian Avalanche Foundation and Backcountry Access set up booths, generating a lot of interest during the breaks. Tony Daffern donated the proceeds from his recently updated Avalanche Safety For Skiers and Climbers book to the CAF. The speakers at this BAW are some of the best in the avalanche industry and all gave excellent talks, providing incredibly useful information for people of all skill levels. A special thanks to Chris Stethem for giving an extra talk with only one-hour notice.

Host: Greg Johnson

Speakers: Steve Holeczi, Burke Duncan, Mark Klassen, Chris Stethem, Mike Smith and Albi Sole.

A crowded house at the CAC's Backcountry Avalanche Workshop in Prince George, BC.

Fernie – Nov. 21

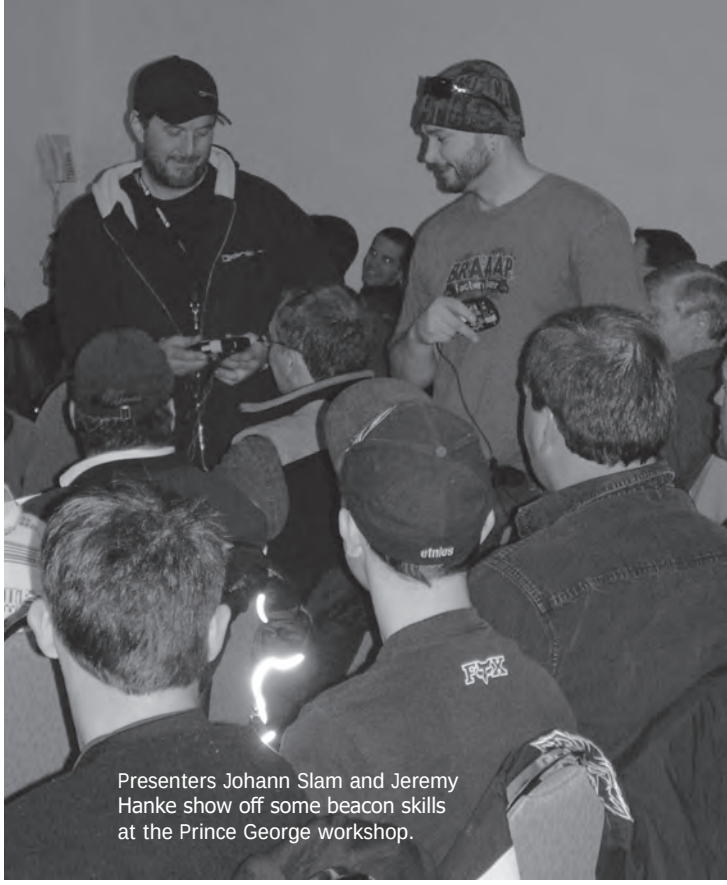
The Fernie BAW drew only about 45 people. The workshop was held at the Arts Station, which is an old train station transformed into a small theatre, giving us a great venue with a personal feel. Like the Calgary BAW, the Canadian Avalanche Foundation and Backcountry Access set up booths, and Tony Daffern again donated sales from his book Avalanche Safety For Skiers and Climbers to the CAF. The mix of information—from the University of Calgary's latest research to local experts sharing regional knowledge—was a big hit with the audience. Jack Bennetto's talk was an excellent perspective on the importance of the CAF.

Host: Greg Johnson

Speakers: Mike Smith, Cam Ross, Jack Bennetto, Steve Ruskay, Jeremy Hanke, Robin Siggers, and Steve Kuijt.

Prince George – Nov. 28

This was our first time with a BAW in Prince George, and we were not sure what to expect. The conference room was set for 132 people and we quickly realized that we would exceed capacity. We ended up with approximately 185 people packed into a relatively small room. The group was very diverse with an even split between skiers and boarders, and sledders, and around 40 students from the University of Northern British Columbia.



Presenters Johann Slam and Jeremy Hanke show off some beacon skills at the Prince George workshop.

Host: Peter Marshall

Speakers: Craig Evanoff, Kevin Taylor, Sean Fraser, Johann Slam, Jeremy Hanke and Mike Smith.

Grande Prairie – Nov. 29

Although we were aware of the very large community of snowmobilers here, along with as many skiers, boarders, and climbers who head to Jasper or Pine Pass, we were unsure of what to expect, especially considering it was Grey Cup Sunday. We were pleasantly surprised to see about 85 people make it to the event, primarily snowmobilers who frequently ride in the Kakwa Park and areas around Tumbler Ridge, Chetwynd, and Pine Pass.

Host: Peter Marshall

Speakers: Peter Amann, Garth Lemke, Johann Slam, Jeremy Hanke, Wren McElroy and Mike Smith.

New Supporting Sponsor

The CAC welcomes Outdoor Research as a new Supporting Sponsor. The birth of this outdoor gear company, based in Seattle, Washington, was inspired by human-powered adventure. Now, 28 years later, this passion remains as strong as ever, while the company's goals have expanded to embrace a greater mission—their customers' experiences of adventures in the natural world. By contributing to the CAC, Outdoor Research is demonstrating their commitment to your safety in your human-powered winter backcountry adventures. In return, we ask you to support them.

OUTDOOR RESEARCH

Reaching Out

The CAC ramps up its sledder outreach in the lead up to the 2009 – 2010 season

After last winter's unprecedented number of snowmobiler avalanche deaths, the CAC is counting on the sledding community to become more engaged with the many avalanche safety programs and services available to them. In the fall of 2009, the CAC committed considerable resources and efforts to attend a wide range of outreach events, speaking directly to snowmobilers and, hopefully, making some good connections.

"In the past, we've worked primarily through the clubs and organizations," explains CAC Operations Manager John Kelly. "We need to build multiple links with the sled community, so we are also concentrating more on the 'grassroots' focus. Amber Wood and Lori Zacaruk are our sledding outreach team and they've been invaluable for their great network of contacts, connections they've made over the past few years of travelling around and giving evening and weekend avalanche awareness courses."

Working with her contacts in Edmonton and Calgary, Lori created an evening event in both cities, focusing on last year's snowpack. The purpose was not to dissect any of the fatal accidents of last year. Rather, the aim of CAC Forecaster Greg Johnson, who led the discussions, was to give the audience a short rundown of the persistent weak layers of 2008-09, and their effect on snowpack stability over the course of the season. Lori and Greg also showed videos of sledders triggering slides, bringing the conversation around to terrain selection.

Close to 50 people attended the Calgary evening, but the show really took off in Edmonton, where some 140 people gathered to hear the talk and participate in the discussion. "It was a great evening, the highlight of all my speaking engagements this fall," said Greg. "Many members of the audience had lost friends in avalanches and one woman lost her husband last year. It was intense." Although the format was the same in the two cities, Greg reports the Edmonton audience were much more engaged and the discussion was "amazing."

Jeremy Hanke is another sledding contact who's become very involved. Many CAA members were introduced to Jeremy at last year's AGM, when he and Wren McElroy gave a presentation at the public and technical meetings on the challenges of avalanche awareness with snowmobilers. Jeremy is a very experienced and accomplished rider and, as an avalanche survivor, he is also very keen to work with and help the CAC get the message out.

In addition to speaking at our sledder-focused BAWs in Prince George and Grande Prairie, Jeremy also spoke at an avalanche awareness evening organized by the Vernon Search and Rescue at the end of November. Working with a local snowmobile dealer, the Vernon SAR group screened a new sledding movie and asked the CAC to provide a speaker for the evening.

An audience of snowmobilers in Edmonton listens closely to CAC Forecaster Greg Johnson as he talks about the season of 2008-09.

Lori Zacaruck

Lori Zacaruck uses volunteers to demonstrate the three different avalanche airbag systems at the Calgary Sled Show.

Lori Zacaruck

CAA Curriculum Specialist Wren McElroy and Jeremy were the speakers and Wren noted the audience seemed to appreciate the significance of "a professional avalanche worker and a sledder working together to raise awareness." The feedback from the presentation was very good, with audience members approaching Jeremy later asking about avalanche education.

Of course, not everything always goes according to plan and we're regularly reminded that much work remains to be done on this issue. While the Prince George and Grande Prairie BAWs were very successful, workshops in Fernie, Calgary and Vancouver all received negative feedback from the few snowmobilers who attended. This feedback reflected the perception that education delivered by and aimed at skiers is not relevant for snowmobilers. While we feel strongly this isn't entirely true, we recognize that perception is reality. Next year, our BAWs will be even further refined and tailored for specific user groups.

Another disappointment this past fall was a talk organized by Teck Coal in Sparwood, a company that lost four employees in the Harvey Pass accident of December 2008. Our speaker Greg Johnson was planning to present and lead a discussion similar to those he gave in Calgary and Edmonton. Teck (also a long-time CAC sponsor) prepared for an audience of 100; five showed up.

Despite these setbacks, we are making headway. We have seen a marked increase in demand from snowmobiling groups wanting evening presentations or day-long workshops. Lori Zacaruk and Amber Wood are reporting a significant increase in support from dealers to promote classes in their communities, and CAC forecasters are hearing directly from more snowmobilers than ever before.

While we would all like to see snowmobile avalanche safety on the fast track towards improvement, cultural change is a slow road. Our aim is to shorten up the learning curve for sledders with avalanche safety knowledge and practices developed over time for other user groups. We'll keep working the grassroots with the belief that together, we're growing something special.

Lori Zacaruk and Amber Wood run the booth for the CAC at the Vernon snowmobile show in early fall.

Lori Zacaruck

A race to assemble avalanche safety gear is always popular at the sled shows. Lori Zacaruk's two daughters (Nicole is second from left and Monica is third from left) take on two friends.

Lori Zacaruck

"I am Avalanche Aware"

The challenge: five students, $1 each, and five weeks to make as much money possible for a charitable cause. This is the course work for the Ventureship Challenge course, a requirement for the Entrepreneurial Management program at Royal Roads University. Elena Elder, and four classmates, Brandan Somers, Mike Hamfelt, Frank Li and Willow Easton, took the challenge for avalanche awareness.

The team developed artwork for bandanas with the text "I am Avalanche Aware." Two hundred bandanas were produced; 130 were sold through retail outlets around Whistler and Victoria, and some were sold during avalanche courses. The remaining inventory of bandanas and a cheque from the proceeds of the sales were donated to the CAC. The CAC will distribute the majority of bandanas to our Youth Avalanche Safety programs and during select Avalanche Awareness Days events. Thank you Elena and your Royal Roads team!

A Message from the President

By Chris Stethem

Since its formation in 1999, the Canadian Avalanche Foundation has provided just over one million dollars in support of avalanche safety, education and research. In that time, we've seen tremendous improvements in the number and quality of public avalanche bulletins. Strong and vibrant research programs continue to flourish at the University of Calgary, the University of British Columbia and other universities. We've also seen huge growth in educational initiatives for teenagers and young adults. The Foundation has played a significant role in funding these trends.

On this, our tenth anniversary, the Board of Directors is very proud of the support it has received through the years from all Canadians. We would like to thank each and every one of our sponsors and donors. We have received funds from memorial contributions, gala dinners, big corporations, hockey teams, book sales, restaurant dessert sales, golf tournaments, DVD sales, rose bush sales and a "Miles for Mountains" run, to name a few. Without the support of each of these donors we would not be able to fund the work that is being done. To each and everyone, a big heartfelt thank you!

In keeping with our vision, the Foundation has proposed a five-year funding initiative to provide financial resources in three key areas, starting in 2009. These key areas are:

- The Canadian Avalanche Center for the preparation and delivery of public avalanche warnings. ($68,000 per year)
- The Canadian Avalanche Association in support of research at the University of Calgary. ($20,000 per year)
- The Gaspé Avalanche Centre for the preparation and delivery of public avalanche warnings and programs. The Centre in Gaspe is the focal point of avalanche safety and education in Quebec. ($10,000 per year)

Our majestic winter mountains provide endless opportunities for our enjoyment and fulfillment. With the explosion of winter backcountry enthusiasts—skiers, snowboarders, ice climbers, snowshoers and snowmobilers—our goal is to ensure the public has access to avalanche warnings, education and new knowledge in order to be safe. Although change has occurred, much work is still needed to be done.

Ideally we would like every family who uses the great outdoors to have an understanding of avalanche safety, and be aware of and know how to access information about the daily avalanche bulletins. It's a wondrous thing to enjoy the beauty and challenges the Canadian outdoors has to offer but we also have a responsibility to do so safely. We need your support to continue this vital work!

>>Chris Stethem is the President of the Canadian Avalanche Foundation

The FreeHeel Film Fest

Grassroots fundraiser supports CAF and public avalanche bulletins

Steve McCarthy is a telemark aficionado with a taste for adventure and a strong sense of community. Noticing an absence of events focusing on telemark skiing and self-propelled backcountry adventures, he took it upon himself to organize the FreeHeel Film Fest. Held on the evening of November 14, 2009, in Calgary, the festival was aimed at the city's telemark community, with proceeds going to the CAF in support of public avalanche bulletins.

"I had never seen a festival focusing on telemarking and it was just something I wanted to do," explains Steve. "There are lots of films on alpine skiing that may have backcountry elements but tend to involve heli-lifts, or in-bounds, terrain park riding. I really wanted this festival to focus on self-propelled backcountry skiing."

Close to 100 people came out, the majority of them telemark skiers. "It was a good night," says Steve. "It was a good way to get in touch with the community, the industry reps were happy to get exposure, and I thought the turnout was great and the donation to the CAF was $600, so overall the night was a success."

The festival screened three films on telemark skiing and included a small gear expo. Deciding where the profits should go was not much of a challenge. Steve racks up many backcountry trips each winter, including Rogers Pass, Sunshine Meadows and Fernie. "The bulletins are so important," he says. "My friends and I use them all season long and I thought this would be a good way to give something back."

CAF President Chris Stethem is very supportive of the event. "It's great to see the telemark community linking up with the CAF to back the public bulletin," he says. "We look forward to future cooperation and support."

Encouraged by the interest and enthusiasm, Steve says he'd like to try to build the event for next year. "I'd like to run something similar but the limiting factor is whether there will be more telemark ski films. There's just not that many film-makers out there focusing on tele-skiing, so I may have to broaden the scope to include alpine backcountry. But the main focus will stay the same—these will be 'earn-your-turns' films."

The FreeHeel Film Fest thanks the following individuals and companies for their support:

Albi Sole and the University of Calgary's Outdoor Centre
George Achilleos at Out There
Jeff Perron at Sasso Vertical
Richard Davies at The North Face
Telemark Skier Magazine
John Ouellette at Recreation Outfitter Inc.

Yamaha Media

Yamaha Leads the Pack

Yamaha Canada offers avalanche safety package to new-sled buyers

It's a deal that makes sense for avalanche safety: anyone purchasing a new Yamaha Nytro MTX mountain sled this year is eligible to receive the new Float 30 Airbag System, a Tracker DTS and the new Arsenal shovel, all from Backcountry Access.

