Sawtooth 2013
An Expedition into the Wilderness of Idaho

by
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Submitted in partial completion of the requirements for EXP 436
*Revised: March 2013*
The Sawtooth crags are mighty snags.

Their crests rise up like spires.

The air is thin where goats have been,

And their beauty never tires.

-Unknown [Sawtooth Tales, 4]
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Expedition Abstract:

This proposal will give you a detailed understanding of my planned expedition to the Sawtooth wilderness in March of 2013. Within these pages you will find a brief history of the area, some geological background, a glimpse at the types of wildlife you would likely find in the Sawtooth, as well as my detailed trip plans. This proposal is written as partial completion of the requirements for my Senior Expedition class with SUNY Plattsburgh's Expeditionary Studies program.

The structure of the proposal is modeled to simulate the level of preparation needed for a professional expedition proposal. It includes a risk management plan, emergency protocols, detailed meal plan, and equipment list satisfactory for a multi-week ski mountaineering expedition. This proposal also includes a system of assessing risk and making decisions which I outline in the section titled: Go/No Go Standards. You will also find an analysis of the Sawtooth snowpack up to the date on the cover of this proposal as well as an essay on leadership in the outdoor industry and a section for my personal and professional goals. Additional information includes a budget, a training and conditioning plan, and my contingency plans.

This proposal will give you an idea of the type of planning required to launch a multi-week expedition into a remote location, and maybe give you ideas for a trip of your own. Keep in mind, some of the planning procedures are specific to my experience and preference and follow guidelines put in place by the Expeditionary Studies Department.
Introduction:

I have skiing since I was 18 months old. For a long time in my life I took skiing for granted. Everyone I knew skied, snowboarded or cross-country skied. During wintertime my school had what we called ski days. On Friday of every week we would finish classes by 11 am and everybody would pile into the buses and we would be taken to the local ski hill, Dartmouth Ski Area. My father took the winters off from working to ski every day with his gang of friends. Occasionally, I was invited along with them. Having skied my whole life I took it for granted because it was part of who I was. I assumed everybody skied as much as I did. Only when I went to high school and there were no more ski days did I realize how lucky I was. I went from skiing 20–40 times per winter down to 4–6 times. I missed it bad. Then it became time to choose a college. When I found out about Plattsburgh's Expeditionary Studies Program (EXP) I applied immediately. I could backcountry ski and rock climb as a major! Count me in.

When I came in for my interview, I walked into the EXP office and sat down with professors Larry Soroka and Steve Maynard. I did not know what to expect, let alone what to say. Professor Soroka was so well spoken and composed I was almost afraid to say anything for fear of looking stupid, and Steve, well all he had to do was lumber up to me and shake my hand and I was terrified. I was so nervous I don't remember anything from that interview except that I better start a log book right away to be ready for the fall! I could not wait.

It has been almost four years since that fateful meeting and here I am planning my senior expedition, the finale of a wild four year ride. This ride has taken me to ski in Utah, ski mountaineering in Colorado, rock climbing and skiing in the same day in Oregon, and landing a ski plane on an Alaskan glacier! This ride has taken me to beautiful places. This ride has stunned me, confused me, and taught me to be who I am. I have learned skills such as the bowline knot, how to build an anchor by burying skis, safe travel through avalanche terrain and many more.
Most of all this program has given me friendship. The people who share passion for the outdoors are a diverse people, and I feel a kinship with everybody. When I look to the future I don’t know what is in store for me, I don’t know what path my career will take. No matter what I do now I will always have friends across the globe. Some of them are EXP, some are not, and it doesn't matter. It has occurred to me how much of a social animal I am. I am most happy when surrounded by people who love what I love, the outdoors, whether that be climbing, skiing, kayaking, or spelunking!

This is why when I think of my senior expedition, the most important aspects are sharing it with friends and safe return. The trips that we friends take are dangerous sometime. That danger is real danger, the kind you could not come back from. Avalanches kill backcountry skiers every year. Some of those skiers are family, some of them are friends, some of them are professionals in the Outdoor Industry. In order to keep doing what we love we need to be as prepared as possible to be ready for any possibility. We can never, of course, prepare for everything. Mother Nature is far too unpredictable, and she flexes her muscles when we are least expecting. We all know how terrible a force she can be when she wishes. She demands respect everyday, and with respect and passion, we meet her. Having a well thought out risk management plan (RMP), contingency plans, and emergency call out protocols in place will help ensure the safe execution of this expedition.

RMP's and careful planning lead to safe expeditions, but that's not everything. If my travels and studies have taught me one thing, its that the reason we study, the reason we get certifications, and the reason we take precautions, is because we want to keep skiing, climbing and spelunking with our friends. We do it because its fun, and we want to do fun for work. Professional guides are just that because we do not want to sit in an office all day, we do not want the everyday work grind, and we hate paperwork. We chose guiding in order to keep our sanity, and because we could not give up outdoor pursuits. In the mountains you find out who people are for real, and what it is they are made of. The mountains humble us, scare us, teach us, and reward us. We are transfixed by this power they hold over us, and only fellow explorers know this feeling.
Ruedi Beglinger said in the film *A Life Ascending*:

"I believe mountains have energy in them which gets passed on to us as we travel in them."

I am reminded of this quote every time I venture into the mountains, especially when I am accompanied by a like minded friend. I most strongly felt this energy on July 3rd, 2011. Descending a cravasse ridden snowfield below the summit of Flower Mountain in Alaska I looked behind me, saw teammate Billy Morgan bouncing along in the snow behind me. He had a jumble of snowpickets and ice axes holstered in his harness jangling like wind chimes with each step. As I watched he paused, turned to look at the mountain behind him, nodded in respect towards her then bounced on. When he neared me I saw the smile on his face and I felt more alive than I ever have. My body tingled and I felt emotion welling up inside my body. I had an incredible sense of accomplishment as I too gazed up at the peak above us. Together we looked at Flower Mountain, Billy and I. The mountain had gracefully stood still and allowed us to climb her jagged flanks to the summit, and now she basked with us in our glory. Moments like these remind me why it is I do what I do, and how I love to share it with friends.

In this proposal I hope to show you the passion I have for what I do. It is through careful planning and thorough preparation that an expedition like this takes place. I must be clear in my reasoning; I want to go on this senior expedition to have fun. But I also want to make the next step towards becoming an outdoor professional. Balancing my professional goals against my natural desire to have fun and be easy is going to be a fine line. I do not want ge so caught up in the process I lose sight of my ideals. At the same time, I can use this expedition experience from inception to planning to execution as a building block for future trips I will plan. Together you and I will take this journey though the planning process of my expedition to the Sawtooth Wilderness in central Idaho.
**Background**

The Sawtooth Mountains are a dramatic range of jagged peaks which lie in the heart of the Sawtooth National Recreation Area (SNRA) in central Idaho. With over 750,000 acres, the SNRA is bigger than the state of Rhode Island and includes other striking mountain ranges including the White Cloud Mountains, the Boulder Mountains, and Pioneer Mountains. Originally designated as a Primitive Area in 1937, the formation of the SNRA in 1972 by the Forest Service brought more attention to the area. An area study was then launched to determine if the area would be suitable for a National Park. The results of the area study suggested setting aside 686,000 acres for the formation of two National Parks. These parks have never been established due to Idaho residents' protests, claiming park status will bring about too many problems.[6] It is a fortunate thing it has played out this way; the installation of National Park buildings and roads along with the influx of people attracted by the dramatic scenery would have all but destroyed the wildlife. Areas like the Sierra in California and the Rockies in Colorado, while no doubt still beautiful, have had their wild spirit tainted by extensive trail systems and the ease of access into their depths. The Sawtooth Range, protected by its status as a "Primitive Area", has avoided the traffic that plagues other wilderness areas. The low level of exploration and exploitation adds to the attraction of the Sawtooth Range.

The first exploration of the Sawtooth area was by fur trappers from the Hudson Bay Company as early as September 1824. The trappers found the area inhabited by the Mountain Shoshoni Tribe. The fur trappers called them the "sheepeater" Indians. [4] These natives were of the Shoshone tribes who occupied parts of California, Nevada, Utah, Idaho and Wyoming. They were among the tribes forced off their homeland during the last massive relocation of American Native peoples, the "Lemhi Trail of Tears", which took place in the early 1900's. [10] By then beaver stock was long gone and so were the trappers.

They had been replaced by prospectors and miners during the Sawtooth mining boom which
began in 1864 when gold was discovered in the Stanley Basin (where the town of Stanley now stands). The basin got its name for John Stanley, one of the first prospectors to explore the area. Miners spread out from Idaho City, establishing camps which swelled into small towns as more precious metals and stones were discovered. The town of Atlanta on the southwest corner of what is now SNRA was one of the most successful mining towns, and by 1938 boasted a total gold production of $6 million. In what is now southeastern SNRA, the town of Galena was established in 1879 by miners at the head of the Wood River Valley, also known as Galena Valley. The town and its 800 or so residents did well enough for a 20-ton smelter and four general stores, now it is home to the Galena Lodge. [6]

In 1967 the American Mining, Smelting and Refining Company (ASARCO) obtained some 50 claims for molybdenum at Baker Lake, which lies nestled in the shadows of Merriam and Castle Peaks deep in the eastern White Cloud Mountains. When they proposed to build a road to reach their claims in 1970, environmentalists opposed them, and the resulting conflict led to the formation of the Sawtooth National Recreation Area in 1972. [6]

Geology

The mountains of the Sawtooth were formed from when molten rock pushed up and cooled while still underground, forming what is called a "batholith". The rock in the northern, western, and southern Sawtooth is grey and is part of the 88-million year old Sawtooth Batholith of granite. The eastern Sawtooth is pink or peach in color and is part of the 44 million year old granite Sawtooth Batholith. The granite of the Sawtooth batholiths were filled with joints where meltwater from the glaciers worked its way into the rock through cracks. These joints made it easy for glaciers to break off parts of the batholith as they retreated, breaking off more and more rock until all that was left was the jagged ridge-lines we see today. The Sawtooth range is what is called an uplifted fault bounded by faults and the basin at the foot of the mountains (home to the town of Stanley) is a depressed fault block called a "graben" and is filled with glacial outwash and deposits. [6]
The Sawtooth is home to 40 peaks towering over 10,000 feet, and over 1100 lakes. The beautiful mountain lakes typical to the range are called tarns. Tarns are carved at the base of high alpine cirques by retreating glaciers. The topography of central Idaho was formed by the combination of continental ice sheets and alpine glaciers. There used to be as many as 202 alpine glaciers in the range, today the glaciers are gone but the rugged terrain remains. [1]

Permanent snow fields exist in the alpine environment and feed those tarns with meltwater. While there are no large ice fields with deep crevasses and dramatic hanging seracs like Alaska or the Himalaya, the Sawtooth range is the only remaining place in Idaho with permanent snow and ice.

**Plants and Animals**

The plants and animals of the Sawtooth vary widely with change in elevation and aspect. The flora of the valley is rich in comparison to what survives in the harsh alpine terrain of the peaks. The low valley floor is filled with grasses such as Idaho fescue and bluebunch wheatgrass. Trees include Douglas fir and subalpine fir. Huckleberries flourish in the shade of the fir. The large marshy meadows fill to the brim with wildflowers such as sapphire blossoms of camas, elephants head and white wyethia. In low areas called fens (areas of peat, similar to bogs) are home to a unique plant called a Sundew or *Drosera*,. It has tiny red leaves which have evolved to produce sticky hairs on their edges, trapping passing insects. In the neighboring White Cloud range a rare plant called the White Cloud Milkvetch which are found only in these mountains. It is a low lying plant which grows along high ridges and alpine lakes with compound leaves and pale yellowish flowers. [6]

At mid elevations lodgepole pine dominate the skyline. The magic occurs in high glacial cirques, where amid steep terrain and little but rock and snow, vegetation flourishes, fed by the meltwater. These cirques are home to fir trees, englemann spruce, elk sedge (sedge is similar to grass but with triangular stems instead of round and their flowers are more tufted), alpine bentgrass, alpine willow, grouse whortleberry, western ledum, and red mountain heath, Kalmia, shooting star, explorers
gentian, and mountain bluebell. Tree line (at about 10,000ft) is home to whitebark pine and limber pine, above that is the alpine, rugged rocky terrain home to not much else besides snow and mountain goats.

Mountain Goats are the primary wildlife found at high elevations, as they are the only folk hardy enough to survive such jagged terrain. The lower elevations of the Sawtooths afford the visitor a wealth of life to see, and sometimes avoid. Bighorn sheep, antelope, elk, bear, cougar, lynx, bobcat, mule deer, coyote, beaver and muskrat, even some wolverines. The forests also are home to more common smaller animals such as: squirrels, mice, shrews, pikas, chipmunks, gophers, badgers, porcupines, rabbits, raccoons, otters, foxes, martens, weasels, and skunks. The area was famous for its salmon before it was fished out. In their heyday the rivers and lakes would have been full of Sockeye, Chinook, and Kokanee. Nowadays the natural salmon are gone, replaced by fish born in hatcheries. [6]

Skiing

Skiing in the Sawtooth’s is a relatively recent phenomenon. The area was put on the map with the development of Sun Valley, a luxury style ski resort established by the railroad baron Averell Harriman (he inherited Union Pacific Railroad) outside the town of Ketchum, ID, some 50 miles south of the Sawtooth Valley. Sun Valley played a key role in the development of the whole area, and has an interesting history. Harriman wanted to develop Ketchum into a luxurious ski resort town accessible by his railroad, rivaling those he had seen in Europe and Canada. He accomplished this, and in doing so launched a revolution in skiing, popularizing what is now know as downhill or "alpine" skiing. [8]

In 1936, when the resort was set to open, Harriman was deciding how to transport the skiers at his resort to the tops of the peaks surrounding the town. After considering many designs, he chose one invented by an engineer who worked for his railroad. That engineer's name was Jim Curran, and his design was the chair-lift. It was the first of its kind, and as Sun Valley became the forefront of the downhill skiing revolution, the chair-lift changed skiing forever. Prior to its invention, the only methods of carrying skiers uphill in the US were various styles of rope-tows or J-bars. The chair-lift
proved to be faster and more convenient. Harriman and Curran could not have know the impact the chair lift would have on skiing forever. The success of Sun Valley inspired many other resorts to be built around the United States, to attract recreational downhill skiers, and each of these resorts installed chair-lifts. The lifts could transports skiers much higher up the slopes than any rope-tow and required no effort from the skier. Harriman started what has now become an enormous industry in the US. [8]

In 1937 Harriman built the "Pioneer Cabin" in the backcountry of Sun Valley and founded the Sun Valley Ski Touring School. Instructors included Florian Haemmerle, Andy Hennig, and Victor Gottschalk. They pioneered hundreds of ski routes in the backcountry surrounding Sun Valley, teaching their techniques to enterprising clients. In 1948, Hennig publishes Sun Valley Ski Guide, a complete guide to ski touring and backcountry skiing in the greater Sun Valley area. This is North America's first ever backcountry skiing guidebook. Then in 1952 when Victor Gottschalk is killed in avalanche on Lookout Bowl. This along with another avalanche which destroys Owl Ski cabin end the operation of the Sun Valley ski touring school. [5]

In the 1970s the first wave of the XC-skiing boom hit Idaho. Its reputation spread as skiers explored further and further into the backcountry from Sun Valley resort at the bottom of the Galena Valley. People were attracted to Galena Valley for its deep and consistent snows. At the head of the Valley was a little establishment called Galena Store. Originally it existed as an outfitting post, frequented by miners and prospectors. Once the silver and gold ran out, along with the creation of the Sawtooth National Recreation Area, it limped along, surviving on the business of passing hunters and explorers tempted by the peaks of the Sawtooths. The road to Galena Store was paved by 1950, which is incredible when you find out that it was only just wired into grid style electric power in 2004. At some point somebody had the genius to set up a rope tow outside the store. When the cross country skiing craze hit california in the 70's, the store became a ski lodge destination; Galena lodge, the heart of a network of XC- ski and snowshoe trails in the surrounding peaks. [11] Those peaks include Galena Peak at 11,153ft, Silver Peak at 11,000ft, Easley Peak at 11,080ft, Norton Peak at 10,400ft, and Galena
Galena Summit isn't actually a summit - it's the mountain pass above Galena Lodge. From the summit, one is afforded tremendous views of the Sawtooth Basin with a backdrop of jagged ridge-lines which make up the Sawtooth Range. The range itself is a thing of beauty. The dramatic glacial valleys are similar to Yosemite Valley in California and are beautiful and dramatically different in each season. During the summer months when the snow is gone, alpine lakes surrounded by evergreen forests reflect jagged alpine domes behind them. The Sawtooth is a hidden kingdom of alpine rock climbing with something for all ability levels. In winter it transforms into a ski paradise waiting to be explored.

Skiing Now

Sawtooth Mountain Guides (SMG) was founded in 1985 by Kirk Bachman. and is the first and only AMGA certified guiding service in the area. Bachman and co-owner Erik Leidecker, an Idaho native, have been exploring the Idaho backcountry since the 70's. Today many backcountry ski trips into the sawtooth are offered by SMG as well as guiding companies out of Sun Valley like Sun Valley Trekking (SVK). Both companies have built Yurts in the the Sawtooth frontcountry. From what I have been able to find out, backcountry skiing is popular but relatively undocumented. It seems the locals have done a good job keeping the place unnoticed. Compared to nearby Sun Valley the Sawtooth is significantly more primitive. On the 200 mile stretch of mountain roads between Sun Valley and Boise there is only one town, Stanley. The photograph on the cover of this proposal is a view of the Sawtooth range from Stanley, Id.
Senior Expedition Guidelines:

All senior expeditions must meet a set of guidelines set forth by our program directors. The guidelines are designed to push us to undertake an expedition that is enough of a challenge, but still within the realm of possibility. There are general guidelines for all types of expeditions and there are discipline specific guidelines for skiing expeditions. In this section I will address each one explaining how it is that my expedition will meet or exceed the requirements.

