Life in the Range of Light: Reaching New Heights

A Senior Expedition Proposal Submitted by

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There have been so many people who have helped shape me, and as a result, this expedition. I would like to take a moment to acknowledge and thank them.

To the staff and instructors of the Expeditionary Studies department: The dedication to your students is unparalleled and remarkable. You have all helped instill confidence, trust and responsibility in everyone who has been lucky enough to come through this department. The quality of your instruction and the quality of your character inspires and drives us to achieve a level of excellence I truly believe would not be matched otherwise.

To my friends and fellow students: It has been an honor and a privilege to share in these experiences with all of you. The friendships and the resultant memories that I have come to treasure are not taken for granted. Here’s to future trips to incredible places with equally incredible people.

And finally, to my Family: The unconditional love and support that I have received from you my entire life, especially during the times where I was lost and unsure of my potential and future, is a gift that I will forever be thankful for. Words cannot do justice to the depth of gratitude and love I feel for you. You are my rock, my home, my world. I love you with my entire being.
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Abstract

The following expedition proposal created and submitted by myself, Aaron Friedland, with input from my expedition partner Aaron Stone, is a compilation of all the research, as well as a clarification of the intentions and goals of our team during an extended backcountry-climbing trip to California’s Sierra Nevada mountain range. This plan is in accordance to the guidelines, rules and ethics established by SUNY Plattsburgh’s Expeditionary Studies (EXP) program. Included in this proposal is a detailed explanation of our goals, theories and methods.

This is the senior capstone course that puts all of our learning into practice in the form of an unsupported student planned and led expedition. However, beyond the surface level motivation to complete the course requirements and obtain our bachelor’s degree, this expedition is a manifestation of our desire to build our skills, gain practical, hands-on experience and further our professional development.
Introduction

“Mountains are not stadiums where I satisfy my ambition to achieve, they are the cathedrals where I practice my religion.” — Anatoli Boukreev

There is something odd about the way we are as humans. We both prize and fear that which does not fit the mold of the usual, the familiar or the expected. We constantly encourage our children, friends and family to “follow their dreams,” but, more often than not, are critical when they do. As a result, it seems as if the “dreams” we pursue have become narrowed to fit a range of acceptability. Anyone who toes, or flat out ignores this spectrum of the suitable is inevitably viewed differently. The two most common reactions I have come across ever since my fateful decision to abandon my quest for a “respectable” business degree and instead become a “mountain man,” are complete opposites. There is either an instant spark of delight, akin to seeing a mythical beast long thought to be imaginary, followed by a barrage of enthusiastic questions, or a confused and skeptical furrow of the brow accompanied by a palpable feeling of dismissal. Far and few between are there any different responses.

Truthfully, I wouldn’t have it any other way. After only one semester of my previous life in business I knew it was something I would never feel a fire for, nothing I would ever come to internalize as an essential component of my being. However, I was able to delude myself that it would get better and that even if I wasn’t passionate about it, the high paying job I could eventually get would be enough of a carrot at the end of the stick. It took two long, frustrating and expensive (sorry Madre and Padre!!) years before I finally was able to be honest with myself.

This is why I have no problem with my perceived status as either the unicorn, or the weirdo. All the mistakes, self-deceit, and frustration that I have experienced have ended up being the catalyst for finding something more than simply a means to an end. I have experienced the transformative power that wilderness holds, and I have made damn sure to hold onto it.
The Expeditionary Studies program is truly a unique opportunity. It was founded by a man (Dr. Larry Soroka) who also believes in the value and the power of the experiences to be had in the backcountry, and has come to be staffed by professionals of the highest caliber including distinguished mountain guides Casey and Sarah Henley, master of all things watersports Steve Maynard and Dr. Soroka himself. Students in the EXP program are expected to hold themselves to the high standards of their instructors in the entirety of their education.

Sometimes, it is difficult to impart upon others, especially those who are foreign to the types of outdoor pursuits we aim to achieve excellence in, just how much commitment, drive and responsibility is veiled behind the enjoyable nature of these activities. Mistakes come at a high cost in climbing, backcountry skiing and paddle sports. Even under the safest conditions, serious injury or death to us, or our future clients is a possibility. To help prepare and impart upon us all the tools that will keep us and the people under our charge as safe as possible, classes focus upon the physical, psychological, technical and tactical techniques and skills that are essential in our professional pursuits.

The following expedition that I have painstakingly researched, planned and prepared for, is the culmination of all this effort on mine, my partner and my professors’ behalf. This is the proving ground, the opportunity to put all of the judgment, logistical and technical skills we have been learning and acquiring over the duration of our time in EXP into practice. This expedition is meant to be challenging physically and emotionally, building practical experience in safety and self-reliance, all while pushing the limits of what we believe we are capable of. This is the first step in our transition from the academic to the professional world. It is the beginning of a life of powerful connections, experiences and achievements; the beginning of life driven by passion. As John Muir famously stated, “the mountains are calling and I must go.”
Senior Expedition Guidelines

Our expedition into Muir’s beloved “Range of Light” is more than just a personally motivated undertaking; it is the culmination of our academic and technical education during our time with the EXP program. Therefore, it must meet certain standards to satisfy a standardized curriculum, but more importantly, it must live up to the values and expectations that have been at the core of our education.

Follow Leave No Trace Ethics

Any time we venture into the backcountry, one of the most enticing aspects about the experience is entering into an area that is pristine, where the presence of others cannot be felt and nature is as unimpeded as possible. “Leave No Trace” (LNT)\(^1\) is a list of “rules” that set forth ethical practices to help preserve the areas we value for their wild properties. LNT ethics include seven main points that promote low-impact use of our wilderness and recreational areas. Aaron and I will adhere to these principles so that we can leave the High Sierra just as wild and beautiful for the person who comes after us. The tenants of the LNT ethic are as follows:

- **Plan Ahead and Prepare**
  - As Benjamin Franklin once said, “If you fail to plan, you are planning to fail!” Planning ahead allows us to gain a deeper understanding and knowledge of the area we intend to immerse ourselves in. I have researched the High Sierra extensively, including subjects such as weather, natural and cultural history, climbing tradition, local ethics, regulations, restrictions and hazards. With this deeper understanding or the region, Aaron and I will be able to travel and climb in accordance with the areas ethics as well as our own. This greatly increases our chances of not only completing our goals, but doing

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so in a way that minimizes our impact to the land, mitigates risk and does not ruffle the
feathers of any locals.

- **Travel and Camp on Durable Surfaces**
  - We will be primarily using backcountry (unestablished) campsites during our expedition.
  
  This means that we will need to pay close attention to this guideline. The alpine is a very
  sensitive environment. Plants that do grow in this biotic zone take a great deal of time
  and energy to flourish and are very fragile. We will therefore take special precautions to
  avoid pitching our tent on any kind of vegetation. The Sierra alpine is primarily a
  landscape dominated by talus, scree and dust, which will make this relatively easy.
  When we do camp near lakes and vegetation, we will observe the minimum distance
  buffer requirements (200’) from all water sources and aim to pitch our tent on a durable
  surface like rock or the non-vegetated ground. We will also be traveling cross-country
  on trail-less terrain. The terrain is a lot of rock-hopping and scrambling so it lends itself
  very well to keeping impact low. All we will have to be careful of is avoiding vegetation
  when we are not scrambling.

- **Dispose of Waste Properly**
  - While catholes are an acceptable means of waste disposal in the Sierra, I intend to use
    WAGS bags as much as possible as the impact to the area is essentially zero. All trash
    will be carried with us and packed out until a proper trash receptacle can be found at or
    near the Whitney Portal Trailhead. All cooking and cleaning “gray water” will be
    properly “broadcast” away from trails, water sources and campsites.

- **Leave What You Find**
• We will be following the “take nothing but pictures, leave nothing but footprints”\(^2\) mantra. All objects, whether natural or man-made, will be left as is (unless we find trash/garbage that someone left behind).

• **Minimize Campfire Impact**

  o There are no fires allowed above 10,000’ in the High Sierra as there are not enough trees to provide sustainable amounts of fuel. As such, we will not be having camp fires, which will certainly minimize our fire impact.

• **Respect Wildlife**

  o There is not a high concentration of animals living at the altitudes we will be at, however, some that we will have to be wary of are marmots, black bears (at lower elevations) and big horn sheep. We will respect this wildlife by avoiding them as much as possible and practicing proper food storage methods.

• **Be Considerate of Other Visitors**

  o As a two person team, Aaron and I will be able to minimize our impact in many ways, especially in regards to affecting others experiences. We both value the calm and solitude of wilderness settings, and as such we will act accordingly. This means not being loud/rowdy at campsites, leaving gear or trash strewn around, or being generally obnoxious. This also applies to when we are climbing. We have to be aware of others who may be on the same route as us. This means climbing safely, not kicking off rocks and allowing faster parties to pass by if the situation calls for it.

**Follow minimalistic equipment ethics**

\(^2\) Originally the motto of the Baltimore Grotto, a caving society. Now a saying synonymous with LNT ethics as a whole.
Minimalistic equipment ethics is essentially what it sounds like. It is the practice of carrying with you the minimum amount of gear and food that will allow you to safely complete your objectives. This is important because it helps reduce weight, conserve energy, increase efficiency and allows us to be self-sufficient.

For our expedition, this is a necessity, not a luxury. We have to be able to carry everything we need in with us while not overloading ourselves. This includes ropes, racks, shelter, clothes, food and sleeping equipment. We will need to be very efficient with packing. Everything we bring should be multi-purpose so that it can be used to complete multiple tasks, instead of bringing items that are so specific they primarily just take up space and add weight to the pack.

Our climbing gear also abides by this rule. We have chosen routes that are able to be free climbed in the “traditional” style. This means that the gear is all removable. We only need to bring a rope and enough gear to safely protect us as we climb the routes under our own power.

**Be unsupported**

We will have no help, no support once we reach the Sierra. We will not have a guide, instructor or anyone else with us. This expedition has been planned with the intention of accepting no outside help and being solely responsible for all our equipment, actions and decisions.

**Advance personal skills**

Our expedition is pretty much one chance to expand our skill and experience set after another. We will be climbing at altitude, using new techniques such as simul-climbing, and climbing on terrain that is much larger and requires a different style of climbing than we are used to in the Adirondacks. We will gain practical experience route finding on long climbs where features are less distinct and require attention and awareness to properly navigate.
On top of these new skills/experiences that we will be incorporating into our repertoire, we will be also be furthering our confidence and ability in the skills we already know such as leading, anchors, rope management, and general efficiency of all systems related to multi-pitch climbing.

Part of our training for this expedition is to practice all the new skills that we will use out in the Sierra, so we will be building our skill set both before and during our expedition. On top of the planned growth in our skills, the mountains are a very dynamic environment and as such, we will be faced with new situations that we will have to respond to in the moment. This will further our judgment and decision making skills as well.

Self-reliance establishing timeframe

On top of the 10-12 days we will be spending out in the backcountry of the Whitney Region of the High Sierra, Aaron and I will also be spending time in the Tuolumne Meadows area beforehand and the Palisades region after the expedition. This will end up being just shy of a month of climbing and traveling in the Sierra. We will have to be totally self-reliant as we are only a two person team. We have to be able to take care of ourselves, our teammate and our equipment/supplies. This will require, discipline, open communication and trust.

Be planned and executed by students

I, (Aaron Friedland) have been the primary planner of this expedition. I received a bit of input from my partner Aaron Stone and of course general feedback from Larry Soroka during the editing process. Aaron and I will be the only ones partaking in the expedition.

Be of sufficient difficulty to make failure a possibility, but sufficiently flexible to allow dangers to be avoided when possible
This expedition certainly is difficult enough to make failure a possibility. We are undertaking an experience that is slightly foreign to us. The routes are bigger, the elevation higher and the commitment is more intense than what is common on the east coast. However, with the acclimatization period in Tuolumne where we will also be able to practice our big mountain skills, combined with the extra days I have worked into the itinerary to accommodate for weather, physical condition and the unknown, I believe that we will have the flexibility and skill to avoid dangers and complete the majority, if not all of our objectives.

**Be outside a familiar area and 100 mile exclusion zone of hometowns and Plattsburgh**

Our expedition is in the High Sierra, an area that neither Aaron nor I have ever been to. The expedition is on the other side of the country, well beyond the 100 mile exclusion zone.

**Be justified based on the nature and explanation of identified outcomes (Goals)**

When planning my expedition, I thought about what I wanted to do first, rather than where I wanted to go. I knew I wanted to climb larger terrain, at a higher altitude, with a high commitment level. At the same time I wanted to practice and become proficient at efficient movement techniques on long alpine multi-pitch routes. I then looked for an area that would allow all those things as well as offer relative stable and safe weather and conditions. My search landed me at the Sierra, which is consistently described as a relatively calm and predictable mountain range that offers exciting and varied climbing. I believe that because I chose the area to fit my goals, the expedition is well justified.

**Exceed 300 level EXP course expeditions in level of challenge and duration**

Our expedition calls for us to spend 10 days at altitude. That alone exceeds the duration and challenge of 300 level courses. Add to that the fact that we will be also spending several days in Tuolumne and the Palisades Region and we are well past the duration requirement. Additionally, we
will be the only ones available to make decisions, lead climbs and carry our gear. I believe we have sufficiently exceeded any requirements involving challenge and duration.

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

The expedition I am going to undertake with Aaron will advance us and add value to our profiles in several ways. We will have become familiar and proficient at a new type/style of climbing, operated at altitude, and utilized new climbing systems/methods that improve efficiency and speed while still remaining safe. The effort and time that I have invested in the planning of this expedition has made me much more capable and confident at planning expeditions in general, which is always useful in the outdoor industry. We will also be adding well-known and classic routes to our climbing portfolios, which convey a certain level of knowledge and skill just from being able to plan and then execute a successful ascent. All of these factors can be very beneficial to adding value and legitimacy to our standing in the adventure industry.

Be completed with a publication or presentation

I have the good fortune of having Aaron as my partner. Aaron is the part owner of his own photography company. Due to this, we will be documenting the trip extensively for the purpose of the general presentation to the EXP community, as well as creating a movie that can be used to tell the story of our experiences to a much wider audience.

We hope to capture the process of an expedition; the planning, the training, the excitement, trials, tribulations, successes and failures. All of these are what make us passionate about what we do, and it is our aim to convey the emotions of the experience. We want to show that goals are achieved as a result of commitment, joy, suffering, perseverance, flexibility, and above all else, teamwork.
CLIMBING SPECIFIC GUIDELINES

Show evidence of additional training

Aaron and I have already created and implemented a training program that builds our physical, psychological, technical and tactical skills. We are keeping track of our workouts and keeping a log that records important factors such as weight, reps, distance, time etc. This is going to help us stay honest as well as provide accountability to make sure we stay on track. Weekly Skype meetings keep us up to date and allow us to get on one another if someone starts slipping behind.

We also have plans to meet up and climb together prior to our expedition. Due to the season, our first few meet-ups will involve ice climb. While this is not the specific activity we will be engaging in in the Sierra, it will allow us chances practice working together on a rope team and staying in synch with each other as climbing partners. As the weather warms and rock is climbable again in the spring, we plan to meet in the Adirondacks to practice techniques such as short roping/simul-climbing, and effective/quick belay transitions on routes as close to alpine style as the Adirondacks have to offer (Case Route at Wallface, The Diagonal at Wallface, The Chapel Pond Slab for example).

Include a minimum of six pitches per day

Our expedition will meet this requirement with ease. The routes that we are planning on climbing are not all pitched out in the traditional sense. Some routes we plan on ascending are 3rd and 4th class alpine scrambles on ridges. While these do not include technical pitches in the traditional sense, they do include thousands of feet of continuous movement over rock, often in highly exposed positions requiring the use of ropes. The routes that do include technical pitches are often longer than 6 pitches in of themselves. The longest route we plan on climbing is 12 pitches long.

Cannot be single pitch, top-roping or bouldering focused
We are going to be climbing long multi-pitch routes up the faces and ridges of mountains in the Sierra Nevada range. These routes are the focus of our expedition.

**Be planned to exceed all requirements in order to allow for partial failure or plan modification**

The itinerary I have created, when averaged out, allows for more than 6 pitches of climbing per day. This combined with the fact that we have built in rest and bad weather days will allow us to modify and adapt plans as necessary. If the conditions are somehow so terrible that climbing is not possible in any region of the Sierra, the proximity of other climbing areas that have drastically different climates will allow for contingency plans to be readily available.
The History of the Sierra: Science, Culture and Tradition

Simply going to an area with the intention of completing a specific goal can be enough to elicit a memorable and meaningful experience. However, I believe that understanding the area on a deeper level, the natural and humanistic history as well as the ethics and traditions of the region, can make an a huge difference in the overall connectivity we feel when in pursuit of our goals. The Sierra Nevada is a land full of natural and cultural history. Every peak and pass holds several stories; the massive chain of geological events that led to their current form, and that of their first discovery, their first ascent and the people who made them. The Sierra has long captivated countless minds with the inherent value of the ranges beauty and diversity. A deeper understanding of the Sierra will allow us to experience the range in a way unobtainable to us if the proper respect and knowledge is not first cultivated.

Today, the Sierra Nevada is a dramatic, imposing chain of mountains that is over 400 miles long and up to 80 miles wide. The Sierra is home to Mt. Whitney, the tallest mountain in the contiguous United States (14,505') and the difference between the highest and lowest points of elevation within the range is a staggering ~14,000'. The Sierra was not always this impressive spine of granite running along the border between California and Nevada, but was a very different region in the past.

The rocks that comprise the modern day Sierra got their start back in the Mesozoic Era, the same time as when dinosaurs walked the earth. During that time, the region in which the Sierra now stands was home to a chain of volcanoes very similar to the present day Cascade volcanic arch that stretches from British Columbia all the way down into northern California. These volcanoes allowed molten rock to penetrate through the older Paleozoic Era rock and raise to the surface, however, the

majority of the now exposed rock solidified while still deep within the earth. Due to this character of the rock formation, the Sierra Nevada is actually a Batholith (a very large igneous intrusion extending deep in the earth’s crust primarily comprised of felsic or intermediate rock types such as granite and diorite).\footnote{Merriam-Webster Definition}

Essentially, the Sierra range was formed subterraneously and consists of several different bodies ranging from 90-150 million years old. For example, one body is the well-known and iconic monoliths of Yosemite, such as Half Dome.\footnote{\cite{1}}

As the magma was cooling inside of the earth, both forming and pushing the batholith upwards, there was a massive amount of erosion taking place on the surface. By the late Cretaceous, about 70 million years ago, the granite that had cooled and formed under the earth’s crust began to become exposed above ground. This is due to a large uplift event in the area, and a great deal of erosion that weathered away an estimated 10 miles of the volcanic rock that had been deposited by the volcanoes of the Mesozoic Era. The result was the beginning of the modern Sierra, the first of the exposed granite mountain chain. However, when it first was exposed, so much erosion occurred that the ancient Sierra had a relief of just a few thousand feet; nowhere near it’s prominence of today.\footnote{\cite{2}}

This uprising of the subterranean igneous granite also had another important result. As it intruded through the layers of sedimentary rock left from the Paleozoic era, metamorphism occurred due to the heat and pressure of the uplift event. Along these contact lines, precious and rare metals including gold, silver, copper, lead, zinc and tungsten came to the surface, especially along a metamorphic belt along the western base known as “The Mother Lode.”\footnote{\cite{1}}

The modern Sierra Nevada started to grow relatively recently in geological time. Less than 20 million years ago during the Miocene Epoch\footnote{\cite{2}} the continental crust to the east of the Sierra boarder began to stretch in an east-west orientation. The result is the series of mountain ranges and corresponding valleys that trend north-south like the Sierra Nevada and the Owens Valley.
Then, less than 5 million years ago the defining moment that helped form the modern Sierra took place. The Sierra sits upon what is essentially a micro-plate, bound on the western end by the San Joaquin Valley and to the east by the Owen Valley. This micro-plate is basically a tilted fault block which is acting like door on a hinge. As the fault block is pushed into the plate of Owens Valley, it is essentially pivoting on its western border like a door would pivot on its hinge. Paired with the lifting motion of the Eastern sierra, The Owens Valley plate is losing altitude. The result is the steep escarpment of the Eastern Sierra along the Owens Valley fault line, with a long and gradual elevation gain from the ranges western border to its crest. This is also why the Sierra mountain range is very asymmetrical. The crest of the range lies just 4-6 miles from the eastern base, but over 60 miles from the western edge.\(^1\)

The asymmetrical way in which the range up lifted led to the majority of the rivers and drainages of the region being oriented east-west. The water flowing west takes a path up to ten times longer than water being shed off to the east and follows the much gentler slope down to the San Joaquin Valley. As the fault block continues to lift, the angle of the western rivers increases and the erosion capabilities of the water increases as well. It is partially due to this fact that many of the north-south oriented tributaries to the main rivers have been left “hanging” to create the spectacular waterfalls of the region\(^1\) (most famously in Yosemite).