Yamaha Canada has been a CAC Supporter since 2007, and is by far the most proactive snowmobile manufacturer in terms of avalanche awareness and education, says CAC Operations Manager John Kelly. "We were very pleased to hear of this initiative," he said. "By linking the machine with avalanche safety gear, Yamaha makes it clear to its customers the two go hand-in-hand. This has always been one of our key messages, and it helps us immeasurably when a manufacturer with the profile of Yamaha communicates it too."

Randy Swenson, the western representative for Yamaha Canada, reports that buyers are impressed with the package. "We have had positive results and hope this sends the proper message to the community," he said. "Now riders need to get the education. We also work with the CAC to ensure our customers know where to take an accredited Avalanche Safety Training course."

Amber Wood is an AST provider and an accomplished snowmobiler, sponsored by Yamaha. Through this partnership, Amber is able to offer a free spot in one of her AST courses to anyone buying a Yamaha mountain sled. "I really hope this promotion takes off," she said. "Yamaha is really going the extra mile for avalanche safety this year and if it makes the difference for the sled buyer, that's great."

At the CAC, John Kelly hopes these promotions really do make a difference. "What we would really like to see is other manufacturers finding ways to promote avalanche safety as well," he said. "We need more voices telling riders to connect with the CAC's programs and services. Yamaha's efforts here are a great first step and an impressive model for others. We hope to hear about similar initiatives soon."

Memorial Stone Honours Avalanche Victims and Survivors

By Jenna Jensen and Renee MacCormack

This article originally appeared in Vol 1, Issue 11 of Black Rock News, the local paper for Sparwood and Elkford, BC.

As strong as the memories in the hearts of the people of the valley and around the world stands a memorial stone—a tribute to the eight men who lost their lives and the three survivors of the tragic avalanche that occurred in the Elk Valley on December 28, 2008. On August 23rd, family and friends of the eight valley boys who were taken from their families due to the unpredictability of nature gathered at the avalanche site to remember and honour these fine gentlemen.

As a survivor of the avalanche, Jeremy Rusnak was instrumental in bringing this memorial stone to life to honour the friends he lost that fateful day in December. He and the other two survivors—James Drake and Jeff Adams—will be connected for life as they continue to deal with the emotions of that day. Jeremy designed this plaque to help others never forget the 11 great men involved in the tragedy that shook the Valley at the end of 2008.

Jeremy obtained special government permits to have this memorial placed on the mountainside where the avalanche occurred. He and his friends carried the large plaque to bring everlasting memory of the husbands, fathers, sons, brothers and friends who meant so much to others.

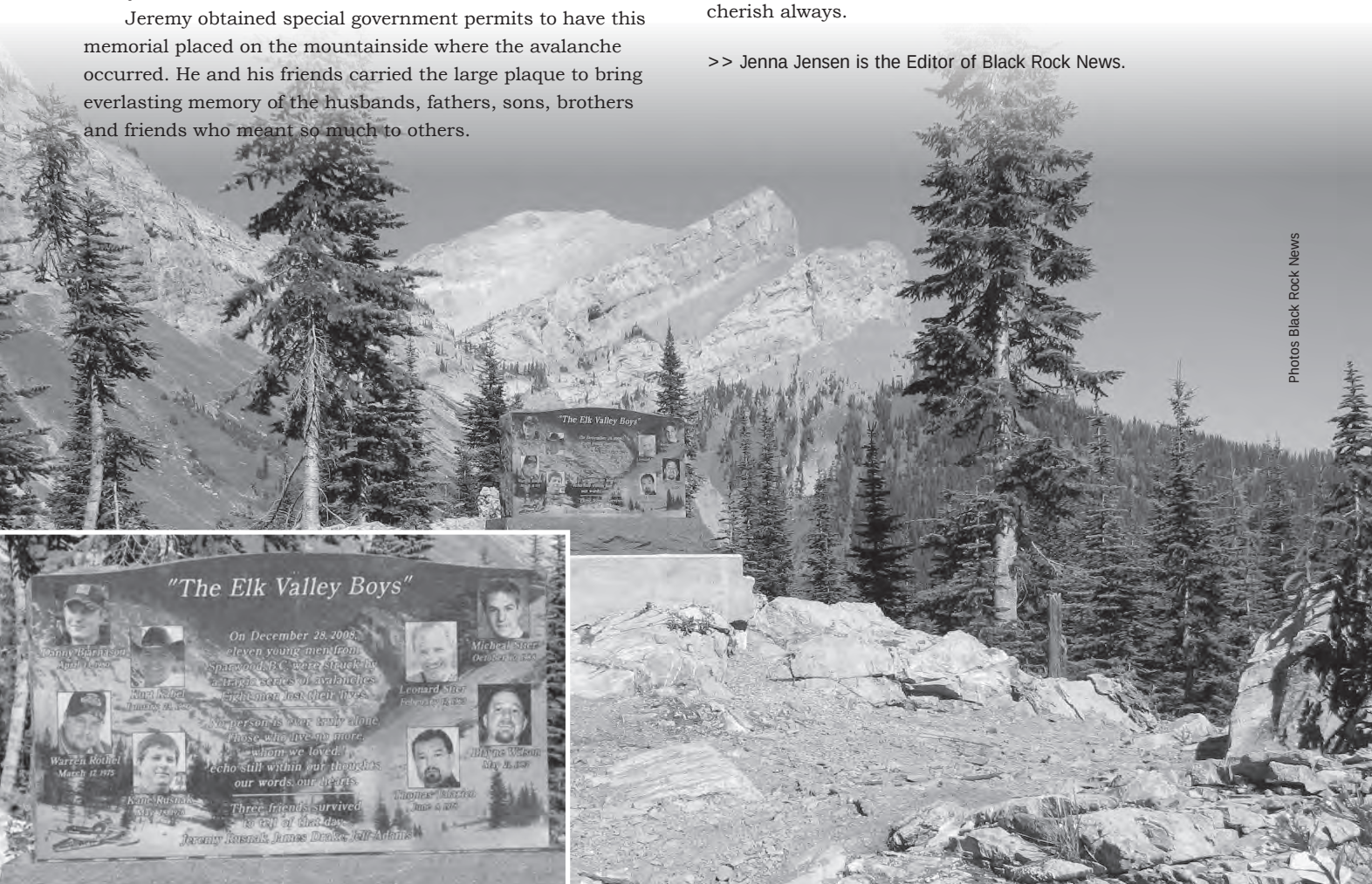
A special "thank you" goes out to the many different groups and individuals who were involved in bringing this stone to its final resting place up high in the mountains of the Elk Valley. SMS Equipment (for whom Jeremy Rusnak is an employee) paid for the stone. This fade- and crack-resistant piece of slate was laser etched with photos of the eight valley boys, a snowmobile and the mountains in the background by Remco Memorials Ltd from Lethbridge. Cat Rental in Sparwood also had a part in this special tribute as they donated tools and supplies. Alpine Lumber in Sparwood donated the forms and the concrete for the base.

Bambi Bodie, a friend and sister of the deceased says, "The stone is awe-inspiring, very detailed, and put in a good place to honor our loved ones in remembrance. It was a very emotional day when we went up to the mountain for the unveiling and we hope that when others view it, they are reminded of our boys and what they faced that day. Let it bring awareness to all that nothing is more powerful than Mother Nature. We would like to say thanks to SMS for their generous gift with special thanks to Jeremy for putting it all together. He spent many hours on the project from start to finish. We would also like to thank all who helped bring the stone up the mountain."

Jeremy would also like to say a big "thank you" for all those who helped this beautiful creation become an everlasting tribute. Public viewing of the memorial stone is welcomed but members of the public are asked not to leave anything such as flowers or plants behind at the site.

This memorial stone will last forever as a symbol of the memories that family and friends of these eight valley boys will cherish always.

>> Jenna Jensen is the Editor of Black Rock News.



Photos Black Rock News

We Remember the Sparwood 8

There are many methods of remembering tragedy. Quin Lockwood of Cranbrook has applied both creativity and entrepreneurial spirit in his efforts to not forget. Quin created the decal shown here to commemorate the eight men who were killed at Harvey Pass in December, 2008. "That accident hit pretty close to home," he recalls. "It happened only about an hour away from here, and could just as easily have been me and seven of my friends."

A couple of days later, Quin was sitting at his computer thinking about what he could do for the families left behind, when he came up with the idea to create a decal for fund-raising. "I was laid off at the time, and had no money to donate for the families left behind," he explains. "I had an art program open on the computer and drew the basic design freehand."

He took the idea to SnoRiders magazine, a publication based in Cranbrook. "The publisher Keith was gung ho right off the bat," Quin remembers. With the help of the magazine's graphic designer, Quin refined the design to its current form. Small decals were created (7.5 cm X 5.5 cm, about 3 in x 2 ¼ in) and the fundraising project began. "They fit perfectly on a helmet or hood," says Quin. "They have a very clean look to them."

The decals sell for a minimum of $2 and last winter were available in Cranbrook and Sparwood. At the end of the winter, Quin donated all the money raised to a trust fund established for the families. This year, people close to the families have suggested he choose another good cause to support, and Quin has chosen the CAC.

""I'd like the money raised to be dedicated to snowmobile programs in BC, and in the East Kootenays in general," he says. "I hope we can raise some awareness with this decal. If it's on people's helmets or hoods, it makes people think." He's hoping more stores will agree to carry the decal, and he can build on the funds that have been raised. "I'm looking forward to making a donation to the CAC," he says. "It's my way of saying, 'thanks for being there.'"

Review of ISSW 2009

By Jürg Schweizer

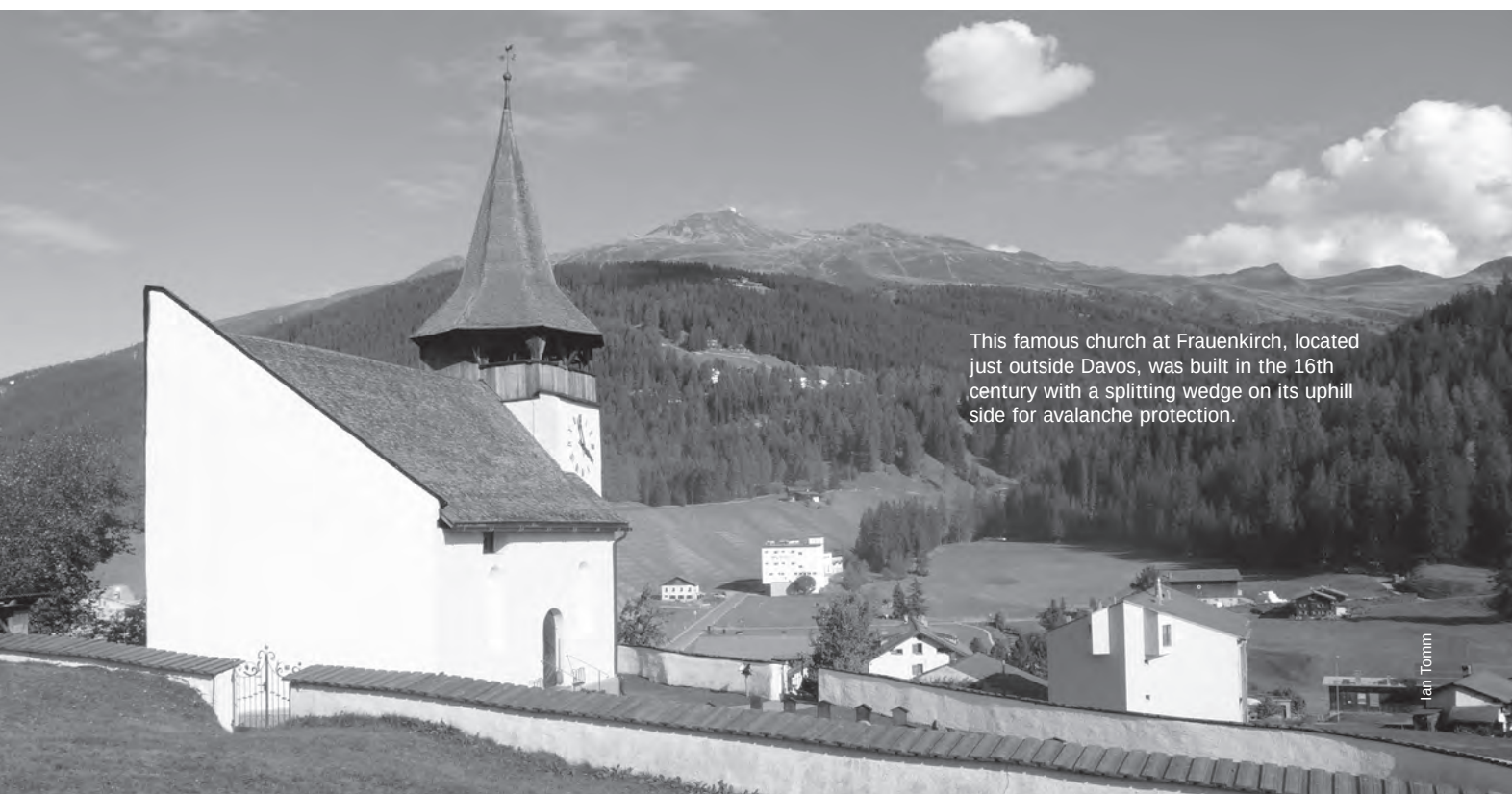
Almost 550 experts engaged in scientific research, natural hazard management and mountain sports attended Europe's first hosting of the International Snow Science Workshop (ISSW) to discuss topical issues and promising solutions concerning snow and avalanches. Considering the event's popularity, the varied conference programme and the large contingent of practitioners, the organisers were delighted with the success of the ISSW's European premiere.

The ISSW took place in Davos, Switzerland from September 27 until October 2, 2009, and was attended by nearly 550 experts—many more than anticipated. For the first time in its history, the foremost snow and avalanche congress for practitioners was held in Europe. It was organised by the WSL Institute for Snow and Avalanche Research SLF and Science City Davos. Researchers, engineers, safety experts, mountain guides, education and training officers and practitioners from 24 nations travelled to Davos, which is acknowledged as the cradle of modern avalanche science. The systematic investigation of snow and avalanches was initiated on the Weissfluhjoch above Davos in 1936.

The ISSW is not a conventional academic congress on snow and avalanches, but serves rather as a meeting place for researchers and practitioners. This underlying objective is reflected in the workshop's official billing as "a merging of theory and practice." The ISSW in Davos was the fifteenth congress in the series and the most international one to date. It has been held in North America every two years since the 1970s.

An extensive range of presentations and discussions took place during the five-day event. Experts addressed congress on current problems relating to avalanches and possible solutions. Academic lectures dominated the morning sessions, while the afternoon events, in the form of workshops and excursions in the Davos region, focused primarily on practical issues. About half of the more than 100 speakers were practitioners—chiefly safety authority representatives, mountain guides and avalanche forecasters. The afternoon workshops covered artificial avalanche release, avalanche forecasting and rescue, avalanche dynamics (computer simulation of avalanche movement), avalanche education, quantitative stratigraphy, and the role of snow as a natural resource for winter tourism. An extra whole-day workshop on the subject of building on permanently frozen soil or permafrost proved especially popular.