General Senior Expedition Guidelines:

1) Follow LNT ethics:

- **Plan ahead and Prepare**: I am planning this expedition 5 months in advance and will make every possible effort to attend to every detail and prepare for everything that could possibly happen.

- **Travel and Camp on Durable surfaces**: I will be travelling over snow, using existing snowmobile trials when possible. The impacts of skiing and camping on snow is very little.

- **Dispose of Waste Properly**: I will be using what I like to call a "groover" kit. It works just like a wag bag system so I will pack out all my waste. All trash will be sledded out.

- **Leave What You Find**: I will leave only ski tracks and take only memories (and photos).

- **Minimize Campfire Impacts**: I will be making no fires.

- **Respect Wildlife**: I will make every effort to distance myself from any wildlife I find and I will make sure my camps do not disturb any wildlife.

- **Be Considerate of Other Visitors**: Golden rule: I will treat others as I wish to be treated, with respect.
2) Follow Minimalist Equipment Ethics:

We will be travelling light or "Alpine Style" as much as possible, bringing all our gear with us every time we move. We will pack up and move camp with each move, leaving only footprints.

3) Be Unsupported:

Everything we need for the entire expedition we will carry in with us on our backs.

4) Advance Your Skill:

This will be the longest ski trip I have been on, the amount of logistical work far exceeds anything I have dealt with before. I will be in avalanche terrain most of the time, testing my avalanche knowledge every day. Much of the terrain is above tree line, posing significant risks and technical challenges. It is unsupported and entirely self directed. My decision making in the field will be tested, I am responsible for every aspect of this trip, from route finding to how many granola bars we bring. My leadership skills will be tested, and I will be called upon to make real time decisions about group safety and route finding. This will be the cumulative test of my four years of learning through the EXP program.

5) Cover a span of time sufficient to establish self-reliance; 10 - 14 days

6) Be planned and executed by students, with minimim of guidance from other parties;

This expedition is mine, from the ground up. I will collect any beta I can from friends who have been to the Sawtooth before, but I will only rely on what I have discovered for myself.

7) Be of sufficient difficulty to make failure a possibility but also flexible to allow danger to be avoided when possible:

All mountaineering and skiing objectives will be assessed based on objective hazards and conditional hazards. Mother nature is the ultimate boss, and avalanche conditions can limit any trip at any time. But skiing is still possible even in the worst avalanche conditions, we will stick to low angle slopes and tree skiing. During any summit push I will have a backup plan if we are forced to turn around, turns can be found almost anywhere, even if its just a small slope near camp.
8) Take place at a time and in a place where seasonal weather patterns are conducive to a successful expedition:

This expedition takes place in the Sawtooth wilderness in the Idaho backcountry. The trip is scheduled for March, during which there should be plenty of snow on the ground and plenty of new storms bringing in fresh snow. We will ski whatever conditions we find (safely of course) but by planning the trip for march I hope to have lots of new snow.

9) Not take place in areas with which you are already familiar:

I have never been to Idaho or the Sawtooth wilderness.

10) Take place outside a 100 mile exclusion zone around Plattsburgh and your family residence:

The expedition will take place in the Sawtooth wilderness, over 2,500 miles from Plattsburgh.

11) Be justified based on the nature and explanation of identified outcomes:

Advanced experience ski mountaineering and avalanche assessment + testing. I want to enjoy a ski trip with friends, doing what we love with each other.

12) Exceed 300 level EXP course expeditions in level of challenge and duration:

The trip will be longer in duration than any 300 level courses. The objectives we will be pursuing will be technical peaks with many big ski lines possible. The peaks are serious mountaineering objectives with technically difficult ascent routes and ski descents. The level of skiing + climbing will be very demanding.

13) Add value to your profile as a member of the adventure industry:

This will help solidify my avalanche skills and my winter camping and expedition skills. This will be valuable experience for me as I enter the industry in May. The process of planning this trip from inception to execution will serve as valuable practice, and add to my "tool kit" of marketable skills.

14) Be completed with a publication or presentation:

I plan on returning to Plattsburgh and giving a senior expedition presentation before graduation in May.
Discipline Specific Guidelines:

1) Show evidence of additional training, as necessary, to cover areas not included in or which offer limited training in EXP backcountry snow travel courses. These include but are not limited to extended living in winter conditions, operating at altitude, skiing in varied conditions, mountaineering skills;

   I spent the last semester in Alaska and took two 24 day backcountry trips where I skied in varied conditions, lived out of tents for over 48 days in winter conditions (including a 12 day storm when it snowed over 1" per hour for 8 days straight.) and practiced mountaineering skills every day.

2) Cannot be single-pitch, top roping, or bouldering focused;

   All peaks are around 10,000ft and many offer multi-pitch mountaineering challenges.

3) Cannot be resort based;

   It will be entirely in the backcountry.

4) Must be planned to exceed the requirements in order to allow for partial failure or modifications to the original plan;

   The plan will always be modifiable. There is great backcountry skiing in many other mountain ranges within 4 hrs drive and there are also many options in the Sawtooth alone. The itinerary is not so strict, and the plans can be altered at any time to push for a different objective, for safety or any other reason.
**Crux Points:**

On any expedition there will be crux points which are different depending on where you go. They can be crux points on a climb or just difficult logistical problems. It is important for the expedition leader to identify these crux points and prepare for them. With the amount of gear needed for a multi day ski mountaineering trip like this, one major crux will be carrying everything. As part of the requirements for the senior expedition you must move base camp at least 7 times. In addition to all the gear the team will need to carry, we also need to carry with us all our food supplies for the entire time. That means breakfast, lunch, dinner, and all snacks for up to 10 days. This is quite a lot of food. When you add that weight and volume in your pack, it leaves an awful small amount of space for gear. This means each person will need to minimize the amount of personal gear they bring, the trip will need to be as minimal as we can. We have to shave weight wherever we can. I have pulled sleds on expeditions before, and I would like to keep the sled pulling to a minimum on this trip. While we definitely need to pull sleds on the first day, we can cache food and hopefully sleds as well, in strategic locations for use further along during the trip. It will be a crux point figuring out where these caches will need to placed, how many of them we can do, and what we should cache (with considerations for weight, waste, and volume).

Another Crux point I anticipate is getting enough skiing in. The days which we move camps are going to be hard days. We will be skiing many miles with 60-90 lb backpacks on. With the need to move camp at least 7 times, we will have to climb and ski some peaks on the same day we move. The best way I see to get this done is to get up early (alpine starts 1-3am) and ski the peaks in the morning, aiming to be back in camp by noon. Then break down camp and move as efficiently as possible in the afternoon. The other option would be to do the reverse, get up early to move camp then ski the peaks after we get there in the afternoon.

The alpine starts are going to be a crux point for several reasons. First of all, 1 AM is very early
and sometimes it can be difficult to rouse oneself, especially if the last day was a difficult one. After waking up, the next difficulty is going to be route finding in the middle of the night. Sometimes if the moon is out it can help light the way, otherwise we will have to guide ourselves by headlamp and what we can remember from scouting the route we did the day before. Unfortunately the lunar calendar will not be on our side for this trip. During the days we will be in the backcountry (March 19-30th) the moon will be in its last quarter and its first quarter; it will be the darkest part of the moon cycle.

Another crux point I anticipate will be finding safe campsites. With steep terrain and deep valleys the potential for terrain traps is large. Realizing where they are and avoiding them will be a huge part of our success, and it will take constant vigilance. Planning a campsite location is important for several reasons. First of all is safety, sitting around in our tent at night makes us sitting ducks for any avalanche's. To mitigate this risk we will pitch our camp away from any avalanche terrain, and double check to make sure we do not get stuck in a terrain trap such as a deep valley or runout area of a steep slope. Campsite location is also important because it is your springboard for the next day's activities; whether that be climbing and skiing down a peak, or simply moving camp. I will need to pay close attention to the distances between our next days objectives and our campsite at night.

Route finding is another crux point that will not get any easier throughout the trip. Although we have maps, it will be the first time Andy or I have been to the Sawtooth. This makes efficient and safe route finding absolutely imperative. It requires constant vigilance assessing the terrain for terrain traps and potential trigger points for avalanche's. It will also require us to hold back when we first see potential ski routes. Both Andy and I are east coast skiers and easily excited by a backcountry pillow line for example. We will need to exercise caution when scoping out these lines that we see; making sure we consider every variable and play out every possible scenario in our heads before skiing. This goes for the uphill as well, it is just as easy to get caught in an avalanche while skinning uphill as it is while skiing down.
**Go/No Go Standards:**

To determine go/ no-go standards for avalanche safety I have adopted a system. There are four categories: Snowpack, Terrain, Weather, Group. Each category has 3 grades- RED light, YELLOW light, and GREEN light. It works just like a traffic light; RED means high danger. Yellow means medium danger. Green means little or no danger. eg:

*You are standing on a ridge looking at a slope below you deciding to ski it or not. You dug a pit on an identical aspect nearby less than 1 hour ago. The pit results were good, you saw no weak layers and got no significant results in multiple stability tests. The Snowpack category gets a GREEN light. As you look at the terrain below, it's a 25º slope with no rocks, but you notice a small cliff off to the right with a large bertrund below it. If a skier was to fall near that cliff, it is a possibility (even if its a small one) that said skier may tumble over the cliff into the bertrund below, possibly resulting in significant injury. For those reasons the Terrain category gets a YELLOW light. The weather on this particular day has been beautiful and there have been so signs of any approaching systems. So the Weather category gets a GREEN light. This leaves only the Group category. Your group has competent skiers and you trust each other. It is early in the day, and no one is injured or fatigued. The Group gets a GREEN light. Take a look at our results:*

- Snowpack: GREEN
- Weather: GREEN
- Terrain: YELLOW
- Group: GREEN

I would consider these results a GO. If, however, I was to get a RED light in any of the categories, the result would be a NO-GO. Also if I were to get three YELLOW lights, that also would be a NO-GO. These are the rules I will be using on my expedition, and I will stick to them.

The categories do not always have to be the same. This also works very well for route finding, turn around calls, or everyday decisions. You could use this with any category you wish. Some examples might be: food, gear, mashed potatoes, sanity, etc. . . .
Leadership and Decision Making

Art Davidson said it best in his book *Minus 148°*: "Most of all our expedition needed a leader, someone with a strong personality who could gather the right people around him and fuse them into a close-knit family that would work smoothly under the most miserable circumstances." [3] For a team to be successful members need to get along and function under stress. Some people do this naturally, and this is how climbing partners are often found. On any team you will have different personalities and this brings on potential personality conflicts. It is the job of the expedition leader to identify and smooth out any conflict, ideally before but sometimes after it happens. This being my senior expedition, I am the leader. Leadership goes beyond just managing personalities, though, for as a leader I will make decisions that will affect the whole team. In particular, I need to be aware of how my decisions will affect both team as a whole and each person individually.

A leader has many different roles on an expedition like this; coach, decision maker, planner, conflict resolver, team manager, and cheerleader. One of the most important roles of a leader is the team manager. This includes but is not limited to setting expectations, daily and long term. A manager also needs to pay attention to motivation levels and in teammates. The team so far is myself and Andy Mossey. Our personalities are actually a very good match, we are both mellow and we get along very well. This has been proven over the last three years of climbing and skiing together. We work together well and have an unspoken trust and confidence in each other. We each have our own personal strengths weaknesses and we know what they are. At this point our communication is so good in the mountains that we barely need to speak to each other, we know based on body language. As leader of this expedition I have the utmost confidence in my teams strength, teamwork, and rescue skills.

I will have to use some different leadership styles at different times. Donald Clark in his article *Leadership Styles*[2] outlines three major types of decision making techniques for leaders: Autocratic, Democratic, and Delegative. Autocratic is when the leader tells his followers what to do and how to do
it. It is not "bossing around" but it is firm and authoritative. It should not be used all the time, instead it should only be used when you are short for time and know how to solve the problem.

The next style, Democratic is when the leader includes his followers in the decision making process. The leader retains the final say in the decision but opens the floor to discussion and input from his followers. This is a very good style as long as you have the time to allow for discussion.

The third and final style of leadership is Delegative which is when the leader steps back and lets his followers make the decision. This is used when the leader knows and trusts his followers to analyze the situation and determine what needs to be done and how to do it. This style can be risky because the followers may make a decision the leader may not be entirely satisfied with. There is a time and a place for this, however, it is important to use this style wisely. These styles are all very useful in certain situations, but sometimes it may be necessary to use a combination of all three style to most efficiently solve a problem. [2]

Besides decision making techniques leadership also entails a certain kind of behavior. The commitment the team has made is to each other, and the leader is part of that. Alex Kosseff outlines what he considers to be ten important principles of expedition behavior in his book *AMC Guide to Outdoor Leadership* [7]. I picked out the ones I related to the most and elaborated on them.

1: Self awareness - Be aware of how you portray yourself. Your actions effect the rest of the group and you need to be in tune with this. Also be aware of yourself and your needs, act true to you personality, do not feel forced to act a certain way.

2: Self leadership - "Styled and Dialed" as my brave IWLS guides called it. Have all your personal gear and systems organized at all times. Even if this means getting up an hour before everybody and going to bed an hour after everybody. Lead by example, keep yourself fed and hydrated, and take care of your body.

3: Selflessness - Or self-sacrifice I call it. If team members are struggling you may need to take a little extra weight in your pack. Sometimes the leader may need to sacrifice a personal goal
(summiting the next peak for example) for the better of the team if they cannot make it.

4: Tolerance - Many times you may not totally agree with everyone, but work to not take offense easily.

5: Communication - Open, honest communication is one of the most important aspects for success in any type of group. It is especially pertinent on an expedition where you may be isolated with only each other for long periods of time.

6: Humor - Having a good sense of humor is another of the most important things on an expedition. Even in the worst kinds of weather humor can work wonders to raise spirits and inspire motivation. It distracts us from the obvious, even in the most miserable conditions. [7]

Something I think should be added to that list of Kosseff's is "The Big Picture". In my eyes a leader should always be keeping the big picture in mind during an expedition. There may be many goals individuals have, and while it is important to satisfy the needs of your team or clients, a good guide must always be thinking in the future. Deciding where to make camp at night is a good example. You may need to stop sooner than planned because a team member got injured, and that setback will effect where you camp the next few nights. A leader must see this and plan accordingly. For example you may hike a little further than planned on the next few days to gradually make up time, or you may double the distance for one day to make it up immediately. The leader needs to always be thinking ahead of what is happening in the now, and be flexible enough to adapt the plans without loosing sight of the original goal.
Emergency contacts and Call out protocols

Personal contacts, alert only in event of serious injury or death:

Cedar:
  • Maria Cabri (mother):
    - home: 802-765-4662  cell: 802-649-2340
  • Scott Davidson (father):
    - cell: 802-291-4114

Andy:
  • Linda Mossey (mother):
    - cell: 518-429-5939
  - home: 518-346-5786

Protocols:
  I will carry a SPOT locator beacon during the expedition. The beacon is equipped with several
  features. I can send an update signaling team is "Ok" which marks my position on a topographical map
  of the world viewed online. The website will be monitored by Larry Soroka. I will send a SPOT signal
  on the first (Sunday 3/17) and last day (3/27) of our expedition. If no signal is received within 48 hours
  of these dates; alert local search and rescue.

  Another feature of the SPOT beacon is the "SOS" signal. If such signal is activated please contact
  local search and rescue. Only call emergency contacts in the event of hospitalization or death.

  The "Help" feature contacts my personal contact, Larry Soroka, alerting the need for assistance in
  a non life threatening event.

Local emergency contacts:
Sawtooth National Recreation Area Headquarters: 208-727-5000
  5 N Fork Canyon Rd
  Ketchum ID, 83350

Sawtooth Rural Fire District (Stanley, ID): (208) 774-2222

Blaine County Search and Rescue (Blaine, ID): 208-788-5555

Sawtooth Mountain Guides: (208)774-3324
  P.O. Box 18 Stanley, Idaho 83278
  Fax (208) 774-3729
**Seasonal Weather Conditions:**

The expedition launch date is set for March 17th, hopefully during prime snow conditions. The Sawtooth Avalanche Center (SAC) has an archive of all advisories in the last 10 years. Over those years during the period our expedition will be out, there has been 12 days rated High on the advisory, 57 Considerable, 28 Moderate, and 3 Low. Keep in mind statistics are not facts, but they do help us see trends. This trend indicates there is consistent avalanche danger during March. In March of 2011 SAC reported 50 inches in a 10 day stretch. [14]

According to the National Weather Service data during the month of March for the last 5 years the average temperature was 24.6º F in Stanley, Idaho. The month registered a high of 58º F in 2007 (warmest day on record during March) and a low of -22º F in 2009. [15] Extrapolating on that information and estimating that the temperatures will on average be slightly colder in the Sawtooth Mountains than they would be the Stanley Basin it is reasonable to conclude that temperatures in the Sawtooth Mountains can be expected to be between 0º and 32ºF during our expedition. This warrants bringing a 0º sleeping bag, I prefer to sleep warm over anything else.