Glaciers are also responsible for a large part of the area’s topography. At the beginning of the Pleistocene Epoch approximately 1.5 million years ago, also known as the Ice Age, the global temperature cooled, allowing glaciers to form in the Sierra highlands. They then began to slide and grind their way down the same channels that had been carved out by the rivers before the glaciers formation. As they made their way down the slopes they left the quintessential “U” shaped valley, common to glacially carved terrain.

This fact is what created the steep and exposed walls of granite that are synonymous with the Sierra and Yosemite.\(^2\) This period of glaciation is also responsible for the numerous moraines that are
found throughout the Sierra range and in the foothills (such as the glacial erratic’s found in the boulder fields of Bishop). It is thanks to the combination of all these geologic processes that the Sierra is the incredible mountain range we know today.

The Sierra has developed a diverse and unique ecosystem due to the natural formation of the range, as well as influence from different cultures that have inhabited the region. In general, there are several biotic zones that tend to follow elevation contours and are often described as “belts that follow the length of the Sierra Nevada.” However, while the zones are the same on the west and east side of the ranges crest, the elevations, as well as some of the species of plants and animals that inhabit them are very different. This is due to the eastern Sierra being in the rain shadow of the range and receiving significantly less precipitation than the west.

The first biotic zone is the foothill zone. This is the lowest elevation biotic zone and makes up the area between approximately 500’-3,500’ in elevation (on the western slopes). This area is generally hot and dry in the summer and receives little to no snow in the winter. Two centuries ago, this biotic zone would have looked much different as all the native grass has now been replaced by grasses native to the Mediterranean. This is a largely a result of livestock introduced into the area during the 18th and 19th centuries by the Spanish and Mexicans. The most common types of grasses currently found in this biotic zone include wild oats, red broom, foxtail fescue and soft chess. Many native wildflowers also call this zone home, including baby blue-eye, paintbrush, purple owl’s clover, lupine and golden poppy (the state flower). Larger flora including blue oak, gray pine, digger pine, and Mediterranean-like chaparral including gooseberry, poison oak, buckbrush and manzanita are also found in the zone.

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The native fauna of the foothill biotic zone are, in general, “small and quick.” This allows them to survive on a relatively sparse diet and avoid predation from larger animals searching for food. Common to the area are reptiles such as common kingsnake, garter snake, gopher snake and the western rattlesnake. Smaller mammals including the Californian ground squirrel, western harvest mouse, San Joaquin Valley pocket mouse and “numerous moles, shrews and gophers” scurry overland while turkey vultures, red-tailed hawks, golden eagles, American kestrels and western bluebirds fly overhead, searching for meals.

In Owens Valley on the east side of the crest, the foothill zone is replaced with a woodland zone primarily occupied by single-leaf pinyon pines and Sierra junipers and is located at about 5,000’-7,000’ in elevation. There are fewer animals on the eastern side and fauna is primarily limited to desert big-horn sheep and the pinyon jay. Below 5,000’ there is not enough precipitation to support trees and the soil has high salinity, making it mostly inhospitable.

The second biotic zone is the Lower Montane Forest. This biotic zone begins around 3,000’ in elevation and extends to about 7,000’ in the west and ranges from 7,000’-9000’ in the east. The Lower Montane biotic zone typically receives several feet of snow during the winter and this supply of irrigation allows the greater biotic diversity that characterizes this zone. The indicating tree species for this zone include the ponderosa pine on the western slopes and the Jeffery pine on the steep eastern slopes. It also contains other trees such as the Californian black oak, sugar pine, incense-cedar and the white fir. The iconic giant sequoias are also found in this biotic zone.

Many of the animals that reside within this biotic zone are also commonly seen in the foothill zone. They commonly venture down to the lower elevations to hunt and feed. These animals include mule deer, black bears, coyotes, bobcats, raccoons, gray fox and even the rare mountain lion.

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The Upper Montane Forest begins at elevations near 7,000’ and extends near 9,000’ west of the crest and ranges from 9,000’-10,500’ east of the crest.\(^5\) The growing season is shorter in this biotic zone due to heavy snows starting in November that can remain until as late as June. Red fir and lodgepole pine grow in this zone in homogenous stands.\(^5\) Jeffery pine as well as western juniper can also be found at these elevations but are not as prolific. Wildflowers are common in meadows during the months of June, July and August. Commonly spotted animals in this biotic zone include many birds such as the great grey owl, hermit thrush and the dusty grouse, as well as rodents such as the golden-mantled ground squirrel and martens (though less common).\(^5\)

Near 9,000’ the sub-alpine biotic zone begins on the west slopes and in the east they start at 10,500’. This zone is dramatically less vegetated than the previous zones due to the much harsher climate. Winters are long, cold and snowy and hamper growth. The most common tree found at this elevation is the whitebark pine, but western white pine, mountain hemlock and lodgepole pine are also present. Due to the weather conditions and the thin, nutrient-poor soil, growth occurs slowly and at relatively low temperatures.\(^11\) The fauna of this zone is shared with that of the alpine zone.

The alpine zone is the least hospitable and least populated biotic zone of the Sierra. This zone begins above tree-line, which begins at 9,500’ in the west and approximately 12,000’ in the east. The landscape is dominated by exposed granite, talus slopes and boulder fields. As the name suggests, no trees grow above tree-line in this biotic zone and only colonies of lichen truly thrive. Wila, wolf-lichens and crustose lichens are commonly found on and around the exposed granite. Several animals have been able to thrive in this high altitude environment, including American pika, Belding’s ground squirrel, yellow bellied marmot, and the endangered Sierra Nevada bighorn sheep.\(^5\) Essentially, as you climb in the Sierra, you pass through each successive biotic zone, which all progressively become increasingly barren.

The Sierra is not only rich in ecology, but also in history. The area was originally inhabited by American Indian tribes. Groups such as the Koso Shoshone, Miwok and Maidu populated the western slopes of the southern Sierra while the eastern slopes were home to the Paiute and Washoe tribes. These tribes subsisted primarily off of a hunter-gatherer life-style and had very little permanent effect on the landscape besides the occasion intentional, localized fire to help aid hunting practices. While they did not affect their physical surroundings in a way similar to Europeans, they did form complex trade routes throughout the area and used the natural flora and fauna of the region for medicine and everyday necessities. Some of these trade routes most likely crossed the Sierra, but due to lack of written records, they are unknown. Unfortunately, as is common in American history, the arrival of Europeans quickly led to the downfall of the tribes in the area.

The Spanish were the first non-natives to come to the area, beginning in the 1700’s. The Spanish had a claim on California (and Mexico) since 1602, but did not colonize until 1768. When they did come to California, they brought with them disease and contempt for the natives and in just 68 years only ~100,000 natives remained (from initial population estimates of between 300,000 to 1 million natives). The Spanish did not spend much time or effort in the Sierra Mountains, but they did have a significant effect on the flora inadvertently. The Spanish focus on cattle-raising was responsible for the change in the native grasses of the Sierra foothills. The Spanish brought grasses native to the Mediterranean with them for their cattle. These introduced species soon crowded out the native grasses and still remain to this day as the primary vegetation of the foothills biotic zone.

The Spanish remained in control of the area until Mexico won its independence in 1822, at which time California swore allegiance with Mexico, but was allowed to remain self-governing. The ranching society established by the Spanish, and the Californian loyalty to Mexico continued until the early 1840’s when a group of Americans organized the “Bear Flag Revolt” which began the process (The

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Mexican-American War) of California becoming a territory of the United States. This process was greatly expedited by the discovery of gold in the Sierra foothills in 1848 and the resulting migratory tidal wave of Americans that followed.

After the first discovery of gold in January of 1848, word spread quickly and the California Gold Rush began. The gold was found in an area called the “Mother Lode,” a 245 mile strip of land that stretches from Mariposa to Sierra City. Within two years, there nearly 50,000 working miners in the foothills of the western Sierra. Between the miners, their families and people simply seeking a new life, California’s population boomed and its economy followed suit. San Francisco and Sacramento became the first cities in the west, developing businesses, banks and transportation facilities. Logging, agriculture and industry soon arose as well to help support the growing population. This explosion of population and industry was one of the most substantial reasons that California’s statehood was quickly establish in 1850, only two years after first becoming a territory of the United States.

The Gold Rush populated California, but the Sierra remained mostly unexplored. The miners had crossed the range in the north and then followed the valley south to the gold fields. They did not venture far up into the mountains. As a result, the southern Sierra was essentially unknown. To remedy this fact, the U.S. government funded the 40th Parallel Survey, a major expedition with the intent of mapping the terrain and cataloging the resources of the Sierra Nevada. In 1867, with the financial backing of the War Department, Clarence King and his team began the first of their ventures into the Sierra. This was the birth of exploration in the southern Sierra and the beginning of climbing in the


14 The passes they took are now major highways, I-80 and US-50.
region. King and his men summited peaks to get barometric readings, establish altitudes and survey the
greater landscape of the region, not purely for the challenge.\textsuperscript{13}

Despite primarily making “easy” ascents of mountains such as Mt, Tyndall and Mt Clark, via 3\textsuperscript{rd}
and 4\textsuperscript{th} class routes, King and the men on his expedition climbed in hard, leather hob-nailed boots with
static rope.\textsuperscript{16} They faced snowy conditions as well as smooth granite while climbing, making their
ascents much more difficult. The men of the first expeditions into the Sierra did not have or use any sort
of climbing protection other than the rope and their nailed boots. King’s expedition and the subsequent
years of the surveys continuation, (through 1873\textsuperscript{13}), yielded ample data on the geology, resources and
topography of the region. This era of exploration also saw the first climbing of peaks in the region and
laid the foundation for those to follow.

A few short years after the first of the surveys into the Sierra, one of the regions most famous
travelers began his exploration. John Muir first walked into the high country of the Sierra in 1868.
Overwhelmed by the beauty they inspired in him, Muir claimed they should not be called the “Nevada,
or snowy range, but the Range of Light... the most divinely beautiful of all the mountain chains I have
ever seen.”\textsuperscript{17} Muir spent his time herding sheep, walking the high country and taking in as much of the
Range of Light as he could. Muir formulated the theory that glaciers were responsible for shaping the
Sierra, which first began to gain him notoriety.\textsuperscript{18} While Muir is most well know for his environmental
preservation works, especially the battle over the Hetch Hetchy dam, he was also one of the first to

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\item[$\dagger$] John Muir: “The Treasures of the Yosemite”, \textit{The Century Magazine}, volume XL, number 4 (August 1890) pages 483-500

\texttt{<http://vault.sierraclub.org/john_muir_exhibit/life/muir_biology.aspx>}
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climb in the Sierra. Like King and his expeditions, Muir pioneered 3rd and 4th class mountaineering routes up several peaks, including Mt Ritter, Mt Hoffman and Cathedral Peak. On top of these first ascents, Muir explored and climbed in a vast region of the Sierra.

While Muir is undoubtedly the most well known explorer of the Sierra, the first real climbing legend was Norman Clyde. Clyde first came to the Sierra when he was in his mid twenties in 1911. Between 1914 and 1940, Clyde climbed Mt. Whitney 50 times, and made first ascents of at least 126 peaks. Clyde spent 50 years in the Sierra, climbing peaks, exploring the region, (said to be second only to Muir “as an intimate pioneer of places inaccessible”) and also preforming recues and recoveries of climbers and explorers. Norman Clyde was the first of the true mountaineers whose playground was the Sierra. He was an avid member of the Sierra Club and guided many trips into the high country. Clyde mostly soloed his routes, but always carried what he called an “emergency rope” for rappels. In the twenties, as rock climbing hardware advanced, he started to carry more technical gear, such as rubber soled shoes for rock climbing and a few pitons (though they were reserved for “safety caution reserve on difficult pitches” in his mind) Clyde was of the first generation to use fixed gear in the mountains. This helped allow more difficult terrain to be accessed and also began the formation of climbing ethics in the Sierra.

As the years progressed and climbing technology improved with Salathe’s improved pitons and the creation of nuts, hexes and cams, climbs previously thought impossible became realities in the Sierra.

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and the rest of the world. Many famous names have climbed in the Sierra including Fred Beckey, Yvon Chouinard and John Salathe (among innumerable others).

The High Sierra has a specific climbing ethic that is different than many other areas within the range. While many of the popular cragging and easy access peaks have many routes with bolts and fixed anchors, the High Sierra focuses on not permanently altering the rock. The terrain in the High Sierra is very conducive to removable fixed anchors; there are many horns and blocks that can be slung and cracks that accept trad gear easily. Any fixed anchors should be placed unobtrusively with camouflaged material so that others in the wilderness are not forced to see them. If you come upon a questionable anchor, it is good practice to replace it following the minimal visual impact practices above. Pitons and bolts are last resort options. If a bolt is the only thing that will allow a safe ascent/descent of a route, it must be placed by hand; power drills are a faux pas in the wilderness. Aside from those specific rules, the general summation of the High Sierra climbing ethic is to “treat others the way you want them to treat you, and respect the rights of other climbers and wilderness users.”

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Seasonal Weather and Conditions of the High Sierra

One of the most important pieces to the patchwork of information that becomes our realized goal is the gathering of information and the resultant interpretation of the weather patterns of the Sierra as a whole, with special focus on the High Sierra; the region we will be at our most exposed. The most detailed and comprehensive expedition plan can become useless if we fail to recognize that the month we pictured ourselves enjoying sunny, bluebird days up in the alpine is actually the monsoon season. As such, to truly have a detailed and comprehensive expedition plan, studying the weather and climate patterns of the Sierra becomes imperative.

In order to give myself and my expedition the greatest chance of good weather, I have chosen early-mid June as my preferred window of opportunity. This decision is the result of all the information I have accumulated about historical weather/climate patterns, projected weather trends and first-hand accounts from trip reports. I have also factored in considerations such as the Whitney regions peak tourist season, personal availability of my partner and I, as well as access issues. As a result, I believe that June will be a perfect time for my expedition.

The Sierra is, in general, an arid climate. It receives a limited amount of precipitation during the spring, winter and fall that totals between 20”-80” per year and comes primarily in the form of snow.
The majority of this precipitation occurs on the west side of the crest of the range and in the northern mountains. This discrepancy in the distribution of the precipitation is due to the “nearly unbroken wall” of the Sierra Crest which lifts the air masses of the mid-latitude storms coming from the Pacific (these storms are the Sierra’s main source of precipitation). This lifting of the weather systems essentially wrings all of the moisture out on the west of the crest, creating the rain shadow that makes Nevada the driest state in the country. The range east of the crest (such as the area I intended to be in) is generally in the rain shadow and as a result receives a much lower average precipitation rate of about 25” per year.

The snow totals can be very varied year to year. This is due to many factors, but two stand out among the rest as good indicators. These two indicators are the El Nino phenomenon and the North Pacific High anticyclone. El Nino is a natural shift in surface water temperature of the equatorial Pacific Ocean characterized by unusually warm temperatures. El Nino can have a drastic effect on the weather patterns of the western United States during the winter months. During periods of time with El Nino in effect, the Northwest usually is warmer and drier than average, while the Southwest is generally colder and wetter than normal. This decrease in temperature and increase in moisture leads to years with heavier snowfall than normal. This year, while indicators were initially pointing towards a dramatic

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23 The snowmelt from the Sierra is one of the primary sources of water for agriculture and sustenance in California. This is why there are great dams such as the Hetch Hetchy dam located in valleys of the northern mountains.
27 Climate Prediction Center. *Average October-December (3-month) Temperature Rankings During ENSO Events*. 

El Nino season, measurements from September and October have brought about a significant reduction in the likelihood of a strong El Nino year, now calling for weak El Nino conditions from Oct-Dec.\textsuperscript{28}

The Pacific High anticyclone is the other good indicator for winter weather. The Pacific High is a semi-permanent high-pressure system that commands the area between California’s coast and the islands of Hawaii during the summer months. The eastern edge of these systems is generally synonymous with stable air that “produces low relative humidity and sunny skies.”\textsuperscript{29} It is this high-pressure system that is largely responsible for the stable and relatively storm-free weather enjoyed during the summer months on the west coast. During the winter, the Pacific High shifts south allowing the Aleutian Low (a semi-permanent low system off the coast of Alaska) to creep south and bring the winter storms that deposit the annual snowfall on the region. If the high fails to shift south, it inhibits the ability of the winter storms to make it as far south as they usually do and lead to a low precipitation year in the Sierra and most of California as a whole. This year, on approximate July 1\textsuperscript{st}, the Pacific High shifted northward from latitude 34N to 41N; an action described as “dramatic.”\textsuperscript{30} This could indicate that the Pacific High may not move as far south this year, however, that remains to be seen as changes are hard to predict and can happen rapidly. However, due to the low influence of the El Nino effect, paired with the current abnormal position of the Pacific High, it seems to suggest that there is a low likelihood of an above average snowfall this year.

When looking at the climate of a region such as the High Sierra, it is important to understand that it is more than just the averages. The mountains provide an interesting and unique environment as they have a three dimensional climate. The weather and normal climate of the region varies not only


due to longitude and latitude, but elevation as well. This difference in climate due to elevation manifests in the different biotic zones that are present as you ascend in elevation\textsuperscript{31}; the differences in flora and fauna of each zone are directly related to the variances in climate. As you increase in altitude, you pass through several climate zones\textsuperscript{32} that progressively decrease in average temperature and increase in annual precipitation. When traveling from Lone Pine to the summit of Mt Whitney, you start in a desert climate and end in a climate similar to that of a polar highland.\textsuperscript{33}

All this leads me to set my parameters for my expedition to the summer months as they are drier, warmer and have less severe weather, but June became my first choice due to a few extra weather and aesthetic related factors. June is “usually dry with warm temps”\textsuperscript{34} which will make climbing and traveling in the rugged terrain much more enjoyable than if the sun was at full force and bearing down on us. June is also the period of time when the winter storms are past and the summer thunderstorms are just beginning to develop.\textsuperscript{13} This is one of the facts that attract me to June the most. Being relatively inexperienced in alpine climbing, having the most subdued and reliable weather is something that I am striving for. Early July-late August is the prime season for afternoon thunderstorms to come rolling over the peaks, so, by going in early/mid June, I will dramatically lower the probability of getting caught on a ridge or a peak in the face of an oncoming storm.

June is also the month with the longest days of the year. The summer solstice in 2015 is on June 21\textsuperscript{41}. This means that during the time that I am out there, I will have the maximum amount of daylight at any point in the year. Again, due to the fact that I am relatively inexperienced, having the maximum duration of sunlight available will help allow my partner and I the most leeway while climbing. With a

\begin{footnotes}
\item[31] Discussed in the Geology, History and Culture chapter
\item[32] Figure one.
\end{footnotes}
proper alpine start, the pressure to climb fast due to diminishing daylight will never be an issue, allowing us to be able to focus on proper route finding and enjoying the experience.

Climbing in the Sierra during June will also mean that the approaches and gullies are still mostly covered in snow. While some would find this a daunting realization, I actually look forward to the snow coverage. The snow will have gone through some freeze thaw cycles at this point and will be neve snow which is hard packed and relatively easy to travel on. These conditions may necessitate the use of an ice axe and traction devices (such as micro spikes or crampons) but can even out the rocky and rugged terrain allowing for faster travel overall. An added bonus is that many of the descent gullies will have snow still which will allow for glissading. This will require us to have more care when descending due to the potential consequences of an unarrested slide, however, if proper care is taken, the snow filled gullies will make descending more efficient and faster overall.

Finally, due to the reputation of July and August to be prime climbing months for the Sierra, June will see less traffic to the Whitney region than during those months. The crowds start showing up at the end of June, so the area will be much less populated than during the following months. This is especially enticing to me as I really want to experience the solidarity of wilderness climbing and it is hard to do that with scores of tourists and other climbers flooding the region. This will also make the permit process much easier as it is a less popular time of the year to visit the Sierra and more permits will be available.

Due to all the information above, I believe that June will be the perfect time for my expedition because it has the right weather, snow, light and tourist conditions to help me realize all of my goals and objectives for this expedition.
Expedition Goals

Henry David Thoreau once said, “What you get by achieving your goals is not as important as what you become by achieving your goals.” This sentiment is at the heart of my proposed expedition to California’s High Sierra. While I look forward to, and am extremely excited to stand on the summit of a Sierra peak, I hope to achieve more than just the physical feat. I want to make this expedition a truly meaningful and memorable experience for my partner and I; one where we gain not only skills, but also understanding.