In most disciplines, remarkable progress has been made recently in the quantification of key processes, including snow metamorphosis and transportation by the wind. Modern visualisation methods (computer tomography), image processing and remote sensing now provide a far more detailed view of the snowpack than was possible just a few years ago, and new findings are certain to emerge in the near future. The capture of high-definition periodic images allows deformation and fracture processes in the snowpack to be quantified. For the first time, terrestrial laser scanners are capable of recording the complex patterns in which snow is deposited by the wind. Computer models simulating snow transportation, which is a key process in avalanche formation, can thus be validated. Several presentations investigated the processes that take place in the snowpack and play a major role in the formation of wet snow avalanches.



This famous church at Frauenkirch, located just outside Davos, was built in the 16th century with a splitting wedge on its uphill side for avalanche protection.

Ian Tomm

Structures for avalanche defence can be seen everywhere in the densely populated Alps.

Ian Tomm

In France, where avalanche warning is the responsibility of the national meteorological service, the computer models used by forecasters when issuing avalanche bulletins are very advanced. Such models facilitate not only an assessment of the snowpack's current condition at various altitudes and in different aspects, but also the forecasting of its development over the next day or two. Besides model data, current data gathered in the field are also crucial.

The primary interest here lies not in the data delivered by automatic measuring stations, of which there are very many nowadays, but in observations of the snowpack and avalanche activity. By way of special, latest-generation mobile phones with integrated GPS, mountain guides, for example, can for the first time report such observations directly to the avalanche warning services. The SLF conducted a successful trial last winter. A significant improvement in avalanche warning is expected to arise from better communication of the information on which warnings are based. As illustrated by examples from the USA, the use of visual elements such as pictograms, images and even short films, can capture the attention of new user groups to make them aware of current avalanche problems. Similar projects have also been initiated in some European countries.

The focus on the prevailing avalanche problem (e.g. fresh snow or snow drift accumulations) is an important aspect of avalanche training—not least because of the recognition that proficient decision-makers in avalanche-prone terrain assess the situation primarily by identifying patterns, and then adopt a course of action according. The experts at the congress were unable to agree on how avalanche training should be structured to counter the influence of the "human factor" —feelings, intentions and attitudes—on decision-making. It became clear, however, that the assessment of the human factor depends largely on the accident analysis and the applied error model. The error model represents a hypothesis on the behaviour that caused the avalanche to be released; in other words, on the key factor of human influence. The type of inappropriate behaviour that predominates in avalanche accidents is, however, largely unknown. It must be borne in mind that the cause is not always an obvious lack of caution. Even when the prevailing avalanche danger is "considerable," the probability of release is in the range from 1:100 to 1:1000. If behaviour is adjusted accordingly, the probability is even lower.

In the densely populated Alpine region, hazard zone planning and the appropriate dimensioning of buildings and infrastructure facilities in danger zones are especially important issues. The congress took a much closer look at this topic, therefore, than previous ISSW workshops held in North America. Presentations focused on the various computer models that simulate the movement of avalanches and their effects. Such avalanche dynamic models are much more detailed than they were 10 years ago. Progress in this respect has been achieved, in particular, by measurements taken in a variety of test sites in Norway, France and Switzerland (Vallée de la Sionne, Valais), chiefly by releasing avalanches artificially. An innovation unveiled at the congress was the prototype of a wireless sensor that is carried along by the avalanche and transmits relative positional data, so that the movement inside the avalanche can be tracked.

It was encouraging that the presentations at the congress were delivered not only by established researchers, but also by a large number of young scholars, eager to inject fresh impetus into the field of snow and avalanche science. Many practitioners, whose contingent constituted the largest group of attendees, were taking part in such a conference for the first time and expressed great satisfaction with the event. A large number of delegates would not have attended had the presentations not been simultaneously interpreted (German, French, Italian and English). This enabled the experts, in particular those from the major Alpine countries, to deliver presentations and engage in discussions in their mother tongue.

Swiss mountain guide Werner Munter, who has made a ground-breaking contribution to avalanche science over a period of decades, was presented with an award at the congress in recognition of his life's work. A meeting of the ISSW steering committee broadly welcomed the proposal that the ISSW be held in Europe regularly in future. The successful debut made by the ISSW in Davos is thus likely to have a lasting influence on the congress.

>>Jürg Schweizer is a Senior Research Scientist at the Swiss Institute for Snow and Avalanche Research (SLF) and was the Co-Chair of ISSW 2009.

ISSW 2010

By Russ Johnson

In October of 2010 the International Snow Science Workshop will be held at Squaw Valley, California. The venue is the Resort at Squaw Creek, a four star hotel and spa located at the east end of the valley. This venue is ideal for our purposes. The auditorium, the exhibitors, the posters and the sponsor booths are all located in one area on one floor. This space will also accommodate food breaks.

The area could hardly be more picturesque. Lake Tahoe, only a few miles from Squaw Valley, is truly one of the most spectacular bodies of water found anywhere. With a depth of over 490 m (1600 feet), it is the second deepest lake in the nation. The clarity (you can see the bottom in 20 m or 70 feet of water) and sheer size (35 km by 17 km, or 22 miles by 11 miles) make Lake Tahoe one of the finest alpine lakes in the world.

To the north of Squaw Valley lies the historic town of Truckee. The downtown features many unique shops and several great restaurants. Between Tahoe and Truckee flows the Truckee River featuring boating and fishing opportunities on the beautiful, clear stream.

The history of skiing in the area goes back to the middle 19th century. In fact, the earliest recorded skiing in the US took place among Scandinavian miners in the mountains north of Truckee. The oldest ski club in the western hemisphere, the Alturas Ski Club, was founded in 1867. And, of course, the famous "Snowshoe" Thompson carried the mail across the Sierra just south of Tahoe for 20 years beginning in 1856. This winter tradition has carried through to modern times with the founding of several ski areas in the late 1930s, the Winter Olympics at Squaw Valley in 1960 and continues with envelope-pushing riding and skiing locals such as Jeremy Jones and the late Shane McConkey to Daron Rahlves and Julia Mancuso.

Organizing the ISSW in the current economy is a challenge. We have attempted to mitigate the expenses of the participants in various ways. Check out the early registration/accommodation packages on our website www.issw2010.com. Registrants who stay at the resort will also be offered free transportation from Reno-Tahoe Airport as well as transportation locally to Tahoe City and Truckee. Therefore, it should not be necessary to rent a car for the event. Several of the Wednesday activities have no charges associated with them. We are trying to be as creative as possible with the expenses associated with attending the ISSW and are ongoing in our efforts to keep the costs down.

Thanks to the Canadian Avalanche Association for its continued support of the ISSW, and we'll see you at Squaw next October.

>>Russ Johnson is the Chair of ISSW 2010

Dave Smith and Will Geary on a field trip in the Kootenays.

Mike Boissonneault

The Last Profile

By Mike Boissonneault

As I write this, Dave Smith and Will Geary are in the final few weeks before they retire from service with the Ministry of Transportation, Avalanche and Weather Programs. Both have worked for the Ministry for a combined total of 50 years. Over the past nine years, they have worked together on the Kootenays Avalanche Program based in Nelson. This program monitors and controls avalanche hazards above provincial highways throughout the Southeast part of the province (excluding Kootenay Pass).

Both Dave and Will are well-known fixtures within the Canadian avalanche industry. For many years, Dave chaired the CAA Education Committee, in addition to serving on the Board of Directors as Secretary-Treasurer. Currently, Dave is our newly elected Vice-President and continues to work in the capacity of an ITP course instructor and course leader. Will has also served as an ITP course instructor.

Dave and Will leave a legacy of service excellence as demonstrated by the diligent manner in which they approached their day-to-day duties. The safety of those who work and travel on provincial highways during the winter avalanche season has been the driving force that has motivated them throughout their careers.

They have an extraordinary strength, especially as a team of two with respect to the necessary field work that is required. Despite the advancing years of service, they both maintained their skills and fitness. For anyone who spent a day in the field with them, the breaks were few, and the pace was steady. Combined with this is the mountain wisdom and intuitive knowledge both possess that can only come with many years of living and working in the mountains. It is as if they know what is going on in the snowpack, by what they sense and how it feels in their bones.

As Dave and Will work their final few days and dig their last profiles, they will long be remembered for the contributions they made in the development of the Ministry Avalanche and Weather Program. On behalf of all your work-mates, best wishes to Dave and Will. It has been an honour and a pleasure to have worked with both of you!

>>Mike Boissonneault is the Manager of the Avalanche & Weather Programs for BC Highways

In Memoriam: Mike McKnight 1947-2009

Mike loved his family, powder skiing, and the mountains. He worked as a Park Warden, environmental co-ordinator and ski area specialist for Parks Canada. After 33 years he retired in 2002. His last years were spent sailing and biking in Penticton, and helping build Chatter Creek, the cat-skiing lodge of which his son Dale is part owner. Mike loved construction and the outdoors and took special pride in his part of building the Whitetooth Ski Area, which has matured into Kicking Horse Mountain Resort.

Mike is survived by wife Merle, son Dale, (Isabelle) and Leo, daughter Kathy (Jon), Anastasia and Zoe, sisters-in-law Helena Moorhouse and Evelyn Matthews. A ski barbeque is being planned for late winter at the Whitetooth site. We all love Mike and miss him. We also thank Golden for the unwavering support in building Whitetooth. What a legacy for a small community!

All photos McKnight family collection

Friends Remember

Susan Hairsine

There are a handful of people one meets in life that end up having a huge impact on one's destiny. In my life, Mike McKnight was one of those people. I was employed as a radio dispatcher in Rogers Pass in the early 1980s and met Mike when he was on assignment as Environmental Coordinator for the CP Rail twinning through Glacier Park. Living year-round at Rogers Pass and working shifts left a lot of free time, and one day Mike asked if I'd like to take notes at his weekly construction meetings. It was a rainy spring so I readily agreed to volunteer. This was my first attempt at scribing and, as it turns out, is something I've ended up doing countless times since then for Parks Canada and the CAA/CAC. In exchange for meeting minutes, Mike would take me touring on the new right-of-way and was always patient with my endless questions about construction methods.

Mike had a huge heart and a great sense of fun. He was the guy who helped you find your skis after a powder wreck, and waited for you when skiing on Mt Fidelity. He worked very hard at his job but was never too busy to engage in some practical joke scheme of Gord Peyto's or quick game of Hearts with the Schleiss brothers at lunch.

When the CP Rail Project was winding down, I was offered a job in Jasper that paid a lot less money. Mike strongly encouraged me to take it, stating that I couldn't live in Rogers Pass as a radio dispatcher for very much longer. This turned out to be great advice and I spent three awesome years in Jasper. A few years later I got reacquainted with Mike when I transferred to Banff. We had many laughs over lunches at the Mount Royal Hotel where Mike always ordered the same thing—BLT on brown bread.

The last time I saw Mike was at last year's AGM in Penticton. Mike knew he was sick but displayed his usual optimism. Over lunch, Mike gave me one last piece of advice. He recommended retirement as soon as possible because you never know the cards life is planning to deal you. Once again, I plan to follow Mike's advice.

Clair Israelson

Mike McKnight passed away on October 22th at the age of 61. He is survived by his wife Merle, son Dale, daughter Kathy, their families, and a community of mountain people who are forever grateful for all of the good things that Mike brought to their lives.

Mike was a big man—over six feet tall for sure, but that's not the kind of big I'm talking about. He was a brilliant mind, selfless community activist, a smart and hard worker and a tireless contributor to the organizations he was a part of. Mike was a builder in every sense of the word, equally adept with a chainsaw, heavy equipment, or groups of people. He was a natural leader who everyone trusted.

I got to know Mike in 1975 when he came to Lake Louise as the Assistant Chief Park Warden for Parks Canada. He became my neighbor, my friend and my boss; the best boss I ever had. The 1970s were the halcyon days for the Warden Service. Within a few years, most of the old guard had retired and the Warden Service was being populated by a younger, somewhat educated, idealistic and entirely irreverent group of folks who were all out to change the world.

Mike, a couple of years older than most of us, found himself pressed into the role of supervisor, mentor, father figure, buddy and counselor for his staff. I often felt that Mike was one of the very few in Parks Canada who understood the risks in the work we did, our uncertainties and our passions for skiing, climbing and living in the mountains. When necessary, Mike could always, in his quiet and understated way, find the words (or eye contact that made words unnecessary) to get our attention and then, when we were ready to listen, offer his perspective and advice on whatever was going down.

In those days I was the Public Safety Supervisor, and at the time we were pretty much re-inventing how National Parks did mountain rescue and avalanche forecasting and control. Mike went to bat for us up the organizational ladder, ensuring we had the equipment, training, and other support we needed to avoid killing ourselves or the park visitors we were charged with protecting. I'll never forget the numerous times I sought Mike's advice on how search and rescue situations should be managed, how much risk we should accept, and how we should deal with survivors and the bereaved. I am probably alive because of Mike's (sometimes brutally) honest assessments of the situations we faced, and what our responses to those situations should be. Mike had an admirable ability to keep his perspective and cool when those around him were blowing theirs.

Mike's "working man" attitude to life and his loyalty to his staff eventually put the Parks' executive in an awkward situation. Mike was a brilliant manager, but not an ass kisser. I think Mike's common sense and straight talk made life uncomfortable for some of the Parks bureaucrats who had aspirations of upward mobility. When the Canadian Pacific Railway twin-tracked the rail line through Lake Louise, Mike's negotiating skills and aptitude for construction made him Parks Canada's obvious choice for the job of environmental coordinator for this project. During this period the McKnight family bought land near Golden BC, where they built their own log home. Merle started a graphic design business, and the family immersed themselves in community activities.

Mike loved to ski deep powder snow and frankly, the ski conditions we normally had at Lake Louise didn't thrill him much. Every year Mike and his good friend Gord Peyto would arrange for the Tucker snow-cat and a barrel of fuel to be at Flat Creek in Glacier National Park for a "deep snow school" to keep their powder skiing skills honed. In his green woolen knickers, orange cotton anorak and red Hanwag ski boots Mike would ski down Mt. Fidelity with a smile as big as the sky. The trips up the hill were a ritual of untangling frozen tow ropes, the towed skiers sorting out who was going to trip whom on the corners ahead, and Mike and Gord in the front seats of the Tucker trading good natured insults and drinking coffee from the huge steel Thermos they each carried. I remember Mike at his happiest on these occasions, a memory that I'm sure many of us share.

When the CPR started building the Macdonald Tunnel under Rogers Pass in 1984, Mike's railway experience at Lake Louise made him once more Parks Canada's obvious choice for environmental coordinator for the project, an appointment welcomed by the CPR. Mike accepted the assignment because his daily commute to work was shorter, and it took him back to his Warden Service roots, old friends and the powder skiing at Rogers Pass.

Always thinking of their community, in 1986 Mike and Merle helped rekindle local interest in developing the Whitetooth Ski Area (now Kicking Horse Mountain Resort) for downhill skiing. Development plans existed. What was missing was the vision, money and determination to get the job done. Mike and Merle dusted off the Whitetooth Ski Society with Mike as President, and convinced the community they could develop the ski area themselves, as a not-for-profit community project.