**Snowpack Profile**

When making any backcountry ski trip, whether it be a day tour or a multi-week expedition, you must never fail to plan for the constant threat of avalanches. Avalanche forecasting centers have been established in many major regions of the United States where avalanches frequently happen and are where winter recreation is popular. In central Idaho the center is called Sawtooth Avalanche Center (SAC) and its’ forecasting area covers the Sawtooth and Soldier Mountains as well as the Wood River valley and the Salmon River headwaters. It is supremely important to pay attention to the avalanche forecast when planning an expedition like this one. Many times our team will travel over, under, through and around "avalanche terrain"; by this I mean any feature of the land and or the layering of
the snowpack which might combine to *possibly* cause an avalanche. These forecasting centers give us an update each day detailing how natural events effect the snowpack. These natural events include new snow, rain, hail, temperature events (warm spells/ melt-freeze cycles), wind and recent avalanche activity. It is important to check the avalanche forecast each day, that way as the season progresses you may gain an understanding of how the different snow layers (created by any above mentioned natural events) interact with each other to create possible instabilities within the snowpack.

The establishment of avalanche forecasting centers is directly related to the increased popularity of backcountry winter activities. This includes skiers, snowboarders, snowshoers, XC-skiers and snowmobilers. As the proliferation of recreational activities continues; fueled by the corporate sponsored pro-athletes, and filmed by weekend warriors packing go pro's; organizations funded almost entirely by donation, provide essential information and recommendations to the public for free. This is the service provided to us backcountry enthusiasts by avalanche centers such as SAC.

I should introduce a few key terms:

- **Aspect** - The compass direction a slope faces.
- **Facets** - Angular snow with poor bonding created from large temperature gradients.
- **Temperature gradient** - The change in temperature over snowpack depth.
- **Depth hoar** - Large grained, faceted crystals found at ground level.
- **Surface hoar** - Feathery crystals that form on the snow surface during cold, clear conditions. Can form a persistent weak layer once buried.
- **Graupel** - Heavily rimed new snow, often shaped like little Styrofoam balls.
- **Lee slope** - The downwind slope.
- **Wind loading** - The added weight of wind drifted snow.
- **Slab** - Strong cohesive layer of snow bonded well together.
- **Wind slab** - A cohesive layer of snow formed when wind deposits snow onto leeward terrain.
- **Cross loading** - Wind blowing across a slope, depositing drifts on the sides of gullies or other
terrain features.

- **Upside-down storm** - Pattern of snowfall where cold, light snow falls first followed by warm, damp and heavy snow.

- **Upside-down snowpack** - Same principle, but applied to entire snowpack: weak, sugary snow falls first towards the beginning of the season followed by heavy wet storms on top.

- **Wind slab** - Deposits of snow on lee slopes

- **Snow water equivalent (SWE)** - the amount of water (measured in inches) within a given amount of snow.

The graphic below outlines the danger scale established by the American Avalanche Association (AAA) in collaboration with the Canadian Avalanche Association (CAA). Retrieved from the AAA at [http://www.avalanche.org/danger_card.php](http://www.avalanche.org/danger_card.php)

<table>
<thead>
<tr>
<th>Danger Level</th>
<th>Travel Advice</th>
<th>Likelihood of Avalanches</th>
<th>Avalanche Size and Distribution</th>
</tr>
</thead>
<tbody>
<tr>
<td>5 Extreme</td>
<td>Avoid all avalanche terrain.</td>
<td>Natural and human-triggered avalanches certain.</td>
<td>Large to very large avalanches in many areas.</td>
</tr>
<tr>
<td>4 High</td>
<td>Very dangerous avalanche conditions. Travel in avalanche terrain not recommended.</td>
<td>Natural avalanches likely; human-triggered avalanches very likely.</td>
<td>Large avalanches in many areas; or very large avalanches in specific areas.</td>
</tr>
<tr>
<td>3 Considerable</td>
<td>Dangerous avalanche conditions. Careful snowpack evaluation, cautious route-finding and conservative decision-making essential.</td>
<td>Natural avalanches possible; human-triggered avalanches likely.</td>
<td>Small avalanches in many areas; or large avalanches in specific areas; or very large avalanches in isolated areas.</td>
</tr>
<tr>
<td>2 Moderate</td>
<td>Heightened avalanche conditions on specific terrain features. Evaluate snow and terrain carefully; identify features of concern.</td>
<td>Natural avalanches unlikely; human-triggered avalanches possible.</td>
<td>Small avalanches in specific areas; or large avalanches in isolated areas.</td>
</tr>
<tr>
<td>1 Low</td>
<td>Generally safe avalanche conditions. Watch for unstable snow on isolated terrain features.</td>
<td>Natural and human-triggered avalanches unlikely.</td>
<td>Small avalanches in isolated areas or extreme terrain.</td>
</tr>
</tbody>
</table>

Safe backcountry travel requires training and experience. You control your own risk by choosing where, when and how you travel.
An avalanche rose or "avy rose" is a graphic which many avalanche forecasting centers use to illustrate the different danger ratings on the different aspects and elevations of their forecasting region. They display a compass rose with the different magnetic directions representing slope aspect and the concentric circles representing elevation with the outer circles being low elevation and inner circles being upper elevations. Below are a few examples of avy roses and how to read them:

(both images retrieved from utahavalanchecenter.org [23] on 2/12/13)

On the following pages is a summary of the current snowpack in the Sawtooth Mountains. All of my information is extracted from the Sawtooth Avalanche Center daily forecasts [14]; the only source providing any information on the matter. I have attempted to present the information in a concise manner and without bias.

**November:**
During this month the mountains received 29" of snow from 3 different storms. Several wind events transported snow to leeward slopes. Forecasters avoid higher elevation (above 8000ft) wind loaded slopes over 35º. Forecasters noted weak faceted layers near the bottom of the snowpack on upper-elevation N-E facing slopes. Just before thanksgiving a big storm brought 10-12" of heavy snow with a high-moisture content. This along with several wind events created several concerns early season:

- The pre-Thanksgiving storm dropped up to a foot of dense snow (1-1.5" of water).
- Strong S/SW winds created winds slabs on some upper-elevation slopes.
- The storm contained graupel, forming a weak layer in the upper portion of the snowpack.
- Lower in the snowpack, we found faceted snow crystals that produced "unstable" results in stability tests on a N aspect near treeline. We'd expect to find this faceted layer on many upper-elevation N-E facing slopes.

The rest of the month brought warmer temperatures and stabilizing of the snowpack after the pre-thanksgiving storm. The new snow that fell bonded well with the top layers of the snowpack. The graupel layer is well on its way to metamorphosing into rounded well bonded snow. However, there is a lurking weak layer near the bottom of the snowpack. The layer can be found best on upper elevation N-NE shaded aspects. The layer consists of facets from persistent weak layers that take longer to stabilize than graupel or storm interfaces.

The last week of the month had several cold clear nights in a row, creating a weak layer of graupel/crust which became is present on or near the snow surface prior to the big storm on 12/1.

December:
12/1/12 -
The combination of heavy snow and strong winds has created a **CONSIDERABLE** avalanche danger on steep, upper-elevation slopes. Human-triggered avalanches are likely on slopes steeper than about 35 degrees where a foot or more of new and wind-drifted snow has accumulated in the past 36 hours. On lower-angled and mid-elevation slopes, the avalanche danger is **MODERATE** - which means human-triggered avalanches remain possible. Recent avalanches, shooting cracks and collapses are clear signs that the storm snow is unstable; avoid steep slopes if you see any of these.

A large snowstorm combined with strong winds created a considerable avalanche danger with the primary concern being cohesive wind slabs 10-15” thick on all aspects. The snow fell on a smorgasbord of old snow, so conditions vary greatly with aspect and elevation. The main concern is fresh storm snow overloading slopes which had the weak layer present on or near the snow surface.

New snow - 12”

12/2/12 -
Intense snowfall and strong winds will rapidly increase the avalanche hazard today, meaning human-triggered avalanches are likely on all mid and upper elevation slopes. These locations have received a large snow load in the past 36 hours and the loading intensifies today, creating a widespread **CONSIDERABLE** danger. Lower elevations slopes are expected to receive enough new snow to make avalanches possible and will have a **MODERATE** danger. Exercise caution on all slopes and reevaluate conditions frequently during the day.

Three day storm totals are reaching 3-5 feet of new snow. This combined with continuous strong winds (30-50mph) makes that weak layer near the top of the snowpack very overloaded. The main concern is slab avalanches as the weak layer from the end of November has received a very significant load from the new storm snow. New snow - 22”

12/3/12 -
Heavy precipitation and strong winds have created dangerous conditions and a **CONSIDERABLE** avalanche danger at upper elevations and on steep middle elevation wind-loaded slopes. Given the impressive 3 day storm totals, human-triggered avalanches are definitely possible on less steep and non-wind-loaded terrain; these areas have a **MODERATE** danger.

The main concerns are wind slabs and persistent buried faceted layers. Forecasters have
identified two weak layers within the snowpack that are reactive. The first is the depth hoar buried near the bottom of the snowpack. This layer can best be found on upper elevation shaded NW-E slopes at the bottom of the snowpack. The second weak layer is a buried graupel layer leftover from the cold clear nights at the end of November and all the recent storm snow rests on top of it, just waiting for a trigger such as a skier. New snow - 0"

12/4/12 -

New snowfall and wind transported snow will continue to stress the snowpack, creating dangerous conditions and a **CONSIDERABLE** avalanche danger at upper elevations and on wind-loaded middle elevation terrain. Lower and middle elevation slopes that are not wind-loaded are still adjusting to the recent storm and are receiving additional loading; human-triggered avalanches are possible and these areas have a **MODERATE** danger.

Monday 12/3 provided a brief respite from the heavy snowfall that came over the weekend, but this evening brought another wet snowstorm with heavy moisture content. This may create an upside-down snowpack with 10-12" of fresh snow falling on the 3+ ft of storm snow from the weekend. Winds 20-40 mph will move this snow around quite well creating wind slabs on leeward slopes.

New snow - 2"

12/5/12 -

Human triggered avalanches are likely in upper elevation terrain where new snowfall and wind transported snow are creating a **CONSIDERABLE** avalanche danger. Although warm temperatures have helped the new snow settle and stabilize on mid and lower elevation terrain, avalanches within the new snow are still possible on very steep slopes and/or terrain features. Watch for small wet loose avalanches in areas where rain is falling on new snow.

The new snow totals were over 8" of dense high moisture content snow above 7500ft. The rain/snow line hovered around 7100ft, which could create a rain crust on all aspects below it. More heavy wet snow is expected today, with moderate winds along ridge-lines and mountaintops. New snow - 8"

12/6/12 -
A **CONSIDERABLE** avalanche danger remains on upper elevation, wind loaded terrain features where recent snowfall and wind have created dense, potentially reactive slabs. Winds have been primarily from the south and west, and human triggered avalanches are likely on exposed leeward slopes. Warm temperatures followed by last night's colder temperatures have helped the new snow settle and stabilize on mid and lower elevation terrain.

The recent wet snow/rain brought with it between 4-7” of snow water equivalent (SWE) across the Sawtooth's. This storm created a 3” foot cohesive slab of heavy wet snow which rests on two unstable layers on upper elevation shaded northerly aspects: 1) Basal facets (depth hoar) on upper elevation shaded NW-E slopes at the bottom of the snowpack. 2) Buried crust/graupel layer from the end of November, found on varied aspects and elevations under the week's storm snow.

Conditions vary greatly between upper elevations and mid-lower elevations. Below 8500ft the snowpack is well bonded as a result of warm temperatures. Above 8500ft however the temps stayed cold and the weak layers described above are alive and well. Forecasters gave upper elevation leeward slopes where significant wind loading had occurred a wide berth today. New snow - 0"

12/7/12 -

The avalanche danger is **CONSIDERABLE** on steep, shaded, upper-elevation slopes where recent winds and storms have created slabs several feet thick. These remain sensitive to triggering by a person, particularly where the slabs are burying thin layers of older, faceted snow. The avalanche danger decreases with elevation because warmer temperatures have consolidated recent storm snow and older weak layers are isolated. The avalanche danger is **MODERATE** at mid-elevations, meaning human-triggered avalanches are possible.

At elevations below 9000ft the basal facet layer is damp, and beginning to compress beneath the load of the snowpack above it. It is still present at upper elevations especially in shaded couloirs, and northerly aspects. The "end of November" layer is still present but it varies by aspect and elevation. It is a thin crust that was reactive during the storm, and while it does not seem to be very reactive anymore, it could still cause a slide on very steep slopes and should be watched as the season continues. Wind slabs continue to be a concern on leeward slopes, especially upper elevation slopes.

New snow - 0"
12/8/12 -

The avalanche danger is **CONSIDERABLE** on steep upper elevation slopes where a complex pattern of old and new wind loading has created tricky and dangerous avalanche conditions. Human-triggered wind slabs 6-12" deep are likely on slopes steeper than about 35 degrees with fresh deposits of wind-blown snow, while triggering deeper, older slabs remains possible on all steep slopes at these elevations. The avalanche danger is **MODERATE** on steep, shaded slopes at mid-elevations where layers of weak, faceted snow exist near the snowpack base.

After a week of generally southerly winds, they shifted to the northwest for the last couple of days, creating a complex pattern of wind loading on all aspects. The Sawtooth's picked up 6-8" of fresh lightweight snow which was rapidly transported by strong winds, loading all southern and eastern lee slopes with fresh although not dense wind slabs. On upper elevation slopes however, old hard wind slabs remain from last week's storm on NW-NE aspects. Best to give them a wide berth. New snow - 6"- 8"

12/9/12 -

The avalanche danger is **MODERATE** on wind-loaded middle elevation and all upper elevation slopes steeper than about 35 degrees and where a complex pattern of old and new wind loading has created tricky avalanche conditions. Skiers and riders could trigger recent shallow wind deposits and triggering larger wind slabs or storm slabs on deeper faceted layers remains possible. At lower elevations and in middle elevation terrain that hasn't been recently wind-loaded, the avalanche danger is **LOW**.

The complicated pattern of wind loading at mid to upper elevations on all aspects continues to be the main concern. But the two weak layers in the snowpack are still present on shaded and upper elevation northerly aspects and should continue to be monitored. Mountain temps are forecasted to stay cold, so this will not help the snowpack consolidate, but rather keep those layers cold allowing for facets to continue to grow. The snowpack at low elevations is extremely thin, while upper elevations are boasting a dense 5'-7' snowpack and the transition between thin and deep is abrupt in many places. New snow - 0"
12/10/12 -

Human-triggered avalanches are likely in recently wind-loaded terrain at upper elevations, creating a **CONSIDERABLE** avalanche danger. The avalanche danger is **MODERATE** on wind-loaded middle elevation terrain and on upper elevation slopes without recent wind deposits. Lower elevation terrain is not affected by the wind and has a **LOW** danger.

Large hard wind slabs leftover from last weeks storm remain a concern on steep upper elevation slopes which are wind loaded. They were widespread earlier in the week but generally speaking the old wind slabs are beginning to stabilize in mid to low elevations and some upper elevations, but remain on upper elevation slopes above 35°. More high winds (from the west and northwest this time) continue to move around the light fresh snow that fell the last few days. This is creating a complicated pattern of fresh wind slabs and cross loading on top of the old wind slabs from last week. Cool temps have kept the two weak layers (1 the basal facets, 2 the "end of November" graupel/crust layer now buried 70-100cm deep) from metamorphosing into stronger bonded snow. Both are capable of producing large destructive avalanches and while there has been no reported activity on these layers, they continue to be present in forecasters snowpits and should be monitored especially on steep upper elevation slopes.

New snow - 0"

12/11/12 -

The avalanche danger is **CONSIDERABLE** on recently wind-loaded, upper-elevation slopes steeper than about 35 degrees. Human-triggered slides are likely on these slopes, while natural avalanches are possible. On other upper-elevation slopes and on recently wind-loaded, mid-elevation terrain, the avalanche danger is **MODERATE**; human-triggered avalanches are possible. On most other slopes, the avalanche danger is **LOW**.

Strong winds overnight caused transporting of snow which overloaded many already wind loaded slopes and a cycle of natural avalanches released on south, southeastern, and easterly aspects overnight and into this morning. The largest of these was at about 10,000ft and the crown was 300ft wide and up to 3ft deep. This is a concern for today, but in the bigger picture of the snowpack over the
season this is a stabilizing event. If enough of the windslabs slide naturally it will reduce the wind slab risk from all aspects to just a few. Prior to this natural avalanche cycle, wind loading and cross loading had occurred on many different aspects throughout the week due to high winds from changing directions. In addition, forecasters noted a reduction in the reactivity of the two week layers mentioned in the previous few days. While they are still present, the load of the above snow is stabilizing the layers and forecasters reported that the layers are responding less to stability tests made during snow pits. New snow - 0"

12/12/12 -

The avalanche danger is **CONSIDERABLE** on recently wind-loaded upper elevation slopes steeper than about 35 degrees. Human-triggered slides are likely on these slopes, while natural avalanches are possible. On other upper elevation slopes and on recently wind-loaded mid-elevation terrain, the avalanche danger is **MODERATE**; human-triggered avalanches are possible. On most other slopes, the avalanche danger is **LOW**.

The dangers remain the same. Wind has died down to 15-20mph but continues to move the fresh lightweight snow on the surface. The natural avalanche cycle has reduced risk on some aspects but wind slabs remain on W-NW-N aspects and can be found on all leeward upper elevation slopes. The two weak layers continue to slowly stabilize but we must not forget they are there until they fully consolidate. Recent cold temperatures and clear nighttime skies have weakened the surface snow by creating surface hoar in many areas. It is not much of a concern now, there is no slab sitting on top of it, but could be a cause for concern later if a consolidated slab of snow forms on top of it. New snow - 3"

12/13/12 -

The avalanche danger is **MODERATE** on recently wind-loaded mid and upper elevation slopes. Human-triggered slides are possible, especially along leeward ridgelines and/or in the upper reaches of exposed avalanche start zones. The danger is generally **LOW** on slopes where wind drifts and slabs do not exist.