“Understanding,” however, is a broad and vague idea. This overarching idea is not specific enough to give guidance to my ambitions or abilities, and as such I have developed several goals using “SMARTER” criteria. These goals include both personal and professional benchmarks that I hope to successfully realize during my time in the Sierra. With the direction these goals provide, I believe that I can plan, organize and execute my expedition in such a manner that I complete most, or all, of what I set out to accomplish.

Due to the more straightforward nature of my professional goals, I will begin by discussing them.

1. Time management and efficient climbing.
   
   • Time is precious when climbing long alpine routes. Unless you are prepared to spend the night bivvying en route, once you start climbing you are in a race against the sun, the
weather and fatigue. Being able to climb at the most efficient, yet safe, pace is one the goals I place the highest importance on for my expedition. This is because not only will this skill greatly lessen the chance of getting caught by nightfall or approaching weather fronts, but it will also allow me to maximize the time available for climbing. Five minutes of inefficiency per pitch does not sound like much, but over a 12-pitch climb, those minutes add up into a significant loss of time, and can be the difference between a pleasant outing and an epic. This skill is also universally transferable for any of the climbing I do in the future, whether it is in a personal or professional setting. Friends and clients will always have a more enjoyable experience climbing with me if I can minimize wasted time on and off route.

2. Practice, effectively employ and become proficient with alpine climbing techniques such as simul-climbing, short roping/the use of the “Kiwi-coil” and different belay applications such as hip belays and munter hitches.

- Cragging and alpine travel share many elements, but are entirely different beasts. In the alpine, sections of easy 5th class and 4th class terrain that can accommodate these techniques are frequently in-between pitches that necessitate full security belays. As I hope to be in alpine environments a considerable amount in the future, I aim to become experienced and proficient with these skills during my time in the Sierra. I feel that these skills are important to my professional development as they allow for efficient, fast and yet safe climbing on less demanding pitches that both the leader and follower feel confident and secure on. Not only will these skills allow me to move more efficiently in alpine terrain (one of my other goals), but they will also allow me to hone my skills on reading terrain in general. Making judgments about which skill to use will become easier as I become more acquainted with the type of terrain it is most applicable for. Once I can look at a section of a climb and make a judgment call (based off of route descriptions, research and experience)
on the best method of protection, my overall climbing ability and proficiency will be able to improve.

3. **Navigation to objective/Route finding.**

   - One of the aspects of my expedition that I believe will be challenging is the navigation and route finding. While I have a good deal of experience with maps and compasses, as well as reading/following cliff topo’s here on the east coast, the terrain and routes are significantly larger, less straight forward, and daunting in the Sierra. I have heard many statements to the likes of “the route finding was harder than the climb itself” from friends, instructors and various trip reports online. One of my main professional development goals is to expose myself to these less defined routes/approaches and become comfortable/confident in my ability to not only locate, but also properly follow long alpine routes. I find this to be extremely important because poor navigation/route finding can lead to dangerous situations such as exposure, inadequate protection, significantly harder climbing than anticipated, or simply becoming lost and disoriented. To be able to correctly find and follow a long multi-pitch route up a nondescript line (and then find the correct descent as well) is an important skill I will need, whether it be for personal climbing or, more importantly, if I am in a role of responsibility with clients or friends in the future.

4. **Weather forecasting. Recognize weather patterns and potentially hazardous storms.**

   - Being able to recognize and interpret weather patterns becomes a critical skill during alpine climbing. Due to the exposed, remote nature of mountaineering/alpine climbing, it is essential to understand what inclement weather looks like and to know what to do if the situation is one that demands immediate attention. The Sierra Nevada are known for afternoon/evening thunderstorms during the late spring and summer months, so being able to identify an approaching storm is paramount. I need to be able to see an oncoming storm
and then make the correct decisions to get my partner and I to safety. By learning to actively read and interpret weather in mountainous regions, I will be better prepared for any time that I set out to climb, whether it is a large peak in the Sierra or a small crag back at home.

5. Develop and employ solid “go/no-go” criteria both on and off route.

- Being able to judge whether or not to continue, or even to begin, a route is a necessary skill for climbing in general. I already have a good foundation for the criteria of making an informed decision, however, in mountains such as the Sierra, it becomes a much larger task with many more variables in comparison to the more user-friendly cliffs of the Adirondacks. Factors such as the extended time on route, altitude, quickly changing weather conditions, sunset/darkness, strenuous route finding, fatigue and complicated descents are all concerns that I have not had significant experience with. As a result, I need to be able to err on the side of caution and recognize any and all red flags that could be raised while on my expedition. Exercising good judgment when it comes to decisions on whether to begin or continue a route is an ability any good climber/guide needs to have to ensure the safety of themselves and the people they are with.

6. Experience the realities of a climbing team dynamic.

- Even though I only plan to have one other partner on my expedition, it is still a goal of mine to gain a better understanding of the group dynamics process. Climbing partners need to be able to communicate and perform to accomplish their goals in a safe and efficient manner. Disagreements are inevitable due to differences in ability, comfort, personality and attitude, but they must surmountable in order for the team to successfully complete their intended tasks. I am looking forward to exposing myself to a different type of “group” than I am generally accustomed (i.e. groups with several people) and seeing how a pair of people, (my partner and I), go through and handle the stages of group dynamics in comparison to these
larger groups. This will allow me to better understand a wider range of interpersonal situations that I may likely find myself apart of in the future as a guide, or as a teammate.

7. Climb at altitude.
   - I have spent time at altitude and have even done some 3rd/4th class scrambling during that time (Macherma-Ri, 4th class, ~17,000’ and Gokyo-Ri, 3rd class, ~18,000’, Khumbu Region, Nepal), however I have never experienced the demands of roped, technical climbing at altitude. I aim to expand my skill set to include technical climbing at altitude, as this will give me real life experience and insight to draw from when planning and participating in future ventures into the mountains.

My professional ambitions are not exclusively responsible for my desire to travel in the Sierra; I also have several personal aspirations I hope to accomplish.

1. Climb a route with a IV commitment grade.
   - This goal stems from my desire to push myself as a climber, and complete a type of route that will require me to grow and progress from where my ability and experience currently are. This goal will, in a way, be the culmination of many of my professional goals, as I will have to employ them effectively in order to successfully and safely complete a IV route. As a result of this fact, while this is an important personal goal I have set for myself, it will only come to fruition if I feel confident in my partner and my own skills on the terrain. I plan to start the expedition with 3rd and 4th class scrambles as well as easy 5th class routes to become familiar with the terrain, altitude and provide time and a progression, to properly allow us to hone our technical skills. If my partner and I feel like we have become proficient enough due to the experience gained on our earlier climbs, only then will completing this goal be possible.

2. Climb a secluded peak.
“To those devoid of imagination a blank place on the map is a useless waste; to others, the most valuable part.” Backcountry climbing is one of my favorite climbing experiences. Removing myself from the crowded camps and routes of more accessible areas, and instead escaping to a haven of solitude is a pleasure and a privilege I hope to accomplish during my time in the Sierra. I wish to camp and climb in a place that strips away the illusion of man’s “dominance” over nature, and instead lays the pure power and simple splendor of the mountains out in front of you, bare and exposed as the granite you hope to climb. This is one of my main objectives of my expedition. I want to experience the dichotomy between climbing a popular route such as the “East Face” of Whitney, and a remote route such as Mt. Williamson’s “North Arête.” By using the heavily traveled access points such as the Whitney Trail to reach my intended remote destinations, I will get to experience both extremes in relation to proximity to others. I think of it almost as a pilgrimage to a time before climbing culture was so widespread. As I travel away from the realm of well-worn paths and established campsites, it will be like peeling away decades back to the era of the unknown.

3. Immerse myself in the experience.

There is something about the experience of going out into the backcountry that expedites and encourages introspection. As Loren Eiseley once said, “It is a commonplace of all religious thought, even the most primitive, that the man seeking visions and insight must go apart from his fellows and love for a time in the wilderness.” Some of the most influential and powerful discoveries I have made about myself, my beliefs and my life goals have come as a direct result of time spent in the wilderness, and as such, I would be remiss if I did not open myself to the moment and allow the full impact of what I have undertaken to wash over me. I do not have a specific outcome that I desire, as that could lead to contrived and

forced results. Instead, I intend to absorb all aspects of the expedition, both the good and the bad, and derive meaning (if there even ends up being any) from the raw experiences.

4. Follow in Clarence King’s footsteps.
   - Clarence King was one of the very first recorded people to explore and climb in the Sierra. He was a geologist on the 1860 “California State Geological Survey”\(^\text{36}\) as well as the “Fortieth Parallel Survey” which started in 1867 and lasted approximately six years\(^\text{37}\) and during those periods, King climbed several peaks in the Sierra including Mt Tyndall.\(^\text{38}\) I want to summit this peak so I can experience the same sense of wonder that King and his partner Richard Cotter as they looked across the horizon and saw Mt Whitney for the very first time. Mt Tyndall is located in an area guarded by “one of the burliest approaches in the Sierra”\(^\text{39}\) and as such will allow me to accomplish my goal of climbing a remote peak, as well as giving me insight into what it must have been like for one of the historical pioneers of the Sierra. I will be arriving at the mountain and ascending via a similar route as King himself did over a century ago. Following such an old and historic route will allow me to connect with the history of the area and the history of climbing in a way that will inspire awe. I will be able to imagine the differences and difficulties these men faced and chose to accept in their pursuit of the summit with climbing technology vastly inferior to the kind we possess today. I find this an invaluable experience, as it will allow me to fully grasp how far the sport of climbing has progressed from King’s era until now.


5. Climb a peak without following an established route.

- One of the most beautiful attributes about the mountains that entices me greatly is the pure creativity and potential that they still possess even after years of exploration. New lines can be found anywhere for those willing to seek them out. I do not have the desire to establish a FA for the sake of a FA, or gain notoriety from the undertaking, but instead I aim only to experience a more organic form of climbing, one without a recipe or instructions to follow. In a way this is connected to my goal of following in the footsteps of King, Clyde, Muir and the other first explorers of the region. I want to look upon the mountain as if mine were the first eyes ever to scour its surface. Then I want to use all of my judgment, navigation and technical skills to identify and then climb a suitable route from the ground up. This, more than anything, is a way to connect with the true spirit of discovery, adventure and mystery that is expressed through the actions of climbing.
Expedition Itinerary

The Sierra is the perfect venue to explore as it offers a wide variety of options in terms of climbing styles and difficulty. From 3rd and 4th class routes to more technical 5th class terrain, the diversity of the landscape is conducive to any and all goals we set for ourselves. Once we have those goals, the next step is to create a plan/route/itinerary that allows us to put those goals into motion and eventually completion. A good itinerary will foster an expedition environment in which we feel safe and not overly exerted, but at the same time challenged. Not only do the plans for expeditions have to be efficient enough to accomplish goals, but they must also have some flexibility so that if unexpected hindrances become a reality, the whole plan doesn’t fall apart. As such, I have put together a route through the Mount Whitney/John Muir Wilderness region of the High Sierra that I believe will allow my partner and I enough time to travel, climb and explore, while still leaving room for the unexpected.

While technically not part of my senior expedition, I believe it is important to mention that before arriving in the Whitney region, we will be spending 5-6 days in the Tuolumne Meadows region, camping and climbing to help acclimatize to the high altitude. While in this region, we would take advantage of the relatively easy access to peaks from Highway 120 and climb routes on Cathedral Peak (10,911’), Eichorn’s Pinnacle (10,700’), Matthes Crest (10,918’) and North Peak (12,242’). Starting off our trip in this area, which has a lower elevation than the Whitney region, will be a much easier transition coming from the east coast, and I believe will aid greatly in our ability to acclimatize and operate at altitude. Not only will it help us become acclimatized, but it will also be a great way to become familiar with the type of terrain, climbing and route finding we will be encountering in the more remote areas we will travel to around Mount Whitney and especially Mount Williamson/Tyndall.

Once we leave Tuolumne and arrive at the Whitney Portal, this is when my true expedition will begin.
Day One

- Wake up having spent the night at the Whitney Portal trailhead. Pack up camp and begin hiking along the Mount Whitney Trail.

- After about 1 mile we will encounter the North Fork of Lone Pine Creek that has a climbers trail that follows the drainage and leads to the Boy Scout Lakes and Iceberg Lake. This trail has some class 2 terrain on it as well as several stream crossings. We will follow this trail to Upper Boy Scout Lake where our first camp will be (11,300’ elevation).
  - Elevation gain: 3,100’. Total distance: 3.2 miles. Total time: Approx 4 hours.

- Once camp has been set, we will have extra time to explore the area around Upper Boy Scout Lake. There are two options we can choose from based on time, weather and stamina.
  1. Continue from Upper Boy Scout Lake to Iceberg Lake (12,600’) following the climber’s trail. This will add another 1.3 miles (2.6 round trip) to the day and another 1,300’ in elevation gain.
    - Approx 2 hours and 15 min on trail camp to camp (does not include time spent at Iceberg Lake exploring and marveling).
  2. Summit Mount Carillon via Russell-Carillon Pass. This requires a class 2/3 scramble up to the saddle between Russell and Carillon (13,280’), and then a class 2 scramble along the ridge to the summit of Mount Carillon (13,552’).
    - Descent/Bail: Retrace route of ascent. No rappels necessary due to the fact it only takes non-technical scrambling to reach the summit.

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Based off of Naismith’s Rule. Assuming a conservative pace of 2mph average hiking speed, plus 1 extra hour for every 2,000’ of elevation gain, plus an extra 20 minutes per 1,000’ elevation gain in this case to accommodate high altitude/heavy packs. All other time estimates will follow this basic formula (even for climbing days when we will not be carrying big packs as it will help automatically build in extra time so we do not under estimate the amount of time required for completion).
• This would add approx. 2 miles round trip, 2,250’ in elevation gain and take approx. 3 hours (only walking time).

• Day’s Totals (To Upper Boy Scout Lake)
  - Starting elevation: 8,320’ Ending Elevation: 11,340’
    - Elevation Gain: 3,107’
    - Elevation Loss: 85’
  - 3.2 miles
  - Approx 4 hours on trail

**Day Two**

• Wake up early and prepare for our first climb. Be hiking at or very shortly after 6am.

• Follow the SE facing class 2/3 slope from Upper Boy Scout Lake (11,300’) to the saddle between Mount Russell and Mount Carillon (13,280’). This is the where the route begins.

• **East Ridge of Mount Russell- 3rd Class**
  - 800’ of vertical. Half mile in length.
  - Approach
    - 1 mile, 1,980’ elevation gain, approx. 1 hours 30 min to saddle from Upper Boy Scout Lake.
  - A long and exposed 3rd class traverse of the East Ridge that leads to the east summit from the Russell-Carillon Pass (13,280’). From the east summit, it is relatively easy to continue onward to the true summit of Mount Russell (14,086’).

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This route follows the ridge proper almost the entire way making route finding pretty straightforward. Only at a few points do you drop off the ridge on the north side to avoid some 4th/5th class moves. (*During early season, it is possible that there may still be some snow on the north side of the ridge, forcing you to climb 4th and easy 5th class terrain).

We will climb this route with a short rope and some gear (set of nuts and singles from #.3-#3 BD cams and many slings), especially if there could be snow that forces us onto the ridge at tougher terrain. Due to the easy nature of the 4th/5th class terrain, simul-climbing will most likely be our method of travel in order to move quickly and efficiently while remaining safe.

- Total time to climb route: 4-5 hours.

Descent/Retreat

- For descent, there are two options. The first is to simply retrace the route in the opposite direction back to the pass.
  - Takes slightly less amount of time to retrace route, approx. 3-4 hours plus ½ an hour to descend from the saddle back to Upper Boy Scout.
  - The second option comes when you get to the east summit. There is a 3rd class gully that is on the south face. It is a possible descent or bail option should weather close in when we are closer to the summit than to the pass. Neither option requires leaving gear or rappels.

This will be a big day. With the approach, climbing and descent it could be as much as 11 hours camp to camp. However, there is extra time built into the considerations due to the fact we will be moving faster due to the lack of a large pack (which my calculations include). Starting early will be necessary for this day.
- **Day’s Totals**
  - 2,749’ elevation gain/loss.
  - 3 miles round trip.
    - 1 mile of technical, exposed scrambling
  - 9-11 hours camp to camp

**Day Three**

- Another early day. Start by packing up camp and once again heading up to the Russell-Carillon Pass. Once at the pass, we will negotiate the steeper 3rd class slope down into the cirque that contains Tulainyo Lake (12,802’).
  - 1.5 miles, 1,980’ elevation gain, 450’ elevation loss. Approx 2 hours 30 min.
- Stash bags and supplies around Tulainyo Lake.
- **Traverse of The Cleaver and Tunnabora Peak**
  - Approx 2.5 mile loop from the stash spot around and back. 580’ elevation gain up SW ridge of The Cleaver to summit, 300’ elevation loss to saddle between The Cleaver and Tunnabora Peak. 500’ Elevation gain up Tunnabora Peak, 600’ elevation loss back to the gear stash. Approx. 4-5 hours to complete circuit.
  - Start off by walking around the south shore of Tulainyo Lake until directly beneath Cleaver Col. Ascend to the col and then follow the SW ridge up to the summit of The Cleaver (13,355’). The ridge is primarily 3rd/4th class scrambling with an occasional 5th class move up to about 5.6 depending on how you meander up the ridge. Descend the 3rd class NW ridge down to the saddle between The Cleaver and Tunnabora Peak. From this saddle wander up the 2nd class south slope of Tunnabora, hopping through talus to the peak (13,565’). Descend the south slope back down to camp.

- **Gear**
We will bring a short rope and a minimal rack (a set of nuts and a few cams), as it is primarily a scramble with only a few 5<sup>th</sup> class moves.

- Simul-climbing the SW Ridge of The Cleaver and then unroped scrambling (unless we feel the need to rope up at any other point).

**Descent/Retreat**

- This route is easy to descend or escape from. At any point other than the SW Ridge of The Cleaver you simply down climb the 2<sup>nd</sup>/3<sup>rd</sup> class terrain found on the NW ridge of The Cleaver and Tunnabora Peak. The SW Ridge needs a bit more attention and care, but is not much more of a challenge if you need to down climb it as the 5<sup>th</sup> class moves are short and relatively easy. However, many blocks and horns can be slung for rappel anchors if you have to resort to rappels.

- Depending on the time, remaining daylight and our stamina, we will either set up camp on the banks of Tulainyo Lake, or continue to Wallace Lake and make camp there.
  - 2 miles, 1,380’ elevation loss. Approx 1 hour.

**Day’s Totals**

- Starting elevation: 11,340’ Ending elevation: 11,500’
  - Elevation Gain: 2,970’
  - Elevation Loss: 2,800’
- 6 miles
- 7.5-8.5 hours

**Day Four**

- REST DAY
If we stayed at Tulainyo Lake the previous night, we will descend to Wallace Lake and stay at the lower elevation (11,450’).

- 2 miles, 1,380’ elevation loss. Approx 1 hour.

- Use the day to rest up, explore around the lake and scout terrain.

**Day Five**

- Wake up and break camp.

- Climb 2nd/3rd class slopes up to Vacation Pass (12,640’) and the plateau that stretches down the SE of Mt. Barnard East
  - 1 mile, 1,190’ elevation gain. Approx 1 hours 30 min.

- From Vacation Pass, head NW along the broad, sloped plateau to summit of Mt Barnard East (13,680’).
  - 1.5 miles, 1,020’ elevation gain. Approx 1 hour 45 min.

- Descend from the peak of Barnard East down the north slopes to 13,100’ and then contour around the cirque. Once we reach the lowest point on the ridge between Barnard and Trojan Peak, get onto the ridge and then around the SW Ridge of Trojan Peak slightly on the western slope (13,300’) to where the north slope of Trojan Peak descends into Williamson Bowl.
  - 1¼ miles, 500’ elevation loss to low point on ridge, 300’ elevation gain to edge of Williamson Bowl. Approx 1 hour.

- Descend the 2nd class north slope of Trojan Peak to Lake Helen of Troy (12,515’).
  - 1/3 mile, 800’ elevation loss. Approx 20 min.

- Contour around the west edge of Lake Helen of Troy to the north point. From here continue north down gentle slopes past a second lake on the left. Once we pass the north point of the second lake there is a large flat area in the center of Williamson Bowl where we will make camp.
  - 1 mile, 300’ elevation loss. Approx 30 min.
• Spend the rest of the day resting/relaxing, enjoying the setting and scouting the lines for day five.

• Day’s totals
  o Starting elevation: 11,450. Ending elevation 12,300’.
    ▪ 2,410’ elevation gain.
    ▪ 1,650’ elevation loss.
  o 4½ miles.
  o Approx 5 hours on trail

Day Six

• Wake up early.