Mike worked tirelessly to see it to fruition. They cleared the forest, built ski runs, lifts, a lodge and maintenance buildings. Under Mike's direction they did it all, from idea to skiing, in just ten months. The residents of Golden had what Mike later called a "damn nice little ski hill." According to plan, the Whitetooth Ski Area was later sold to the private sector, generating a tidy surplus that was invested into a trust fund to provide free skiing, equipment and instruction for kids from low income families.

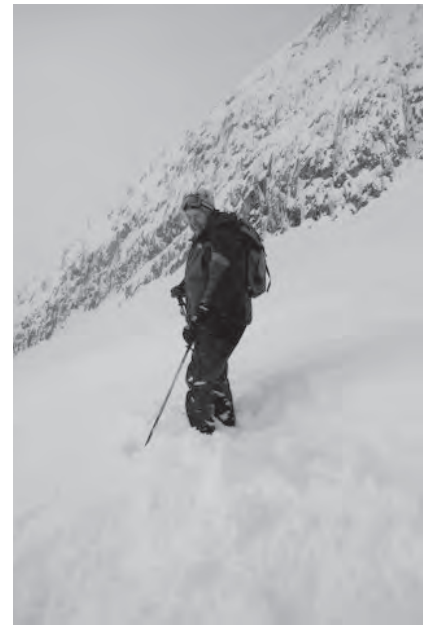
In the late 90s Mike turned his energy to helping develop Chatter Creek Cat Skiing in the mountains north of Golden. Together with Merle, son Dale and other business partners they built what has become one of the best cat skiing companies in BC with good planning, hard work and an unbounded enthusiasm for their product—powder skiing. Mike was doing what he loved most, building roads, log buildings and an organization of good people to operate the business. Best of all, he was skiing powder snow with friends old and new. For Mike it was the perfect retirement job.

Mike's commitment to community participation continued as the Chatter Creek development moved forward. He became active in the organization known now as HeliCat Canada, and served as a Director for Associate Members on the Board of the CAA from 2002 to 2004. Our careers had come full circle. I was then working as Executive Director for the CAA, and I was once again looking to Mike for advice and direction. He never let me down.

Mike was a brilliant man with a vision for what was possible if a few good people put their heads together and worked hard. I never heard him boast about his accomplishments, but often heard him praise the contributions made by others. He loved his family, building things, and deep snow skiing. His life touched us all, he was our unsung hero. Thanks Mike. You helped more people in more ways than you ever imagined.

Dave McClung

Mike McKnight was a good friend and colleague of mine for more than 25 years. I remember his work along with CPR in relation to construction of the tunnel through Mt. McDonald. There was a congruence of opinion with Fred Schleiss on this: placement of the tunnel entrance in the largest avalanche path in the Rogers Pass sector (Ross Peak)! I remember he had a very accurate and succinct definition of the powder skiing for which our province is famous: "It's the closest a human being can come to complete freedom without leaving the surface of the earth!" Thank you, Mike—that's all I need to know.



Rupert Wedgwood

My strongest memories of Mike where during the deep powder schools on Mount Fidelity. As a young warden in the early 90s, I was always impressed by how easily and effortlessly Mike would float down the steepest slopes. I tried to mimic Mike's movements and he was always willing to help pass on advice on technique or on approaching a tricky slope. I never saw Mike fall or out of breath. In later years he may not have been the first to the top of the slope but he was waiting for us at the bottom with a big smile on his face. God speed Mike, rest in peace.

In memory of Mike McKnight, a fund has been created with the Golden and District Community Foundation to assist people who wish to train for a career in the Ski Industry. Donations are welcome and can be made by cheque payable to Golden and District Community Foundation—McKnight Fund. You can send your donations by mail to Box 1485 Golden BC V0A 1H0. You can also donate online at the Foundation's website www.goldencommunityfoundation.ca. Charitable Income Tax Receipts will be given out for all donations. For more information, call Glen Ewan, Q.C. chair of the foundation at 250-344-5258.

Centennial of Disaster, 100 Years of Progress

A united effort to commemorate Canada's worst avalanche accident, and celebrate the advances made in avalanche risk management

March 4, 1910. In a late-evening blizzard, CPR Road Master John Anderson toiled alongside 60 men to clear an avalanche that had covered hundreds of metres of track near the summit of Rogers Pass, BC. As the workers and their machinery punched a trench through the deposit, Anderson walked to the watchman's shack to advise the Revelstoke dispatcher of their progress. On his return, he was met with an eerie silence. A second avalanche had come down from the other side of the valley, entombing the workers and taking 58 lives.

Since that fateful night, little has changed in the mountain environment, yet everything has changed in the way we interact with the many elements that create avalanches and avalanche hazard. Today, Rogers Pass is not only a vital transportation corridor but also home to some of the world's most advanced avalanche risk management programs. Today, Canadians are world leaders in avalanche science and safety.

March 4, 2010 marks the centennial of this tragedy. To commemorate this event and celebrate the many achievements in avalanche safety since then, the CAC has joined forces with Parks Canada, CP, the Revelstoke Museum and Archives, the Revelstoke Railway Museum and the Town of Revelstoke. Together, we are holding a number of events over the course of the spring and summer. The anniversary itself will be marked with an evening service in the town square. That day will also see the official opening of an exhibit created by the CAC's Nancy Geismar, showing the development of avalanche safety over the past century through images and words.

Of the 58 men who died in the avalanche, 32 were Japanese workers. The Revelstoke Museum and Archives has played a vital role in establishing the identities of all the men lost that night, and CAA Professional Member Tomoaki Fujimura has done some invaluable work for the 1910 committee in tracking down the families of some of the Japanese victims.

There will be another memorial service held at the actual site of the slide, later in the summer when access is easier. This ceremony will be linked with Revelstoke's annual Railway Days, Aug 13 – 22, 2010. There will be daily field trips to Rogers Pass National Historic Site, and the on-site memorial service will be held on August 15. There will also be special exhibits on the 1910 slide opening at the Revelstoke Railway Museum and the Revelstoke Museum and Archives.

If you're going to be in the Revelstoke area in March or later this summer, please come join us as we mark this event with respect for the lives lost—and recognition for the gains made.

Joseph Daem family collection

Search!

Part 5: After Validation

By Jay Pugh

Jay Pugh and Laddie demonstrate a validation-style search.

Zuzana Driediger

In the previous instalments of this series, the focus has been on the initial training and validation of the CARDA Search Dog Team. The students have spent the first two years committed to attaining this goal and making every effort in achieving it. The process is so intense that it can be easy to forget the actual purpose, which is to be an active and experienced team. This entails establishing and maintaining relationships with the RCMP and local Search and Rescue Groups, ongoing training and constantly preparing for the real life-or-death call. In short, the handler must take the necessary steps to be in a position to respond in a timely manner to an avalanche, and do so throughout the working life of the dog.

To begin with, there is no sense in validating a team when there is little or no possibility of being called on for a rescue. By now the handler should be working or volunteering in the winter industry where there is a mandate for search and rescue. There is still a wide variety of support for the handlers, ranging from full food and veterinary financial support to a begrudging "you're lucky the dog is even allowed here."

Most CARDA handlers are professional ski patrols although there is also a strong representation from the guiding industry and highways workers. In every case the support of the agency involved is crucial. There are some places, such as Whistler/Blackcomb, where the importance of having avalanche rescue dog teams has long been recognized. However, there are still situations where a new handler may find themselves playing the role of pioneer. They have to prove that the dog, with all the perceived problems, is an asset that does not take away from the normal duties of the handler.


CARDA

Handler Chris McLean and partner Chephren.

This can be a frustrating and lonely spot. As passionate dog people we tend to forget that the rest of the world might not see situation as we do. The non-dog world is concerned with allergies, hygiene and the fear of someone getting bit. As handlers we are obligated to alleviate or at least mitigate theses fears as much as possible. The handler can find themselves in the role of trail blazer where every interaction involving the dog reflects on the future of the program. It is a difficult and delicate position that gives the handlers the opportunity to show professionalism on a daily basis.

CARDA has been privileged and in no small measure aided by the support of the RCMP and Parks Canada. The selection and training of CARDA dogs is based on RCMP protocols and every CARDA course has RCMP Doghandlers teaching alongside CARDA Instructors. It is, however, still a responsibility of CARDA handlers to make themselves known to their local RCMP Handler and conduct themselves professionally. In other words, trust must be gained. All search and rescue operations fall under the mandate of the RCMP, so this is a crucial relationship for a handler to establish and maintain.

In order to continue being an active resource, the handler must meet the requirements of both the affiliated rescue agency (in BC this is PEP) and of CARDA. Validation of the dog is not a one-shot affair. CARDA teams are required to re-validate every year and participate in a course every second year. The nature of the beast is that the dog needs consistent training that motivates and challenges it. Handlers are encouraged to create scenarios more tailored to the handlers' situation. For example if the handler works on a ski hill, it would be important to work the dog while other rescuers are performing probe and beacon searches.

On the second year, the handlers now have the option of either being in the advanced group at the regular CARDA course or participating in the smaller advanced course. In both cases, the team is given a higher level of difficulty and expected to take on more of a leadership role. A successful conclusion means the team achieves Senior Avalanche Rescue Dog Team status. The handler is now capable of leading large-scale scenarios with multiple dog teams (the ins and outs of an advanced group and advanced course are a topic for another instalment).

As a long-time CARDA member and handler, I have seen many teams come and go. There is a high dropout rate due to life changes, health of the dog and sadly, lack of support. Of those I have witnessed who have stuck with it, almost every case has exhibited a level of commitment and dedication I find fulfilling and inspiring.

A perk to being an instructor is that every two years I get to re-connect with former students and find out what they've been doing for training. I also learn a few new things based on their experiences. As the years go by, I have witnessed the path many a young handler has taken. Some have reached the top levels of their jobs and attained the CAA Level 2 and completed the ACMG Guide courses. Others have become helicopter pilots and RCMP Officers. It's never been a surprise since I saw the motivation and drive they put into their dogs. Along the way many have answered the call.

The reality is that the handlers of CARDA will at some time respond to a real call. All the training in the world cannot duplicate the tension and urgency that goes into it. As most know in the avalanche field, if there is no self-rescue, there is little chance of a live recovery. CARDA handlers hope and train for the best result but the sad fact remains that there is a strong possibility it will be a body recovery. Personally speaking, I never really thought what the word "dichotomy" meant until my dog went above and beyond to help locate a young child. We were too late and the family's grief will always stay with me. Many of my colleagues in CARDA have been through similar and even more tragic circumstances, some several times. It is the hope that others may live because of the training and effort we put into our dogs, which makes the everlasting training process worth every minute.

Terms used by CARDA

Advanced Course • A smaller yearly course that covers the CARDA mandate of attending a course every two years. Handlers work their dogs in more complex scenarios and have the opportunity to further their backcountry skills.

Advanced Group • The most experienced attendees of the general course, who perform more complex searches and work in more difficult terrain. Successful validation for both Advanced Group and Advanced Course members are given "Senior Avalanche Rescue Dog Team" status.

PEP • Provincial Emergency Program. All CARDA residents of BC must be a member of good standing in order to be on PEP's resource list.

RCMP • People who are in a business where the customer is always wrong.

CAA Level 2 • The top-level course and certificate for the avalanche industry. Roughly similar to a degree in nuclear physics (on taking this course in 1995 the author opted for a career in firefighting).

ACMG Guide • Similar to getting a Nobel Peace Prize in Nuclear Physics.

Working Life • The period between first validation to retirement, which is usually around eight to ten years old. The average working life for the larger breeds is six to eight years.

Ongoing Training • An expression that means the training of an avalanche search dog never ends throughout the working life of the dog.

Veterans • Handlers who have been with CARDA for more than one dog. Some CARDA handlers are on their fourth dog with the previous having a full working life.

Retirement (dog) • Usually when physically unable to work in a timely manner in the environment. Now qualifies for the "the Life of Riley" (i.e., three meals a day, gets to sleep inside and has the right to put the new pup in its place).

Retirement (human) • Usually a life change, such as a career move outside the avalanche industry. No CARDA handler has admitted to physical demands being the reason, although skiing styles have changed noticeably in a few.

Schedule of Coming Events

January 21, 2010
1910 Rogers Pass Snow Slide Commemoration Film Night
Where: Revelstoke, BC
Info: www.friendsrevglacier.com

March 4, 2010
1910 Avalanche Memorial Service and opening ceremony for the CAC's exhibit, "A Century of Avalanche Safety."
Where: Revelstoke, BC
Contact: Call Nancy Geismar at 250 837 2141 (233)

April 2 – 7, 2010
European Geosciences Union, General Assembly
Where: Vienna, Austria
Info: www.meetings.copernicus.org/egu2009/

April 19 – 23, 2010
Western Snow Conference
The Western Snow Conference is an annual tradition that began in 1932 as an international forum for individuals and organizations to share scientific, management and socio-political information on snow and runoff. This year's theme is: "Adaptive water management in a changing climate: data, products and tools for practical application."
Where: Logan, Utah
Info: www.westernsnowconference.org

May 2, 2010
HeliCat Canada Annual General Meeting
Where: The Delta Grand Okanagan Resort, Kelowna BC
Info: Phone 250.542.9020 or e-mail info@helicatcanada.com

May 3 – 7, 2010
Canada West Ski Areas Association Spring Conference and Trade Show
Where: The Delta Grand Okanagan Resort, Kelowna BC
Info: Phone 250.542.9020 or e-mail office@cwsaa.org

May 3 – 7, 2010
CAA & CAC Annual General Meetings
Mark your calendar! You won't want to miss any of the presentations, meetings or discussions at this year's AGM.
Where: The Ramada Inn, Penticton, BC

Ray Mason

Skiers take some time to fill out a survey before heading out of bounds at Sunshine Ski Village.

Matt Gunn

Promoting Avalanche Safety Among Out-of-Bounds Skiers and Snowboarders

An Update from the ADFAR2 Project

By Pascal Haegeli

Over the past few years, out-of-bounds (OB) skiing and snowboarding has seen a dramatic increase in popularity. While these skiers and snowboarders enjoy the convenience of chairlifts for getting to the top of the mountain, they leave the ski area boundaries in pursuit of fresh powder snow and more challenging terrain for their descent. Unfortunately, this increased traffic brings more avalanche accidents involving injury and death. Within the last decade there was, on average, one OB avalanche fatality per winter in Canada, which accounts for 7% of all avalanche fatalities during that time period. A more detailed look at the long-term statistics shows an upwards trend in the number of OB avalanche fatalities in Canada. During the 2008/2009 winter season there were four fatalities in OB or permanently closed terrain that resulted in significant media coverage. During that season, OB avalanche fatalities accounted for 17% of total avalanche fatalities in Canada, which is closer to the statistics published by the International Commission for Alpine Rescue (ICAR). Between 2003/04 and 2007/08, OB skiers and snowboarders accounted for 22% of all known avalanche fatalities in North America and Europe.