The snow that started falling yesterday finished by leaving 5" of heavy dense snow and a rime
cycle above 8,000ft. In areas sheltered from the wind the new snow bonded well with the existing snow surface, but in exposed areas much of the snow was transported to lee areas and created hollow reactive wind slabs. This continues to be the main avalanche concern, although the two weak layers existing in the snowpack should still be monitored even though they are continuing to stabilize. New snow - 2"

12/14/12 -

The avalanche danger is **MODERATE** on upper-elevation slopes, where several rounds of strong winds this week have created unstable wind slabs. Triggering one of these slabs remains possible on steep, wind-loaded slopes near ridges and around cross-loaded, mid-slope terrain features. The avalanche danger is mostly **LOW** in lower-elevation terrain and slopes without fresh deposits of wind-drifted snow. The hazard in this terrain is mostly small pockets of soft, shallow slabs sitting on recently buried weak layers.

The new wind slabs continue to be the concern. Especially in areas where the wind blew big drifts on to slopes where weak surface hoar existed from cold clear nights this last week. Travelers in avalanche terrain should avoid steep upper elevation where fresh wind slabs lay waiting for a trigger such as a skier. The varied wind over the last week has led to widespread and variable wind slabs. They are variable in their location as well as their characteristics. They exist not on any specific slope and aspect, but rather anywhere the wind has blown in the last week, so winter travelers are advised to travel with care and stay vigilant in our travel techniques and terrain selection. New snow - 1.5"

12/15/12 -

The avalanche danger is **MODERATE** on upper and middle-elevation slopes where recent snowfall overlies a layer of surface hoar and/or faceted crystals. Human triggered avalanches are possible on slopes where this weak layer exists and on slopes that received large wind loads earlier in the week. In lower elevation terrain, this weak layer is not as widespread and these slopes have received less recent snowfall and wind-loading. Human-triggered avalanches are unlikely here, resulting in a **LOW** avalanche danger.

The main concern has shifted now from wind slabs to the weak layer of surface hoar that formed earlier this week and is present on most middle elevations and NE-S-W aspects of upper elevations. It is now buried under 6"-12" of new snow and deserves our attention, especially as we receive additional snowfall. The wind slab conditions described during this last week continue to be a
concern, secondary to the buried surface hoar. New snow - 2"

12/16/12 -

The avalanche danger is **MODERATE** on most slopes but will rise to **CONSIDERABLE** on steep, leeward, upper elevation slopes as gusty winds create unstable wind slabs. Today you'll find it possible to trigger freshly-formed wind slabs in exposed terrain and shallow soft slabs on steep, sheltered slopes where a sensitive weak layer is buried 10-12" deep. The size and likelihood of avalanches will rise through the day, particularly if tonight's storm arrives faster than forecast; be alert for increasingly dangerous conditions.

Winds have increased to 25-30mph along ridge lines and are very effectively transporting all the light new snow around off exposed ridge lines to lee slopes and cross loading gullies and other terrain features further downslope. Newly formed wind slabs will be present and especially sensitive on areas where they form on top of the surface hoar layer buried 6"-12" down. It will be important to continually monitor this layer as a new storm approaches and will add more load. New snow - 1"-2"

12/17/12 -

The avalanche danger is **CONSIDERABLE** in middle and upper elevations where heavy snowfall, strong winds, and weaker snow in the upper snowpack are combining to make human-triggered avalanches likely. Expect to encounter dangerous avalanche conditions on steep wind-loaded terrain, including mid-slope terrain features. At lower elevations, it will be possible to trigger avalanches and the danger is **MODERATE**.

The storm came in upside-down and brought heavy snowfall with rates over 1"/hour. This along with strong westerly (25-30mph, gusts >40mph) winds is creating fresh storm slabs as well as wind slabs on N-E-S aspects and the danger will just increase throughout the day as more snow falls and gets moved around by the wind. The buried surface hoar layer is now buried 1-2 feet down and is the secondary concern behind fresh storm snow. The snow will continue throughout the day and the Sawtooth's may receive up to 2' in the next few days New snow - 12"
12/18/12 -

Yesterday's strong winds and heavy snowfall created variable soft and hard wind slabs at all elevations. The avalanche danger is **CONSIDERABLE** in middle and upper elevation terrain where you'll encounter wind slabs 2-4' deep in leeward terrain (generally NE-S). On slopes not loaded by the wind, weaknesses exist within the 14-24" of new snow and at the old snow interface. Large wind drifts also formed in some lower elevation terrain where today's avalanche danger is rated **MODERATE**.

The layer of faceted crystals that was buried 6"-12" down pre-storm is now getting loaded with the new storm snow, and forecasters found it reactive on many different slopes and aspects. The conditions are very tricky, with a combination of hard and soft slabs found at all elevations resting on top of a couple of different surfaces. On exposed areas it is resting on top of a faceted crust layer, and in sheltered areas it is on top of a buried surface hoar layer. Both layers are found at the same depth in the snowpack, about 6" below the fresh storm snow. Winds during this storm have picked up, blowing steadily at 34-45mph with gusts up into the 70s and 80s. New snow - 8"

12/19/12 -

Strong winds and heavy snowfall early in the week created variable conditions at all elevations. The avalanche danger is **CONSIDERABLE** in middle and upper elevation wind-loaded terrain where you'll encounter harder wind slabs 2-4' deep (generally NE-S aspects). On slopes not loaded by the wind, the slab is softer, and weaknesses exist at the old snow interface, and at a faceted layer buried about 2' deep.

During the end of this storm a natural avalanche cycle occurred with many small to medium sized avalanche's reported on N-NE-E-SE aspects, mostly wind-loaded terrain. The new snow has created variable depth hard wind slabs at most elevations on lee slopes. Cold temps remain (0°F -15°F), keeping the unstable layer as it is for now, but warmer temps are forecasted which will hopefully help consolidate the buried surface hoar/crust layer that existed just below the surface prior to this last storm. New snow - 0"
12/20/12 -

Strong winds and heavy snowfall early in the week created variable conditions at all elevations. There are pockets of **CONSIDERABLE** avalanche danger on steep mid and upper elevation slopes where 2 feet of newer snow is sitting on a thin layer of surface hoar. The layer is not intact on every slope, and these pockets are defined as slopes over 35 degrees in steepness where the surface hoar layer exists. Human triggered avalanches are likely on these slopes. The avalanche danger is generally **MODERATE** elsewhere. Keep an eye out for new wind slabs along upper elevation ridgelines.

The buried surface hoar layer continues to be the main avalanche concern, found on mid-upper elevation N-E-SE slopes, but many wind slabs still exist on mid-upper elevation slopes as well. The temps rose slightly (5º-10º) from yesterday but remained relatively cold staying in the teens and low 20's. Winds slowed since the storm and stabilized at 15-25mph with gusts into the 40's. Lots of human triggered avalanche activity was reported in Galena Pass (south of the Sawtooth Mountains) which seems to be where the weak layer is concentrated. But it also is the most popular backcountry skiing area, and the Sawtooth's probably have the same widespread weak layer or close to it. Something to keep an eye on as another warm Pacific storm front approaches. New snow - 0"

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12/21/12 -

The avalanche danger is **MODERATE**; this week's storms and bouts of strong wind loaded leeward slopes near ridgelines, cross-loaded mid-slope terrain features, and buried various weak layers 16-24" deep. Many recently-created slabs remain unstable and human-triggered avalanches are possible on slopes steeper than about 35 degrees. The most dangerous slopes are those where wind-drifted snow and storm snow have buried thin weak layers; these are most common on easterly aspects at mid and upper elevations. Avoid any steep slopes if you observe shooting cracks or collapsing.

Widespread wind slabs and cross loading exist at varied elevation and aspect. Winds have been shifting in direction and speed for the last few days, resulting in wind loading in unexpected places. There is no pattern to this loading and it could be found anywhere, any elevation or aspect. Many of these wind slabs are resting on weak layers ranging from surface hoar to graupel to crust. These layers are buried 16"-24" below the surface and are found on many different aspects. Temps hovered in the mid 20's, climbing into the low 30's during the heat of the day. Wind was very erratic, shifting in
direction and speed, and sometimes dying altogether during the day. Highest reported speeds were up to 40mph along ridge lines. New snow - 0"

12/22/12 -

The avalanche danger is **MODERATE** on mid and upper-elevation slopes. Human-triggered avalanches are possible on slopes steeper than about 35 degrees, especially those where a troublesome layer of surface hoar and/ or small facets is buried 12-20" deep. These are most common on easterly aspects at mid and upper elevations. Some recently-formed wind slabs remain unstable in exposed terrain. Riding safely in these complex and variable conditions requires avoiding steep slopes or doing rigorous, slope-specific assessments.

The pattern of frequent storms accompanied by strong winds and brief lulls between storms has created a huge spacial variability within the snowpack. What this means is that the buried surface hoar weak layer can be found and poses a significant danger on some aspects while on others it is non-existent. The same thing can be said for wind slabs, they are present on many aspects sometimes resting on top of the aforementioned buried surface hoar layer, sometimes not. There are also many areas of cross loading occurring mid-slope and down-slope as well as along ridge lines. Overnight temps dipped just below freezing and got as high as the mid 30's during the day. Winds were 25-35mph from the Southwest. A new Pacific system moves in tonight with forecasters calling for up to 6" of new snow overnight. New snow - 0"

12/23/12 -

The combination of lower-density new snow and moderate winds have created a **CONSIDERABLE** avalanche danger at upper elevations and on steep wind-loaded middle elevation slopes where newly formed wind slabs will be sensitive to the weight of a skier or rider. This storm event may also activate a surface hoar layer buried 18-24" deep where it exists. The surface hoar layer is not widespread in this area but may be present on some slopes. At lower elevations, the avalanche danger is **MODERATE** on slopes steeper than about 35 degrees.

5"-9" of low density (5% water content) snow fell overnight and Southerly winds up to 30mph blew most of it onto leeward slopes and created many cornices and wind slabs on all Northern aspects.

The main concerns continue to be wind slabs and the buried surface hoar layer which is now 2' deep.

The surface hoar is mainly found around Galena Pass area which is well south of the Sawtooth
mountains but should still be monitored as it may very well be present in the Sawtooth's as well. Temps ranged from low 20's during the day to 10º overnight while winds came in from the South at 20-30mph.

New snow - 9"  

12/24/12 -

1-2 feet of low density snow and strong variable winds have created a **CONSIDERABLE** avalanche danger at upper and middle elevations where you'll find newly deposited wind slabs on several aspects. Skiers and riders will be able to trigger sensitive slabs 1-3' deep on many slopes. Additionally, a surface hoarfaceted crystal layer buried 20-30" deep may become active with the recent snow load. The surface hoar is not widespread in this area but may be present on some slopes. At lower elevations, a **MODERATE** danger exists on steeper wind-loaded slopes. Watch for cross-loaded terrain features at this elevation.

Concerns continue to be wind slabs and buried surface hoar/weak layers. The complicated wind loading that has occurred the last few weeks is hard to deal with but the Sawtooth Avalanche forecasters put it well:

"How can we deal with a complicated loading pattern like this? KISS: Keep it Simple Stupid (Scotty). Due to the variable winds, assume that any slope over 35 degrees is "guilty until proven innocent." Thoroughly investigate any steep terrain in which you plan to play. Dig quick hand pits to evaluate the layering in the upper part of the snowpack. Safely slope cutting small, low consequence wind-loaded terrain features is a good way to get a feel for how the fresh wind slabs will react to your weight. Watch for recent avalanche activity on near-by slopes or cracks shooting from your boards or snow machine, both obvious signs of instability. Slopes without fresh wind slabs will harbor excellent skiing and riding conditions, but do your due diligence with each terrain decision you make."  [14]

It will be important to employ these techniques during my expedition as this complicated wind loading may very well still be present (just buried) during my expedition. Constant vigilance as well in monitoring the persistent weak layers progression in the next few months until the expedition will be very important. This layer was responsible for several human triggered avalanche's on E-SE aspects over the last 2 weeks. Temps today were cool, in the high teens and NW winds blew 15-25mph. New snow - 8"
12/25/12 -

Recent storms and gusty winds have scattered unstable wind slabs across exposed terrain at all elevations and created a MODERATE avalanche danger on leeward and cross-loaded slopes. These are most widespread at upper elevations. Because of variable wind directions during the past few days, it is possible to trigger 1-3 foot deep wind slabs on steep slopes on any aspect. Also of concern is a thin layer of surface hoar and/or facets that is buried 20-30” deep and remains unstable on isolated, easterly slopes.

The storm continued overnight then died off by the morning. The main concern today continues to be wind slabs on leeward slopes and cross loading down-slope on many aspects and elevations. The winds during this storm started from the South, then shifted to the NW yesterday and last night. This just adds to the complicated wind loading that exists everywhere in the forecasting region. The buried surface hoar/crust/graupel weak layer has not disappeared either, and is the secondary concern. Temps stayed cool in the teens and winds were from the South at 5-15mph with gusts into the 20’s. New snow - 10"

12/26/12 -

Today there is a MODERATE avalanche danger on leeward and cross-loaded slopes. Recent storms and variable, gusty winds have resulted in complex loading patterns in mid and upper elevation terrain, and it is possible to trigger 1-3 foot deep wind slabs on steep slopes on any aspect. Avoid obvious wind-pillows, especially where you observe shooting cracks. There is a thin layer of surface hoar and/or facets buried 20-30” deep in some locations. The reports we have received on this layer indicate that although isolated, it is more prevalent on NE-E-SE slopes, and may remain sensitive to human traffic on very steep slopes.

Concerns remain the same, although the danger is still very high. Wind loading, cross loading and the persistent weak layer buried now at least 3 feet deep. Although the forecaster's say it is found on NE-E-SE slopes, I feel that is where they have found it where it is most prevalent: Galena Summit.

It will be important to continue to monitor this layer, because in the Sawtooth's, I have a feeling it may be more widespread and variable. Temps stayed in the teens at upper elevations but rose to the mid 20's in the valleys. Winds were light and from the West, 5-10mph. New snow - 1"-2"
12/27/12 -

Today there is a **MODERATE** avalanche danger on leeward and cross-loaded slopes at upper elevations, where increasing northerly winds will create thin and variable slabs and drifts on the leeward side of exposed terrain and human triggered avalanches will be possible. Recent storms and variable, gusty winds created complex loading patterns in mid and upper elevation terrain early in the week, and deeper wind slabs may linger on slopes where the slabs were deposited on weak, sugary snow. Avoid obvious wind-pillows and chalky, ‘hollow sounding’ slabs on steep slopes.

More of the same concerns. The largest danger lies waiting, where deeper wind slabs rest on top of weak layers buried 3’ deep, especially on upper elevation slopes at or above 35º. Temps stayed in the teens up high and along ridge lines but got to the mid 20's in the valleys. Winds were light and from the West, much the same as yesterday. New snow - >1"

12/28/12 -

The avalanche danger is **MODERATE** at mid and upper elevations, where it is possible to trigger wind slabs on leeward or cross-loaded slopes. Most wind slabs sensitive to the weight of a person or sled are small and shallow, but a few deeper, older pillows remain unstable and have been obscured by recent snowfall. Persistent weak layers buried 1-2 feet deep continue to pose a danger on isolated, very steep slopes. Avoid this danger by avoiding shallow areas, steep rollovers and other likely trigger points.

The same concerns are present; wind slabs on many slopes and elevations, as well as the weak layer buried over 3’ deep. Today is cold and clear with temps reaching the teens to low 20's and winds blew NW @ 15-25mph. Last night was cold and clear with temps dropping to single digits. The cold, clear weather continues to weaken existing weak layers and destroy bonds within the snowpack. This will serve only to increase the danger surrounding that variable weak layer 3’ deep. New snow - 0"

12/29/12 -

The avalanche danger is **MODERATE** at upper elevations where it is possible to trigger wind slabs that formed earlier this week on steep leeward or cross-loaded slopes. At middle and lower elevations, a **LOW** danger exists; however, it is possible to trigger avalanches in very steep terrain/rollovers where a weaker, shallow snowpack exists.

Forecaster’s claim: "*In the Sawtooth Mountains, the absence of widespread buried persistent weak layers has resulted in less avalanche activity to date than in the zones above. As in the North"
Valley and Headwaters area, wind slabs that formed earlier this week have stabilized but still deserve respect in steep alpine terrain." [14]

While this is encouraging, it does not lower the level of respect the terrain deserves. The fact is those layers exist in the mountains all around the Sawtooth's and could still be found in some sheltered upper elevation areas. The wind slab concerns remain although it is encouraging to hear they are stabilizing with the weight of new snow on top. Temps today were cold again, low teens at upper elevations and low 20's at low elevations. Winds were light from the South. New snow - 0"

12/30/12 -

The avalanche danger is **MODERATE** at upper elevations, where it is possible to trigger wind slabs on steep leeward or cross-loaded slopes. Unstable wind slabs won't be obvious because recent winds have affected the snow surface on many slopes. Avoid steep slopes above terrain traps like cliffs and gullies that can magnify the consequences of small slides. On slopes without recent wind-deposited snow, the avalanche danger is **LOW**; triggering an avalanche is unlikely except on steep, convex slopes with shallow snowpacks.

Wind slabs remain the major concern. The wind loading follows no pattern and slabs can be found at depths varying from surface to >3' deep in leeward areas. Cross loading is also still a concern on all aspects down slope from the ridge lines. The secondary concern is the buried surface hoar/graupel/crust layer from early in December. Although cold temperatures promote creation of facets, especially in and around pre-existing weak layers, the weak layers we have been monitoring are becoming less and less reactive. Forecasters still claim this layer to be rare in the Sawtooth's, but they should not be forgotten about! Temps today hovered in the high teens and low 20's with winds from the NW at 5-15mph. New snow - >1"

12/31/12 -

The avalanche danger is **MODERATE** at upper elevations where older wind slabs may be hidden underneath a variable wind-affected snow surface. Exercise caution on steep leeward or cross-loaded slopes where triggering an avalanche would have high consequences. At middle and lower elevations, the avalanche danger is **LOW**. Triggering an avalanche is unlikely except on very steep, shallow, convex slopes.