• Approach Mt. Tyndall’s east face. Arrive at base of climb by absolute latest 7am.
  o ¾ mile, 300’ elevation gain. Approx 30 min.

• The Climbing Art-5.7, III, 6 pitches
  o 1,500’ elevation gain, ~900’ technical climbing. 4-6 hours on route.³
  o This route ascends a rib of rock on the northern portion of the east face, above the SW tip of the western most lake in the Williamson Bowl. The climb begins at a ledge above a band of orange rock.
  o From the ledge, climb up and slightly left for three pitches following the rib slightly on the right side.
  o After the first three pitches, a large gendarme becomes visible on the skyline to climbers right. Climb three more pitches aiming for the left side of the gendarme, which is directly next to a large roof. Pass the gendarme on its left side, which spits you out on the NE arête. Once on the arête, you can either continue up the arête which follows 4th
and low 5th class slabs to the summit, or traverse climbers right and then follow the 2nd/3rd class north face/NW ridge to the summit (14,018').

- This route is described as “having little loose rock and good protection.”

**Gear**

- Full 60m rope and standard Sierra rack.
- All belays are gear anchors.

**Descent**

- Any point after reaching the NE arête at the end of pitch 6, simply walk/scramble down the north face (2nd class) of Tyndall, skier’s left of “The North Rib.” This is also the descent from the summit.
  - 1 mile, 1,500’ elevation loss. Approx 1 hour 30 min.

**Retreat**

- Rappelling the route is the only viable retreat option before reaching the top of pitch 6. There may be some blocks/horns that can be used as natural anchors for some rappels, but this would almost certainly require leaving gear.

- **The Tyndall Effect-5.6, II, 4 pitches**

  - Depending on how approaching afternoon weather looks while descending from The Climbing Art.
  - ~600’ technical climbing, 2-4 hours on route.
  - This route climbs the face between the NE arête and the prominent, blocky, open chute on the far-right flank of the east face.

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43 The “standard” rack in the Sierra is comprised of 1 set of nuts, 1-2 set(s) of cams (BD C3 #1 (red TCU)- #3 (blue C4)), 10 slings (mix of double and single length) and 20 non-lockers (for slings). Belay device and several lockers.

44 We will most likely be carrying doubles of cams.
Follow the left raising layback flake/crack system for 4 pitches. After four pitches, you encounter 3<sup>rd</sup>/4<sup>th</sup> class terrain.

- Usually, you would follow this up to the NW ridge and continue on to the summit. However, because we already plan on summiting via The Climbing Art, we will not summit again and will instead descend after the 4<sup>th</sup> pitch.

Within the layback system there are many variations that go at around 5.4 or lower. If time becomes an issue, climbing these variations will speed up our progress.

**Gear**

- Full 60m rope and standard Sierra rack.
- All belays are gear anchors.

**Descent**

- Same as for The Climbing Art. From the top of pitch 4, move right on 4<sup>th</sup> class terrain until meeting up with the North Rib and then descend on the 2<sup>nd</sup>/3<sup>rd</sup> class terrain skier’s left of the rib.
  - ½ mile, ~800’ elevation loss. Approx 1 hour to base of route.

**Retreat**

- Retreat is possible by rappelling the route. This would involve leaving gear.

- Return to camp by walking back across the bowl.
  - ¼ mile, 300’ elevation loss. Less than 30 min.

**Day’s totals**

- 2,100’ elevation gain.
- About 1,500’ technical climbing.
- 10 pitches plus plenty of scrambling.
- 6-10 hours on route.
Day Seven

- Wake up and eat breakfast
- Approach the west face of Mount Williamson towards its south end where a rocky outcropping with noticeable black streaks protrudes from the talus slopes.
  - ½ mile, 300’ elevation gain. Approx 30 min.
- **West Face- 3rd Class.**
  - 1,875’ elevation gain. 3-5 hours on route.
  - The West face of Williamson is a maze of chutes and gullies, many of which dead-end in walls of granite. This is route is a route finding and mountain-sense challenge.
  - From base of the west face, we’ll climb the talus slopes to the prominent rock outcropping with the large black streaks.
  - Climb past the rock outcropping on its right. Once above the outcropping look for and enter a chute that leads up and to climbers left (north). Avoid the smaller chute that angles slightly climber’s right.
  - Follow the left raising chute almost to the crest of the NW buttress, then, at a head wall, traverse climbers right for about 100’ to a 60’ long 3rd class crack that leads up to the summit plateau.
  - Once on the plateau, the true summit (14,375’) is a short distance to the south (climber’s right).
- **Gear**
  - Short rope and a set of nuts.
  - Mostly unroped scrambling as exposure in the gullies is not an issue. If need be, the rope and nuts can be utilized for any section we feel needs protecting.
**Descent/Retreat**

- Retrace the route of ascent. May be a good idea to leave a marker at the point where the route meets the summit plateau to eliminate any possibility of accidentally taking the wrong chute back down.
  - 1,875’ elevation loss. 2-4 hours to descend.
- Return to camp.
  - ½ mile, 300’ elevation loss. Less than 30 min.

**Day’s totals.**

- 2,000’ elevation gain.
- 3-5 hours of climbing/scrambling.
- Additional 3-5 hours for approach/descent.
- 1 mile of hiking.

**Day Eight**

- Wake up and eat breakfast.
- Hike to Lake Helen of Troy. Contour around east edge of lake to where the 2nd class north slopes of Trojan Peak begin.
  - 1 mile, 300’ elevation gain. Approx 45 min.
- Ascend the north slopes of Trojan Peak to beginning of its SW ridge.
  - 1/3 mile, 800’ elevation gain. Approx 1 hour.
- Descend into the Barnard cirque until about 13,100’ and then contour to the north slopes of Barnard East. Ascend to Barnard East’s summit.
  - 1¼ miles, 300’ elevation loss to contour, 500’ elevation gain to Barnard East summit. Approx 1 hour.
- Descend along the summit plateau heading SE to Vacation Pass.
1.5 miles, 1,020’ elevation loss. Less than 1 hour.

- From Vacation Pass descend to Wallace Lake.
  - 1 mile, 1,190’ elevation loss. Approx 1 hour.

- Make camp in the flats surrounding Wallace Lake. Scout lines for day nine.

- Day’s totals
  - Starting Elevation: 12,300’. Ending Elevation: 11,450’.
    - 1,600’ elevation gain.
    - 2,400’ elevation loss.
  - 4 miles.
  - Approx 4 hours 30 min on trail.

Day Nine

- Wake up and eat.

- Two options for this day

1. Find a way to the top of a peak.

- One of my goals for my expedition is to summit a peak by pure route-finding without following a specific established route. The cirque surrounding the Wallace/Wales Lakes basin offers a plethora of terrain mostly in the 3rd and 4th class range, but 5th class terrain is also abundant.

- The final decision of what peak to climb and how to climb it would come as a result of the scouting we do the evening of the eighth day when we arrive at Wallace Lake. However, based off of what I have seen from photos, trip reports and topo maps, two possibilities include ascending the southeast face of Mount Barnard (13,990’), or the north face of Mt Hale’s north peak above Wales Lake (12,793’).

- Gear
- Full 60m rope and standard Sierra rack (due to unknown nature of route).
- All belays (if necessary) would be gear anchors.

**Descent/Retrofit**

- Part of the reason I have those two possibilities in mind is due to their proximity to easy terrain. There are obvious 2nd or 3rd class lines all over the southern slopes of Mount Barnard and Mt Hale’s north peak’s west face is a similar class 2/3 scramble.
- Retreat would mean rappelling back down the route we meandered up. Most likely would involve leaving gear and/or slinging horns/blocks.

2. **West Rib Center- Mt Carl Heller. 5.6, II, 3 pitches.**

- 1776’ Elevation gain. 450’ technical climbing. 2-4 hours on route.
- From Wallace Lake, scramble up a gully on the low band of cliffs to gain the dust and talus slopes of the west face.
- Continue up the west face, through another gully until its top where the west face broadens. Climb up and left, aiming for the southern-most arête that leads directly to the summit.
- Follow this arête for three pitches, which takes you to just below the summit where 3rd/4th class ledges lead to the summit (13,211’).

**Gear**

- Full 60m rope and standard Sierra rack.
- All belays are gear anchors.

**Descent**

- From the summit, follow the south ridge for 5-10 min, passing over some exposed 4th class terrain, then back to the 2nd/3rd class west face. Descend the broad slopes back down to the gullies that were climbed at the beginning of the route.
• Approx 1 hour 30 min.

• **Retreat**
  
  o From the arête, a single rappel will allow you to get back onto the easier terrain of the west face. May require leaving gear, but not nearly as much as other climbs.

• Return to camp.

**Day Ten**

• Break Camp

• Climb back up to Tulainyo Lake.
  
  o 1.5 miles, 1,350’ elevation gain. Approx 1 hour 45 minutes.

• Climb up to the top of the Russell-Carillon Pass.
  
  o .5 miles, 450’ elevation gain. Approx 45 min.

• Descend to Upper Boy Scout Lake.
  
  o 1 mile, 1,980’ elevation loss. Approx 30 min.

• Continue to Iceberg Lake
  
  o 1.3 miles, 1,300’ elevation gain. Approx 1 hour 30 min.

• Set camp, explore around Iceberg Lake and scout routes for following day.

• **Day’s Totals**
  
  • Starting elevation: 11,500’ Ending elevation: 12,640’
    
    o Elevation gain: 3,176’.
    
    o Elevation loss: 2,064’.

  • 4.5 miles

  • 5 hours

**Day Eleven**

• Alpine start! Arrive at base of climb by 7am (climb loses sun around 2 pm).
• **Approach:** ½ mile, 900’ elevation gain. Approx 1 hour.

• **East Buttress, Mount Whitney. 5.7, IV, 11 pitches.**
  
  o 1,900’ elevation gain, 1,000’ technical climbing. 4-8 hours on route.
  
  o From Iceberg Lake, scramble up talus slopes to the obvious East Buttress. The route starts at a stance in a left facing corner below the second tower.
  
  o The route follows the buttress the entire time making route finding relatively easy.
  
  o The first six pitches (except for the fourth pitch) generally trend right along the buttress. Each pitch has a “short, steep and fun crux” followed by 4th class terrain.
  
  o After the 7th pitch, the climbing progressively becomes easier. Many groups solo or simul-climb after pitch 8.
  
  o Every pitch has a large, comfortable belay ledge, and there are many natural features that can be slung and used as anchors.

• **Gear**
  
  o Full 60m rope and standard Sierra rack.
  
  o Gear or natural anchors (many horns and blocks to sling).
  
  o With a 60m rope some pitches can be combined, however this makes communication more difficult.

• **Descent**
  
  o The standard descent is to follow the 3rd class Mountaineer’s Route back down to Iceberg Lake.
    
    ▪ Approx 2 hours.

• **Retreat**
Rappel off the buttress climbers right into the Mountaineer’s Route gully. The higher up the climb you are, the more rappels needed. There are many horns and blocks to sling, but rappelling will most likely result in leaving gear.

- Return to camp.
- Day’s totals.
  - 1,900’ elevation gain/loss
  - 1,000’ technical climbing.
  - 1 mile round-trip approach/descent from Iceberg Lake to start of route.
  - 7-11 hours.

**Day Twelve**

- Wake up and break down camp.
  - Hike back to Whitney Portal Trailhead via North Fork of Lone Pine Creek.
    - Elevation loss: 4,370’. Total distance: 4 miles. Total time: Approx 3 hours.
- Drive into Lone Pine, get a large burger and a larger beer.

Our wilderness permit is for fourteen days, so there is a cushion of two days to accommodate for bad weather, an extra rest day, or the unknown.
Team, Leadership and Decision-Making

Planning and preparing for an undertaking such as the expedition to the Sierra I am organizing requires lots of attention to detail, research and judgment. One of the most important judgment calls in this process is the decision of who will be accompanying me on this expedition. My partner will be my only true support while in the backcountry of the Sierra and as such, I have to be able to rely on them not only for their technical skills and climbing ability, but also their judgment and decision-making. On top of these factors, I also need a partner who will share the same enthusiasm for the trip, as well as someone that I will enjoy spending an extended period of time traveling and climbing with. All of these factors are integral to forming an effective and functional team.

Based off of these criteria, I have chosen Aaron Stone, a fellow Expeditionary Studies student to join me on this exciting expedition. Aaron and I both joined the program at the same time and have had two and a half years of backpacking, paddling and rock/ice climbing experiences together. We have spent ample time in the field together, both on trips as well as a summer spent working and living together. We have also traveled to Nepal together, which is very helpful in discerning how we both handle and operate at altitude. Due to all the time we have spent together and the activities we have participated in together, I have become familiar with his climbing mentality and ability, his judgment, his personality, as well as how we function together in the field. As a result, I feel confident in my decision to include him in my expedition as my partner.

One of the reasons I feel so confident in my decision of having Aaron as my partner is that I know his enthusiasm for climbing has manifested as a self driven motivation to get in as many climbing days as possible and learn skills that will further his abilities. We often discuss new techniques/skills we have seen or learned (i.e. hauling systems, anchor building methods, rescue skills, protection techniques
etc.) and get excited at their practical applications. This enthusiasm gives me confidence that although we will primarily be in separate locations from the months of December until May, he will continue the development of both his physical condition/climbing ability, as well as his technical skills just as I will be.

Aaron and I climb at a similar level and are both able to lead/follow any of the routes I have planned to climb during the expedition. I feel that this is important because it will allow us to both feel confident at any and all points when on a rope team. Knowing that my partner is just as solid on the terrain as I am will be comforting. There will be no moments of doubt that a pitch is too hard for him to complete. Neither of us will feel like we have to act as a guide for the other, so the experience will be less stressful and/or nerve wracking. By not having to worry about the others ability, we can instead focus on our own physical/mental condition. It is hard to take care of yourself when you are focused on someone else, so having a similarly skilled partner is key.

Aaron and I have not only been getting out climbing a lot, but have also been going to both the rock gym and lifting together. Almost every week this semester we have gone to either Metro Rock climbing gym in Burlington or the climbing gym at Plattsburgh. We use these days to push ourselves climbing hard routes indoors and to work on our endurance and overall strength. Simply put, one of the best ways to train for climbing is to climb! To help increase our endurance and power on rock, we have also been going to the weight room to lift. We go three times a week (on top of other days spent climbing inside or out) and are following a workout routine that specifically targets muscles that are used in climbing, as well as their opposites so that balance is maintained and one muscle group does not become neglected. This is important because balanced muscle groups help prevent injury by stabilizing joints and connective tissue. We will continue this weight training routine, as well as the climbing days

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during the months we are not together. This will require personal accountability and motivation. However, to increase accountability, we will have a skype meeting at least once a week to discuss our progress, what we have been doing and to motivate each other.

While Aaron is my immediate support in the field, there are other resources and people that will be there for support if an emergency arises. This includes local SAR teams, the park rangers, our emergency contacts and even other people we encounter during our expedition\textsuperscript{46}. These resources will not be immediately available and will preferentially not be needed at all, but are an important and necessary (if unknowing) part of our team.

Another reason I am confident in Aaron as a partner is his recent experience on his own senior expedition. He traveled to four different classic climbing locations, gaining experience and mileage on many different types of rock with different styles of climbing. Not only did he climb a considerable amount, but also he went through the group dynamics of a climbing expedition (though his was less backcountry oriented). This gives him practical experience and know-how with team decision-making, conflict resolution and communication.

Group dynamics is an important part of how a team operates. Due to the fact we will only be a team of two, communication will be key. All issues, concerns, complaints or disagreements must be able to be voiced in a way that is productive. Holding back or “riding out” issues is not an option as it will directly affect the efficiency/ability of our team. This is another reason I am choosing Aaron as my partner. I know that he is not afraid to voice opinions or address issues when they arise, just as am I. We have had experiences on previous trips where we have had conflicting views on what the best course of action is and have been able to effectively manage them. He is outspoken and can be opinionated, but not in a bad or unreasonable way. In fact, I highly value this trait in team members because it leads to

\textsuperscript{46} For the full list of emergency services and contacts see “Emergency plans, phone numbers and call-out procedures” chapter.
solutions, not simmering resentment. I know that if he or I feel that something needs to be discussed, it will be discussed before it turns into a problem.

While, I will technically be “team-leader” because this is my senior expedition, my input is not any more valuable than his. In a team of two, decisions must be made together. There is no room for ego or pride because there is no third party to weigh in or point out frivolity. Before any decision is made, whether it is as small as where to pitch our tent, or as important as whether to bail off of a route, we will have to discuss our options in a factual, level headed manner that weighs the pros and cons of each action or non-action. As I stated previously, I have had disagreements with Aaron before, but we have always been able to come to either an agreement or a compromise that was both practical and acceptable to both of us.

It is due to these facts that I believe Aaron and I will be able to not only function well as a team and accomplish what I have planned for this expedition, but also have fun in the process. Our work ethic, climbing ability and personalities are similar, so I believe we will be able to properly prepare for the trip before hand, as well as support and push each other while out climbing in the Sierra. Plus, as an added bonus, both our names are Aaron, so we have that going for us, which is nice.
Crux Points and Go/No-Go Standards

In climbing, there are certain moves that stand out as the hardest of the route; these are called the “crux” moves. They are the defining moments of the climb where the potential for failure is greatest. This principle is the same for expedition planning. As our plan comes into focus, there are certain aspects of the trip that stick out as potentially difficult. It is important to recognize these crux points of the expedition so proper focus and foresight can be applied to ensure the highest possibility of success. The crux points that I have identified for our time in the Sierra are as follows.

Altitude

One factor to our expedition that could be problematic is the altitude at which our objectives lie. Living on the East Coast, both Aaron and I do not have exposure to altitude or its effects on any consistent basis. We will be camping between 11,000’-12,500’ which is certainly high enough to cause physiological reactions such as AMS. In order to decrease the potential for adverse effects due to altitude, both Aaron and I have been following a training routine to help increase our cardio and improve our overall strength and endurance. This training program will help to build our overall fitness level until the beginning of our trip. Then, once we arrive in the Sierra, we will spend 5-6 days climbing and camping in the Tuolumne Meadows area of Yosemite. Most of the camping in Tuolumne is between 8,000’-9,000’ in altitude, while the peaks (that we intend to climb) range from 10,000’-12,000’. By starting off at a generally lower high-altitude, the initial acclimatization will be less drastic and the likelihood of initial AMS symptoms developing is low. Then the process of climbing to high altitudes during the day, followed by returning to lower sleeping elevations will greatly aid in the process of acclimatizing. As our time in Tuolumne progresses, we will climb the taller peaks in the region, spending more time at/near the elevations of the Whitney Region, and sleeping at higher altitudes to progressively become better adapted to the high altitude we will face. This combination of training and
acclimatization, as well as our previous reactions to altitude\textsuperscript{47} leads me to believe that we will be able to overcome the altitude issue if we stick to the plan.

**Climbing at Altitude**

This crux point is different than altitude in general. The concern here is how the thinner air will affect our climbing ability. To help combat this, potential issue, I have planned several preemptive measures. The training and conditioning will certainly help, as will the acclimatization process, however I have also created a climbing progression in order to become familiar with how climbing differs at altitude vs. climbing in the ADK. We plan to start off climbing mainly 3\textsuperscript{rd} class routes/scrambles that may have a few 5\textsuperscript{th} class moves sprinkled in. Starting off climbing these easier, “non-technical” routes will get us accustomed to the rock, the exposure, as well as the realities of climbing at altitude. As the days progress, we move towards more sustained technical routes. This progression will allow us to know how capable we are climbing at altitude and if adjustments need to be made to our route selection, that can be done early on.

**Carrying 12-14 Days’ Worth of Food**

Our planned route of travel through the Sierra backcountry does not lend itself towards easy resupplies and as such we will have to carry in all of our gear and food with us on our backs. Food is bulky and heavy, especially when the use of bear barrels is necessary. In order to cut down on some of the weight and bulk of carrying multiple bear barrels, I am planning on creating a food cache in the area of Wallace Lake. This way we can avoid carrying all of our food at all points. However, this means that the first couple of days we will be loaded down with the food meant for the resupply. While this is not

\textsuperscript{47} Aaron and I traveled to Nepal together. During that time we trekked to the Gokyo Region of the Khumbu and reached altitudes of approximately 18,000’. Both of us handled the altitude very well with minimal physical symptoms and climbed two easy peaks, one above Macherma, the other above Gokyo. I even managed without taking Diamox.
optimal, I believe that the benefits of having two days of full load while hiking at the beginning of the expedition when we are fresh and rested and strong is reasonable and preferable to lugging everything around with us throughout the entire expedition. The resupply will be a good way to lighten our pack loads and yet still be fully equipped and self-reliant.