OB skiers and snowboarders are an important target audience of the Canadian Avalanche Centre. However, a number of specific characteristics of this activity make the promotion of avalanche safety among this group more challenging than in the traditional backcountry community. The visibility and easy access from ski areas to inviting OB terrain allows for spontaneous decisions to enter avalanche terrain without any planning and preparation. Skiers and snowboarders can be in challenging avalanche terrain within minutes, making the communication window for avalanche information very short and their personal

collection of relevant observations almost impossible. In addition, proximity to the resort can lead to a false sense of security, with the perception that rescue service is readily available should anything go wrong. While traditional backcountry skiing has a well established safety culture that strongly influences the decision process, OB skiers and snowboarders tend to be much more driven by the search for powder snow and challenging terrain, and are exposed to a much wider range of powerful influences including ski area advertising and boundary policies, the local ski culture, and ski magazines and movies.

The fact that OB skiing and snowboarding often offers a first introduction to recreation in avalanche terrain makes the promotion of proper avalanche safety practices among this target group particularly important. While individual resorts have developed effective strategies for dealing with their specific OB challenges, there is currently no comprehensive framework that offers evidence-based guidance for the promotion of avalanche awareness among this target audience. In order to fill this void, the ADFAR2 (Avalanche Decision Framework for Amateur Recreationists) included a specific OB research objective. The research team consisted of Ian McCammon (Snowpit Technologies), Pascal Haegeli and Matt Gunn (both Simon Fraser University). The focus of this project was to gain a better understanding of avalanche awareness among OB users and to identify effective strategies for promoting informed decision-making in OB avalanche terrain.

Based on various site visits, expert interviews and a number of focus groups with OB skiers and snowboarders, Ian McCammon adapted the Precaution Adoption (PA) Process Model to describe the different awareness stages of OB skiers and snowboarders. The PA Process Model is a relatively young framework for designing risk communications that has proven useful for hazards that may initially be unknown to the target audience and where risk perception plays a central role in voluntary precautionary behaviour. The modified OB PA Model comprises five distinct stages of awareness and precautionary behaviour: 1) Unaware (no functional knowledge of avalanches); 2) Unengaged (basic awareness, but does not believe that avalanche hazard applies to them); 3) Engaged (perceive the hazard as relevant and has decided to act); 4) Emergent (has acquired basic hazard recognition and mitigation skills), and 5) Practitioner (hazard recognition and mitigation has become routine). The key message of the framework is that the adoption of precautionary behaviour is not a linear process and that the OB skiers and snowboarders at different stages require different messaging and initiatives to further promote and strengthen their avalanche awareness and safety behaviour (Fig. 1). In order to develop effective awareness initiatives, it is therefore crucial for ski areas to have an in-depth understanding of the characteristics of their local OB community.

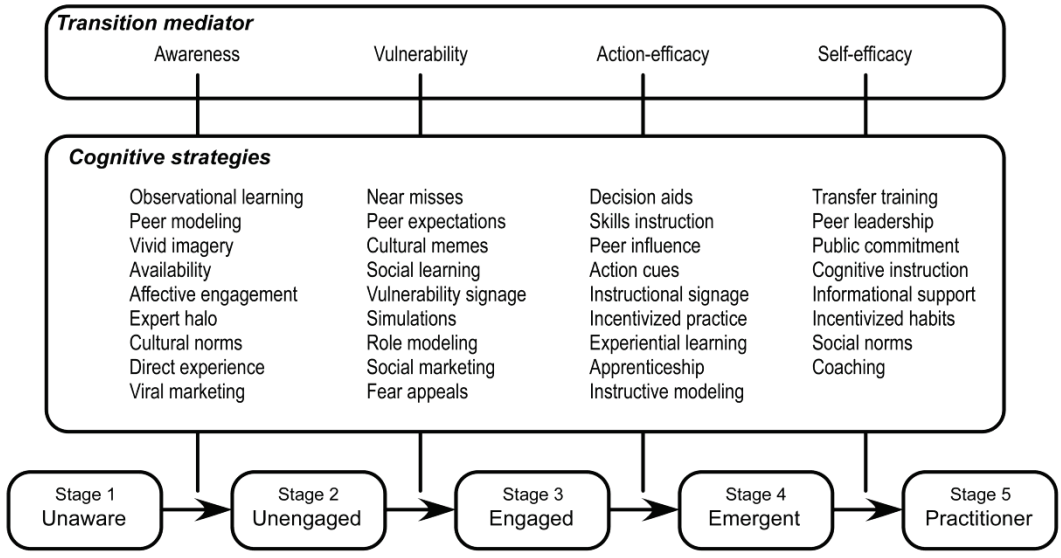


Fig. 1: Transistion Mediators for the promotion of OB avalanche awareness (McCammon, 2009)

The second component of this research project is aimed at developing a better understanding of the OB segment most at risk of being involved in an avalanche incident. To address this question, Matt Gunn and Pascal Haegeli interviewed OB skiers and snowboarders at exit points of various ski resorts and conducted an extensive online survey. The survey results confirmed that OB skiers and snowboarders are not a single homogeneous group as they are often depicted in the media. Based on their answers to a series of survey questions related to their OB behaviour, survey participants were classified as low-, intermediate- or high-risk takers.

As expected, the high-risk takers were only a relatively small portion of the complete survey sample. A direct comparison of the high- and low-risk groups offered additional background information for the development of evidence-based safety messages that specifically targets at-risk individuals. Overall, the analysis showed that high-risk individuals exist in all of the awareness

Ian McCammon (back to the camera) leads a focus group session at Lake Louise as part of the ADFAR 2 research into out-of-bound skiers and boarders.

Matt Gunn

stages of the OB PA model. The results revealed that high-risk OB recreationists had a higher percentage of individuals with an incomplete understanding of OB policies and signage. Ski resorts would therefore benefit from using consistent signage and better educating their clientele with respect to their specific policies. Furthermore, the characteristics of the high-risk group highlighted the fact that effective awareness messages need to be emotionally engaging and must focus on making the potential severity and consequences of a avalanche involvement personally relevant.

In an effort to put these research results into action right away, the CAC is currently supporting a project initiated by Ashley Turk, a student at Emily Carr University of Art and Design. As a term project, Ashley, an avid OB snowboard rider herself, developed an avalanche awareness brochure for fellow riders. We are now working together with her to turn her draft into a peer-to-peer avalanche awareness brochure primarily aimed at the Unaware and Unengaged OB skiers and snowboarders. Focusing on an attractive design, great photos and avalanche related quotes from well-known riders, the goal of this brochure is to raise basic awareness and a sense of personal vulnerability among this user group.

More background about this entire research project can be found on the CAC's website. Ian McCammon's ISSW 2008 paper and a detailed report of his research can be downloaded from the CAC's online library, and a summary of the Master's Thesis of Matt Gunn will be made available later this winter. In order to make this research more accessible for practitioners, the CAC is currently working on an applied document that summarizes the main research results and offers practical examples for their implementation. We hope this document will offer a common platform for ski areas and avalanche educators to discuss the challenge of OB avalanche awareness and assist in the development of new and innovative approaches to more effectively promote informed decision making among OB skiers and snowboarders.

>>Pascal Haegeli is the ADFAR2 Project Manager

2009 Transceiver Test

Assessing the New Three-Antenna Transceivers

F. M. Swangard MD[1], Bob Sayer[2], Steve Gunderson[3]

Abstract

There has been a great deal of change since the last transceiver test which the Canadian Ski Patrol presented in 1999.[4] Transceivers have changed in their technical construction and as a result of these changes, there has been a profound change in how they are used. A number of extra features have been added which may improve finding a buried person. We tested the most common five new transceivers used in BC against the Ortovox F1, an older, single antenna transceiver, which is the most commonly used in BC. We first tested the transceivers with 15 certified ski guides who in their workplace used the Ortovox F1. Each guide used all six transceivers in a simulated avalanche.[5] The times to find the two buried transmitters were recorded. We then performed the same program with 15 high school students who had never used transceivers. We staged it so that the novice high school students were divided into three groups, each of which used the transceivers in a different sequence to rule out a learning advantage by using the transceivers in the same order.

The results showed only a small difference in the times of the guide using the new models, with the Ortovox d3 being the fastest and the F1 the slowest even though the F1 is the transceiver they used most often. The results with the students was most interesting. Only four out of ten (two of the three groups) were able to find the second buried transmitter within the seven minute time limit using the Ortovox F1. All students were able to find all the targets with their new model transceivers in their test group. The fastest times were with the Ortovox S1 which was slightly faster than the Ortovox d3, Mammut Pulse, Tracker DTS, and the Pieps DSP which finished in that order and quite close together. Clearly the new transceivers are much better in the hands of a novice or irregular user.

Mammut/Barryvox Pulse

Ortovox S1

Materials and Methods

We received four transceivers from Mammut (Pulse) and Pieps (DSP). Mountain Equipment Coop loaned us four Tracker DTS. Ortovox sent us four d3s and four S1s. We borrowed four Ortovox F1 transceivers from the Canadian Ski Patrol System, Greater Vancouver Zone. We also borrowed the Ortovox remote-controlled test system (five transmitters which can be remotely turned on and off) from Mike Wiegele Heli Ski Resort at Blue River, BC.

The first session took place at Mike Wiegele's Resort in Blue River, using the heli-ski guides as knowledgeable testers. These guides and their clients use the Ortovox F1. We created a simulated avalanche 30 x 50 metres in size and buried the transmitters across the run-out area. The transceiver manufacturers' instructions for use of each transceiver were given to each tester prior to using each transceiver. We randomly turned on two of the five Ortovox transmitters then let each tester (guide) enter at the top end of the "avalanche" to start a search grid until a signal was received, at which time they were to follow the instructions from the applicable transceiver manufacture. The time was measured from the entry until finding the second transmitter. Two different test transmitters were switched on for every test. The results are shown in Appendix 1.

The second session took place at Hemlock Resort just east of Mission, BC. We created a simulated avalanche 30 x 50 metres in size and buried the five Ortovox test transmitters

Key Words: Avalanche; Transceiver; Avalanche Beacon; Ortovox; Mammut; Pieps; Tracker.

1 Canadian Ski Patrol System Life Member, Canadian Delegate to the International commission of Alpine Rescue.

2 President of the Canadian Ski Guide Association, Associate Delegate to the International commission of Alpine Rescue.

3 Member and Board Member Canadian Ski Patrol System, Greater Vancouver Zone and Avalanche training officer for B.C.

4 Canadian Ski Patrol System (CSPS) Transceiver Test 1999 presented at IKAR.

5 Training material taken from the user manual of each transceiver.

across the run-out area at the base of the "avalanche." The 15 students were divided into three groups and each group had a different sequence of transceivers to test (to remove a learning effect whereby the use of first transceivers could lead to improved times with the later transceivers). Using the transceiver manufacturers' instructions, the groups were given a 30-minute instruction course with practice prior to the testing of each transceiver. Two of the five test transmitters were switched on and each novice tester was started at the top of the "avalanche," where a normal search pattern was followed until a signal was received, at which time the instructions from the applicable transceiver were followed. The time was measured from "avalanche" entry to marking of the second transmitter. Two different test transmitters were switched on for every test. A time limit of seven minutes was set to find the second transmitter. If this was not achieved the test was declared as "not found." The results are shown in Appendix 2.

Backcountry Access Tracker DTS

Results

In the hands of a knowledgeable user there was only a small difference in search times between the two-antenna and the newer three-antenna transceivers. The fastest was the Ortovox d3 (avg. 1 minute, 13 sec), then the Tracker (1 minute, 35 sec), the Pieps (1 minute, 36 sec), the Ortovox S1 (1 minute, 38 sec) and the Mammut Pulse (1 minute, 47 sec). The slowest was the Ortovox F1 (at a still respectable 1 minute, 56 sec). The standard deviation (STDEV) shows how much variation there was in the times and a low number suggests a more consistent ease of use, ranging from the Ortovox S1 at :23, Ortovox d3 at :31, Tracker at :32, Pieps at :36, Mammut at :47, and the Ortovox F1 at 1:07. In the hands of an expert user there appears to be little difference in the results using the multi-antenna transceivers and all are faster than the F1 which is nearing two decades of use.

The results from the naive users are very interesting! Six out of ten testers failed to find the two targets using the Ortovox F1 in the allotted time. All the naive users did much better using the two and three-antenna transceivers. The fastest was the Ortovox S1 (2 minutes, 59 sec), the Ortovox d3 (3 minutes, 21 sec), Mammut (3 minutes, 25 sec), the Tracker (3 minutes, 26 sec,) and the Pieps (3 minutes, 34 sec).

Pieps DSP

Discussion

Both the guides and naive users liked the ease of use and the marking of multiple burials on the screen of the Ortovox S1. The screen of the Ortovox S1 did not seem to be affected by the cold (at times -15C to -20C). The Ortovox d3 was very easy to use but not as easy to find multiple burials as the S1. Both the Ortovox model S1 and d3 also had the best attachment systems.

The Mammut Pulse worked well when correctly set up. It seemed to have too many parameters to set and really needs a lock function to stop a desired setting from being changed. The authors also feel that the "Pulse" feature should not be used on ethical grounds because of questionable reliability. The attachment system is good.

The Pieps DSP worked well but the on-off slider switch which sticks out from the transceiver seemed to present a risk of being easily broken. We also found the deactivation of the transceiver with the special probe presents a risk of abandonment of the buried person if the transceiver is turned off and the probe were to be removed by a person not knowing what had been done. We would advise not to use this feature. The attachment system was not as easy to use as the others.

The Tracker DTS did better than we expected as a two-antenna transceiver compared to three-antenna models. The pinpointing with this transceiver was more difficult than with a three-antenna transceiver. The authors expect this company will update their transceiver in the near future. When this is done we recommend they also update their attachment system, which was determined to be the poorest.