According to the Idaho SNOTEL website during the season so far the Sawtooth region has
received 130%-170% of normal precipitation, resulting in deeper than normal snowpacks [24]. The trend of warm + wet conditions have led to a more stable snowpack than usual without as many faceted sugary layers. The early december surface hoar/graupel/crust layer is stabilizing and continues to be reported only in the Wood River Valley below 8,000ft (south of the Sawtooth's). Despite cold temperatures, weak layers have healed well in the snowpack up to this time. Temps today were in the high teens to low 20's with winds were light to moderate from the north. New snow - 0"

1/1/13 - Happy New Year!

The avalanche danger is **MODERATE** at upper elevations where older wind slabs may be hidden underneath a variable wind-affected snow surface. Exercise caution on steep leeward or cross-loaded slopes where triggering an avalanche would have high consequences. At middle and lower elevations, the avalanche danger is **LOW**.

The main concern continues to be older hard wind slabs and cross loaded slopes. Temps today rose to mid 20's and winds remained light to moderate from the north. New snow - 0"

1/2/13 -

The avalanche danger is **MODERATE** at upper elevations where several generations of wind slab exist within a variable and wind-affected snow surface. These slabs are not particularly unstable, but human triggered avalanches are possible where dense snow was deposited above weak, sugary snow. Exercise caution on steep leeward or cross-loaded slopes where triggering an avalanche would have high consequences. At middle and lower elevations, the avalanche danger is **LOW**, and triggering an avalanche is unlikely. Continue to use normal caution on very steep, shallow, and/or convex slopes.

An inversion has moved into Stanley valley with temperatures on the ridge lines reaching 32º while temps in the valley hover in the single digits to mid teens. This is potentially creating some interesting variability in the snowpack. At lower elevations where a thin weak snowpack already exists, the cold temperatures are weakening the snowpack. While upper elevations have experiencing warmer temps and lots of sunlight in the last few days, they have been receiving sustained winds which has scoured the snow surface and created widespread wind loading and cross loading. And the middle elevations are somewhere in between. It will be important to monitor how this progresses. Winds today are almost non-existant as a high pressure system has settled over the area. New snow - 0"
1/3/13 -

The avalanche danger is generally **LOW**; triggering an avalanche is unlikely on slopes below 38 degrees in steepness. Continue to use normal caution on very steep, shallow, and/or convex slopes. There is a **MODERATE** danger on steep upper elevation slopes where several generations of wind slab exist within a variable and wind-affected snow surface. These slabs are not particularly unstable, but human triggered avalanches are possible where dense snow was deposited above weak, sugary snow. Exercise caution on steep leeward or cross-loaded slopes where triggering an avalanche would have high consequences.

The main concern continues to be the wind slabs found at upper elevations on variable aspects.

Temps today hovered in the mid teens with light winds from the NW. The inversion continues to weaken the low elevation snowpack. New snow - 0"

1/4/13 -

At upper elevations, the avalanche danger is **MODERATE**; it remains possible to trigger wind slabs 1-3 feet deep on steep leeward or cross-loaded slopes. Be cautious about committing to terrain that magnifies the consequences of triggering wind slabs. Natural and triggered loose snow avalanches are also possible on steep, sunny slopes; avoid the runouts of these slopes. At middle and lower elevations, the avalanche danger is **LOW**. Continue to use normal caution on very steep, shallow, and/or convex slopes.

The two major concerns are wind slabs in upper elevation terrain and shallow loose snow avalanches from warm temps and sun exposure on southern and western aspects. The wind slabs could be present on any aspect as the wind patterns which caused the slabs were very irregular and led to loading and cross loading on a variety of aspects. Temps today climbed into the high 30's at mid elevations and high 20's near the highest ridgelines. Winds were light from the N-NW. New snow - 0"

1/5/13 -

The avalanche danger is generally **LOW**; triggering an avalanche is unlikely on most slopes less than 38 degrees. Maintain safe travel practices and be alert for situations where heightened avalanche danger exists. At upper elevations, these include steep, cross-loaded and leeward slopes, where some wind slabs remain unstable. Loose snow avalanches are also possible today; avoid the runouts of steep, sunny, slopes. At middle and lower elevations, be cautious about committing to very steep, convex slopes above terrain traps.

The snowpack is very well consolidated at this point, with little to none of the buried surface hoar layer concerns. Forecasters can still identify the weak layers in a pit wall, but it is not reactive.
Wind slabs and cross loading still remains a concern at upper elevations. Most of the wind slabs have stabilized but a few could still be reactive. Temps today rose to the mid 30's and sunlight bathed the area. Winds picked up, blowing 10-15mph from the South, ahead of a Pacific low pressure system which should move in during the next few days. New snow - 0" 

1/6/13 -

The avalanche danger is **LOW** at all elevations. Natural or human-triggered loose snow avalanches are possible in very steep terrain. Exercise caution where a dry slough or wet loose avalanche could carry you over cliffs or into terrain traps. It is unlikely but possible to trigger small slabs in very steep terrain where the snowpack is relatively thin but hard layers still exist near the surface. Avoid high-consequence terrain with a hollow sounding snowpack.

With the recent stint of sunlight the snowpack has continued to stabilize at upper elevations. The temps have remained cool however, which is affecting the snowpack as a whole. Many faceted layers have emerged within the snowpack, although none are significant enough to pose a danger yet, they could with the additional of a new storm. Surface hoar/ near surface facets are likely to be found on any aspect at any elevation. This will also be a concern as the area receives new snow, which will probably happen soon with a high moisture, pacific low pressure system approaching. Temps today reached the 20's along ridgelines, while an inversion returned keeping temps low in the valleys. Winds were light from the South. New snow - 0"

1/7/13 -

The avalanche danger is **LOW** on most slopes. Small, shallow wind slabs may form near ridgelines this afternoon, and loose snow avalanches may also be possible; both of these hazards will be most dangerous in steep terrain above terrain traps. Triggering older slabs is unlikely. Be alert for changing conditions and maintain safe travel practices.

Winds increased overnight and were blowing 20-25mph from the W-NW by morning. However there is little to no snow to move around as there has been no snow for at least a week so if there are any wind slabs they will be small and soft. Old wind slabs continue to consolidate with the load of the
snow on top of them, and there have been no reports of any avalanche's on them. New snow - 4" (overnight)

1/8/13 -

The avalanche danger is **MODERATE** at upper elevations where NW winds have created thin, fresh wind slabs on leeward and cross-loaded slopes. The new slabs are sitting on top of weak faceted snow and/or surface hoar on most slopes and will be sensitive to human triggering. Once triggered, the fresh wind slabs could entrain weak faceted snow, creating larger avalanches than expected given the thickness of the wind slabs. Middle and lower elevation terrain did not receive as much new snow and the wind is not affecting these areas, resulting in a **LOW** danger. On slopes over 40 degrees, you may be able to trigger sloughs that involve the new snow and weaker faceted snow beneath it.

The new snow has been transported by the overnight NW winds creating fresh wind slabs and cross loading, which is all resting on the surface hoar which was created by last weeks cold, clear skies. The largest danger in upper elevations is if a surface slab is triggered it could step down to a buried weak layer creating a much larger avalanche. Temps today were in the high 20's to low 30's, skies were mostly cloudy with gusty variable winds. New snow - 1"

1/9/13 -

The avalanche danger is **MODERATE** at upper elevations where southerly winds have created thin, fresh wind slabs on leeward and cross-loaded slopes. The new slabs are sitting on top of weak faceted snow and will be sensitive to human triggering. Once triggered, these slabs could entrain weak faceted snow, creating larger avalanches than expected given the thickness of the wind slabs. Middle and lower elevation terrain has not been as affected by the wind and the avalanche danger is generally **LOW**. On slopes over 40 degrees, you may be able to trigger point release avalanches (sluffs) that involve the new snow and weaker faceted snow beneath it.

The shallow wind slabs resting on top of the surface hoar continue to be the main threat, this danger will intensify as a storm comes in tonight, bringing fresh load. Upper elevations continue to be the main threat area, while mid-lower are relatively safe. Temps today in the high 20's to low 30's, winds 15-25mph from the south. New snow - 1"
1/10/13 -

The avalanche danger is **CONSIDERABLE**. New snow and gusty winds have added a quick load to our snowpack. The older snow surface is a complicated and variable mix of crusts and faceted crystals, and the resulting pattern of instability may be complex today. Human triggered slab avalanches are likely on wind loaded slopes, and/or where a new dense slab sits above weak, faceted crystals.

The snow that came in last night came in fast, with 0.7" of SWE (Snow Water Equivalent) falling in 3 hours. We have almost an inch of water content sitting on top of the 6" from the last few days, sitting on top of the untested surface hoar that formed the end of December and first week of January. This will need continual monitoring. Temps today are in the upper 20's and low 30's with ridge top winds 15-20mph from the south. New snow - 8"

1/11/13 -

The avalanche danger is **CONSIDERABLE** at upper elevations, where new snow and strong winds have created unstable slabs of combined wind and storm snow. These will be slow to stabilize and triggering them is likely on steep leeward and cross-loaded slopes. On other slopes, a **MODERATE** avalanche danger exists. Two small, skier-triggered avalanches were reported from this zone yesterday; these involved shallow slabs of storm snow that were poorly-bonded to weak, faceted snow. It remains possible to trigger similar slides today on slopes steeper than about 30 degrees.

Still the danger remains the surface hoar layer at the old snow/ new snow interface. The wind continues to transport the fresh light snow to lee slopes and cross load downslope, and its all resting on that weak faceted surface hoar. Winds today are N-NW at 10-30mph while temps hover in the single digits. New snow - 5"

1/12/13 -

Recent snow and winds have created a **CONSIDERABLE** avalanche danger in wind-loaded upper elevation terrain. Skiers and riders are likely to trigger thick wind slabs on leeward and cross-loaded slopes, especially on SE-S-SW aspects. Variable winds during the storm loaded other aspects as well but slabs will generally be thinner on the more northerly aspects. At middle and lower elevations, recently formed wind slabs are thinner and softer and the avalanche danger is **MODERATE**; in steeper terrain, it is possible to trigger wind slabs or shallow slabs of storm snow that are consolidating above crusts and weak, faceted snow.
As the storm wound down, winds from the NW-N-NE moved the light new snow very effectively, continuing the pattern of wind loading and cross loading on top of the surface hoar which makes up the danger in the snowpack. Temps today were cold, -5º to -10º F and winds were 7-15mph from the North. New snow - 0"

1/13/13 -

The avalanche danger is **MODERATE**; it is possible to trigger recently-formed wind slabs or shallow slabs of storm snow that are consolidating above crusts or weak, faceted snow. Unstable wind slabs will be thicker and larger on upper elevation slopes that face SE-S-SW, with thinner slabs existing on other aspects and elevations. Last week’s storm snow fell on various weak snow surfaces; small, shallow avalanches involving near-surface snow layers are possible on steep, convex slopes. Avoid slopes steeper than about 35 degrees that have recent deposits of wind-drifted snow or produce shooting cracks or collapses.

The cold weather after the storm continues with highs today reaching 0ºF and winds were light and variable. Another pacific front is on the horizon and may bring warmer temps and maybe some snow showers. The cold temperatures are not helping the faceted layers in the snowpack, in fact all its doing is preserving them quite well. This will deserve attention if any significant snow load comes from the next storm. As of right now the storm snow lacks widespread cohesion, so large avalanches are unlikely, although small human triggered slides are possible. New snow - 0"

1/14/13 -

Recent snow and wind have created a **MODERATE** avalanche danger in wind-loaded terrain at all elevations. Hard, thick wind slabs formed Thursday through Saturday and are slowly stabilizing. Skiers and riders may trigger 1-3’ deep slabs, especially on slopes steeper than 35 degrees. The stiff slabs are not widespread and are most commonly found at upper elevations and on or immediately beneath ridgelines at middle and lower elevations. Slopes where hard slabs do not exist will have better stability and less avalanche danger.

The winds following the storm have formed hard slabs at all elevations in localized areas. Instead of the slope wide concerns like we had in December, these small hard slabs can be found in small areas such as immediately under a ridge, past a rollover, next to a cliff, and other terrain features. Several human triggered slides and natural avalanches were reported in wind loaded areas. The danger is that the hard slabs are resting on the slow to stabilize weak layer from the end of December and first
week of January. Winds were from the N-NW at 10-20mph, and Stanley Idaho cancelled school due to -30°F temps! New snow - 0"

1/15/13 -

Moderate N-NW winds over the past 24 hours have created a **CONSIDERABLE** avalanche danger on upper elevation wind-loaded slopes steeper than 35 degrees. Skiers and riders will encounter sensitive newly-formed, shallow wind slabs on leeward and cross-loaded slopes. At all elevations, it remains possible to trigger stubborn, 1-3' deep hard slabs that formed late last week. The latent hard slabs are not widespread and are most commonly found on or immediately beneath ridgelines. A **MODERATE** danger exists in steep, wind-loaded terrain at middle and lower elevations. Slopes where neither hard slabs nor fresh soft slabs exist will have better stability and less avalanche danger.

Wind slabs remain the major concern, with fresh shallow slabs forming in the last 24 hours. Also the older slabs resting on the weak faceted layer from the end of December, which are less likely to be triggered, but come with much greater consequences. Wind from the N-NW at 10-20mph with temps finally warming up in the mountains into the 20's. The temperature inversion remained and temps hovered around 10° in the valleys. New snow 2"

1/16/13 -

N-NW winds over the past 48 hours have created a **CONSIDERABLE** avalanche danger on upper elevation and exposed mid-elevation wind-loaded slopes steeper than 35 degrees. Many mid-slope areas are cross-loaded. Yesterday a skier triggered a soft wind slab on a SE aspect near Williams Peak. At all elevations, it remains possible to trigger stubborn, 1-3’ deep hard slabs that formed immediately below ridgelines late last week. Slopes where neither hard slabs nor fresh soft slabs exist will have better stability and less avalanche danger.

Natural avalanches were reported on many different aspects: W,NW,N,E,SE. The cause of these slides was a complex pattern of wind loading and cross loading. Many slopes which would normally be wind loaded may be wind scoured. The 1’-3’ deep hard slab may be lower down slope than is normal, and so hard that they allow a skier to get well out onto the slope before they break. This is a very dangerous trend, and requires monitoring as to how it develops. Temps in the valley stayed cold, Stanley weighed in at 3°, but mountain temps soared into the 30's. This warming will help stabilize the weak layers and buried slabs. Winds from the N-NW at 8-15mph. New snow - 0"
1/17/13 -

The avalanche danger is **MODERATE** on steep, obviously wind-loaded upper elevation and exposed mid-elevation wind-loaded slopes. There was a skier triggered avalanche on a south aspect on Tuesday, and it will be possible to trigger similar slabs on slopes steeper than 35 degrees. Many slopes are cross-loaded along fall-line terrain features and well below ridgelines. These slabs are getting harder and less predictable, so avoidance is the best way to manage the danger.

Again many natural and human triggered slides were reported across the forecasting region. In the Sawtooth's however, only one slide was reported and it was on a SE aspect. All the reported slides were from wind affected snow. This remains the concern, as the wind loading is not traditional. Many down slope areas are wind loaded or cross loaded in areas which would normally be sheltered. Along windy ridgelines temps hovered around 32º, but in more sheltered areas rose to the low 40's. Valley temps stayed in the single digits to low teens because of the remaining inversion. Wind speeds were light from the N-NW. New snow - 0"

1/18/13 -

The avalanche danger is **MODERATE** on steep, wind-loaded slopes at all elevations. Near ridgelines, bouts of strong, northerly winds have formed many hard and uninviting wind slabs, but wind-channeling and cross-loading have also deposited slabs well below ridgelines in gullies and around exposed terrain features. It is possible to trigger these slabs on slopes steeper than about 35 degrees. Avoid obvious drifts and areas of snow that feel chalky, hard, or hollow.

On less steep slopes without wind slabs, the avalanche danger is generally **LOW**.

With more moderate to strong winds overnight it could have created more wind slabs had there been any snow to transport. Luckily (or unluckily) most of the snow has already formed wind slabs and cross loaded areas which makes up the continued danger. The warmer temps will hopefully help the snowpack heal, creating bonds around the wind slabs and stabilizing the beginning of January faceted layer. Conditions today were much the same as yesterday with mountain temps in the 30's and light winds. New snow - 0"
1/19/13 -

The avalanche danger is **MODERATE** on steep, wind-loaded slopes at all elevations. It remains possible to trigger small- to medium-sized wind slabs on slopes steeper than about 35 degrees. This danger is becoming more isolated as warm temperatures slowly stabilize recently-formed wind slabs. Avoid obvious drifts and areas of snow that feel chalky, hard, or hollow. Small, wet loose avalanches are also possible this afternoon on very steep, sunny slopes. On slopes less than 35 degrees without wind slabs or direct exposure to the sun, the avalanche danger is generally **LOW**.