**Large Packs While Scrambling**

Due to the unsupported and extended backcountry nature of my expedition, we will have to be carrying all our supplies with us as we move from campsite to campsite. These routes will almost all include scrambling up/down moderate-steep slopes with our large packs on, which decreases balance and increases the output of energy and effort. As this is an unavoidable part of my proposed travel plan, we will need to be able to safely negotiate these obstacles. To do this, we will simply need to take a moment to survey the terrain and scout a reasonable line through the slope that follows the path of least resistance. Moving with cautious purpose will allow us to move efficiently and safely up/down the steep slopes. We will also keep our harnesses and ropes easily accessible so that if we ever encounter a point where we feel uncomfortable or unreasonably exposed with our packs on, we can have a quick belay available.

**Route Finding (Climbing)**

The most difficult/thought provoking part of my expedition I believe will be route finding while climbing. Some routes will be easy to follow (ridge climbs like Mount Russell’s East Ridge) but others will have more indistinct lines to follow. The terrain is much larger and the routes much longer in the Sierra than where I am used to climbing, so staying on route will be a priority. To help improve our ability to stay on route I have planned two preventative measures. First and most importantly, I have compiled route descriptions and topo’s from several different sources (Secor, McName and MountainProject). We will carry copies of these descriptions and topo’s with us while we climb so that we can reference them
before and during the climb. The other measure I have planned is to scout the routes before hand. Each
time we move locations I have built in time that will allow us to use the small pair of binoculars I am
going to bring to examine the route we plan on climbing. We will be able to visually examine the route
prior to starting it, noting features that will help us stay on route when we do start, locating belay ledges
and other important benchmarks. With the route descriptions and the visual markers we discern from
prior scouting, I believe that we will be able to greatly decrease our likelihood of getting off route.

**Williamson Bowl**

This is not a crux point because it will be any more difficult than the rest of the expedition, but
because it is the point during the expedition where we are at our most remote. The Williamson Bowl is
off the beaten path and secluded, guarded by a rugged approach/descent to the I-395 corridor. We will
make a base camp and stay in the area for several nights, during which we will have to be extra vigilant
in regards to our safety and condition. I have researched alternative “escape” routes out of the area
including the Shepard’s Pass Trail, and the location of a nearby ranger outpost, but the area is still our
most remote and will need to be treated with a certain level of elevated consciousness.

**Go/No-Go Standards**

Whenever there is a goal, there is a pressure, whether internal or external, to complete it. This
driving force is a good thing: it’s motivation. However, in the world of expeditions, motivation without
humility and/or practicality can get you into dangerous situations. It is for this reason we impose go/no-
go standards on ourselves as a personal system of checks and balances. Expeditionary history is full of
accidents where something as simple as an ignored turnaround time has led to disaster.\(^48\) As such, it is

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\(^48\) One example is the 2008 Mountaineering tragedy on K2 where 11 people died after they continued pushing for
the summit after their proposed 2pm turnaround time. A fantastic and unique retelling/analysis of this accident
can be found in
Zuckerman, Peter, and Amanda Padoan. *Buried in the Sky: The Extraordinary Story of the Sherpa Climbers
not enough to just come up with these guidelines, it is imperative to be able to follow them. To be able to take a moment, step back and separate ego from the analysis of a situation is the key for responsible decision making. The following criteria are the questions and concerns that I believe will be necessary to objectively examine when deciding if conditions are viable to start/continue a climb or section of the expedition.

**Weather**

Rock climbing is a very weather dependent activity. Precipitation such as rain or snow quickly begins to affect rock properties like friction and, potentially, the security of protection placements. This can cause routes to become much more difficult or dangerous than they would normally be. If a lightning storm rolls overhead while climbing, the exposure to and potential for a lightning strike is greatly increased. Even something as simple as excessively hot or cold temperatures can cause potentially hazardous situations like dehydration, heat stroke or hypothermia. It is for these reasons that the weather will be a big deciding factor on whether we decide to climb or hunker down in a tent.

While June is a pretty stable month for weather patterns in the Sierra, it is still a very real concern when climbing long, exposed routes such as the ones we intend to climb. As such we will be paying very close attention to the forecasted weather. I will have a small, lightweight weather radio that I will be bringing with us to aid in the weather forecasting. The weather blows in from the east in the Sierra, so special attention will be given to weather conditions when climbing a route with a western aspect as storms will not be visible until they are directly overhead. If any sort of storm or questionable weather front is observable or predicted for the day, west facing routes will be considered too high risk and therefore not be started. East facing routes offer a bit more leeway. In general, they are less committing as they are generally less technically difficult and offer views of approaching weather systems. If there is a possibility of light or intermittent precipitation, (as long as there is no lightning forecast), these routes
can provide an alternative than can be attempted safely. Any forecasts of lightning or hail will result in a
day of rest instead of exposure.

**Injury/Illness**

The condition of expedition teammates is always an important factor when deciding to set off
on an objective or not. This criteria addresses only non-emergency injuries and illnesses as anything of a
serious nature would automatically be a no-go/evac standard. Aaron and I both have Wilderness First
Responder certifications and will be able to properly inspect and judge the viability of the afflicted
member’s ability. Any injury or illness that affects balance or coordination will be a red-flag and treated
as such. This guideline is a bit more vague and dependent on situational conditions, however I feel
confident that with objective and rational analysis from the non-affected member as well as honest
feedback from the affected member, we will easily be able to decide whether or not we are the proper
condition to begin/continue our objective.

**Acclimatization**

Related to the injury/illness standard, the acclimatization criteria will be a major part of the
expedition. The entire expedition is based off of our ability to acclimatize to and preform at altitude. If
we arrive in the High Sierra and find ourselves unable to properly function at the altitude, we will have
to make the tough decision to revert to contingency plans.\(^{49}\)

**Time/Light Constraints**

When climbing long alpine routes, it is important to plan for all aspects of the climb including
time for approach, the route itself as well as the descent. Even if the summit is reached at sunset, this
means that the descent will almost guarantee time spent in the dark. Even though we will be carrying

\(^{49}\) See the “Contingency Plans” chapter for details.
headlamps with us on all climbs, just as a precautionary measure, it is less than ideal to be descending in the dark as it can easily lead to getting lost. We will be climbing during the time of year when the days are longest, however we still need to be acutely aware of our position verses the projected time to climb/descend the route. If we arrive at the base of a climb late, either by necessity from waiting out a rainstorm, or something accidental as a late wake-up or a line of other climbers, we have to be willing to recognize a “do not climb after” time. Very similar to a turnaround time, this will be the point where we feel starting at or after this time will not allow us enough time to climb/descend the route during daylight. If we get to that time we will have to swallow our pride and either find another, shorter route to supplement for the day, or choose not to climb at all.
Risk Management Plan

Risk is a part of everyday life; there is simply no avoiding it. At any given point there are several things that could go wrong with potentially severe consequences. For example, crossing the street carries the risk of being hit by a car, cooking breakfast can lead to a fire and “even a bathtub can be hazardous if someone slips and falls in it.” So why aren’t we paralyzed with fear every time we step to a crosswalk or a bathtub? It is because we have accepted those risks and developed ways to manage them in a way that helps mitigate the consequences; we look both ways before crossing the street, we monitor the stove as breakfast is cooking and we make sure to have stable footing while bathing. The consequences still exist, but are much less likely to occur because of the mitigating actions.

This same principle is applicable in the mountains. There is risk involved any time you venture into the mountains, the key part is identifying those risks and ways to mitigate them, as well as discerning what your personal level of “acceptable risk” is. “Acceptable risk” is a personal decision of each individual climber as to what amount of risk they feel comfortable exposing themselves to. It is based off of experience, “skill level, individual goals, and... personal comfort level with the hazards encountered while climbing.” Some climbers may be more than happy with exposing themselves to less risk by seeking out routes that involve scrambling instead of technical climbing, whereas others may intentionally seek out routes that take a much higher level of commitment and skill. This is all based off of what their personal level of acceptable risk is. When putting together a risk management plan, it is important to know what type and levels of risk is considered acceptable by every member of the team.

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51 It is also important to know the general level of risk acceptable by other climbers of the area. Climbing teams do not exist in a vacuum. The decisions of others around you can directly influence your experience/safety on route.
For my risk management plan, I have compiled a list of potential problems that may arise during my expedition in any category, (i.e. camping, transportation, climbing, etc.). I have then calculated the risk of those problems by assessing the likelihood of the problem occurring, the severity of the consequence of each problem, and how each problem can be controlled/mitigated followed by an overall risk rating. The risk ratings are based off of a “high,” “medium,” and “low” system to qualify likelihood, severity and overall risk of each problem.

A “low” likelihood rating designates that there is a very slim chance of that problem becoming an issue at any point during the expedition. For example, getting lost while traveling cross-country in the Sierra has a low likelihood of occurring on my expedition. The route that I have planned follows very identifiable landmarks that are constrained by peaks and ridges. We would have to actively try to cross into an opposing valley or cirque to get off route while backpacking. Conversely, a “high” likelihood problem is something that could easily become an issue on any day during the trip. An example of a “high” likelihood problem is sunburn. In exposed environments such the alpine above tree-line, sunburn can be extremely common. Pair with that the high-altitude of the Southeastern Sierra and you can go from “healthy tan” to “deep fried” easily. A “medium” likelihood rating is a problem that has a decent chance of becoming an issue. An example of a medium likelihood event would be the onset of altitude sickness. It is a potential problem for a while, but at a certain point you either will have AMS or you will be acclimatized.

For the purpose of my risk management plan, a “low” consequence rating is something that would not affect the team in a way to change the itinerary or affect the team’s ability. This would be something minor like a cut or a scrape. It may sting or hurt for a little bit, but after a quick bandage, the teammate is almost entirely unaffected. A “medium” consequence rating is a problem that would affect

As such, to get an idea of the general climbing trends, I have inspected many trip/incident reports (see bibliography for full list).
a team member’s performance for a relatively short period of time (1 or 2 days) and may require altering the itinerary. Mild AMS is an example of a “medium” consequence. It would make the effected person less physically capable and may require descending to a lower altitude for a night or two to help recover. This would alter the expedition, but would not require an evacuation. A “high” consequence rating is a problem that would necessitate the end of the expedition and an evacuation. A prime example of a “high” consequence problem is a broken bone. If one of us breaks a bone while out in the backcountry, evacuation and medical attention becomes the objective and the expedition would have to end.

For each potential problem, there will be an explanation of ways to control/avoid the issue. This will be a column in the chart used to organize my risk management plan. “Controls” do not have to be very in depth. To go back to a previous example, to avoid getting hit by a car crossing the street, we look both ways before stepping into traffic. This act of looking both ways is the “control” that prevents us from becoming a road pizza. Some risks will have only one control or only be able to be avoided by using caution. This is the nature of risks, some are easier to prevent than others. This being said, risk is not completely preventable, accidents still occur even when preventative measures have been taken. All we can do is take every precaution seriously and do all that is in our power to decrease the possibility of an incident.

The hardest part of a risk management plan is determining the overall level of risk for each potential problem. This is determined using the information about the likelihood, the severity of the consequence and factoring in real world knowledge/experience. For example, take determining the overall risk of a cut rope. There is a very low likelihood of that specific event occurring, but if it does, the consequence would be extreme and life-altering if not life-ending. While to some it would make sense to average the two ratings and end with an overall risk rating of “medium,” I believe it to be an overall
risk of “low.” This is due to the low likelihood of the event occurring, paired with my own knowledge of rope strength and durability. In the real world, cut ropes are very rare and as a result, they are a “low” overall.
<table>
<thead>
<tr>
<th>Problem/Hazard</th>
<th>Likelihood</th>
<th>Consequence/Risk (\text{w/o controls})</th>
<th>Control</th>
<th>Overall Risk (\text{w/ controls})</th>
</tr>
</thead>
<tbody>
<tr>
<td>Driver Fatigue</td>
<td>Low</td>
<td>High</td>
<td>Take turns driving, get enough sleep the previous night</td>
<td>Low</td>
</tr>
<tr>
<td>General Vehicle Issues</td>
<td>Medium</td>
<td>Medium</td>
<td>Full inspection pre-trip, check/change all fluids</td>
<td>Low</td>
</tr>
<tr>
<td>Engine Failure</td>
<td>Low</td>
<td>Medium/High</td>
<td>Full inspection pre-trip</td>
<td>Low</td>
</tr>
<tr>
<td>Flat/Bald Tires</td>
<td>Low</td>
<td>Low</td>
<td>Carry spare tire, check and/or replace tires pre-trip</td>
<td>Low</td>
</tr>
<tr>
<td>Poor Traction on Whitney Portal Road</td>
<td>Low</td>
<td>Low</td>
<td>Carry tire chains, snow salt</td>
<td>Low</td>
</tr>
<tr>
<td>Poor Driving Conditions (Snow/Ice/Rain)</td>
<td>High</td>
<td>Low</td>
<td>Be aware of weather forecast, drive appropriately based on conditions, pull over/stop if unsafe</td>
<td>Low</td>
</tr>
</tbody>
</table>
### Access

<table>
<thead>
<tr>
<th>Obtaining Permits</th>
<th>High</th>
<th>High</th>
<th>Apply in advance</th>
<th>Low</th>
</tr>
</thead>
<tbody>
<tr>
<td>Closures Due to Animal Habitats</td>
<td>Low</td>
<td>High</td>
<td>Research (restriction on Williamson Bowl due to Bighorn Sheep habitat lifted in 2010)</td>
<td>None</td>
</tr>
</tbody>
</table>

### Camping

<table>
<thead>
<tr>
<th>Crowded Campsites</th>
<th>Low</th>
<th>Low</th>
<th>Arrive ASAP at popular campsites (Upper Boy Scout/Iceberg Lake), use of backcountry campsites, expedition scheduled for less crowded time of year</th>
<th>Low</th>
</tr>
</thead>
<tbody>
<tr>
<td>Animals-Bears</td>
<td>Low</td>
<td>Medium/High</td>
<td>Bear barrels, planned campsite altitudes above normal bear habitat, LNT ethics, cook downwind and reasonable distance from</td>
<td>Low</td>
</tr>
<tr>
<td>Animals-Marmots</td>
<td>Medium</td>
<td>Medium</td>
<td>Keep all food and scented items in bear barrel, leave packs and tent open if set up so marmots do not chew through material to access it anyways (better yet hang pack from tree/boulder where they cannot get to it)</td>
<td>Medium</td>
</tr>
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<td>---</td>
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</tr>
<tr>
<td>Animals-Mosquitoes</td>
<td>Medium</td>
<td>Low</td>
<td>Wear long sleeves/pants, DEET based repellent, mosquito netting</td>
<td>Low</td>
</tr>
<tr>
<td>Rockfall</td>
<td>Low</td>
<td>High</td>
<td>Natural rockfall is rare. Camp away from chutes, couloirs and avoid the base of rocky slopes</td>
<td>Low</td>
</tr>
<tr>
<td>Avalanche</td>
<td>Low</td>
<td>High</td>
<td>Avoid camping below snowy slopes/avalanche terrain</td>
<td>Low</td>
</tr>
<tr>
<td>Burns</td>
<td>Low</td>
<td>Medium</td>
<td>Proper stove procedure/safety</td>
<td>Low</td>
</tr>
<tr>
<td>Risk Category</td>
<td>Probability 1</td>
<td>Probability 2</td>
<td>Mitigation Measures</td>
<td></td>
</tr>
<tr>
<td>------------------------------</td>
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<td>---------------</td>
<td>-------------------------------------------------------------------------------------</td>
<td></td>
</tr>
<tr>
<td>Cuts/Lacerations</td>
<td>Low</td>
<td>Medium</td>
<td>Proper knife handling</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Proper nutrition, hydration, carry general medications</td>
<td></td>
</tr>
<tr>
<td>Illness</td>
<td>Medium</td>
<td>Medium</td>
<td>Proposed route has lakes and streams readily available, snow will be available as contingency plan, water purification methods, dromedaries</td>
<td></td>
</tr>
<tr>
<td>Inadequate Water Sources</td>
<td>Low</td>
<td>High</td>
<td>Proposed route has lakes and streams readily available, snow will be available as contingency plan, water purification methods, dromedaries</td>
<td></td>
</tr>
<tr>
<td>Inadequate Water Sources/Non-potable Water</td>
<td>Low</td>
<td>High</td>
<td>Proposed route has lakes and streams readily available, snow will be available as contingency plan, water purification methods, dromedaries</td>
<td></td>
</tr>
<tr>
<td>Hunger/Low Supplies</td>
<td>Low</td>
<td>Medium/High</td>
<td>Carry an extra days worth of food, food cache left midway through route for second half of trip</td>
<td></td>
</tr>
<tr>
<td>Widow Makers</td>
<td>Low</td>
<td>High</td>
<td>Expedition occurs almost exclusively above tree line, identify and avoid, camp away from perched/unstable boulders</td>
<td></td>
</tr>
<tr>
<td>Stove Flair-up</td>
<td>Medium</td>
<td>Low/Medium</td>
<td>Proper stove technique</td>
<td></td>
</tr>
<tr>
<td>Stove Malfunction</td>
<td>Low</td>
<td>Medium/High</td>
<td>Repair kit, knowledge/ability to fix</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Low</td>
<td>High</td>
<td>Cook in well ventilated area, do not cook in tent</td>
<td>Low</td>
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<tr>
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<td>-----------</td>
<td>---------------------------------------------------</td>
<td>-----------</td>
</tr>
<tr>
<td>CO2 Poisoning</td>
<td>Low</td>
<td>High</td>
<td></td>
<td>Low</td>
</tr>
<tr>
<td>Tent- Broken Pole</td>
<td>Low</td>
<td>Low</td>
<td>Splint, repair kit, duct tape</td>
<td>Low</td>
</tr>
<tr>
<td>Tent- Rip/Animal Hole</td>
<td>Low/Medium</td>
<td>Low</td>
<td>Patch kit, duct tape</td>
<td>Low</td>
</tr>
<tr>
<td>Tent- Wind Damage/Blown Away</td>
<td>Low</td>
<td>Medium</td>
<td>Repair kit, sheltered campsite selection, secure stakes/anchor points, keep packs inside tent as weights</td>
<td>Low</td>
</tr>
<tr>
<td>Sleeping Pad Puncture</td>
<td>Medium</td>
<td>Low</td>
<td>Clear sharp objects from tent area, patch kit, duct tape</td>
<td>Low</td>
</tr>
</tbody>
</table>

**Hiking/Approach**

<table>
<thead>
<tr>
<th>Abrasions</th>
<th>High</th>
<th>Low</th>
<th>Wear clothing that will help prevent cuts and scrapes</th>
<th>Low</th>
</tr>
</thead>
</table>

76
<table>
<thead>
<tr>
<th>Condition</th>
<th>Low</th>
<th>Medium</th>
<th>Medium/High</th>
<th>Low/Medium</th>
<th>Low</th>
</tr>
</thead>
<tbody>
<tr>
<td>Blisters</td>
<td>High</td>
<td>Low</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Broken Bones</td>
<td>Low</td>
<td>High</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dehydration</td>
<td>Medium</td>
<td>Medium</td>
<td></td>
<td>Low/Medium</td>
<td></td>
</tr>
<tr>
<td>Exposed Terrain</td>
<td>Medium</td>
<td>Medium/High</td>
<td></td>
<td>Low</td>
<td></td>
</tr>
<tr>
<td>Scree/Talus Fields</td>
<td>High</td>
<td>Low</td>
<td></td>
<td></td>
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<tr>
<td></td>
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<td></td>
<td></td>
<td></td>
<td>Be aware of other parties above/below, stay close together so objects dislodged by teammate</td>
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<td></td>
</tr>
<tr>
<td><strong>Rock Fall</strong></td>
<td>High</td>
<td>Medium/High</td>
<td>cannot gather much momentum, spread team out horizontally so no one is below anyone else, “ROCK!” calls, use of helmets, constant vigilance</td>
<td>Medium</td>
<td></td>
</tr>
<tr>
<td><strong>Snow/Ice</strong></td>
<td>High</td>
<td>Low/Medium</td>
<td>Bring micro-spikes and mountaineering axe. Rent snow shoes if conditions require</td>
<td>Low</td>
<td></td>
</tr>
<tr>
<td><strong>Snow Blindness</strong></td>
<td>Medium</td>
<td>Medium</td>
<td>Wear UV resistant sunglasses</td>
<td>Low</td>
<td></td>
</tr>
<tr>
<td><strong>Hypothermia</strong></td>
<td>Low</td>
<td>Medium/High</td>
<td>Proper layering, proper calorie intake, proper hydration</td>
<td>Low</td>
<td></td>
</tr>
<tr>
<td><strong>Heat Exhaustion/Stroke</strong></td>
<td>Low</td>
<td>Medium/High</td>
<td>Proper layering, proper hydration, do not over-exert, seek shade when hot</td>
<td>Low</td>
<td></td>
</tr>
<tr>
<td><strong>Sprained Ankle</strong></td>
<td>Medium</td>
<td>Medium/High</td>
<td>Footwear with ankle support, walk with focus/caution, bring ankle brace</td>
<td>Medium</td>
<td></td>
</tr>
</tbody>
</table>