Ortovox D3

6 Time Is Life Video from the International Commission of Alpine Rescue (www.IKAR-CISA.org)

7 Canadian Avalanche Centre (www.avalanche.ca)

Appendix 1

CSPS / CSGA Transciever Test Results

at Mike Weigele Helecoptor Resort

	I<=	Time mm:ss				=>I
NAME	Ortovox S1	Ortovox d3	Mammut Pulse	Pieps DSP	Tracker DTS	Ortovox F1
Justin	1:45	0:39	1:10	1:05	1:44	0:52
Scott	2:00	0:44	4:00	1:06	1:00	0:31
Ian	1:45	0:50	1:13	1:07	2:00	1:34
Willy	1:30	0:30	2:10	1:08	1:25	2:20
John	2:15	1:01	1:13	1:09	1:07	0:31
Erin	1:10	1:47	0:58	2:18	1:43	2:48
Crosby	1:29	1:08	1:30	1:55	1:13	1:06
Steve	1:27	2:08	2:56	2:57	1:21	1:37
Mike	2:25	1:14	1:24	1:18	2:36	3:36
Jason	1:32	0:57	1:30	2:00	2:02	4:34
Rankin	0:56	1:49	2:11	1:31	1:35	2:04
Mike H.	1:45	0:43	1:45	1:09	1:03	1:31
Erich	1:45	2:05	1:47	2:29	1:20	1:31
Andras	1:10	1:28	1:50	1:44	2:45	1:54
Tim	1:43	1:15	1:22	1:05	1:05	2:45
Avg	1:38	1:13	1:47	1:36	1:35	1:56
Stdev	0:23	0:31	0:47	0:36	0:32	1:07

Appendix 2

09,01,31& 02,01 CSPS / CSGA Transceiver Test Results : Hemlock Resort

	I<=	Time mm:ss				=>I	
NAME	Ortovox F1	Tracker DTS	Mammut Pulse	Pieps DSP	Ortovox S1	Ortovox d3	Line Avg
Taylor R	* 07:00		4:00	2:48	1:43	4:11	3:10
Gidron C	* 07:00		3:37	1:36	3:22	2:47	2:50
John D	6:42		3:40	2:03	3:02	4:23	3:17
Indianna C	* 07:00		2:30	4:41	2:20	3:22	3:13
Bryan Fast	* 07:00		3:39	5:00	3:20	3:14	3:48
Jocheon M		2:07	3:22		2:48		2:45
Dreni W		4:24	2:07		2:23		2:58
Chris V		3:23	5:00		3:26		3:56
Ben N		4:59	3:30		3:52		4:07
Nathan R		2:43	2:47		3:42		3:04
John B	3:45	5:00		3:29		3:32	4:00
Lucas D	* 07:00	2:55		5:00		2:38	3:31
Dawson S	6:06	3:35		2:30		1:58	2:41
Stephen S	5:04	2:35		4:53		2:28	3:18
Chuck L	* 07:00	2:48		3:49		5:00	3:52
Avg	6:36	3:26	3:25	3:34	2:59	3:21	3:21
Stdev	No Stdev	1:01	0:48	1:17	0:40	0:56	0:57

* Note: If the tester did not find the first target by 7 minutes the test was deemed failed

Conclusions

Any transceiver is better than none! The new three-antenna transceivers are faster in finding a buried person in an avalanche than the older single antenna transceiver. This is especially true for the naive user. Guides or guiding companies using anything other than three-antenna transceivers should consider upgrading. The simpler the transceiver is to use the better. Extra functions such as the pulse detection with the Mammut and the probe switch with the Pieps may have serious ethical problems and detract from the primary goal—to find and rescue the buried person.

The "Test Box" from Ortovox for the Ortovox S1 appears to be a very good way to assure full function of each S1 transceiver prior to its use. This will be especially useful for larger operations such as heli and snow cat companies and rescue organizations.

Disclosures

This study was not supported financially or materially by any of the transceiver manufacturers whose equipment was used in this study. The authors, Swangard, Sayer and Gunderson have no financial ties or conflict to disclose.

We would like to thank Ortovox, Mammut, Pieps and Mountain Equipment Coop for loaning us the transceivers. We would also like to thank Mike Wiegele Helicopter Ski Resort and Hemlock Ski Resort for providing us with staff and mechanical support. Thanks also to the Canadian Ski Patrol System, Greater Vancouver Zone which provided testing, training and support without which we could not have completed this program. We would also like to thank the Mennonite Educational Institute (a high school in Abbotsford, British Columbia) and the 15 wonderful (naive) test subjects who volunteered for this study.

Manufacturers' feedback:

Michael Cater
Director
Pieps Canada

The Pieps DSP was the first three-antenna transceiver on the market. It set a new standard for digital transceivers and has proven to be a very durable product. Since its release in 2003, 70,000 units have been produced. These are in use throughout the world and no problems with the sliding On/Off switch have been reported.

Pieps believes that a successful search for an avalanche victim includes efficient transceiver searching, probing, and digging. The Pieps iProbe was engineered to enhance a rescuer's effectiveness during the probing search phase by validating a probe strike with an acoustical tone. The iProbe receives signals from all transceivers transmitting on the 457 kHz frequency. In addition, it has a deactivation switch that can temporarily turn off a transmitting transceiver (this function only works in conjunction with Pieps DSP or Pieps Freeride transceivers) to aid a multiple burial situation. If the iProbe is mistakenly removed from the location marking the victim, the deactivated transceiver will immediately start to transmit again. A deactivated transceiver can also be reactivated manually with the iProbe. An iProbe is an additional tool for the rescuer. In order to be effective it requires a thorough understanding of its operational features, much like a transceiver. By practicing with an iProbe during rescue scenarios, users will uncover its true potential.

Bruce Edgerly
Vice President of Marketing and Sales
Backcountry Access, Inc.

These guys did a great job segregating expert and novice beacon users. In the past, beacon tests have mainly been performed by experts. But experts represent less than five percent of beacon users, so they sure got this right.

The "take home" message for me is how insignificant the time differences were between the various digital units. We had an outside statistician crunch the numbers for both the novice and the expert groups. He found that–with the exception of novices using the F1–the time differences were statistically insignificant. So, for me, this reinforces the importance of good shovels and good shoveling technique. While the difference in search times were on the order of seconds, excavation times at this burial depth can be on the order of 10-20 minutes per victim. So the crux is really how effectively you can organize the rescue and excavate, not how marginally fast you might be with one beacon over another (providing it's a digital beacon, of course).

It was also interesting that the special marking functions didn't make a significant difference in the search times. In my experience, people are always better off moving when they're using a beacon. Stopping to press buttons can cost valuable time, even if the functions are working properly. The beacons that can cleanly isolate signals based simply on their signal strength were quite effective with both groups.

Thoughts on Transceiver Research

By Mary Clayton

Transceivers have long been recognized as one of the vital tools for travelling in avalanche terrain. While professionals and experts in the field have strong opinions on how they work and how the different brands compare, recreationists need and deserve guidance. While we recognize this research isn't perfect, we also recognize that publishing it is an important step in encouraging dialogue on a subject integral to our world.

This is the first time since I've edited this journal (close to six years) that we have published a comparison study of transceivers. A serious omission but not for lack of trying. The animosity between transceiver manufacturers is well known; finding a truly unbiased researcher interested in entering this fray is no easy task.

This article has had its methodology questioned, and has drawn comments on certain elements being more related to a product review than a comparative analysis. We have included feedback from the manufacturers who wanted to comment, as an indicator that this research is not the final word.

The need of the community and the purpose of this publication is to encourage technology and techniques that will help save lives. We all have our eyes on the same goal—to find buried people faster. This is simple in concept but in regards to transceivers is dependent on a wide range of contexts—human factors, ergonomics, technical design, to name just a few. It is likely there is not one beacon on the market that is superior in all situations. We encourage all efforts to duplicate these findings and further this field of study.

Will a Guest Ever Be Able to Save Your Life?

Manuel Genswein, Meilen, Switzerland

1.INTRODUCTION

A variation of companion rescue is performed by clients of commercial guiding, off-piste and helicopter skiing organizations. The experience level of non-commercial back-country users is typically similar and their training level has primarily been achieved by their own motivation and sense of responsibility. Hence during an accident the level of competence amongst buried and non-buried subjects is similar. In contrast, the level of responsibility, preparedness and training between clients and guides in commercial operations are hugely different.

By emphasizing "Safety," some commercial operators create expectations that are difficult to fulfil in the context of ski touring, heliskiing or off-piste skiing. This does not help the clients' mental preparedness for an accident.

The motivation to train their clients is partly due to their own interest and partly due to laws concerning product liability. In countries with harsher product liability laws the training of clients is implemented more thorough than in countries where those laws barely exist. Another interesting fact is the diverging opinion among guides as to the usefulness of training their clients.

Some guides highly value a good base education also for their own good in order to be rescued. Others just hang an avalanche transceiver around the neck of their clients and have resigned themselves to never having a hope of being rescued by them. Because of the hopeless attitude of the latter group, typically their clients don't get equipped with probe and shovel, which makes a rescue basically impossible.

The combination of probe, shovel and transceiver—called "personal rescue equipment"—forms the base of an efficient rescue. This holds true even for commercial back country operators. In this context, the potentially rapid availability of rescue equipment—e.g. Helicopter aided companion rescue by heliski companies—is not enough of an excuse to fail in outfitting each client with their individual personal rescue equipment.

The topic of training and equipping clients appears especially important, if one considers that statistically it is the first person to enter a slope, that has clearly a higher probability to release an avalanche than subsequent persons.

2. HOW MUCH TRAINING IS REALISTIC AND ADEQUATE.

Central to this discussion is the amount of time needed to adequately train the clients. The threshold for clients and guides is rather low compared to non-commercial groups, where education is a substantial part of the work for a guide.

After extensive enquiries with many commercial guiding, off-piste and helicopter skiing organizations (daily and weekly operators) in regards to an "acceptable" amount of time allocated for client training, the choice for an adequate and practicably possible time frame was 15 minutes. For those operators who have always valued fundamental training, this may appear quite short. For those guides that have "just hung the transceiver around the clients' neck," each minute appears to be too much.

Ultimately the 15 minute time frame meets the requirement for "acceptance" and "usefulness." Especially those who see the situation in a rather pessimistic light might put a little more importance into adequate training and personal rescue equipment for clients once they see the rather convincing test results.

Increasing client training time from 15 to 30 minutes would with great likelihood not significantly increase rescue efficiency. In the additional time no great advantages in search and rescue techniques are achieved. A valuable addition would be a short practice of a rescue scenario. Within the chosen time frame it is possible to learn search/ strategy for multiple burials by applying the "marking" feature.

The goal of this project and the field test is to design a training module for client training. After extensive enquiries with many commercial guiding, off-piste and helicopter skiing organizations (daily and weekly operators), the choice for an adequate and practicably possible time frame was 15 minutes.

Immediately after the 15 minute training, the clients were asked to search for and excavate two buried subjects in a 50m x 80 m field. Based on the quantitative results of this test, conclusions as to the efficiency of the training module were made and the subsequent module was changed to optimize the content for the next group.

3. TEST PARTICIPANTS

All participants were clients of guides and ski instructors. For the field test the clients were separated from their guides. 83 clients participated in 14 groups. The clients' knowledge was varied; most were beginners. The average age was 53; 17 clients were older than 65. Guides were instructed not to hold any special lessons prior to the test. At the time of the test clients knew each other for a couple of hours up to a couple of days.

4. TEST ENVIRONMENT

4.1 Test fields

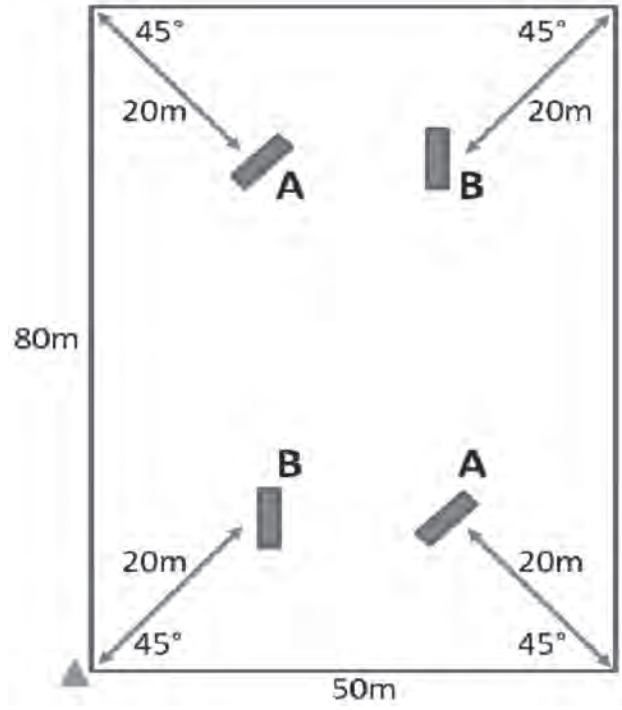
For efficient data recording, two test fields were used. They were 50m x 80m (see illustration 1), which represents the median size of "survived recreational avalanches" in Switzerland. Slope inclination was approximately 5 degrees in the lower third and up to 20 degrees in the upper end of the field.

Starting point for all rescuers was always a corner at the bottom end of the field (see illustration 1, triangle). In comparison with a typical off-piste avalanche accident this constitutes a significantly more difficult scenario. During an off-piste accident significantly more than 50 % of all rescues are conducted from the top. Foot penetration was between knee and hip deep. This cost the rescuers a significant amount of time and effort, as they were only allowed to move without skis.

4.2 Buried Subjects

The "victims" were two bags normally used to carry firewood, sewn together and filled with straw. The approximate size per "victim" was 180cm x 70cm. When burying the victims, the snow was stomped down layer by layer. Burial depth was 50 cm – 100 cm, representing the average burial depth in off-piste avalanche accidents. The buried subjects were equipped with remote control avalanche transceivers with probe detection device. Two buried subjects were activated per search, combination A-A or B-B.

Illustration 1.



5. TEST PROCEDURE AND DATA RECORDING

All groups were lead to the site by their respective guides. Skis and other non-rescue specific gear was left behind. Guests received adequate probes and shovels. Only three-antenna avalanche transceivers with specific "marking" function to eliminate a previously located signal were used in this test. After the group arrived at the site they received a 15-minute instruction. After the short instruction participants were presented with the rescue scenario.

Details recorded:

- **Signal search time:** The time until the first signal is received.
- **Coarse search time:** The time from the first point of reception until the signal decreases for the first time as the rescuer walks over the buried subject.
- **Fine search time:** The time when a clear minimum of distance (or maximum of volume) can be isolated.
- **Pinpoint search time:** The time when the rescuer hits the buried subject with a probe.
- **First visual contact with the buried subject**
- **Full body free**

6. PRACTICAL TRAINING MODULE

The 15-minute training module included the following content:

- **General goal and overview**
  Search procedure including "airport approach"
  Mounting of the probe and shovel
- **Basic handling of transceiver**
  "OFF – SEND – SEARCH.". Switch SEND ←→ SEARCH two or three times on command, all together, repeat until a routine has been established. Verify after each step, if all participants were able to switched to the appropriate mode.
- **Practical search with explanation of each search phase.**
  Practical search of one buried subject at 35 m distance. Transceiver angled at 45 degrees to group → curved search path, which forces attention on direction indication on transceiver. Flux lines / flux line characteristics not discussed. Clients follow with their transceiver on receive. Group is halted before next search phase to explain the next steps.
- **Signal search**
  If distance to buried subject is greater than range of transceiver → signal search, as per diagram on back of transceiver, is necessary. 3D rotation until signal is detected. **Move** – no life has yet been saved by just standing still!
- **Coarse search**
  Hold device horizontally "move in direction of arrow." Does distance indication decrease or increase? At distance 10: airport in sight → slow down!
- **Fine search**
  Approach → slowly and precisely, holding transceiver close to snow surface. Absolutely no grid search! Place shovel at the point of smallest distance indication.
- **Pinpoint search** with spiral probing (4) up until the "hit" at approximately 1.5 m burial depth. Leave probe in snow. "Mark" with marking function on transceiver; wait until all clients have marked. Activate second transceiver in 15m distance. All guest will locate the second transceiver on their own.
- **Excavation**
  Short explanation of V-shaped snow conveyor. Put clients in V formation while teaching basic concept—"cut blocks" and central snow conveyor belt, paddling motion and correct handling of the avalanche shovel. Actively running of conveyor belt. Explanations and corrections while the clients work. Let conveyor belt run for 3 – 4 min. Practice rotation on command, no specific instructions as to behaviour when first contact with buried subject.