The sustained warm temps are stabilizing the wind slab and the faceted layer, although it remains a concern. Mid-upper elevations have experienced a significant amount of melting, with snow gone off tree branches and exposed rocks. A few small wet slides were observed, opening the possibility of a sun crust forming on S-W aspects from warm temps and sunlight. This will need monitoring in the following days-week. Temps today were in the high 30's and low 40's with winds from the N-NW at 10-20mph. New snow 0"

1/20/13 -

The avalanche danger is **MODERATE** on steep, wind-loaded terrain in upper and middle elevations. It remains possible to trigger small- to medium-sized wind slabs on slopes steeper than about 35 degrees. The slabs are becoming more difficult to trigger but skiers and riders should continue to avoid obvious drifts and areas of snow that feel chalky, hard, or hollow. At lower elevations and on slopes without wind slabs, the avalanche danger is generally **LOW**. At all elevations, small, wet loose avalanches are possible this afternoon on very steep, sunny slopes in areas sheltered from the wind.

The hard slabs continue to stabilize with the clear skies and warm temps, but they are still possible to trigger. With diminishing wind speeds, it opens the door for wet avalanches and formation of sun crusts on S-W aspects. Temps today hovered around 32º while winds calmed down to light and variable. New snow - 0"

1/21/13 -

The avalanche danger is **MODERATE** on steep, wind-loaded slopes at upper elevations. It remains possible to trigger small- to medium-sized wind slabs on slopes steeper than about 38 degrees. Continue to avoid obvious drifts, pillows and areas of snow that feel chalky, hard, or hollow. At middle and lower elevations and on slopes without wind slabs, the avalanche danger is generally **LOW**. At all elevations, small, wet loose avalanches are possible this afternoon on very steep, sunny slopes sheltered from the wind.

The danger of wind slabs is still there, especially because it is so variable in depth, anywhere
from 1' to >3'. See this video by Sawtooth Avalanche Center:


Today's temps reached the 40's with NW wind 10-20mph. The mountains stayed warm overnight, and did not freeze. New snow - 0"

1/22/13 -

The avalanche danger is **MODERATE** on steep, wind-loaded slopes at upper elevations. It remains possible to trigger small- to medium-sized wind slabs on slopes steeper than about 38 degrees. Continue to avoid obvious drifts, pillows and areas of snow that feel chalky, hard, or hollow. At middle and lower elevations and on slopes without wind slabs, the avalanche danger is generally **LOW**. At all elevations, small, wet avalanches are possible on steep, sunny slopes in areas sheltered from the wind.

As a result of the thaw in the mountains last night, springtime conditions are what will be encountered at this time. This means wet avalanches are a concern. The wind slab concerns remain, and as is demonstrated in the video above, they are still reactive. Temps today soared to almost 50º with little to no wind. What this is doing is creating a layer of breakable crust on the surface of the snow, which if it became buried could provide an efficient sliding surface for snow above it. While a lot would need to come together to make that happen, it will require monitoring. New snow - 0"

1/23/13 -

The avalanche danger is **MODERATE** on steep, wind-loaded slopes at upper elevations. It remains possible to trigger small to medium sized wind slabs on slopes steeper than about 38 degrees. Continue to avoid obvious drifts, pillows and/or areas of snow that feel hollow. At middle and lower elevations and on slopes without wind slabs, the avalanche danger is generally **LOW**. Small, wet avalanches are also possible in steep, rocky areas that get a lot of sun and are sheltered from the wind.

With yesterday's warm temps a lot of water was introduced to the snowpack. This can create several instabilities, the first and most obvious is the wet slides and loose snow avalanche that may occur today. Less obvious is what this means for the future. There is a significant crust which has formed, as well as variable snow conditions. Also many water may have run down into the snowpack and possibly lubricated some weak layers buried beneath. This will not be widespread, but could be
found in specific areas where significant warming occurred. Temps today reached the low 40's in the mountains and winds were light from the SW with occasional 20mph gusts. New snow - 0"

1/24/13 -

The avalanche danger is MODERATE on steep, wind-loaded slopes at upper elevations. The 2-3" of new snow will be lightly drifted along exposed ridgelines, and you may encounter thin and sensitive slabs where the new snow did not bond well to the older surface. It also remains possible to trigger older wind slabs on slopes steeper than about 38 degrees. Yesterday these slabs were easily identified by their hard, very smooth surface and hollow representation. Today the new snow will make them more difficult to spot. The avalanche danger is generally LOW at middle and lower elevations and on slopes without wind slabs.

The new snow drifted across many areas and did a great job of hiding the lurking deeper slabs which have been our problem for the last few weeks. Snow conditions are good in lower elevations where cool temps due to the inversion the last week kept the snow surface from developing the crust that formed on mid-upper elevations. Temps today ranged from the 20's to low 30's with light winds from NW gusting to 15mph. New snow - 2"

1/25/13 -

The avalanche danger is MODERATE on steep, wind-loaded slopes at upper elevations, where it remains possible to trigger older wind slabs on slopes steeper than about 38 degrees. Recent snow will make them more difficult to identify and avoid. A few shallow, freshly-formed wind slabs may also exist near ridgelines and may be poorly bonded to underlying snow. The avalanche danger is generally LOW at middle and lower elevations and on slopes without wind slabs.

Primary avalanche concern continues to be the hard slabs buried 1’ - 3’ deep, although they are becoming more difficult to trigger, the danger remains, especially on steeper upper elevation slopes. Thankfully the warm temps have consolidated the snowpack at mid-lower elevations, and it does not have any notable weak layering. This is a good sign for the future, hopefully the upper elevation slopes will follow. Temps today hovered in the 20's, climbing to near freezing at mid to lower elevations.

Wind was light and southwesterly as slight snow and rain showers started in the afternoon. New snow - 1"
1/26/13 - The avalanche danger is **MODERATE**. Wet snow avalanches are possible on steep slopes at low and mid elevations; avoid being on or under these slopes until the snow surface refreezes, which should happen by early this evening. At upper elevations, it is still possible to trigger hard wind slabs on slopes steeper than about 38 degrees; fresh snow is making these hard to identify. A few shallow, freshly-formed wind slabs may also exist near ridgelines. The avalanche danger is generally **LOW** on slopes with a dry snow surface and no wind slabs. Warm and wet conditions make the wet avalanche danger the most prominent today. The wind slabs are not very reactive at all, it seems the warm temps have bonded them with layers underneath. Temps today ranged from 20's on ridgetops to high 40's in the valleys with winds at 10-20mph from the SW. New snow - 1"

1/27/13 - Recent snow and moderate winds formed soft, shallow wind slabs at upper elevations, creating a **MODERATE** avalanche danger. Skiers and riders are most likely to encounter fresh slabs directly beneath ridgelines in alpine terrain. At middle and lower elevations, the combination of less new snow, less wind, and colder temperatures refreezing the wet snowpack means that the avalanche danger is **LOW**. The fresh snow has been transported creating fresh windslabs 6"-10" deep in the Sawtooth's. These slabs are sitting on a variety of snow surfaces ranging from crust to faceted layers. At upper elevations it remains a slight possible to trigger a deeper slab. Temperatures today cooled off hovering in the teens to low 20's with winds 10-20mph from the N-NW. New snow - 6"

1/28/13 - The avalanche danger is **CONSIDERABLE** at upper elevations. Increasing winds have created wind slabs in exposed leeward terrain. At middle elevations, the wind slabs will be less widespread and the danger is **MODERATE**. Expect the size, hardness, and distribution of the wind slabs in middle and upper elevation terrain to increase late today and tonight as strong winds and heavy snowfall affect the area. The avalanche danger will rise tonight and possibly today if the storm arrives earlier than forecast. Lower elevation terrain has a **LOW** danger rating today. The hard and soft wind slab concerns dominate the forecast today. They are widespread and rest on a variety of snow surfaces including the crust I mentioned earlier. Temps hovered in the teens with winds were 5-20mph from the NW. New snow - 1"-2"
1/29/13 -

The avalanche danger is **CONSIDERABLE** at upper elevations and in wind-loaded middle elevation terrain where NW winds have formed wind slabs. Skiers and riders should expect the size, hardness, and distribution of the wind slabs to increase today and tonight as stronger NW winds and continued snowfall impact the area. On middle elevation slopes not loaded by the wind and in steep lower elevation terrain, you may be able to trigger sloughs or very soft slabs, resulting in a **MODERATE** danger rating.

The take away point here is the variability of the snowpack right now. All the fresh snow and NW winds have created soft and hard slabs on lee slopes. These slabs are resting on a variety of snow surfaces. In some sheltered places they rest on surface facets, but in most areas they rest on a crust ranging from 4” to razor thin. It is extremely variable out there right now and it will be important to monitor how this crust/new snow interface develops. Temps hovered in the upper teens with winds from the NW at 15-30mph. New snow - 6”

1/30/13 -

The avalanche danger is **CONSIDERABLE** at upper elevations and in wind-loaded middle elevation terrain where strong winds have formed drifts and slabs. Skiers and riders should expect different conditions today, as slabs have thickened and stronger winds have cross-loaded terrain features. On middle elevation slopes not loaded by the wind and in steep lower elevation terrain, you may be able to trigger sluffs or very soft slabs, resulting in a **MODERATE** danger rating.

The main avalanche concern continues to be the fresh wind slabs formed by the steady NW winds. Some variability in wind patterns has caused cross loading down slope as well as wind slabs on all E-S-SE aspects. It will be important to monitor these slabs as stormy weather continues. Winds were from the NW at 15-20mph with variable gusts up to 40pmh. Temps hovered in the upper teens to low 20's. New snow - 2”

1/31/13 -

The avalanche danger is **CONSIDERABLE**, and human triggered avalanches are likely in the alpine areas where strong winds have formed drifts and slabs. The danger is **MODERATE** elsewhere. Yesterday's wind event affected the snow surface at all elevations, and you may encounter unstable slabs on the sides of steep gullies, or where slopes steepen and 'roll-over'.
Today the wind calmed down a bit, but it is clear that 1’-3’ wind slabs exist in upper elevation areas and should be avoided. The wind slabs from last week appear to have stabilized, although now we have another cycle of wind slabs on top of them! Todays temps climbed into the 20's, reaching 30º at lower elevations while winds remained from the NW at 10-30mph. New snow - 1"

2/1/13 -

Strong winds earlier this week have deposited unstable slabs on steep slopes, and the avalanche danger is CONSIDERABLE in upper-elevation terrain and MODERATE on wind-loaded and cross-loaded slopes at mid and low elevations. These slabs are a few inches to a foot or more thick, vary in hardness, and can be difficult to distinguish from slopes where the wind has only affected the snow surface. Safe travel requires avoiding steep slopes - or very careful evaluation. The danger is lower on slopes without recently-formed wind slabs.

Reports of natural avalanches from the Sawtooth's were predictable. They ran on SE aspects, which received the most wind loading, and they ran on the crust/facet combination which formed in the period of warm weather before this last storm. This layer must be monitored to see if it can heal or if the crust will continue to be a sliding surface for the remainder of the season. Especially in areas where faceted snow is present near the crust layer. Temps were in the upper 20's with wind speeds around 20mph from the NW. New snow - 0"

2/2/13 -

The avalanche danger remains CONSIDERABLE in upper elevation terrain and MODERATE on wind-loaded slopes at mid elevations. Strong winds earlier this week deposited hard, unstable slabs 1-2 feet thick in wind exposed terrain. Safe travel requires avoiding steep slopes or very careful evaluation. The danger is lower on slopes without recently-formed wind slabs and on low elevation slopes.

The northern and western areas of the Sawtooth's received the most snow from this recent storm and as result present some of the largest and most widespread of the the wind slabs in the range. There are reports of several natural and human triggered avalanches occurring on W-SE-S-E aspects in the last few days. The danger increases with elevation, especially in steep leeward terrain. Wind slabs and cross loading still exists in the southern areas, just not as widespread. Temps at low elevations in the
30's and 20's along exposed ridgelines and upper elevations. Wind NW at 5-20mph. New snow - 0"

2/3/13 -
The avalanche danger remains **CONSIDERABLE** in steep, heavily wind-loaded upper elevation terrain and **MODERATE** on steep wind-loaded slopes at middle elevations. Strong winds earlier this week formed 1-2' deep hard slabs. While triggering these slabs has become more difficult, avoidance is still recommended. The danger is lower on slopes without lingering wind slabs and on low elevation slopes.

The danger remains the hard wind slabs, although forecasters report they are becoming harder to trigger. They can be found on SW-S-SE-E aspects as winds were mostly NW during the last storm. The slabs vary in thickness but range from 1'-3'. Where they lay on the crust/faceted layer they have the potential to propagate across the slope and be very large avalanches. Today was a clear sunny day with winds 10-20mph from the west and temps reached the low 30's at upper elevations. New snow - 0"

2/4/13 -
The avalanche danger is **MODERATE** at mid and upper elevations. It is possible to trigger wind slabs on slopes steeper than about 35 degrees. On low elevation slopes and slopes without recent deposits of wind-drifted snow, the avalanche danger is **LOW**.

Same concerns exist. Nothing has changed except as more time passes the mild temps are healing the wind slab to the layers around it, stabilizing the snowpack slowly. There have been no reports of avalanches in the last 2 days. Generally the avalanche danger is less at lower elevations, but a few areas of localized cross loading and leeward wind loading may exist. Today was sunny with temps in the low to mid 30's and W-NW 5-15mph. New snow - 0"

2/5/13 -
The avalanche danger is **MODERATE** in steep, wind-loaded terrain at middle and upper elevations where it remains possible to trigger wind slabs created last week. On slopes without recent deposits of wind-drifted snow, the avalanche danger is **LOW**. At lower elevations, the danger is rated **LOW** but wet avalanches are possible on very steep slopes where the snowpack is thin.
More of the same. No new snow, mild temps and hard wind slabs on upper elevation W-S-E aspects. Today was sunny and warm with valley temps reaching the 40's and upper elevations reaching 30's. Winds were 5-15mph from the NW. New snow - 0"

2/6/13 -

The avalanche danger is **MODERATE** in steep, wind-loaded E-S facing terrain at middle and upper elevations where it remains possible to trigger wind slabs created last week. The avalanche danger is **LOW** on slopes without recent deposits of wind-drifted snow.

Avalanche concerns remain similar. Today had clear skies, temps in the mid 30's and slight winds from the west. New snow - 0"

2/7/13 - 2/12/13:

Long period of high pressure and no snowfall. Danger goes from MODERATE to LOW. Temps were generally mild, ranging from teens to 30's over the week. No significant wind events occurred, and even if they did there was no new snow to move anyway! What this means is that the snowpack generally stabilized over this time. Weak layers and cohesive slab layers slowly healed until the snowpack was generally clear of both of them. But not totally clear. In some upper elevation areas on E-S aspects the old hard wind slab is still present on slopes 40º or more. The are difficult to trigger but could have disastrous results so we must not forget about them. New snow - 0"

changing to:
2/13/13 -

The avalanche danger is **LOW** this morning, human-triggered avalanches are unlikely on most slopes. Maintain safe travel protocols and be alert for isolated avalanche dangers. The possibility of small human triggered avalanches will increase this afternoon and the danger will rise to **MODERATE** at upper elevations as 2-3 inches of new snow is drifted onto the lee side of ridgelines. On sheltered mid-elevation slopes the snow surface is weak enough that small point releases, or 'sluffs' are possible on very steep slopes.

Upper elevations along the northern edge of the Sawtooth's picked up maybe and inch of snow as the first low pressure system in over 2 weeks moved in. Temps today were in the high 20's and low 30's, with bluebird conditions and gusty variable winds. New snow - 1"-3"

The next month (2/13-3/13) of the snowpack, I simply included the danger rating and description found on the Sawtooth Avalanche Center's (SAC) advisory page for each day. While I tracked the patterns of the snowpack and presented them in great detail up until 2/13/12, for the last month I continue to follow the snowpack, only I will not include a detailed report. The snowpack has set up well, and it lacks any significant weak layers or avalanche threats. From here on the danger rating and description provided by the SAC will be sufficient to give the reader an understanding of what's going on in the snowpack.

12/14/13 -

The avalanche danger is **LOW**; human-triggered avalanches are unlikely on most slopes. Maintain safe travel protocols and be alert for isolated avalanche dangers. Old hard slabs persist in the alpine, avoid them on steep slopes where they rest on very weak older snow. On sheltered mid-elevation slopes the snow surface is weak enough that small point releases, or 'sluffs' are possible on very steep slopes.

2/15/13 -
The avalanche danger is **LOW**; human-triggered avalanches are unlikely on most slopes. Maintain safe travel protocols and be alert for isolated avalanche dangers. At upper elevations, avoid steep slopes where old hardslabs sit on sugary facets. At mid elevations, the cohesion-less surface snow may sluff on very steep, shaded slopes.

2/16/13 -

The avalanche danger is **LOW**; human-triggered avalanches are unlikely on most slopes. Maintain safe travel protocols and be alert for isolated dangers. At upper elevations, avoid steep slopes where old hardslabs sit on sugary facets. At mid elevations, the cohesion-less surface snow may sluff on very steep, shaded slopes.

2/17/13 -

New snowfall and strong variable winds overnight have created wind slabs, resulting in a **MODERATE** avalanche danger in exposed terrain. While not large, the fresh wind slabs overly a slick frozen surface on many slopes and will be sensitive to human triggers. Terrain without recent wind deposits has a **LOW** danger.

2/18/13 -

The avalanche danger is **MODERATE** on steep slopes with fresh deposits of wind-drifted snow. These conditions will be most widespread near upper elevation ridgelines and isolated to more exposed terrain at mid-elevations. Natural and human-triggered loose snow avalanches are also possible today on and below very steep slopes.

2/19/13 -

Moderate SE winds have transported low density snow that fell this weekend and created wind slabs, resulting in a **MODERATE** avalanche danger in exposed wind-loaded terrain. Continued moderate winds and possible additional snowfall today may increase the size and distribution of the soft, shallow wind slabs and cause the avalanche danger to rise during the day. Terrain without recent wind deposits has a **LOW** danger, but you may be able to trigger loose snow sluffs on very steep slopes.
2/20/13 -

The avalanche danger is **MODERATE** on upper elevation slopes and human triggered avalanches will be possible on steeper slopes where yesterday's winds formed new drifts and slabs. The avalanche danger is **LOW** in areas sheltered from the wind. Maintain safe travel protocols and be alert for isolated avalanche dangers in very steep terrain.