Sunscreens, protective
<table>
<thead>
<tr>
<th><strong>Sun Burn</strong></th>
<th><strong>High</strong></th>
<th><strong>Low/Medium</strong></th>
<th><strong>clothing/layers, rest in shade when possible</strong></th>
<th><strong>Medium</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Animal Encounter</strong></td>
<td><strong>Low</strong></td>
<td><strong>Medium</strong></td>
<td><strong>Make presence known to animal, do not approach/taunt</strong></td>
<td><strong>Low</strong></td>
</tr>
<tr>
<td><strong>Getting Lost</strong></td>
<td><strong>Low</strong></td>
<td><strong>Medium</strong></td>
<td><strong>Planned route has very distinct/visible landmarks, compass, topo-maps</strong></td>
<td><strong>Low</strong></td>
</tr>
<tr>
<td><strong>Fatigue</strong></td>
<td><strong>Medium/High</strong></td>
<td><strong>Low/Medium</strong></td>
<td><strong>Walk at comfortable pace, rest/snack frequently, hydrate, distribute load equally</strong></td>
<td><strong>Medium</strong></td>
</tr>
<tr>
<td><strong>Altitude Sickness</strong></td>
<td><strong>Medium</strong></td>
<td><strong>Medium</strong></td>
<td><strong>Acclimatization period before arrival at Whitney Portal, Diamox, “climb high, sleep low,” hydrate</strong></td>
<td><strong>Medium</strong></td>
</tr>
<tr>
<td><strong>Stream Crossings</strong></td>
<td><strong>Medium</strong></td>
<td><strong>Medium</strong></td>
<td><strong>Un-lock pack straps. Find shallow, low-flow section of river to cross. Use trekking poles for extra balance</strong></td>
<td><strong>Low</strong></td>
</tr>
<tr>
<td><strong>Clothing Tears</strong></td>
<td><strong>High</strong></td>
<td><strong>Low</strong></td>
<td><strong>Stitch kits, duct tape, pay attention while hiking</strong></td>
<td><strong>Low</strong></td>
</tr>
<tr>
<td></td>
<td>Low</td>
<td>Medium</td>
<td>Low/Medium</td>
<td>Low</td>
</tr>
<tr>
<td>---------------------</td>
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<td>-----------</td>
</tr>
<tr>
<td>Wet Boots</td>
<td>Medium/High</td>
<td>Low</td>
<td>After-market waterproof treatment before trip, gaiters, gore-tex</td>
<td>Low</td>
</tr>
<tr>
<td>Boot Laces/Soles</td>
<td>Low</td>
<td>Medium</td>
<td>Extra pair of laces, boot repair kit, glue</td>
<td>Low</td>
</tr>
<tr>
<td>Pack Tear/Rip (body/straps)</td>
<td>Low</td>
<td>Medium/High</td>
<td>Inspect pre-trip, select durable pack, auxiliary straps, duct tape, stitch-kit, body/pack position awareness while hiking/scrambling</td>
<td>Low/Medium</td>
</tr>
<tr>
<td>Inclement Weather</td>
<td>Low/Medium</td>
<td>Medium</td>
<td>Find shelter if serious enough, proper layers if not unsafe to continue. Expedition is planned for time of year with most stable weather.</td>
<td>Low</td>
</tr>
<tr>
<td>Lightning</td>
<td>Low</td>
<td>High</td>
<td>Find shelter, “lightning position” on insulated pad. Descend off peak, ridge or similar exposed position. Expedition is planned for time of year where thunderstorms are least</td>
<td>Low</td>
</tr>
<tr>
<td></td>
<td>High</td>
<td>Low</td>
<td>Long sleeves/pants</td>
<td>Low</td>
</tr>
<tr>
<td>------------------</td>
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<td>-----</td>
</tr>
<tr>
<td>Abrasions</td>
<td>High</td>
<td>Low</td>
<td>Preventative measures, treat hotspots before becoming blisters</td>
<td>Low</td>
</tr>
<tr>
<td>Blisters</td>
<td>High</td>
<td>Low</td>
<td>Tape/wrap hands</td>
<td>Low</td>
</tr>
<tr>
<td>Flappers</td>
<td>High</td>
<td>Low</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Broken Bone</td>
<td>Low/Medium</td>
<td>High</td>
<td>Climb safely, climb within ability, proper gear placement</td>
<td>Low</td>
</tr>
<tr>
<td>Dehydration</td>
<td>Medium</td>
<td>Medium</td>
<td>Bring plenty of water on climb, electrolyte supplement</td>
<td>Low</td>
</tr>
<tr>
<td>Fatigue</td>
<td>Medium</td>
<td>Medium</td>
<td>Do not overexert, hydrate, proper caloric intake</td>
<td>Low</td>
</tr>
<tr>
<td>Condition</td>
<td>Frequency</td>
<td>Risk</td>
<td>Risk Prevention/Staging Measures</td>
<td>Severity</td>
</tr>
<tr>
<td>-------------------------</td>
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<td>------------------------------------------------------------------------</td>
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</tr>
<tr>
<td>Efficient rests at belays, rest days</td>
<td></td>
<td></td>
<td>Bring rain layers, puffy for belays, hat and gloves</td>
<td>Low</td>
</tr>
<tr>
<td>Exposure to Elements</td>
<td>Medium</td>
<td>Medium</td>
<td>Sunscreen, reapply sunscreen, protective layers, hat, sunglasses</td>
<td>Low</td>
</tr>
<tr>
<td>Sunburn</td>
<td>High</td>
<td>Low/Medium</td>
<td>Acclimatize beforehand, Diamox, hydrate, snack, descend if persistent</td>
<td>Medium</td>
</tr>
<tr>
<td>Altitude Sickness</td>
<td>Medium</td>
<td>Medium</td>
<td>Climb within grade/ability, route selection, proper/frequent gear placement</td>
<td>Low</td>
</tr>
<tr>
<td>Fall/Impact Injury</td>
<td>Medium</td>
<td>Medium/High</td>
<td>Pay attention to rope</td>
<td>Low</td>
</tr>
<tr>
<td>Stuck Rope</td>
<td>Low/Medium</td>
<td>Medium</td>
<td>Check rope</td>
<td>Low</td>
</tr>
<tr>
<td>Knot in Rope</td>
<td>Low</td>
<td>Medium</td>
<td>Extend placements with slings, anticipate/pay attention to nature of climb/pitch</td>
<td>Low</td>
</tr>
<tr>
<td>Rope Drag</td>
<td>High</td>
<td>Low</td>
<td>Check ropes daily, be</td>
<td>Low</td>
</tr>
<tr>
<td>Topic</td>
<td>Risk Level</td>
<td>Risk Level</td>
<td>Risk Level</td>
<td>Risk Level</td>
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<td>------------------------</td>
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</tr>
<tr>
<td>Core Shot</td>
<td>Low/Medium</td>
<td>High</td>
<td>mindful of rope while climbing</td>
<td>Low</td>
</tr>
<tr>
<td>Cut Rope</td>
<td>Low</td>
<td>High</td>
<td>Avoid running rope over sharp edges, check ropes</td>
<td>Low</td>
</tr>
<tr>
<td>Stuck Gear</td>
<td>Low</td>
<td>Low/Medium</td>
<td>Carry nut-tool, do not over-cam placements</td>
<td>Low</td>
</tr>
<tr>
<td>Dropped Gear</td>
<td>Medium</td>
<td>Low/Medium</td>
<td>“No gear in space” rule as much as possible, be careful when placing/removing gear</td>
<td>Medium</td>
</tr>
<tr>
<td>Route Finding</td>
<td>High</td>
<td>Medium</td>
<td>Read/follow guidebook, scout route with binoculars before climbing</td>
<td>Medium</td>
</tr>
<tr>
<td>Rockfall</td>
<td>Medium</td>
<td>High</td>
<td>Test stability of hand/foot holds and placements, offset belay out of fall-line, wear helmets, be aware of rope position (can contribute to knocking rocks loose), be alert (of yourself and any other parties), “ROCK!” calls</td>
<td>Medium</td>
</tr>
<tr>
<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Observe weather patterns</td>
<td></td>
</tr>
<tr>
<td>Bailing: Weather</td>
<td>Medium</td>
<td>Medium/High</td>
<td>(don’t start if inclement weather is approaching), listen to forecast of weather radio night before climb. If on route: find sheltered area (not on peak or ridge) to hunker down in if feasible and safe (non-lightning scenarios). Rappel or down-climb (depending on route). Carry “bail gear” for rappel anchors (slings/webbing, quick-links, nuts, pitons)</td>
<td>Low</td>
</tr>
<tr>
<td>------------------</td>
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<td>-------------------------------------------------------------------------------------------------------------------------------------------------</td>
<td>-----</td>
</tr>
<tr>
<td>Bailing: Route Too Difficult</td>
<td>Low</td>
<td>Medium</td>
<td>Climb within ability</td>
<td>Low</td>
</tr>
<tr>
<td>Bailing: Rappelling</td>
<td>Medium</td>
<td>Low/Medium</td>
<td>Secure anchors using aforementioned “bail gear.” Double rope rappels get you to the ground faster, but increases likelihood of stuck ropes or dislodging a rock.</td>
<td>Low</td>
</tr>
<tr>
<td>Activity</td>
<td>Required Skills</td>
<td>Stress Levels</td>
<td>Notes</td>
<td></td>
</tr>
<tr>
<td>----------------------------------</td>
<td>-----------------</td>
<td>---------------</td>
<td>----------------------------------------------------------------------</td>
<td></td>
</tr>
<tr>
<td>Rappelling Off End of Rope</td>
<td>Low</td>
<td>High</td>
<td>Find middle of rope, tie knots in end of rope, use friction hitch back-up</td>
<td>Low</td>
</tr>
<tr>
<td>&quot;Run-Out&quot; Section of Climb</td>
<td>Medium</td>
<td>Medium</td>
<td>Read route description, climb within ability, make sure to get last available placement before run-out and first available placement after run-out.</td>
<td>Low</td>
</tr>
<tr>
<td>Darkness</td>
<td>Low</td>
<td>Medium</td>
<td>Headlamps, start route early enough to account for time to approach, climb and descend</td>
<td>Low</td>
</tr>
<tr>
<td>Snow-filled Couloirs</td>
<td>High</td>
<td>Medium</td>
<td>Carry ice axe and microspikes, be proficient at glissading and self-arrest</td>
<td>Low</td>
</tr>
<tr>
<td>Descent Route Finding</td>
<td>High</td>
<td>Medium</td>
<td>Know descent route beforehand, carry guidebook/route description</td>
<td>Low</td>
</tr>
<tr>
<td>Descent Focus Lull</td>
<td>Medium</td>
<td>Medium/High</td>
<td>Awareness/stay focused! The climb may be over but the descent is still</td>
<td>Low</td>
</tr>
</tbody>
</table>
### Weather/Forces of Nature

<table>
<thead>
<tr>
<th>Weather/Force</th>
<th>Current Risk</th>
<th>Potential Risk</th>
<th>Action</th>
<th>Risk</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rain</td>
<td>Medium</td>
<td>Medium</td>
<td>Wait for storm to pass/alter itinerary to easier route or rest day</td>
<td>Low</td>
</tr>
<tr>
<td>Snow</td>
<td>Low</td>
<td>Medium</td>
<td>Increased reliance on micro-spikes and mountaineering axe, change itinerary</td>
<td>Low</td>
</tr>
<tr>
<td>Lightning Strike</td>
<td>Low</td>
<td>High</td>
<td>Find sheltered area, assume “lightning position.” If on route: descend. If unable to descend, get off ridges/peaks to as safe a position as possible, assume lightning position.</td>
<td>Low</td>
</tr>
</tbody>
</table>

Check forecast, be aware/knowledgeable of weather patterns based on dangerous.
<table>
<thead>
<tr>
<th>Scenario</th>
<th>Low</th>
<th>Medium</th>
<th>High</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Approaching Storm</td>
<td></td>
<td></td>
<td></td>
<td>cloud formations, constantly monitor horizon for problem clouds/fronts. Do not start route if questionable weather visible before climbing an east-facing route (weather comes from the west and will not be visible until directly on top of us)</td>
</tr>
<tr>
<td>While on Route</td>
<td></td>
<td>Medium</td>
<td>High/High</td>
<td>Low/Medium</td>
</tr>
<tr>
<td>High Wind</td>
<td></td>
<td>Medium</td>
<td>Medium</td>
<td>Proper layering, use non-verbal command communication system (rope tugs), avoid exposed routes. If wind speed is too intense, do not climb</td>
</tr>
<tr>
<td>Avalanche</td>
<td></td>
<td>Low</td>
<td>High</td>
<td>Avoid avalanche terrain, inspect suspect slopes</td>
</tr>
<tr>
<td>Low Temperature</td>
<td></td>
<td>Medium</td>
<td>Medium</td>
<td>Proper layering/hydration/caloric intake, hot drinks, stay active, climb west-facing route</td>
</tr>
</tbody>
</table>

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<table>
<thead>
<tr>
<th>High Temperature</th>
<th>Low</th>
<th>Medium</th>
<th>Hydrate, climb east-facing route (sun exposure ends midafternoon)</th>
<th>Low</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wildlife</td>
<td>Medium</td>
<td>Medium</td>
<td>Do not antagonize or approach, proper kitchen guidelines when camping, LNT ethics, bear barrels</td>
<td>Low</td>
</tr>
</tbody>
</table>
Contingency Plans

“The best-laid plans of mice and men often go awry”\textsuperscript{52}

For all of our planning and research, the real world rarely cooperates exactly the way we want it to. It is for this reason, we have to come up with back-up plans that we can revert to in the event of a monkey wrench being thrown into the picture. While contingency plans are something you hope to avoid (as it usually means that something has gone wrong) they are a vital part of the planning process so that no matter the situation, some alternative is available.

One of the primary factors to our contingency plan is the fact that we are planning on spending close to a month out in the Sierra Nevada range. This allows us a large window of opportunity to complete our goals. While the registration for time specific permits does make this slightly more complicated, permits are also issued on a lottery system at the ranger stations. This will allow us to continue on as planned, albeit a bit later in the month than anticipated.

This extended time period also lends itself to several other very possible solutions to any problem that would prevent us from entering the Whitney Region. As stated previously, we plan to spend time in both Tuolumne and the Palisade regions. We already have goals and itineraries for these regions as well. Either additional section of our time in the Sierra could easily be extended in order to make it a viable option for a full expedition. Tuolumne Meadows would most likely be the replacement location as it is lower in elevation, alleviating concerns about snowpack and altitude ailments that may become a factor in the High Sierra.

\textsuperscript{52} Adapted quote from “To a Mouse” by Scottish poet Robert Burns
However, while it is not likely, it is conceivable that conditions could be so that climbing in the entirety of the Sierra becomes impossible. In this eventuality, we have the good fortune to be relative close to several other climbing areas that have much drier, warmer climates. Red Rocks Canyon, NV is only a 3 hour and 30 min drive from Lone Pine, CA. Red Rocks offers a large concentration of high quality climbing and multi-pitch routes. June is bordering on out of season for Red Rocks, as it starts to get quite hot at that time of year, but plenty of climbers still venture into the area at this time of year.

Joshua Tree National Park is also only four hours away. Like Red Rocks, June is warm, but bearable. There are not as many options for multi-pitch at J-tree, but if need be it could still offer some good climbing as a last resort option.

A bit further away in Utah there are also some viable options. St George and Zion National Park are approximately 6 hours away and have a multitude of multi-pitch routes available to climb.

However, in reality, Aaron and I have the distinct advantage of planning on driving out to California. This opens up essentially anywhere we pass by on the way home to be an alternative destination. If the Sierra is totally out of the question, and the desert locations of Nevada and Utah are too hot to climb, we can stop in Colorado and go climbing in the Rockies. We have the drive and the motivation to find a location that will allow us to complete our goals, no matter where it ends up being.
Emergency Plans, Phone Numbers and Call-out

Protocols

Even with our the implementation of our risk management plan, go/no-go standards, contingency plans and all other safety precautions, it is necessary to accept that control is an illusion in life, but especially in a mountain environment such as the Sierra. We could do everything right, follow every procedure and still, a fateful moment of bad luck could put us in a position of requiring help or an evacuation. In order to be prepared for all possible scenarios, even those we like to imagine could not happen to us, having the right contact information for local emergency services can be the difference between life and death.

- Emergency Numbers
  - Rescue Contacts
    - 911 Emergency Services
    - Eastern Sierra Interagency Visitor Center/Mt Whitney Ranger Station
      - 760-876-6222
    - East of Sierra Crest: Inyo County Sheriff Dept, Lone Pine, CA
      - 760-876-5606
    - West of Sierra Crest: Sequoia and Kings Canyon National Park HQ
      - 559-565-3341
  - Local Hospitals
    - For all emergencies, 911 and/or one of the other rescue services would be the first call.
    - Southern Inyo Healthcare District, Lone Pine, CA
• A smaller regional health clinic located in Lone Pine, CA, near the head of the Whitney Portal road.
  o Main Switchboard Line: 760-876-5501
  o Main Clinic Line: 760-876-1146

- Northern Inyo Hospital, Bishop, CA
  • The next level of care above what SIHD can offer. A slightly larger facility, this hospital is more equipped to handle a moderate injury than its Lone Pine Counterpart.
  o Main Line: 760-873-5811

- Washoe Medical Center, Reno, NV
  • This is not the closest medical facility to Whitney, but is the go-to location for patients who are seriously injured and transferred from SIHD. This facility has a level II trauma center (essentially the same as a level I facility, except it is not a teaching hospital). A serious injury would most likely be taken to this hospital.
  o Main Line: 755-982-4100

- Community Regional Medical Center, Fresno, CA
  • This is the closest level I trauma center geographically. If injured seriously enough, it is plausible to be transported to this hospital.
  o Main Line: 559-459-6000
  o Personal Emergency Contacts

  • Will not be included in this publication for privacy reasons

- Emergency Plans
o Bailing off of a route

- Should the need arise to bail off of a climb\textsuperscript{53} for any reason (weather, fatigue, altitude, etc.), we will be prepared. Depending on the situation and the climb, the necessary actions generally boil down to down-climbing/ retracing the route, or rappelling off the route into a descent gully. Extra slings and/or webbing slung around horns/blocks may be all that is needed to rap some routes, but for others, we plan to carry several pitons that can be set as impromptu rap anchors. The use of pitons can help reduce the amount of personal technical gear (cams and stoppers, which are generally more expensive) we would need to leave behind in the event of a multi-rap bail.

- However, prevention is the best way to counter emergency situations. Amendments to our plans and goals will need to occur to accommodate foul weather and exhaustion. If the probability of issues arising while on route is high, a conservative decision to not start may be the difference between getting caught on a ridge during a storm, or weathering that same storm out safely in our tent.

o Alternative escape routes

- Should a minor injury, illness or dangerous weather force us to leave the area early, there are several options for trails leading out of the region we will be in. All of the evacuation routes I have listed lead down the East side of the Sierra Crest to the Owens valley and towards I-395 as this is the closest civilization. If we were to head west, although the terrain is less steep and easier to negotiate,

\textsuperscript{53} A more in depth look at mid-route bail options is discussed in the “Expedition Itinerary” chapter.
it leads further into the wilderness and away from immediate and higher-level help.

- **North Fork of Lone Pine Creek.**
  ~2.4 miles. 2,940’ in elevation gain/loss. Class 2 terrain.
  - This is the trail we will be using to access Upper Boy Scout Lake, and can be used as an escape route. This is primarily a climber’s access trail that is ignored by tourists taking the Mt Whitney Trail. It starts approx. 1 mile from the Whitney Trail trailhead and is a more taxing second class use-trail that leads up past the Boy Scout Lakes and ends at Iceberg Lake. This trail would be the main route of evacuation during the time we spend at Upper Boy Scout Lake and when we are still close to Tulainyo Lake after crossing the Russell-Carillion Pass. This trail would lead us right back to the Whitney Portal parking-lot and our car.