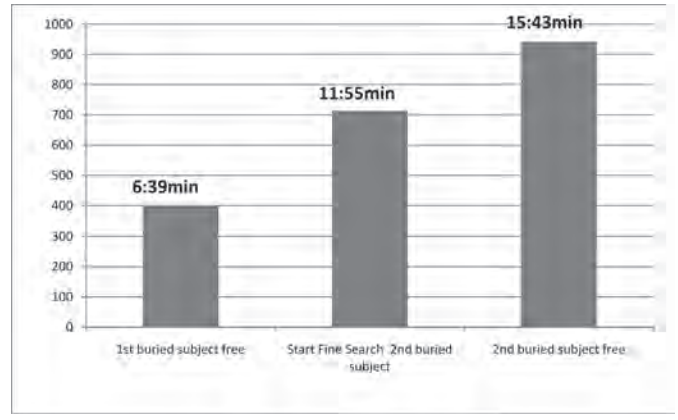
7. RESULTS

14 groups of 83 clients reached the following median times for locating and completely excavating the buried subjects. Fastest and slowest times were measured as follows:

	Fastest excavation	Slowest excavation
1st buried subject	4:20min	22:30min
2nd buried subject	6:48min	27:00min

The biggest time lag resulted between the completed excavation of the first buried subject and the start of the fine search for the second buried subject. Those rescuers who did not locate and mark the first buried subject themselves confessed often great difficulty in physically removing themselves from the first buried subject and moving towards the second buried subject, as the distance indication on their transceiver increased.

8. DISCUSSION AND CONCLUSIONS



The field test results prove that very realistic survival chances exist within a commercially guided group if the guide is buried. The surprisingly short search times make it clear that short and efficient guest training makes sense. The common opinion that a guest cannot ensure the survival of the guide is hereby not accurate and has clearly been proven wrong. Despite the short training time, the second buried subject was located and excavated in all scenarios. Clearly this result can be attributed to the technically advanced transceivers with marking function. Problems arose for the rescuers who did not mark the first buried subject while transitioning to locate the second buried subject. Those problems indicate that transceivers could further be improved.

A basic requirement to achieve the above results is to always outfit clients with modern rescue equipment—probe, shovel and transceiver with "marking" function. The author recommends that instructors use the guidelines and techniques outlined in this paper when training their clients.

The full paper may be downloaded at www.genswein.com

VOLUME 5 PHOTO CONTEST

Do you have a great photo of an avalanche in action or an avalanche involvement? Enter the Volume 5 Photo Contest and you could win: Marmot Twilight two-person tent, Marmot Eiger 65 backpack, $500.00 and your photo on the cover of Avalanche Accidents in Canada Volume 5!

Each entry must include the date and location of the photograph and details of the incident. No fatal accidents please.

Entry Deadline: Due to the extended production date the new deadline will be April 30, 2010.

Photo Formats: High resolution digital (minimum 3 MB in size). No digitally altered images will be accepted. Images must be JPEG, TIFF or RAW format only; all other formats will not be accepted. Digital images may be received on CD, DVD and e-mail bstrand@avalanche.ca (please put "AvAcc photo contest" in title).

The RECCO Rescue System

We update our technology, but do we always update our attitudes? A fresh look at the potential of the RECCO system.

By Dale Atkins

The RECCO Rescue System has been around since the early 1980s, and while many in the United States and Canada know of RECCO, most—including avalanche professionals and rescuers—know little about this radar-based rescue system. The RECCO system is a tool for organized rescue teams, and learning to use any tool takes time, experience, and information. Information is the purpose of this article.

New information provides users with the opportunity to review past perceptions and to make new decisions. Taking a new look at the RECCO Rescue System involves some awareness of our contradictions, avalanche survivors, what RECCO finds, recent rescues, who benefits, the importance of practice, and an awareness of the future. Before exploring the RECCO system, a little self-reflection about rescue technologies is a good place to start.

The rescuers' contradiction

Rescuers, guides, outdoor educators and other professional mountain folks live an interesting contradiction. We tend to be early acceptors of new technologies and techniques that improve personal fun and comfort; however, when it comes to rescue devices we are often stubborn and slow to accept changes. Experience shows our acceptance of rescue technologies may lag by almost a generation, which is not surprising. Rescuers prefer to use techniques and technologies we know and trust, and trust takes time to build. Sure, I have an agenda with RECCO, but we should also remember how unenthusiastically we greeted avalanche rescue dogs, transceivers, and cell phones when these items first became available.

Past actions and attitudes by rescuers just a generation or two ago may seem incredible to today's rescuer. In the 1960s, the use of avalanche rescue dogs in the US and Canada were thought to be superfluous for organized avalanche rescue. Today an attitude like that would be considered blasphemy. The avalanche transceiver—introduced in 1968—was considered a tool solely for avalanche professionals and not recreationists. Not until well into the 1980s were transceivers finally accepted by winter sports people. Even into the 21st century, cell phones were considered by many mountain folks to be an unwelcome intrusion, best left at home. This sentiment still lingers even though cell phones have likely saved more lives on land and water than any other single device.

Bruno Jelk, a long-time leader of mountain rescue in Zermatt, recommends rescuers should not dwell on how people were found in the past. Instead, Jelk advocates rescuers consider what will make it easier to find someone today. As a corollary, rescuers should also consider how many buried victims might have survived if the victim had been found hours earlier rather than hours or days later.

Survivors of long burials

Local and personal experiences heavily influence rescuers, and most rescuers in the US and Canada have no experience in finding buried avalanche victims alive. Since past experiences have not resulted in live rescues, it becomes easy to slip into the representative heuristic trap where we judge the likelihood of an occurrence (finding some alive) based upon our experience (we did not find people alive) of past similar events. This is a trap to avoid.

While time is the enemy of the buried victim, a few lucky victims do survive long burials under the snow. In the US over the past 10 years, six victims have survived burials of at least three hours or longer, including victims who survived burials of 23 and 24 hours. Likewise, in Europe every few winters a few lucky victims survive long burials. Rescuers must always consider their own safety first, at the same time remembering that some buried victims do survive for many hours under the snow. Therefore, no buried avalanche victim should be denied this small chance at life just because a few hours have ticked off the clock.

RECCO finds people

An often-heard criticism of the RECCO system is that it is only a body recovery tool. RECCO, like rescue dogs and beacons, finds people and sometimes the people are alive. Obviously, organized rescue systems are at a disadvantage, having to wait to be notified and then delayed by travel distance. Western North America is the land of wide-open spaces and responses can be slow.

However, in many locales in Canada and the US, the rescue situation has become more similar to the European Alps, where the combinations of cell (or satellite) phones and helicopters (and even snowmachines) have slashed response times from hours

RECCO at work in a rescue practice.

Dale Atkins

to minutes. In more and more places, organized rescue can arrive early enough to maybe make a difference. Avalanche victims found alive because of RECCO clearly demonstrates the system is a people finder.

RECCO rescues—what was and what could be

In reviewing past search and rescue efforts, one should consider not just how technology and techniques were used in the past, but also consider its benefits in the future. RECCO was developed in Europe where many avalanche accidents happen near or in ski resorts. Obviously these accidents mean rescuers can respond immediately and that can make a difference. The list of live RECCO rescues in Europe dates back to 1987, and most but not all have occurred on or near ski resorts. Some recent examples of people found alive with RECCO reflectors include January 2008, where off-piste skiers in La Plagne, France and St. Moritz, Switzerland survived burials up to 1.5 metres.

Some might argue that RECCO reflectors will lead to greater risk taking, and the same could be said about transceivers, airbags, cell phones, etc. So far no survivor has admitted to taking additional risk because they wore RECCO reflectors. In fact, a number of victims did not know they had reflectors.

Surviving an avalanche burial (unless equipped with an AvaLung™) involves luck, and sadly most buried victims were not lucky. In these situations, it is still important to find someone earlier than later. Search efforts tend to be smaller and easier to manage. Risks can be reduced because fewer rescuers are exposed to hazards, and emotional closure starts earlier for grieving family and friends.

For years, immediate or hasty search teams did not use RECCO detectors. Rather the detector was deployed late in the operation and often days later. Despite the delay, rescuers started to notice that once the RECCO detector arrived on site, the

search was often resolved in minutes—in fact, 12 minutes on average. While few avalanche searches end with live recoveries, there are some recent examples of successful RECCO rescues. Sadly these victims, though equipped with reflectors, did not survive; however, rescuers recognized the potential of the system and what could have been if the victims had a chance to be found in time.

RECCO for novice to expert

The RECCO reflector is a passive device that requires no action by the user. Reflectors do not replace an avalanche rescue transceiver (an active device) but even the most experienced mountain professional can benefit by having reflectors. This viewpoint is likely different from what many mountain guides, ski patrollers, and avalanche educators may have considered.

To use an avalanche transceiver effectively requires that a number of conditions be met. The user must be proficient operating the device, must ensure the device functions properly, must wear the device correctly, and the user must ALWAYS recognize the need to carry the device, so one has it when one needs it.

This last point gets both first-time visitors and experienced travelers into trouble. If one is ignorant of avalanche hazards they will not recognize the need to have and use a transceiver. Likewise, even the most experienced avalanche professional has probably forgotten their transceiver, or forgotten to turn it back on after a drill (I have done both and more than once). We are human and thus fallible, so a passive device like RECCO reflectors provides a basic rescue system whether used by a first-time mountain visitor or an experienced mountain professional.

RECCO takes practice

Like modern avalanche beacons, the RECCO detector shares some of the same advantages and disadvantages. Both devices are easy to use and can be learned in minutes; however, to be a competent user takes many, many hours of practice. Think about all the hours you have spent to become and stay proficient with your transceiver, or all the hours spent working with your dog in drills and rescue simulations. Think about your early days and how poorly we sometimes did while gaining experience. The same applies to using the RECCO detector. If one has little experience using the detector in practice and in rescue simulations, one will probably not have a good experience using the detector on an actual rescue. The bottom line with all technology is practice, practice, and practice.

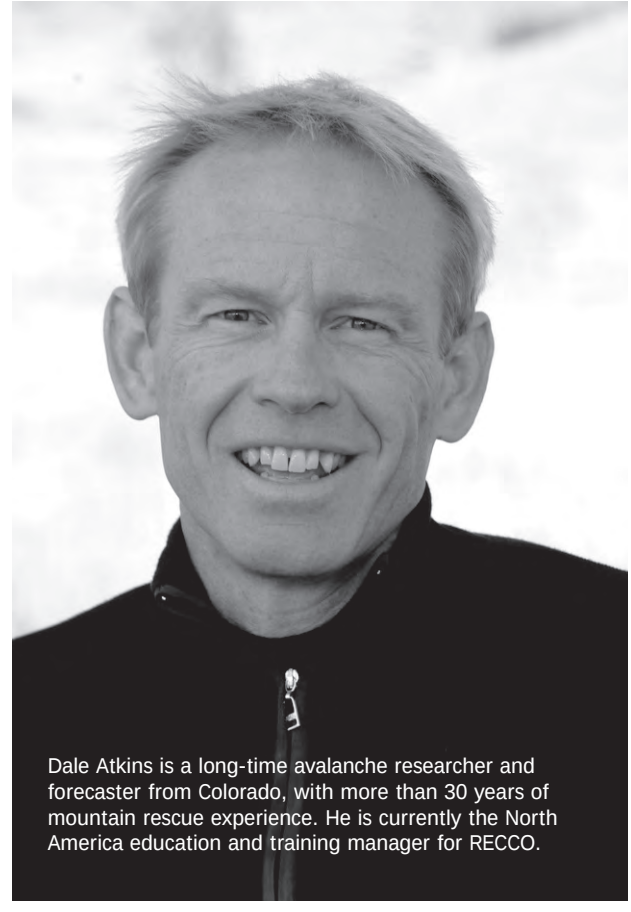
RECCO: The future

The effectiveness of the RECCO system is a function of the number of reflectors worn by skiers, riders, snowmobilers, etc., and the number of resorts and rescue teams equipped with detectors. This decade alone, RECCO estimates to have equipped more than 10 million people worldwide with reflectors, and many of these powder hogs are in the US and Canada.

For rescuers, the number of resorts and rescue teams using RECCO—about 40 in Canada and 70 in the US—has been steady the past couple of winters, but now RECCO's R9 detectors are being built and distribution has started. Over the next couple of winters, the plan is to double the number of rescue teams and resorts in North America with attention to equip more search and rescue teams, especially those teams who respond to backcountry areas where snowmobilers play.

While distances across western North America are far, response times are getting faster. When someone needs more help than their companions can give, the buried victim, the victim's family and friends, and the rescue team do not want to use a probe pole to search. So wear a transceiver, learn how to use it, and use RECCO reflector-equipped gear just in case you need more help than your friends can give.

Additional information about the RECCO Rescue System can be found at www.recco.com, and specific questions in Canada can be addressed by our team: Bart Ross, Alison Cardinal, and Gordon Burns, all of whom can be contacted at info@recco.com.



Dale Atkins is a long-time avalanche researcher and forecaster from Colorado, with more than 30 years of mountain rescue experience. He is currently the North America education and training manager for RECCO.

Product Review

BCA Arsenal Shovel

By Jordy Shepherd

Jordy Shepherd

I walked into the CAC office in early November to do some work, and I walked out with two shiny new Backcountry Access shovels to test drive. Fortunately, the deep early-season conditions have been conducive to lots of shoveling (and sweet powder skiing). The BCA shovels were utilized for snow profiles and digging my snowmobile out of the seemingly bottomless snowpack.

BCA has hit on a good idea with a shovel system that has interchangeable blades, shafts and probe/saw inserts. The two Arsenal shovels I tested collectively cover the complete set of components available in this system:

- Smaller Tour blade (20x25cm)
- Larger Companion blade (25x28cm)
- Fixed length shaft
- Extendable telescopic shaft
- 240cm probe (only fits in fixed length shaft)
- 35cm saw (wood/snow) – fits in either shaft

My general impression is that these are well designed shovels. They seem to be relatively robust (compared with other shovels on the market), and the oval shaft offers increased strength. Weighing in between 800 and 900 grams depending on the component combination, they are not the lightest shovels on the market, but considering they come with a saw or probe in the handle, they are actually quite reasonable weights.

The two push buttons for removing the shaft from the blade and for extending the telescopic shaft have smooth action and worked reliably. The saw will fit in both the fixed and extendable shafts, but the probe only clips into the fixed length handle. The saw and probe snap into the handle easily, but can be a bit difficult to remove with gloves on or if snow/ice is packed into the release. Once the saw/probe is snapped into the handle, they form an extra bump on the backside of the handle that increases grip comfort and leverage.

The saw is a good length at 35 cm, adequate for compression tests. It will cut wood in an emergency, but is too thin to be a reliable logging tool. The thin saw blade can also rattle against the inside of the shaft when it is stored in the handle. This is not a safety

Matt Peter

concern, just a little annoying when travelling or shoveling with the saw inside the shaft.