2/21/13 -

The avalanche danger is **MODERATE** on steep alpine slopes where it remains possible to trigger small slab avalanches on the lee side of exposed ridgelines. These slabs are made of dense wind deposited snow, are moderately reactive to human triggers, and potentially dangerous in consequential terrain. The danger is **LOW** at lower elevations, and/or on slopes without recent wind loading.

2/22/13 -

The avalanche danger is **LOW**; human-triggered avalanches are unlikely on most slopes. Maintain safe travel protocols and be alert for isolated avalanche dangers, such as thin wind slabs near upper-elevation ridgelines and sluffing on steep, shaded slopes. The avalanche danger will rise overnight if the storm develops as forecast.

2/23/13 -

Fresh snow and gusty, moderate to strong winds have created a **CONSIDERABLE** avalanche danger on wind-loaded slopes. Skiers and riders are likely to trigger 6"-2 foot thick, soft and hard wind slabs in exposed terrain and may observe natural avalanche activity, especially in alpine areas. Weaknesses are likely to exist within the new snow and the growing slabs are forming on a snow surface that varied dramatically over short distances, making stability patterns difficult to discern. Exercise caution in and below avalanche terrain. Slopes that are both not receiving wind-transported snow and are not beneath wind-loaded slopes have a **MODERATE** danger.

2/24/13 -

The avalanche danger is **CONSIDERABLE** at mid and upper elevations, where multiple avalanche problems are creating dangerous avalanche conditions. Powerful winds the past 24 hours have formed unstable wind slabs a foot or more thick in wind-exposed terrain. On many slopes without fresh wind-loading, a persistent slab has developed; this slab is 10" or more thick and sitting on a thin layer of facets or facets around a crust. Natural and triggered sluffs also pose a danger on very steep shaded slopes without wind slabs or persistent slabs.

2/25/13 -


Recently formed wind slabs and expected snow and wind today are creating a **CONSIDERABLE** avalanche danger in steep, wind-loaded upper elevation terrain and a **MODERATE** danger at middle elevations. Skiers and riders may trigger wind pillows, especially where the slabs approach or exceed 1' thick and are stiff. The majority of the slabs are located on E through S aspects immediately below ridgelines but isolated cross-loaded pockets exist near terrain features lower on slopes. In steep terrain not loaded by recent winds, you may be able to trigger loose snow avalanches, or sluffs, involving the new snow and weak faceted snow beneath it. Near Banner Summit, recent storm snow is forming a soft slab in sheltered areas and may overload weak faceted snow beneath it, creating a **MODERATE** danger on all slopes.

**2/26/13** -

Recently formed wind slabs are creating a **CONSIDERABLE** avalanche danger in steep, wind-loaded upper elevation terrain and a **MODERATE** danger at middle elevations. Skiers and riders may trigger wind pillows, especially where the slabs are approaching or exceeding 1' thick and are stiff. The majority of the slabs are located on E through S aspects immediately below ridgelines but isolated cross-loaded pockets exist near terrain features lower on slopes. In steep terrain not affected by recent winds, you may be able to trigger loose snow avalanches, or sluffs, involving the new snow and weak faceted snow beneath it. Near Banner Summit, recent storm snow is forming a soft slab in sheltered areas and may overload weak faceted snow beneath it, creating a **MODERATE** danger on all slopes.

**2/27/13** -

A **CONSIDERABLE** avalanche danger exists on steep, obviously wind-loaded upper elevation terrain features. Skiers and riders will be able to trigger small, but potentially dangerous slabs directly below ridgelines and along the lee side of 'flutes' and gullies. This scenario is more likely on E through S aspects. There is a **MODERATE** danger on sheltered slopes where recent storm snow has formed a soft slab above older faceted snow.

**2/28/13** -

A **CONSIDERABLE** avalanche exists in steep, wind-loaded terrain where it remains possible for skiers and riders to trigger wind affected snow that is sitting on weak, faceted layers. This scenario is especially prevalent on E-S aspects where the slabs are dense and a foot or more in depth. There is a **MODERATE** danger on sheltered slopes over 38 degrees where recent storm snow has formed a soft slab above older faceted snow.

**3/1/13** -
The avalanche danger is **MODERATE** at mid and upper elevations, where several avalanche problems exist. On many slopes, shallow slabs comprised of recent storm snow or wind-drifted snow are sitting on weak layers of faceted snow; these slabs may be unstable on slopes steeper than about 35 degrees, especially where they're a foot or more thick. The danger of wet snow avalanches will increase on and below steep sunny slopes.

3/2/13 -

The avalanche danger is **MODERATE**; several avalanche problems exist. At mid and upper elevations, shallow slabs comprised of recent storm snow or wind-drifted snow are sitting on weak layers of faceted snow or facets around crusts; these slabs may be unstable on slopes steeper than about 35 degrees, especially where they're a foot or more deep. At all elevations the danger of wet snow avalanches will increase through the day on and below steep, sunny slopes.

3/3/13 -

The avalanche danger is **CONSIDERABLE** at upper elevations where fresh winds slabs formed overnight. These shallow slabs are overlying a variable snowpack consisting of recent storm snow, older stabilizing wind slabs, faceted snow, and crusts. At middle and lower elevations, last night's snowfall will continue to make it possible to trigger soft slabs involving previous storms' snow and a **MODERATE** danger exists. Sizable loose snow avalanches, or sluffs, are possible in steep terrain, especially this afternoon on sunny slopes that are sheltered from the wind.

3/4/13 -

The avalanche danger is **CONSIDERABLE** on leeward, upper elevation slopes and **MODERATE** elsewhere. On slopes steeper than about 35 degrees, it is possible to trigger shallow soft slabs consisting of fresh deposits of wind-drifted snow or older slabs sitting on weak layers of facets or facets around crusts. Loose snow avalanches are also possible on very steep, shaded slopes.

3/5/13 -
The avalanche danger is **CONSIDERABLE** in recently wind-loaded upper elevation terrain. A natural avalanche cycle occurred Sunday and slabs remain suspect, especially on alpine E-SE slopes in the southern Sawtooths. All other steep, exposed terrain has a **MODERATE** danger as it is possible to trigger recently deposited wind slabs or wind slabs from February storms that overly weak faceted snow or slick crusts.

3/6/13 -

The avalanche danger will rise to **CONSIDERABLE** in wind loaded terrain as new snow is deposited on leeward slopes. New wind slabs will easily slide off of slick crusts in the alpine and a recent natural avalanche cycle on mid and upper elevation E-SE slopes suggests that human triggered avalanches will be likely today if these aspects are rapidly loaded. There is a **MODERATE** danger on steep sheltered slopes where 4 or more inches of new snow sits on weak, faceted snow.

3/7/13 -

The avalanche danger is **CONSIDERABLE** in recently wind loaded terrain. Human triggered avalanches are likely where a foot or more of dense new snow rests on top of weak faceted snow (W-N-E aspects), crust/facet combinations (E-S aspects), and on slick bed surfaces in steep alpine terrain. The danger is **MODERATE** on slopes sheltered from the wind, but it is possible to trigger soft slabs on steep 'roll-overs' and/or pronounced terrain features.

3/8/13 -

The avalanche danger is **MODERATE** at mid and upper elevations. Conditions are complex and variable, requiring careful route-finding and conservative decision-making. The primary dangers are slabs composed of storm snow and wind-blown snow that are sitting on persistently weak layers. Unstable wind slabs also exist, and wet loose avalanches may be possible on the steepest, most sun-exposed slopes this afternoon.

3/9/13 -
The avalanche danger is **MODERATE** at mid and upper elevations. Human-triggered avalanches are possible on shaded slopes steeper than about 35 degrees where slabs a foot or more thick sit on facets or facet/crust combinations. Natural and triggered wet loose avalanches are possible on and below steep, sun-exposed slopes this afternoon. In wind-exposed terrain, some recently-formed wind slabs remain unstable.

3/10/13 -

The avalanche danger is **MODERATE** at mid and upper elevations. Human-triggered avalanches are possible on shaded slopes steeper than about 35 degrees where slabs 10-20 inches thick sit on sugary facets or facet/crust combinations. Natural and triggered wet loose avalanches are possible on and below steep, sun-exposed slopes this afternoon. In wind-exposed terrain, some soft, shallow wind slabs remain unstable.

3/11/13 -

The avalanche danger is **MODERATE** at mid and upper elevations. Human-triggered avalanches are possible on slopes steeper than about 35 degrees where 1-2’ thick soft slabs overly weak facets or facet/crust combinations. In wind-exposed terrain, some soft, shallow wind slabs remain unstable.

3/12/13 -

The avalanche danger is **MODERATE** at middle and upper elevations, and several types of human triggered avalanches are possible today. Lack of a hard freeze overnight and strong sun and elevated temperatures will increase the wet loose avalanche hazard, especially on the shaded margins of easterly and westerly facing slopes. It continues to be possible to trigger a 1-2’ deep persistent slab in steep middle elevation W-N-E terrain, and thin wind slabs created on Monday may remain unstable on isolated slopes.

While this snowpack profile only goes until March 12th, I will continue to analyze snow conditions, checking the Sawtooth Avalanche Center forecast every day until my departure date.
Expedition Itinerary:

Day 1: Park at Beaver Creek Trailhead (NF Access Rd) outside of Sawtooth City. Ski up creek basin pulling sleds. Cache 6 days of food and sleds on ridge before Johnson Creek. Make camp across the river. 8-9 miles accounting for route finding.

Day 2: Take 4 days food, packs only and ski to Marshalls peak. Make camp in the basin to the north of the peak. Ski Marshalls peak 9,680 ft. 6 miles estimate, accounting for route finding.

Day 3: Ski Paradise Peak 9,720 ft. 8 mile round trip estimate, accounting for route finding.

Day 4: Move camp to confluence of Vienna Creek + South Fork Boise River. Ski Two Point Mountain 10,020 ft. 6-8 miles estimate accounting for route finding.

Day 5: Return to Johnson Creek camp and retrieve cache. Take remaining food and move camp to Mattingly Peak. 10-12 miles estimate, accounting for altitude gain and route finding.

Day 6: Ski Mattingly 9,921 ft. 3 miles estimate accounting for altitude gain and route finding.

Day 7: Move camp to Snowyside Mtn. 7 miles estimate accounting for altitude gain and route finding.

Day 8: Ski Snowyside ridge line. 2-10 miles depending on motivation and avalanche danger

Day 9: Move camp to Alice Lake. Ski El Capitan 9,902 ft. 2-3 mile estimate.

Day 10: Ski out to car. 9-12 miles estimate, mostly downhill.

Total milage estimate: 70 miles accounting for route finding and elevation gain.
Contingency Plans

The first and most obvious contingency plan would be to go ahead with Andy Mossey's planned expedition into the San Juan Mountains in southwestern Colorado. Please see Andy's proposal for details of the expedition.

Of course we may get three days into the Sawtooth and decide the avalanche danger is too great, or the weather is not right, and need to turn around. For whatever reason if this happens, we can always spend the 10 days skiing low angle trees at low elevation. Without crossing any of the major ridge lines we can avoid dangerous alpine conditions and stick to safe, moderate, low angle trees. For this we would stick to the ridges near to Alturas Lake, Pettit Lake, Yellow Belly Lake, and Redfish Lake. We could work our way north from bottom of Stanley Basin at Alturas Lake and end up at Redfish Lake, moving camp 7 times along the way.

If a situation arises that prevents me from even getting to the Sawtooth or the San Juans, we will need to take action and take my expedition elsewhere. The way the snowpack has been lining up so far this season does not instill a lot of confidence in me. We may not even go skiing. If this is the case the third contingency plan is to take a rock climbing trip nearby. Starting in Salt Lake City I will head south looking for rock areas that are warm enough and don't have snow. Indian Creek, outside of Moab in Southern Utah will be our first stop. After that we will continue to Red Rocks Nevada. Between those two areas there is more than enough moderate to difficult climbing to keep us challenged for 10 days.
### Risk Management Plan:

<table>
<thead>
<tr>
<th>Hazard/Risk</th>
<th>Frequency</th>
<th>Severity of consequences</th>
<th>Mitigation</th>
<th>Risk after Mitigation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dehydration</td>
<td>High</td>
<td>Medium+</td>
<td>-175ml fuel/ person/ day for melting snow.</td>
<td>Low</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>-Drink more water</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>-carry 2 water bottles</td>
<td></td>
</tr>
<tr>
<td>Frostbite</td>
<td>Medium</td>
<td>High</td>
<td>-Wearing adequate clothing,</td>
<td>Low</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>-staying hydrated, staying in tents during severe weather and/or winds over 30 mph.</td>
<td></td>
</tr>
<tr>
<td>Hypothermia</td>
<td>Low</td>
<td>High</td>
<td>-Stay off frozen bodies of water</td>
<td>Low</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>-If you must cross, move fast and one at a time.</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>-carry hypo kit (see med-kit*)</td>
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</tr>
<tr>
<td>AMS</td>
<td>Medium</td>
<td>Low+</td>
<td>-Ginko Biloba 125mg 2 times/ day</td>
<td>Low</td>
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<td></td>
<td></td>
<td></td>
<td>-Hydrate well</td>
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<td></td>
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<td></td>
<td>- rest if feeling ill, descend to lower altitude</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>-if necessary, Diamox 250mg</td>
<td></td>
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<tr>
<td>Ripped tent</td>
<td>Low</td>
<td>High</td>
<td>-Carry sewing kit with floss for repairs</td>
<td>Low</td>
</tr>
<tr>
<td>Broken stove</td>
<td>Low</td>
<td>High</td>
<td>Carry stove repair kit</td>
<td>Low</td>
</tr>
<tr>
<td>Broken crampon</td>
<td>Low</td>
<td>Medium-</td>
<td>- repair kit</td>
<td>Low</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>- spare crampon parts</td>
<td></td>
</tr>
<tr>
<td>Beacon</td>
<td>Low</td>
<td>High+</td>
<td>- 1 extra beacon for group</td>
<td>Low</td>
</tr>
<tr>
<td>malfunction</td>
<td></td>
<td></td>
<td>- extra batteries</td>
<td></td>
</tr>
<tr>
<td>Situation</td>
<td>Low</td>
<td>Medium</td>
<td>High</td>
<td>Low</td>
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<td>-----------------------------</td>
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<tr>
<td>Broken shovel</td>
<td>Low+</td>
<td>Medium</td>
<td></td>
<td>Low</td>
</tr>
<tr>
<td>- bring extra shovel</td>
<td></td>
<td></td>
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<td></td>
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<tr>
<td>Broken tent pole</td>
<td>Low</td>
<td>Medium-</td>
<td></td>
<td>Low</td>
</tr>
<tr>
<td>- Extra tent pole segments (3) in group</td>
<td></td>
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<tr>
<td>- I will bring a repair kit.</td>
<td></td>
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<tr>
<td>Broken ski</td>
<td>Low</td>
<td>Medium</td>
<td></td>
<td>Low</td>
</tr>
<tr>
<td>- Bring repair kit with</td>
<td></td>
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<tr>
<td>- Duct tape, wire and epoxy</td>
<td></td>
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</tr>
<tr>
<td>Running out of food</td>
<td>Low+</td>
<td>High</td>
<td></td>
<td>Low</td>
</tr>
<tr>
<td>- 1 weeks worth extra food</td>
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<tr>
<td>- 175ml fuel per extra day</td>
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<tr>
<td>Caught out in a storm</td>
<td>Low</td>
<td>High</td>
<td></td>
<td>Low</td>
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<tr>
<td>- Don't leave camp without good visibility.</td>
<td></td>
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<tr>
<td>- Never stray too far from camp</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Trapped by storm no tent</td>
<td>Low</td>
<td>High</td>
<td></td>
<td>Low</td>
</tr>
<tr>
<td>- Practice building snow caves</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Carry Bothy Bag for warmth</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Exhaustion</td>
<td>Medium</td>
<td>High</td>
<td></td>
<td>Low</td>
</tr>
<tr>
<td>- Regimented training schedule for months prior.</td>
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<tr>
<td>- Never push it if team is weak</td>
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<td></td>
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<tr>
<td>- Monitor energy levels, carry energy bars</td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Getting lost</td>
<td>Low</td>
<td>Medium+</td>
<td></td>
<td>Low</td>
</tr>
<tr>
<td>- I will carry topos of all areas</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- I will carry GPS +compass</td>
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<td></td>
<td></td>
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<tr>
<td>- SPOT locator for emergencies</td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Avalanche</td>
<td>Low</td>
<td>High+</td>
<td></td>
<td>Low</td>
</tr>
<tr>
<td>- Evaluate the terrain constantly looking for any terrain traps and possible dangerous slopes.</td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>- Avoid steep shady north facing slopes at high elevation</td>
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<td></td>
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<tr>
<td>- Avoid wind loaded lee slopes</td>
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<td></td>
</tr>
<tr>
<td>- Watch for natural triggers on slopes (rock bands, trees etc)</td>
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</tr>
<tr>
<td>- Carry all the necessary testing gear, dig in-depth pits and hasty pits throughout each day.</td>
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</tr>
<tr>
<td>- Always carry beacon, shovel and probe.</td>
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</tr>
<tr>
<td>- Team practice burial scenarios including multi burial+ single person rescue.</td>
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<tr>
<td>- Check avalanche forecast when available.</td>
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</tr>
<tr>
<td>Wildlife</td>
<td>Medium+</td>
<td>Medium</td>
<td></td>
<td>Low</td>
</tr>
<tr>
<td>- Bury all food 100ft from camp</td>
<td></td>
<td></td>
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<td></td>
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<tr>
<td>- use sleds as covers to keep animals out</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- bear spray</td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>
- avoid animal paths