- **George Creek**
  ~7 miles (16 total). 8,000’ in elevation gain/loss. Class 2 with bushwhacking.
  - The George Creek drainage is a possible evacuation route that can be accessed at three different spots along our route: via Vacation Pass above Wallace Lake, via the cirque between Mount Barnard and Trojan Peak, or via the Williamson Bowl above Lake Helen of Troy. All three of these access points start at a different fork of the upper drainage, but meet with the main gully/drainage at around 9,500’. From there it is an
unmaintained trail that follows the creek (crossing it several times) and drainage to the end of a 4x4 road which marks the trailhead. From the trailhead, it is still approx. 9 miles walking along dirt roads to I-395, where it is common to see cars/other people. Due to this fact, this route is the least appealing and would require the most time and effort if it becomes necessary.

- **Shepard’s Pass Trail**
  - 14 miles. 5,700’ elevation gain/loss. Class 2.
    - This is a maintained trail that starts from Owens Valley and passes by the northern end of the Williamson Bowl at Shepard’s Pass. This is a burly, but maintained trail that will be a good option for evacuation when we are in the Williamson/Tyndall Region. While descriptions say that this trail is comparable to the George Creek “trail” in difficulty, the trailhead parking lot is at the end of the trail, not necessitating the long hike out on dirt roads that would be necessary for the George Creek drainage.

- **Call-out Procedures**
  - In order to keep friends and family up-to-date on our location and condition we will be carrying a spot device which is capable of sending out several different messages (“all is well”, “change of plans” message and emergency) to specific e-mails and also updates those accounts with our current GPS location. This way, even though it will only be my partner and I out in the field, we will have several other people aware of our location at all times.
In order to keep everyone properly updated on where we are, what/how we’re doing, we will adhere to the call-out procedures that follow.

- Check in “OK” at trailheads.
- Check in “OK” when leaving camp in the morning.
- Check in “OK” when at the summit of a route/peak.
- Check in “OK” when descent is complete/we are safely back at camp for the night.
- Turn on tracking mode in-between camp departure and arrival check-ins for travel days
  - This will help distinguish between climbing days and travel days for people following our progress. They can get real-time updates on our location as we negotiate the backcountry terrain.
- If a minor injury, illness or dangerous weather forces us to change our plans and leave early, this will necessitate a low level “emergency” check in. This will alert everyone that there may be an issue and that we are changing plans to head out earlier than expected. If this check-in is used, it will mean that while things are not going according to plan, we are able to evacuate the area under our own power and capabilities and that the cavalry does not need to be called.
- If a serious emergency happens, immediately send out a 911 call-in.
  - This is only in the event of a catastrophic accident/situation in which we are completely unable to self rescue and medical attention is needed. This will alert all of our contacts that something serious has happened.
as well as contact the GEOS International Emergency Response Coordination Center (IERCC)\(^{54}\) which then alerts the closest SAR team.

An expedition to the Sierra Nevada is a serious undertaking. The mountains that we will immerse ourselves in will be both challenging and slightly foreign to Aaron and I. The terrain is larger and the altitude is higher than we are accustomed to here on the East Coast. That being said, I do not believe that anything we have planned on doing is above our ability with the proper training.

Training often gets confused with exercise. While the two are related, there are some very key distinctions that have to be made. Exercise is a term that best describes “a physical activity performed for the sake of the effect it produces on your body today — right now — or immediately following the workout.” In other words, the activity or the workout itself is the main goal. The person aims to achieve the simple goal of elevating heart rate, feeling a pump and getting hot and sweaty to gain the feeling of a positive accomplishment. However, while training certainly incorporates exercise, it is a completely different beast. Training is “the process of moving from one state of... preparedness to another” and “must be carefully planned in advance to produce a specific adaptation at a specific point in time.” The most important part of training is that it is tailored towards a specific goal. The individual workouts /activities are not important in of themselves, but instead as to how their cumulative affect progresses overall preparedness in respect to the end goal.

At this point another important distinction must be made. While exercise encompasses the physical, training goes far beyond simply the physical; especially when training for climbing. Rock climbing as a sport is unique “in that it requires a near-equal balance of mental, technical and physical

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55 This chapter describes the theory and elements of the training plan I will use. To see the practical application/implementation of the plan please see appendix labeled “Training and Conditioning Plan”
prowess. For this reason, training for climbing must go beyond simply enhancing physical capability, or else it will not properly prepare someone for all that is involved with climbing at a higher level. Substantial time and effort must also be allocated and applied to honing/building the techniques/skills and mental fortitude that are defining characteristics of well-rounded climbers.

To properly prepare ourselves for climbing in the High Sierra I have broken down training focuses into three subtypes that are based off of Eric Horst’s methodology and also correlate to the PPTT (physical, psychological, technical, tactical) model. They are as follows.

**Strength and Fitness Training (Physical)**

A functional and practical physical training program specific to climbing involves the development of several key areas: cardio, strength, power and endurance. Cardio workouts are aerobic exercises that use “large muscle movement over a sustained period of time, to keep your heart rate to at least 50% of its maximum level.” This includes activities such as jogging, hiking (especially uphill), swimming and cycling. Strength refers to “the ability of a muscle or muscle group to exert force to overcome the most resistance in one effort.” Power is defined as the amount of work performed per unit of time. Strength and power differ like this: someone with a strong upper body would easily be able to lift something heavy, for example a shot-put, but that does not mean they would be able to throw it far. However, someone with strength and power would then be able to generate enough force and speed to throw the shot-put a good distance: power is the explosive force of muscles. Muscular endurance is the ability of a muscle or muscle group to exert force to overcome a resistance many

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times.\textsuperscript{6} The measure of muscular endurance is the number of reps that are able to be completed; higher endurance equals higher reps.

Knowing \textit{what} to work on is not enough however, it is knowing \textit{how} to work those specific aspects that produces results. According to Mark Twight, a professional alpine climber, “athletes need to vary the intensity of their training to realize maximum benefits.”\textsuperscript{61} He recommends a “training cycle” that builds upon itself to allow for growth and gains. His model involves six steps that each have a specific focus to them. The training cycle is meant to end just before the departure date for the expedition as the person training will be in peak physical condition at that point in time.

1. Foundation Building
   a. Creating a base of strength and endurance through a variety of exercises. 4-6 weeks.

2. Power Training
   a. Building strength and explosive power through weight training. 4-6 weeks.

3. Cardiovascular Power Endurance Training
   a. Increasing aerobic capacity. 4-6 weeks

4. Cardiovascular Extensive Endurance Training and Muscular Endurance
   a. Building cardiovascular and muscular endurance concurrently. 3-4 weeks.

5. Tapering and Rest
   a. Resting strategically to aid recovery and prepare for peaking. Taper for 1-2 weeks and then rest 5-7 days.

6. Peaking

a. Achieving a period of maximum fitness.\textsuperscript{62}

I plan to follow this outline for my training regimen for two reasons. The first is that it will give structure and focus to my training. This important because it is easier to get into a rhythm and routine if there is a set format to training. The second reason I like this outline is because it is very easy to apply the SMARTER\textsuperscript{63} goal setting criteria to it. SMARTER is an acronym that helps to set goals that are realistic and tangible goals and works as follows:

- **Specific**
  
  - A specific plan will always yield better, more consistent results than one that is vague.

  By specifying that step 2 (weeks 4-8) is the time to focus on “power training” it will be easy to focus on workouts and activities that will provide results in that area.

- **Measurable**

  - Training routines effectiveness need to be able to be measurable over time. This training cycle will allow for measurement because we will be able to see improvements in the number of reps and amount of weight we will be able to lift. We will keep logs of when we lift/climb, for how long and how many reps/weight was lifted. These logs will provide a visible record of improvements. Climbing training also has a benefit of being easy to measure by climbing ability. If I am unable to climb, let’s say, a 5.10 route in the gym at the beginning of the cycle, but three weeks in I am able to complete it because I am not as tired, that is a very tangible measurement of improvement.

- **Attainable**


• Making a training regimen that is realistically impossible to follow does no good for anyone. Our plan needs to be realistic in terms of time commitment and physical ability. As a result we have not decided to work out 6 days a week for several hours at a time, as this would be unrealistic and only invite failure. Within each week, we will work out 3-4 times per week, mixing between weight training sessions and practical activities such as climbing (in a matter conducive to training) and/or hiking.

• Relevant

  o As stated previously, training is aimed towards a specific goal, in this case increasing overall fitness and climbing ability. The training cycle we are following is specifically designed for climbers, so by default, everything we will be doing is relevant for our purposes. If we were to add in a goal such as “2 days backcountry skiing per week,” this would have little bearing on our training goals.

• Time Specific

  o This training program is time specific in two ways. Each step and the focus of the training within that step is associated with a specific block of time. This means that we will have the proper motivation and organization to accomplish that specific set of goals within that specific amount of time. On a broader sense, this training is time specific because it has to be completed by the beginning of June, the departure date for the expedition.

• Evaluate + Revise

  o The E and R of SMARTER stand for “evaluate” and “revise.” These steps are more for reflection upon how the preparation for the goal went, and how the methods of accomplishing them can be improved upon. These steps will happen after the
completion of our expedition and will be useful in preparing for any future climbing trips we go on.

**Mental Training (Psychological)**

Climbing is often viewed as an extended pull-up contest by those who are not familiar with what the sport truly entails; brute strength and loud grunts are the perceived tricks of the trade. However, for anyone who has climbed, let alone been on the sharp end, the reality of the situation could not be any farther from the truth. “Great performances begin with bulletproof confidence, singular focus, positive emotions, and a bright picture of and intense belief in a successful final outcome.”³ The mind is the ruler of the body, so if our mental state is one of unease, doubt and/or fear, then it doesn’t matter how muscle-bound we are, because we are already primed for failure.

The way we think and the emotions that arise from those thoughts have a direct effect on the way our body performs. “Mental training” refers to the process of learning how to control our thoughts and emotions instead of allowing them to control us. To accomplish this, we must first take a moment of honest introspection to evaluate what our weaknesses are that require addressing. While the specifics are varied and unique, the root cause is almost certainly fear.

This is not to say that fear is an absolute evil that should be abandoned. People sometimes refer to climbers as “fearless,” but, according to Eric Horst, “the ‘no-fear’ mentality is for buffoons, beer-guzzling frat boys and couch potatoes.”⁶⁴ Fear is, in fact, a very healthy emotion to have when climbing. *Reasonable fears* are what help keep us alive! They keep us from taking exorbitant risks that would inevitably lead to injury. It is when we allow ourselves to be overcome by *unreasonable* fears that our performance is negatively affected.³ With a little generalization, the things that cause climbers fear can be broken down to four categories.³

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1. Fear of Falling

- The first reaction upon hearing this category is that fearing a fall is a totally reasonable thing! It is true that some falls are dangerous, if not deadly, and it would be foolish to pretend otherwise, however, climbers fall all the time with no negative repercussions. It is not the fall itself that we fear, but instead the unknown nature of what the fall will be like. This is why the first fall on a route is always the scariest while any subsequent falls are usually much less nerve wracking. Multiple factors figure into the fear of falling such as the climbers trust in their gear/placements, perception of injury/risk, but they can all be eased by taking intentional falls. This helps to create first-hand knowledge that falls can be safe, and these falls can be mentally recalled in stressful moments to help reassure us that we’ve fallen before and been just fine.

2. Fear of Pain/Physical discomfort

- This category also seems a very reasonable trigger for fear, but we’re focusing on the unreasonable side of things. Climbing’s general physical effort and techniques such as jamming can range anywhere from uncomfortable to downright painful. As we push ourselves toward climbing at a higher level, routes tend to include more of these discomfort causing qualities. Fearing the pain/discomfort encountered while pushing ourselves becomes a large weakness very quickly, as it causes us to give up long before our bodies have reached their real physical limitations. This is akin to marathon runners who talk about “hitting the wall.” The physical exertion is both painful and uncomfortable, and then this perceived threshold is reached. At this point there are two options: resign to the fear of pain and advance no further, or push through, endure the discomfort and finish the marathon. The second option is the one that will bring about progress, redefining our real and perceived pain thresholds along with our limitations.
3. **Fear of Failure**

- Everyone has experienced moments where we are unsure of ourselves and as a result, we botch whatever it is we were attempting. It is an unfortunate human quality that we can easily imagine all the most horrible things that could potentially go wrong in a situation, and then, once these thoughts are allowed to take residence in our heads, they often can build upon each other, becoming a self-fulfilling prophesy. When these fears of failure creep into our consciousness, it manifests in our climbing as decreased aggressiveness, second-guessing, loss of breathing rhythm and over-gripping. All of these symptoms drastically reduce our climbing ability. To battle this fear there are three main strategies. First, we must think of what is *probable* vs. what is *possible*. Yes, it is possible every piece of gear could pull, a sharp edge could cut the rope, or an asteroid could come and take us out, but none of these things are probable. Counter these imagined scenarios by thinking logically about what is probable and realistic based off past experiences. The second and third strategies are closely related. Focus on the present and do not worry about potential outcomes. When we are 300’ up the side of a cliff, wasting energy thinking about “what ifs,” when it could be spent focusing on footwork or rest positions, is wasteful. The third, and arguably the most important strategy is to adopt the attitude that it’s ok to fail! It is necessary to detach pride and/or self-worth from failure. If we willingly accept failure as a part of life and progression, then it can no longer hold us back. “This thing we call failure is not the falling down, but the staying down.”

4. **Fear of Embarrassment**

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65 Quote by Mary Pickford
• This fear is pretty self-explanatory. Often we hold ourselves back for fear of appearing foolish, inadequate or inferior. Just like getting over the fear of failure, we have to separate our ego and/or self-image from the act of climbing. Off days happen to everyone. Even climbers of world-class ability flail from time to time. The key is to learn from the “embarrassing” moments, as they often reveal hints for improvement.

The mental “game” of climbing is something that has to be met head on. Staying cool, calm and collect is a learned response to pressure. Instincts, (such as the fear of heights), combined with adrenaline and physical exertion/fatigue can lead to visceral reactions, instead of conscious actions. To increase the likelihood of staying calm and avoiding the onset of the fears listed above, there are some areas to focus on and hone.

**Awareness** is the first skill to hone. People tend to think that intense, laser-like concentration on the task at hand is a necessity to the achievement of a goal. However, the same intense concentration that allows them to do that one specific action perfectly blinds them to everything else that is going on in their surroundings. Imagine a climber who focuses all their concentration on the next sequence of moves ahead of them, studying every contour and constriction. They plug a cam into the crack and fire upwards, executing every move perfectly, only to reach the end of the sequence to realize the cam they placed down low was the only one that would fit in the crucial spot they are now. Due to the singular focus on their next moves, the climber was caught completely off guard by their now inadequate selection of protection. Had they been slightly more aware of their overall position and less concentrated on the singularity, they may have looked up ahead to notice the crack widened and that the cam was much better suited to placement above than below.

According to Mark Twight, awareness is defined as

66 Pun intended ;)}
“Attention unencumbered by thought or judgment, without memory or speculation, living in the present tense. Awareness strips away the filters of your past experience, allowing an unmediated experience. Awareness of one’s condition and the state of one’s surroundings permits top-level performance by allowing the mind to apprehend the actual situation and respond to it instantly. The understanding of dangers and opportunities, requirements and personal capacity, become clear in a blink.”

Twight asserts that “an aware mind embraces everything.” This includes awareness of the environment, action, as well as the self. Being aware of our surroundings and of our self can help to prevent concentrations tunnel-vision and avoid situations in which fear is able establish itself.

**Visualization** is “the closed-eye, mental rehearsal of an intended action,” such as climbing a difficult pitch. This is a very useful tool in figuring out probable crux points, move sequences, rest positions, even protection placements and route-finding decisions before ever starting up the route. In essence, visualization is the act of using our imagination to “solve” problems before they happen. When visualizing a climb, include real world conditions such as weather, visibility and personal condition (i.e. hydration, hunger, energy level etc.) as this will make the rehearsal more lifelike and relevant.

Always visualize a positive outcome. If visualizations include mistakes or failure, start the process over until the image of a successful experience is all that is left. Every imaginary slip-up, if left to linger, can be an unconscious seed of self-imposed limitation or failure. Rehearse for a successful climb.
Sometimes, when we imagine things, we feel things have gone wrong if reality does not sync up perfectly with what we saw in our minds eye. Even though visualization should detail every aspect of the climb as much as possible, it is important to understand that it is fundamentally different than, and should not be confused with planning. Visualization is the preparation of the mind for the “feelings, thoughts and actions you may” find on the route, while planning is preparing for “specific events or actions you will perform or you know will occur.” Planning implies absolutes and control, but in climbing those are luxuries that do not exist. “If you plan detailed actions based on the assumption of control, you risk becoming a victim, dependent on your plan.” Visualization is a guide to help mentally prepare us for the section we know will be difficult, tricky or exposed, not step by step instruction to be followed to the letter. Visualize in as much detail in possible, but be ready for the unexpected; do not become a slave to your imagination.

Relaxation is a powerful tool to help win the mental game of climbing. Starting off calm and relaxed is a no-brainer, but the true purpose of relaxation is to be able to reign ourselves in when fear, and the inevitable adrenaline rush, takes hold.

There are many ways relax including deep breathing, counting backwards from some preordained number, and going to a mental “happy-place” just to name a few. All of these are effective in their own right, but may not be the most applicable to an impending panic attack midway through a pitch. Twilight raises a very interesting idea in the form of conditioned stimulus. Climbing is full of sensory stimuli that are repeated enough to become conditioned through intentional self-programming.

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67 Conditioned stimulus: a previously neutral stimulus that, after becoming associated with the unconditioned stimulus, eventually comes to trigger a conditioned response. For example, suppose that the smell of food is an unconditioned stimulus and a feeling of hunger is the unconditioned response. Now, imagine that when you smelled your favorite food, you also heard the sound of a whistle. While the whistle is unrelated to the smell of the food, if the sound of the whistle was paired multiple times with the smell, the sound alone would eventually trigger the conditioned response (hunger). In this case, the sound of the whistle is the conditioned stimulus. The most famous example of this is Pavlov’s dog.
Sound is a perfect example. Climbing legend Russ Clune confided in Twight that he uses the sound of a carabineer gate snapping shut as a cue to relax.⁷

“I began to notice how much comfort I derived from knowing I had clipped the rope to a solid piece, and the sound of the biner was the key. I then attempted to artificially create and hear the “sound” in my head when I am stressed-and it worked! Today I can induce relaxation virtually at will...”⁷

**Meditation** can also be very beneficial to gaining the upper hand in the mental battle of climbing. Meditation comes in many forms, styles and practices, but the end result is always very similar: quieting the internal dialogue of our minds to achieve a state of heightened awareness.⁷ Stress, especially the stresses common to climbing, causes our mind to become hyper-active, analyzing and questioning every thought that passes before our minds eye. This flood of fear and the resulting internal debate draws our attention inward and severely decreases our awareness. As a result, the dominos start falling; sloppy mistakes, over gripping, irregular breathing, even “paralysis by analysis”³ can occur and shut us down. “Without a quiet mind every physical action is hampered by the mind itself.”⁷ Meditation and relaxation share many commonalities and aim towards a similar goal. However, they differ in that relaxation is primarily focused upon calming the body, while meditation is used to quiet the mind. In a way, relaxation is the physical manifestation of meditation.

Mental training is much less straight forward than physical training. It involves a great deal of self-examination, constructive criticism and faith. Being honest with ourselves about our fears, perceived shortcomings and doubts can leave us feeling vulnerable, but this is exactly what is needed in order to grow and progress. Only when we recognize and acknowledge our weaknesses are we able to address them; denial gets us nowhere. Mental training will not be the same for anyone. Everyone has different fears, outlooks, beliefs and personalities. All we can do is to put in the necessary time and
effort, cast aside what is not useful, nurture anything that proves helpful and trust that the time we spend on our mind will pay off and aid in our climbing.\textsuperscript{3}

**Skills and Strategy (Technical)**

Aristotle once said, “We are what we do repeatedly. Excellence, then, is not an act but a habit.” For some reason, strength training is the primary focus of climber’s magazines and the most common conversation topic between climbers when training is discussed. However, when it is all stripped down to its most basic, elemental form, rock climbing is exactly that: climbing and movement on rock! To become a truly confident and competent climber, focusing on the techniques and skills that are used to climb and secure us on the rock will be the most important components that improve our climbing.

At this point I find it important to delineate the difference between “technique” and “skill.” A technique is a procedure used to accomplish a specific activity or task, while skill is the ability to select and reliably preform the appropriate technique. The two go hand in hand, complimenting each other, but are different. A sport can have several different techniques that all accomplish the same end result. Skill is knowing how to select and then properly execute the proper technique based on the situation at hand.\textsuperscript{68} For example, while climbing a crack there are several techniques (jamming, lay-backing or aiding) you can use to ascend to the top, but knowing which one to use based off of judgment and experience is a skill.