The probe that fits in the fixed length shaft is 240 cm long. It has 30 cm sections, with cm markings on it. The markings are already wearing off even with minimal use, and will probably not be readable for much longer. At 240 cm, the probe is adequate for rescue and probing snowpack depth in the Rockies, but many avalanche professionals and guides choose to carry a longer probe in the deeper interior and coastal snow packs. The small push button that engages the probe when it is extended seems positive and easy to use. The probe can be a bit puzzle-like to fit back into the shaft. I would prefer to see the system design adapted in future years to allow the probe to fit inside the more versatile extendable shaft. With the ability to store a probe in the fixed length shaft, and coupled with a transceiver, the Arsenal shovel with probe and Companion blade becomes a complete rescue system.

The Tour blade is lighter and smaller than the Companion blade. I found the Tour blade to be a bit small and, although it is light, I would still recommend using the larger Companion blade. Whether you are digging a profile or shoveling during a rescue, the Companion blade is capable of moving a lot of snow quickly. The Companion blade is quite flat, with a straight edge, making it ideal for creating snow profile walls, and the blade is perfectly sized for conducting compression tests.

The fixed length shaft is a good length for shoveling, but it could be difficult to fit it in smaller backpacks. When the telescopic shaft is collapsed it is slightly shorter that the fixed length one. It also offers more options, and stows away more easily than the fixed length style. The additional weight of the telescopic shaft is more than compensated for by its shorter length when stowed and better shoveling ergonomics. As stated above, the probe only fits inside the fixed length shaft, while the saw will fit in either handle.

I am quite impressed by the BCA shovels. This winter I will be using the following combination for work and recreation:

- Companion blade
- Telescopic shaft
- Saw insert (for ski touring) but will carry my trusty logging saw for mechanized guiding

I recommend checking out the Backcountry Access Arsenal Shovel System if you are in the market for a new shovel. The combination of features, value and quality make these shovels a good option. Happy shoveling!

Transitions

Scott Grady
CAC Public Avalanche Forecaster

Where do you live and for how long: I'm a green horn to the Revelstoke area having just moved here in June.

Where did you live before here: I grew up in that little nuevo hippy town to the south (Nelson) and had lived in the area for the past 30+years.

Previous work experience: A mix of winter guiding work in Canada and New Zealand that includes ski touring, snowcat and helicopter skiing, teaching AST courses and OAR (organized avalanche response) courses.

Education: ACMG Ski Guide and Assistant Rock Guide, CAA Level 2 and Adventure Tourism Diploma from Thompson Rivers University.

Interests: Coffee, Climbing, Skiing, Coffee, Snowmobiling, Mountain Biking, Coffee, volunteering with local SAR groups, Coffee and Beer.

Why do you want to work with the CAC? The cool little coffee machine upstairs is pretty rad (joking). I initially got into the snow and avalanche patch for a lot of personal reasons, and now it's rewarding to give back to the greater avalanche community and to help out with public awareness and perception. I remember the good old days in high school and heading into the backcountry with my buddies, my snowboard, a set of snowshoes and a shovel that my parents bought me. At the time, I thought the shovel was for making huge backcountry booters. To think back to the places we rode; it's a good thing that Lucky Charms were my favourite morning feast in those days. Seriously, it's important to get the message out there to all users of the winter backcountry about the risks that can be involved when traveling and recreating in avalanche terrain. Being somewhat of a part-time sledneck, I'm also stoked to branch out and learn about applying my skiing avalanche skills and experience in whole new dimension of exploring the backcountry and "feeling" the snowpack. C'mon, I get to work with a world leader in avalanche awareness, education and safety services—that's cool enough right there!

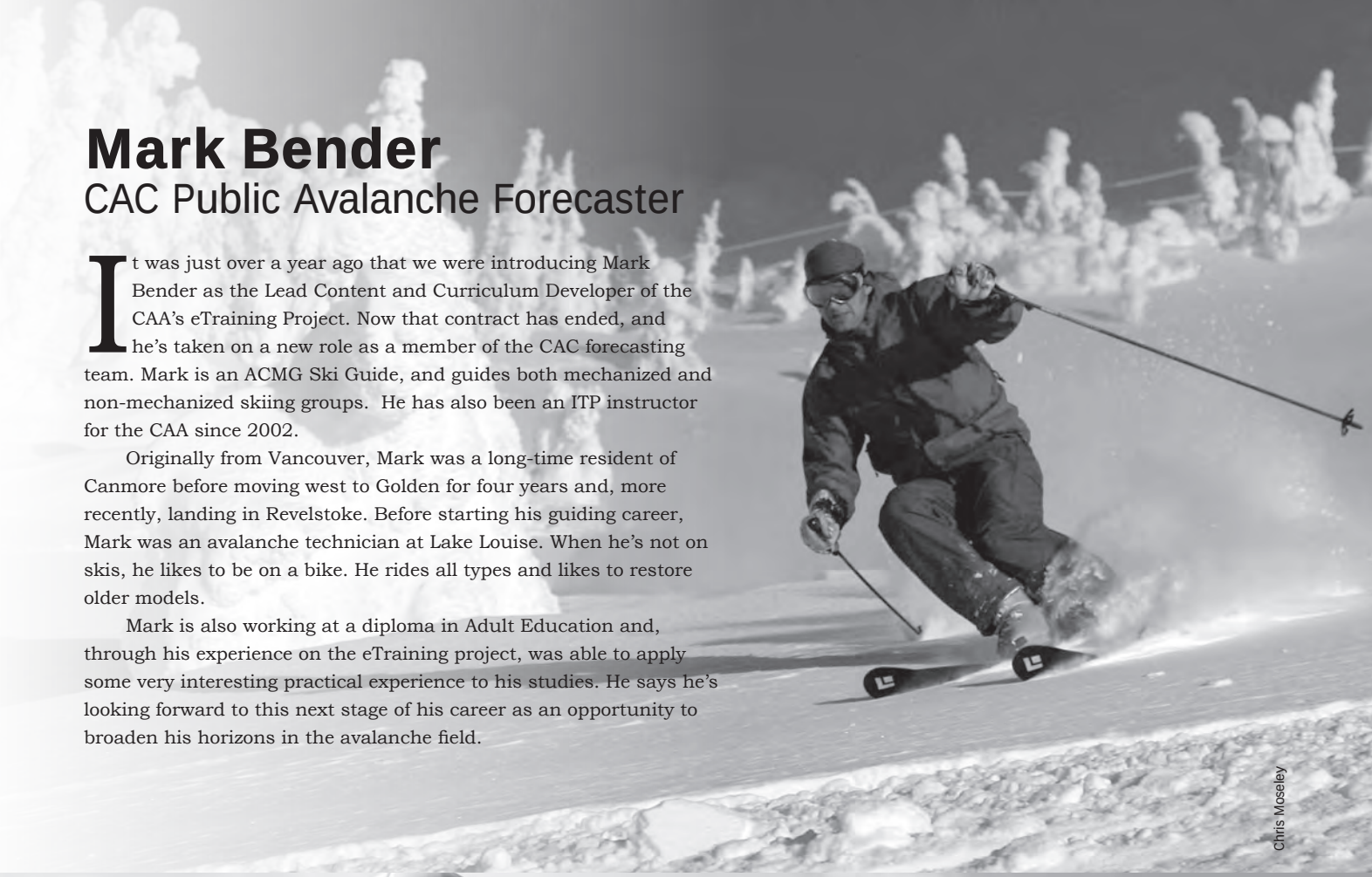
Scott Grady collection

Mark Bender
CAC Public Avalanche Forecaster

It was just over a year ago that we were introducing Mark Bender as the Lead Content and Curriculum Developer of the CAA's eTraining Project. Now that contract has ended, and he's taken on a new role as a member of the CAC forecasting team. Mark is an ACMG Ski Guide, and guides both mechanized and non-mechanized skiing groups. He has also been an ITP instructor for the CAA since 2002.

Originally from Vancouver, Mark was a long-time resident of Canmore before moving west to Golden for four years and, more recently, landing in Revelstoke. Before starting his guiding career, Mark was an avalanche technician at Lake Louise. When he's not on skis, he likes to be on a bike. He rides all types and likes to restore older models.

Mark is also working at a diploma in Adult Education and, through his experience on the eTraining project, was able to apply some very interesting practical experience to his studies. He says he's looking forward to this next stage of his career as an opportunity to broaden his horizons in the avalanche field.



Chris Moseley

Matt Peter collection

Matt Peter
CAC Public Avalanche Forecaster

Matt Peter is a fully certified IFMGA/ACMG Mountain Guide and brings many years and a wide range of guiding experience to the forecasting office. Originally from Edmonton, he has lived in Revelstoke for the past five years, with a five-year stop in Golden along the way.

In addition to his new position as a CAC forecaster, Matt works as a lead guide for Eagle Pass Heliskiing, and as an instructor in the Adventure Studies program at Thompson Rivers University. In the summer months he guides for the Alpine Club of Canada, and serves as an examiner for the ACMG Climbing Instructor stream. For several years, Matt's been the climbing program supervisor for the Mountain Activity Skills Training program at the College of the Rockies. Somehow, he also manages to squeeze in work as an independent guide. When asked about his interests, it's a pretty straightforward answer: "Climbing and skiing!"

In addition to his guiding certification, Matt has a degree in physiology from the University of Alberta. Matt says he views this next chapter in his professional life as a great opportunity for new challenges. "I want to take my practical, hands-on experience and learn how to adapt that to more complex models and bigger pieces of terrain," he explains. "I feel the CAC plays a vital role in providing information to the public, and I want to be a link in this important chain." Welcome to the chain gang, Matt.

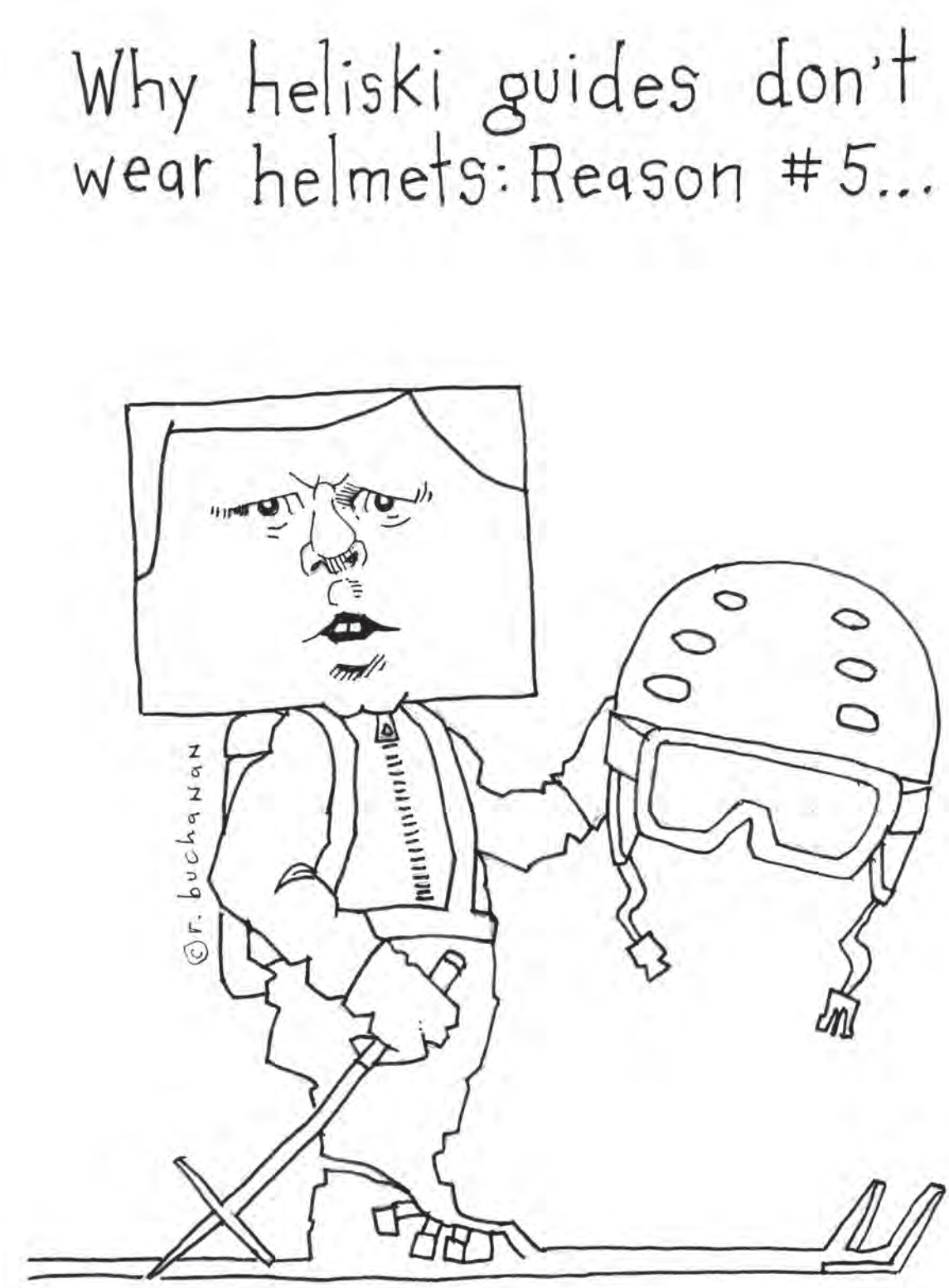
David Zemrau
CAC Director for Supporters

With close to 20 years of experience in a leadership role with the Alpine Club of Canada (ACC), David brings both organizational skills and a love for the backcountry to his position on the CAC's Board of Directors. As the Director for Supporters, David represents the companies, organizations, agencies and individuals who have paid $200 to become Supporting Members of the CAC. The disparate members of this group are united in their commitment to the purposes of the CAC—to serve as Canada's national agency for public avalanche safety.

Based in Edmonton, David's career is in manufacturing, with a strong background in logistics. His career with the ACC began with leading climbing and skiing trips, and progressed to the position of National Vice President, where he was responsible for the Education and Safety committees for over 10,000 members. While still involved with the ACC, he was also active with the Canadian Ski Patrol System as a Patrol Leader, and he's been a First Aid and Ski Instructor for the past 10 years. David's passion for helping others safely enjoy the mountains of Western Canada make him a welcome addition to the CAC's Board of Directors.

David Zemrau collection

Flakes



CAN YOU SEE THE DIFFERENCE?

One of these skiers has made a commitment to safely exploring the backcountry. He didn't just stumble upon fresh snow and decide to have some fun. He knows it's important to take Avalanche Skills Training, regularly check avalanche bulletins and weather forecasts, and make informed choices about the terrain. Of course, he has the necessary safety gear, but it's what you can't see that really makes the difference.

MEC is in a unique position to promote backcountry safety within the outdoor community, and is proud to be a presenting sponsor of the CAC's Avalanche Skills Training program.

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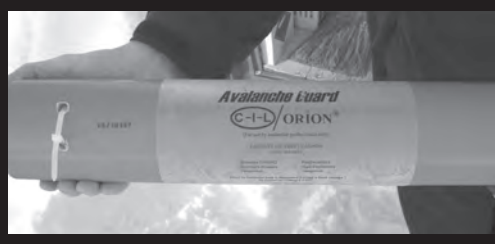

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