<table>
<thead>
<tr>
<th>Activity</th>
<th>Level1</th>
<th>Level2</th>
<th>Level3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hunters</td>
<td>Low</td>
<td>Low+</td>
<td></td>
</tr>
<tr>
<td>Personal Injury</td>
<td>Low</td>
<td>High</td>
<td></td>
</tr>
<tr>
<td>Broken Leg</td>
<td>Low</td>
<td>High+</td>
<td></td>
</tr>
<tr>
<td>Injured Knee</td>
<td>Low+</td>
<td>High</td>
<td></td>
</tr>
<tr>
<td>Sunburn</td>
<td>High</td>
<td>Medium</td>
<td></td>
</tr>
<tr>
<td>Hypoglycemia</td>
<td>Medium</td>
<td>High</td>
<td></td>
</tr>
<tr>
<td>Blisters</td>
<td>Medium</td>
<td>Medium</td>
<td></td>
</tr>
<tr>
<td>Losing maps</td>
<td>Low</td>
<td>Medium</td>
<td></td>
</tr>
<tr>
<td>Snow blindness</td>
<td>Low</td>
<td>High</td>
<td></td>
</tr>
<tr>
<td>Nausea</td>
<td>Low</td>
<td>Medium</td>
<td></td>
</tr>
<tr>
<td>Trench Foot</td>
<td>Low</td>
<td>High</td>
<td></td>
</tr>
<tr>
<td>Separated from</td>
<td>Low</td>
<td>High</td>
<td></td>
</tr>
</tbody>
</table>

-wolf hunting season until March 31.
-wear some bright colors at all times
-I am WEMT certified
-carry med-kit
- exercise caution at all times
-no jumps, belay down tricky sections
-no difficult stuff when tired (late in day)
-no difficult stuff when tired (late in day) (when injuries most often happen)
-belay difficult sections
- ample sunscreen use
- wear hat with bandana neck cover
- carry emergency rations
- snack + hydrate well throughout day
- eat regular meals (>3000 cal/day)
- carry blister kit
- treat hot spots immediately
- each member carries copies
- wear glacier goggles
- carry anti-nausea medication
- thoroughly cook food
- wear dry socks at night
- keep feet as dry as possible
- never leave camp alone
- carry 2-way radios
Training and Conditioning Plan:

General:
-Discipline specific: climbing, skinning and skiing all winter.
-Cross training: rock gym climbing, ice climbing (goal of leading ice routes).
-I will be on a 24 day mountaineering expedition to Ecuador to climb volcanoes up to 20,000ft. This will help with acclimatization.

Weekly routine:

Mondays: Rock Gym workout: 1hr
- traverse the walls as many times as I can in a row before falling off.
- 21's - 3 sets of 7: pull ups, sit ups, push ups.
- traverse walls
- abs - 1 minute planks x2, leg raises (2 sets of 10)
- traverse walls

Tuesdays: Legs: 1.5 hr
- squats (3 sets of 10 reps) 100lbs
- hamstring raises (3 sets of 8 reps) 70lbs
- Bosu Ball - single leg squats (3 sets of 10) -both legs
- box - 3 sets of: 10 controlled jumps immediately followed by 10 rapid jumps
- 1 minute wall sits holding 45lb weight - x3

Wednesdays: *2 mile run*

Thursdays: Rock Gym workout: 1hr
- traverse the walls as many times as I can in a row before falling off.
- 21's - 3 sets of 7: pull ups, sit ups, push ups.
- traverse
- abs - 1 minute planks x2, leg raises (2 sets of 10)
- traverse

Fridays: Legs: 1.5 hr
- squats (3 sets of 10 reps) 100lbs
- hamstring raises (3 sets of 8 reps) 70lbs
- Bosu Ball - single leg squats (3 sets of 10) -both legs
- box - 3 sets of: 10 controlled jumps immediately followed by 10 rapid jumps
- 1 minute wall sits holding 45lb weight - x3

Saturdays: OFF

Sundays: *2 mile run*

During the months leading up to the trip I pledge to either ski or ice climb at least 1 day per week. These days can replace any workout day without interrupting the routine. Any climb or training hike can also replace a workout day.

**Team Bios:**

The team members are myself, expedition leader, skiing with Andy Mossey, friend, fellow climber and skier. Andy and I have skied all across the country together for four years dating back to a January 09 trip to Utah. We have skied powder in Utah, 14,000ft peaks in Colorado, and been rock climbing partners for three years. Andy brings a wealth of technical knowledge and an organized way of looking at climbing, he double checks everything and is one of the people I trust most in the mountains. Then, when he slides down the mountain, on a snowboard or fatty skis, he morphs into a backcountry powder surfer. We have over 100 backcountry days together skiing, rock climbing, hiking, mountaineering, and exploring. He is one of my most trusted backcountry partners.

**Cedar Davidson:** I have been skiing my whole life. As a boy I cross-country skied until I met the snowboard in 5th grade. I snowboarded for 3 years which I liked all right. Then one day I swapped gear with a friend and rode telemark skis for the first time in 8th grade. I was immediately hooked, and now it is a thirst I can never quench. I spent the winter of 2010 in Utah living in Salt Lake City and skiing in the canyons nearby. During that winter Andy and I planned and executed our sophomore expedition in the Lone Peak Wilderness of Utah. The following winter, we both picked up and moved to Durango Colorado to live and ski. During the spring 2011 semester I completed an IWLS semester in Alaska. Since the spring of 2012 I have been working as an instructor and guide for Alaska Mountain Guides and IWLS. I recently facilitated and led a 24 day IWLS Mountaineering Course in Ecuador.

**Climbing Experience:**
- 4 years climbing (NY, CA, NV, ME, NH, VT)
- Grey's Peak, CO w/ ski descent (14,278ft)
- Mt Quandry, CO w/ ski descent (14,271ft)
- Mt Shasta, CA w/ ski descent (14,179ft)
- Mt Hood, OR w/ ski descent (11,250ft)

**Ecuador:**
- Rucu Pichincha, (15,696ft)
- Illiniza Norte (16,816ft)
- Nevado Cayembe (18,996ft)

**Alaska:**
- Flower Mountain
- Boy Scout Peak
- Mt Kashagnack

**Certifications:**
- Alaska Wilderness Emergency Medical Technician (WEMT)
- Leave No Trace (LNT) certified.

**Andy Mossey:**

Andy began his climbing career here with the EXP department in Plattsburgh. In 2009 he travelled to Utah with the EXP 386 Backcountry Day Touring Process and skied the backcountry outside Salt Lake for 7 days. That same year he went to Oregon for a week for EXP 387 Multi-day Backcountry Touring and climbed and skied in the Sisters Wilderness Area in the Cascades. Then in 2010 Andy and I met up in Colorado with the EXP 388 Ski Mountaineering Process where we proceeded to climb and ski several of Colorado's 14,000ft peaks. He has extensive rock and ice climbing experience as well as skiing experience. Below is a bio written by Andy followed by a list of his notable accomplishments:

"My skiing experience has flourished since my introduction to backcountry skiing in the 2008 and 2009 winter. Since then, I have skied in Oregon, Utah, California, and Colorado. During those trips backcountry skiing was my main focus, always avoiding long lift lines, I prefer the solitude of the wilderness. This love has pushed me to ski with Cedar as much as possible, leading to our sophomore expedition in Utah. During the 2010 to 2011 season I fled the east and lived and skied in Colorado, exploring the great Weminuche Wilderness, within the San Juan Forest. This exposure to the San Juan Mountains was intoxicating and a deep love for this place will forever be in my heart.

Beyond skiing I have worked as a snowboard instructor and ran the mountain biking program at Camp Laurel, Maine. While working in Maine I gained my Wilderness First Aid (WFA) certification through SOLO. This past winter season I earned a Wilderness First Responder (WFR) certification through SOLO. During the spring I led the ski process class in Salt Lake City, Utah in backcountry skiing endeavors. I helped teach level one avalanche material and was able to plan course curriculum to teach students beacon skill training, avalanche pit procedure and navigating avalanche terrain."
Notable Climbs and Ski Descents:
- Broken Top Mountain, OR with ski descent
- South Sister Mountain, OR with ski descent
- Mt Quandry, CO with ski descent
- Grey's Peak, CO with ski descent
- Ski touring in UT, CO, OR, VT
- Four years of rock and ice climbing in NY, NH, ME, CO, UT, NV, CA.
- NV: Red Rock Canyon, Birdland & Cat in the Hat.
- UT: Indian Creek
- CA: Joshua Tree
- CO: North Table Mountain, Eldorado Canyon, East Animas Crag
- NY: The start of my climbing life

Certifications
- Wilderness First Responder (WFR), LNT
Meal Plan:

Food is important. "You are what you eat" is how the saying goes, and it is very important to eat well in the backcountry. On an expedition like this your body will be working hard climbing and skiing during the trip. Add that to how much work your body does just to keep itself warm in the colder temperatures and higher altitudes. These added stresses increase the total number of calories your body needs to take in order too break even. On an average day with mild exercise and regular stresses your body needs to take in around 2,000 calories. During an expedition like this that number should be roughly doubled; 3,000-4,000 calories a day is what I planned for. The following is a breakdown of our expedition menu. Meals are consumed based on perishability as well as weight and volume. Eat your big and heavy meals first, eat your fast food on days when you need to maximize efficiency.

Breakfasts:
- Instant oats (6 days): 1 pkg. = 142cal.
  - 1 meal = 4 pkgs. = **568cal**
- bagels and cc (3 days): 1 bagel = 270cal. 2 oz. cc=200cal.
  - 1 meal = 2 bagels w/ cc = **940cal**
- Pancakes + syrup (1 day): 2/3cup mix= 300cal. 1/2cup syrup= 420cal.
  - 1 meal >= **1,000cal**

Lunches:
- tuna+cheese wraps(2 days): 1 can tuna=150cal. 2 onces cheese= 200cal.1 wrap=200cal.
  - 1 meal - 2 wraps, 2 servings cheese, 1 tuna can= **1,000cal**
- bagels w/ cheese + summer sausage (3 days): 1 bagel= 270cal. 2 oz. cheese= 200cal. 1 serv. sausage= 200cal.
  - 1 meal - 2 bagels, 2 serv. cheese, 2 serv. sausage= **1,340 cal**
- Travel lunches (5 days) - 1 meal = **1,380cal** (avg)
  - random combination of 6 bars from the following:
    - Snickers - 280cal
    - Nature Valley cashew - 210cal
    - Nature Valley honey oats - 180cal
    - Nature Valley trail mix - 180 cal
    - M+M's - 200cal
    - Cliff Bars - 240cal
    - Powerbar ProtienPlus - 300cal

Dinners:
- pasta w/ red sauce (1 days): 1 lb pasta - 700cal, tomato paste - 150cal, onion - 50cal, 2 tomatos - 50cal , 1 green pepper - 30cal, 1/2 stick butter - 400cal.
  - 1 meal= roughly **1,400cal**
- chili-mac (3 days): 1 box mac-625cal. 1 can chili - 330cal, 1/2 stick butter - 400cal
  - 1 meal = **1,350cal**
- pasta/rice Sides - 1 pkg./person (3 days): 1 pkg.= 700cal, 1/2 stick butter - 400cal
-1 meal = **1,300cal**
  • burritos (2 days): 1 wrap= 200cal. 1 cup beans= 230 cal. 3 oz. cheese= 300cal. 1 can chicken=100cal
  -1 meal = 2 wraps= at least **1,600cal**
  • Thanksgiving (1 day): 2 cup Dehydrated mashed potatoes - 750cal, 1.5 cup dehydrated stuffing - 300cal, 2 cup dried cranberries 340cal,1 can chicken - 100cal, 1 cup dehydrated gravy - 180cal.
  - 1 meal = **1,970cal**

Spice Kit: pepper, salt, mrs dash, garlic salt, tabasco sauce, 1 lb butter.

**Equipment:**
- Mt helmet
- leather gloves
- BD ski gloves
- Smith Goggles
- BD Liner gloves
- Patagonia GoreTex jacket
- OR light puffy
- Big Marmot puffy
- North Face GoreTex snow pants
- Garmont ski boots
- Skis: BD Amperage
- BD skins
- BD poles (duct tape wraps)
- BD kicker skins
- BCA avalanche transceiver
- G3 shovel
- BD 300cm probe
- BD snow saw
- BD mountain axe
- Grivel crampons
- OR gaiters
- avy kit - buy $100
- Sunnto compass
- maps (3)
- Bora 95L pack
- BD Mountaineering harness
- Edelweiss 30M dry rope
- texas kick set up (waist + leg prussics)
- 1 cordelette+ 4 assorted slings + 4 lockers for anchors

**Personal gear:**
- sun cap
- buff
- sunglasses (Julbo Explorers)+extra
- warm Dakine hat
- sunscreen
- base top x2
- base bottom x2
- wool socks x4
- Sierra Designs micro puffy
- Stoic mid layer
- headlamp x2
- water bottles x2
- soft shell pants
- fair-share+utensil
- waterproof notebook
- pencils
- fire-starter kit
- leatherman
- Mountain Hardware 15º sleeping bag
- sleeping mats x2
- extra batteries (AA, AAA)
- lip balm
- camera
- 2 plastic sleds - *buy = $30
- 2 duffles for sleds
- cord to tie sleds (cordellete)
- 4 ft pvc pipe x4 (1/2 inch) *buy =$20

**Team:**
• pot set
• wooden spoon
• hand sanitizer
• lighters
• trash bags (use recycled bags from dinners)
• wag bags (2/person) + badbag dry bag
• snow pickets + slings (4)
• repair kit
• Alpine Rack (BD .75,1 + stoppers 5-10, 3 pitons)
• 4 season Hilleberg tent (3 man)
• dead man anchors
• Whisperlite stove+extra stove+pump
• stove repair kit
• fuel bottles (4)
• water purifying (chlorine drops)
• SPOT locator beacon

Budget:

Team:
Food: $300
Emergency cash: $100

Personal:
Insurance: $58 (Travel Guard quote ID# 62094902)
New gear: $150

Team: $400
Personal: $208
Total = $608
Expedition Goals: Personal and Professional:

"It is not the destination that matters, but the journey you took getting there." - Anonymus

At its very core this expedition is simply a ski trip shared among friends. My personal goals are simple; a safe return and a fun time.

With that being said, this expedition and its planning are essential parts of my development as a guide. From day one in the EXP program we start to learn the skills needed to succeed in the outdoor industry. The senior expedition is a time to put those skills to the test. Writing a risk management plan for myself is something I have never been asked to do before. Now, as I take my first steps into the Sawtooth backcountry I will be analyzing it, determining risk factors and preparing for the worst. I am the leader on this expedition, a role I will undertake as a guide as well. As a leader I need to constantly manage risk, assessing each situation, identifying potential hazards and playing out worst case scenarios and planning a course of action if such a scenario did come to pass. This is a role I look forward to having on this expedition. So far in my experience, when I am doing this I tend to become withdrawn from the present, and I find myself not enjoying myself as much as I could. A goal of mine on this expedition is to practice balancing risk management while still keeping myself in the moment enough to enjoy myself out their in the wilderness.

This trip is the culmination of 4 years of work here at Plattsburgh State and even more in my life. While I have been skiing my whole life, this offers a unique platform for me to experience skiing. I
have taken courses in avalanche safety and ski mountaineering. I have practiced my skills and tested them in the field. Now it is time for the end all, the grande finale, the senior expedition. This trip will help solidify my mountain skills and be a real test of how well I can plan and lead a trip. In a sense it is my test to pass Expeditionary Studies. It will be a chance for me to prove to myself I can do it, and I can be a leader in the outdoor industry.

As a guide I want to share my love and knowledge of the outdoors with my clients. I want them to walk away as stoked as I am. A big part of making that happen is getting the clients home safely. The planning phase of this expedition has given me lots of time to reflect on guiding. As I start to prepare to become a guide I have discovered many of the skills that go into such a thing. Some of these skills are "soft" skills; conflict resolution and the ability to make your clients laugh. Others are "technical" skills; placing protection to protect your follower if they were to fall and top belaying off a snow anchor with a munter. Both the soft and the technical skills are important to master as a guide, and this trip gives me a chance to perfect some of my technical skills. While my teammate is just as skilled as I in mountain travel, I plan to "practice my guiding" on him. Some of the alpine peaks in the Sawtooth require leading mixed rock, snow and ice routes to attain the summit. My goal is to solidify my protection placements, anchor building, belay techniques, and improve my efficiency and speed on route.

I'm not here make a name for myself in the industry. I'm not hunting for big lines (skier lingo for skiing difficult terrain) to prove myself. I'm not promoting myself for financial gain. That is not what this trip is about. This trip is about skiing and being in the mountains and feeling their energy with my friends. It is about personal pride in the skills I have learned during my college education. It is about getting out there and just doing it. The idea that I can plan and lead a personal ski trip as my senior thesis is incredible to me. I love it. I am proud to be an EXP student and this trip will be my last as one. It holds a certain bittersweet taste. All the above mentioned reasons, pride, joy, fun will be felt. But I also feel how this is the last call. Once this is over and done with, it will be time to move on with my life. I have a job starting in June, and I need to be ready for it. This is a stepping stone for me, a
transition period in my life. While this is what I have been waiting for, and its all happening now, I still
feel a twang in my heart. The Expeditionary Studies family has been my life for the last four years. I
have been given amazing opportunities to travel and do what I love, and I will never forget everyone
who helped me get here.

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