Coming from the Expeditionary Studies department provides Aaron and I a substantial base of knowledge about the intricacies of climbing. We started taking classes at the same time when we entered the program in 2012, at which time we took “Intro to Rock” as well as “The Rock Process I.” During these classes we examined the basic equipment, belaying, body positioning and movement,

knots, rappelling and building natural and gear anchors. As we progressed, we were introduced to more advanced topics like belay escapes, multi-pitch systems, haul systems as well as increased focus on gear placements (relating to leading). These advanced topics were given even more attention the following fall of 2013 in “Rock Process II.” During this class, I visited areas like the Gunks, North Conway, NH, as well as areas in the southern Adirondacks; away from our usual stomping grounds of Keene Valley (Aaron took the west coast version and went to J Tree, CA, and Red Rocks, NV). This exposed us to a variety of different rock types and features which allowed us to practice our movement and technical skills in unfamiliar conditions.

Once we were upper level students, we moved on to the Rock Leadership courses where we were in a teacher’s assistant position. During Rock Leadership I, we completed the AMGA (American Mountain Guide Association) CWI course (climbing wall instructor) which focused on how to safely manage and teach in an indoor gym setting. Almost all of these principles were instantly transferable to an outdoor setting. Then in Rock Leadership II we were given even more responsibility. We were the TA’s in the “Intro to Rock” and “Rock Process I and II” classes, where we helped teach all the techniques and skills we had once learned in those classes to the newest members of the EXP program.

During our training process, Aaron and I will work to keep all of the techniques and skills we have learned in and out of class fresh. Our training involves days intended for spending time in a climbing gym (or outside on real rock if weather allows). These sessions are not just climbing for the sake of climbing; they are a continuation of our broader training regimen. We will use this time to practice the different techniques and skills we need to have dialed for our expedition. This includes, but is not limited to rope management, leading, body positioning and movement, hauling and rescue systems as well as anchor building.
Along with our knowledge and certifications in rock climbing, Aaron and I are also Avalanche I certified through AIARE,\textsuperscript{69} as well as certified Wilderness First Responder’s, Aaron through SOLO and myself through IWLS (International Wilderness Leadership School).

**Tactical**

Tactical training refers to the process of planning the trip. A significant amount of consideration, analysis, research and judgment must be applied to every last detail of the intended expedition. This allows us to be completely ready for the expected, prepared for the unexpected, and able to adapt to anything outright odd.

Our time spent in EXP has been a progression of tactical as well as technical learning. Each class subsequently handed more and more of the planning responsibilities over to us, the students, while the importance of planning was repeatedly emphasized. One quote in particular that stands out above the rest is by Benjamin Franklin; “if you fail to plan, you are planning to fail.”

The culmination of this tactical training to date is currently before you. Every page of this proposal represents a significant investment of time and effort to imagine and prepare for every eventuality that could take place during our expedition. However, that does not mean it is over. As we continue to train and move closer to the start of our trip, the planning will continue. The world is not static, nothing stays the same. Conditions six months from now may be completely different from those we had planned for. As such, I will continue to monitor and amend any and all plans that require adaptation.

\textsuperscript{69} Aaron will be Avalanche II certified by the time our expedition begins.
Nutrition

To properly train, prepare for and preform during stressful, high output activities such as climbing and backpacking, nutrition is key. All of our body’s functions require energy to operate properly. Without a sufficient supply of energy, we begin to feel sluggish, tasks that are normally simple begin to feel difficult, and our muscles lose effectiveness. The energy we use to fuel ourselves comes in the form of the food we eat. In the mountains, when we are putting forth a large amount of effort for extended periods of time, whether it be carrying packs up and down rough terrain or climbing long routes, our nutrition becomes crucial. At home, sub-par nutrition, while less than ideal, is not an immediate concern. In the mountains, poor nutrition can prove disastrous to our health and safety.

While the consequences of poor nutrition may be high, the risk can easily be mitigated with proper planning and foresight. When planning for an expedition such as the one we are going on, there are several important factors beyond nutritional value that we must consider when planning our meal list and the foods we will bring. These include cost, weight, bulk and ease of preparation.

Budgets for expeditions can be very tight, especially when the two team members are typical broke college students. This means that we will have to pay special attention to maintain an inexpensive, but efficient meal plan. This will mean buying in bulk from a list prepared ahead of time instead of going blindly into the process. This may also mean sacrificing some variety in our menu selection. However, this does not mean that we will be eating the same meal every night. Variety of meals can be an essential part of boosting moral, especially after a long day. Buying in bulk just means that we will need to get creative with the ingredients we have.

In backcountry expeditions like ours, we will need to carry in all of our supplies on our backs, so selecting food that is lightweight and does not take up an unreasonable amount of room in our packs
becomes a necessity. A rough guideline suggests having 2 pounds of food per person per day. This means that we will each be carrying roughly 22-24lbs in food alone at the beginning of our trip. However, selecting food that is freeze dried may help lower that weight slightly. Freeze dried food is very useful for backcountry climbers/trekkers, as it weighs much less than ready-to-eat food and is generally able to be packed compactly.

Freeze dried food is also some of the easiest meals to prepare in the field. Many require little to no cooking only needing to be soaked in boiling water for a period of time. They also do not spoil, so there is no need to worry about improvised refrigeration or special storage considerations. However, there is a necessary adjustment to consider when cooking freeze dried food at altitude. For every 1000’ of elevation gain, the atmospheric pressure drops by a half pound (in p.s.i.a. or pounds per square inch absolute). This decreased air pressure causes water to boil at a lower temperature and evaporate quicker. At sea-level, water boils at 212°F (100°C), but at 10,000’ it boils at, and then remains at, 194°F (90°C). Consequently, due to this fact, meals take longer to cook/rehydrate at altitude. If the food is not soaked for the longer amount of time to compensate for the lower water temperature, the meals will turn out more watery and/or crunchy than desired. There is no solid scientific “formula” for gauging the exact amount of extra time needed to rehydrate meals at altitude, but a good rough guideline to follow is to add 1 minute of cooking/soaking time per 1,000’ of elevation. This means that meals will take an extra 10-12 minutes to hydrate when we reach the high country of the Sierra.

When choosing foods as elements of our nutritional plans, it is important to understand how the three different macronutrients (carbohydrates, proteins and fats) are processed and used by our bodies.

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They are all metabolized differently and have different effects upon our daily performance and therefore should be balanced in our meals accordingly.

Carbohydrates are the most effective and efficient source of energy to the muscles and brain.\textsuperscript{73} They are the nutrients most easily converted into energy by our bodies and should constitute between 50-70\% of our daily caloric intake while in the back country.\textsuperscript{3} Carbohydrates are especially important for athletes operating at a high exertion level due to their “protein-sparing” qualities. If we do not consume enough carbs, our body starts breaking down muscle protein for an alternate source of energy.\textsuperscript{4} Obviously, losing muscle is the opposite of what climbers, who depend on strength and power while on route, want to have happen. Carbs come in two forms: sugars (simple) and starches (complex). In general, complex carbs are burned by our bodies slower and provide a longer, more sustained source of energy where as simple carbs supply quick and intense spurts of energy (think sugar rush). Accordingly, we should aim to primarily consume complex carbs when we are in the backcountry as they provide a more sustainable source of energy. Carbs are also most effective in providing energy for the longest amount of time if they are consumed in the morning at breakfast as their supply of energy can be used all day to fuel our body and mind.

While the general description and designation between simple and complex carbs holds true for the most part, recent studies have shown that there is a “large variability in the rise in blood sugar following the ingestion of various foods from both the sugar and starch groups.”\textsuperscript{4} As a result the glycemic index (GI) was developed to help more accurately classify the metabolism of carbs. The GI determines “how the ingestion of a particular food affects blood sugar levels in comparison to the ingestion of straight glucose.”\textsuperscript{4} Foods with a high GI (potatoes, sports drinks, bagels) cause a rapid increase of blood sugar as well as a large insulin response, as opposed to foods with a low GI (beans, 

bulgur, whole wheat) which produce more subtle and stable responses. Stable insulin levels are desirable for endurance activities such as backpacking and climbing and so low GI foods are preferable. However, high GI foods are great in the two hour window following the end of exercise as intense exercise primes the muscles to immediately reload energy reserves in the form of glycogen. The rapid increase in blood sugar and the resultant insulin spike stimulated by high-GI foods helps to drive the repletion process.

Proteins are also essential to our nutritional needs. Protein has many functions within the body, including the building and repairing of tissue, boosting our immune system and making enzymes which facilitate every neurological and physical reaction that occurs in the body. Proteins should make up 15-25% of our caloric intake throughout the day. This low percentage is due to the fact that our body cannot store proteins, so once our body’s protein requirement is met, the excess is either converted into energy or stored as fat. Therefore it would be inefficient to consume more protein than our bodies can efficiently process. Protein is best to consume at dinner/night as our body needs it most when we are asleep and our body is naturally recuperating and repairing itself. Protein is easy to supplement in the backcountry in the weight and space saving form of whey powder. It can be mixed in with drinks like water, milk or juice, to provide a viable protein source while also hydrating (more on hydration soon).

The third macronutrient, fat, has a certain stigma associated with it. In large quantities fat is a large contributing factor to the rampant heart disease, obesity and hypertension we see here in America, however, it is never-the-less a necessary component of a healthy and balanced nutritional plan. Fat should account for 15-25% of our caloric intake. Fat is necessary as a source of fatty acids that are essential in the function of critical physiological processes in the immune system and in hormone production. The fatty acids that are supplied by fat in our diet are also a vital component of making new, healthy cells including muscle cells. Fat can be thought of as the logs on the body’s energy furnace;
they take a long time to catch fire, but once they do they provide heat and energy for a very long, sustained period. It is for this reason that fats are excellent to eat at night and during cold weather as they supply a slow and long burning source of energy that keeps our metabolism active. This is a key part to staying warm in our tent at night during cold weather. This will be helpful for us, as nights have the potential to become chilly or cold in the High Sierra.

For the amount of effort Aaron and I will be expending, we should be consuming at a minimum, 3,000 calories each on high activity days.⁴ This will provide us with the necessary reserves of energy to efficiently and safely navigate the seas of granite in the Sierra. On rest days we can afford to only eat between 2,000-2,500 calories. This is because we will not be expending as much energy, so we do not need the higher calorie count. However, keeping our calorie intake above 2,000 will help replenish our energy reserves and aid in the recovery process. Whether we are consuming and active or rest days calorie count, the percentages of carbs, proteins and fats will stay the same.

Nutrition is not just the food we eat, but it works in tandem with hydration. Being properly hydrated has several effects on our overall health and wellbeing; it helps flush toxins, controls body temperature, keeps cell membranes moistened and resilient and helps transport the nutrients we get from food.⁷⁴ Dehydration has drastic negative effects on our bodies even at low levels. According to Dr. Kristin Clark of Penn State’s Center for Sports Medicine, “even a 1-2% drop in water will cause problems with performance” and goes on to add that “a 3% drop can create headaches, cramping and dizziness.”⁴ Dehydration also causes our joints and muscles more susceptible to injury as water helps to pad and lubricate joints and tissue. In order to stay hydrated, a minimum of 3 liters of water should be consumed in a day, however, during times of high activity that should be increased to help offset moisture loss through respiration and sweat. Proper hydration is also helpful to prevent altitude related ailments. An

extra liter-liter and a half should be consumed at altitude to help with the body’s adjustment to the lower oxygen concentration. This can mean consuming 5-6 liters of water per day. To help maintain proper hydration, we plan to have meals that incorporate water, and therefore hydration, directly into the meal, such as hearty soups for dinner and cereal with powdered milk (which is mixed in with water) for breakfast. This will save on stove and fuel efficiency as well as provide us hydration in forms other than simply chugging Nalgene’s. This method of hydrating with food also helps to prevent hyponatremia. Hyponatremia is not over hydration as is commonly presumed, but is instead when the electrolytes (sodium) are too diluted in our bloodstreams. This causes the body’s water level to rise and our cells to swell, which can be very dangerous to our health.


Appendix 1: Fitness Training Plan

My training plan goes through stages where the aim of the physical training focuses in upon different aspects such as muscular endurance, power, general strength etc. When weight training to achieve these goals, it is not the exercises preformed that change, it is the weight and number of repetitions are the variable. Lighter weights permit more reps before failure, and heavier weights promote power training. Mark Twight presents this general guide to help decide upon the appropriate weight/reps for specific purposes:

- 1-4 reps increases pure strength and power but not muscle mass
- 4-9 reps increases both strength and muscle mass
- 9-15 reps increases strength, muscular endurance and muscle mass
- 15-30 reps increases muscular endurance with little or no increase in strength or muscle mass
- 30-50 reps increases muscular endurance with no effect on strength or muscle mass
- 50-100 reps increases muscular endurance and cardio-respiratory endurance, with no increase in strength and possible loss of muscle mass and/or fat

It is important to note that the amount of weight must be tailored to each range of reps. Lifting a light amount of weight for 1-4 reps will not achieve the desired increase in power; for the exercise to be effective, the weight must be close to our maximum. Depending what stage we are at in our training, we will adjust the reps and weight accordingly. Each range of reps should have enough weight for us to be feeling taxed, but not spent, after each set.

Exercises that we will be using include the following:

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<p>| Back and Abdominals                      | • Planks (front and side variations)  |
|                                        | • Leg lifts                          |
|                                        | • Sit-ups/crunches                   |
|                                        | • Russian Twist                      |
|                                        | • V-ups                              |
|                                        | • Flutter kick                       |
|                                        | • Back Extensions                    |
| Chest and Shoulders                    | • Push-ups                           |
|                                        | • Bench press (incline/decline/flat)  |
|                                        | • Military press (with free weights) |
|                                        | • Cable cross-overs                  |
|                                        | • Lat pull-downs                     |
|                                        | • Shoulder press                     |
|                                        | • Dumbbell shrug                     |
|                                        | • Lateral Raise                      |
|                                        | • Upright Rows                       |
| Legs                                   | • Leg curls                          |
|                                        | • Wall sit                           |
|                                        | • Squats                             |
|                                        | • Lunges                             |
|                                        | • Standing calf raises               |
|                                        | • Leg press                          |
|                                        | • Seated leg extensions              |</p>
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<td>Leading</td>
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<td>Hangboards</td>
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Example of 3 day weight training routine

Day 1 (Back, biceps/forearms, abs)
• Warm up: 10-15 min
  o Dynamic stretching
  o Light cardio
• Cardio: 20-30 min
• Weight lifting (3 sets 10-12 reps. 1 min rest between sets)
  o Wide-Grip Lat Pulldown
  o Chin-Up
  o Seated V-Bar Cable Row
  o Back Extension
  o Machine Preacher Curl
  o Wrist Roller
  o Decline Crunch
  o Flat Bench Reverse Ab Crunch
  o Full Hanging Leg Raise
  o Oblique Crunch
• Stretching/cool-down: 15-20 min

Day 2 (Shoulders, legs)

• Warm-up: 10-15 min
• Cardio: 20-30 min
• Weight lifting
  o Military Press
  o Lateral Raise
  o Dumbbell Shrug
  o Leg Press
- Leg Extension
- Seated Leg Curl
- Weighted Calf Raise

- Stretching/cool-down: 15-20 min

Day 3 (Chest, triceps, abs)

- Warm-up: 10-15 min
- Cardio: 20-30 min
- Weight lifting
  - Bench Press
  - Decline Dumbbell Bench Press
  - Cable Crossover
  - Tricep Dip
  - Tricep Pushdown
  - Decline Crunch
  - Flat Bench Reverse Ab Crunch
  - Full Hanging Leg Raise
  - Oblique Crunch

- Stretching/cool-down: 15-20 min

Weight and reps can be modified to fit the stage of training we are in. Exercises can be substituted as well.

In addition to the 3 days a week spent weight training, a minimum of one other day (preferably two if schedules allow) will be spent in climbing gyms. Climbing for training is different than climbing for
enjoyment. The focus is to “climb to punish the body, not to have fun” and to increase the “maximum volume of work” we are able to accomplish. Some useful tools are:

- **Bouldering**
  - Bouldering is “often touted as the supreme method for developing sport specific strength.”\(^2\) It not only builds great grip-strength, but also forces us to focus on footwork, body position and breathing. It involves all aspects of climbing: power, strength and endurance (especially for long training-specific bouldering sessions).

- **Traversing**
  - Traversing has many of the same benefits as bouldering with one key difference: usually there is no marked traverse route in the gym. Sometimes, completing a bouldering problem becomes so important to us subconsciously that we sacrifice technique to accomplish it. Traversing removes the pressure to complete a specific problem and instead allows us to focus intently on technique. It is also an excellent tool for increasing endurance.
  - To add additional benefits to the exercise, limitation or focus drills can be added.\(^2\) These include objectives such as completing the traverse using a specific type of grip (undercling, side-pull, crimp, etc.) Another excellent exercise is to try and traverse only using two fingers on each hand. This forces us to rely more heavily on our feet and footwork.

- **Downclimbing Routes**
  - This doubles the amount of work you perform on a route. It also helps train the opposite muscles used to pull ourselves up the wall, therefore balancing our muscle build and

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helping to protect our joints and tendons/ligaments. Down climbing increases muscular endurance and also forces us to become more observant climbers while ascending the route as well as descending. It helps to increase our overall awareness of the route and our body positioning while climbing.

- Speed Training
  - When routes get steep or the moves become hard and/or pumpy, there is not better ability to possess than being able to climb quickly through the section while still maintaining proper technique. We’ll pick a route in the gym that is 1-2 grades lower than our maximum. We’ll then climb several laps on the route, with a short rest between laps. Each time we climb the route, we’ll increase the speed at which it is climbed by ~10%. We will keep increasing the speed at which we climb until it begins to affect our technique. At this point we will reduce speed to the fastest level possible without sacrificing our technique. Preforming this drill will naturally increase our climbing speed, without any detriment to our technique.

- Lead climbing
  - Gyms are the perfect place to practice leading. The routes are usually steep and pumpy with clean falls. Practicing leading indoors can be a great asset to our endurance. It also is a perfect tool for strengthening our mental game. Leading indoors is a very low risk/consequence environment. This is the perfect opportunity for us to become comfortable with lead falls and the mental battle of being on the sharp end.

- Hangboards
  - There are many exercises that can be done on hangboards and they are all fantastic for climbing. Hangboards are designed to increase finger and grip strength, lock-offs, endurance and power. The workout can be modified to target specific focuses.
Hangboard workouts are an excellent alternative if getting to the gym one day is not possible.
Appendix 2: Budget

Travel

- Gas (based on Chevy Astrovan)
  - 5574 miles round-trip.
  - Tank size: 27 gal. MPG: 17
    - Approx 460 mile per tank of gas
  - 5574/460 = 12.1.
    - Minimum of 13 tank refills
  - Current national average gas price = $2.75/gallon
    - 2.75*27 = approx. $75 per full tank
    - $75*13 = $975. Round to $1000
    - $150 extra per person (emergency gas money)
  - $1,300 total for gas
  - $650 per person.

Permits

- Mt. Whitney Area
  - $15/person

Food

- $10/day*2 people*30 days = $600
  - $300/person

Unexpected Costs

- $300/person

Grand Total = $2,530

Total Cost Per Person = $1,265
Appendix 3: Gear List

Climbing trips, such as the one I am planning to the Sierra Nevada, require a special attention to detail when coming up with a list of gear needed to complete the objectives. The list is a delicate balance between perceived and actual needs, comfort, function, performance and weight. If items are not properly prioritized, complications can arise, whether they stem from a lack, or surplus of the necessary gear. In order to help add some clarity to this hectic, yet crucial task, I have created a list of gear that I feel is imperative to the success of my expedition. I have further broken it down into categories including “need”, “have”, “borrow” and “buy” so that I can see what items I already possess and which items have yet to be obtained.

HAVE

- Rack of 13 Cams
  - C3 #1, .3, .4, .45 (metolius orange), .5 (x2), .75 (x2), 1, 2, 3, 3.5, 4
- Full set of nuts
- Cordalette (x2)
- Alpine Draws (x6)
- Double Length Slings (x4)
- Non-lockers (x6)
- Lockers (x8)
- Nut Tool
- Prussic Cord (x3)
- Belay Device (x2)
  - ATC Guide and back-up ATC
- Helmet
- Harness
- 70m Rope
- Climbing Shoes
- Back Packing Boots
- Approach Shoes
- Climbing Pack (25-30 L)
- Weather Radio
- Stove
  - MSR Micro Rocket (Tuolumne Meadows section)
  - MSR Whisperlite
- Cooking pots/pan
- Utensils
- Multi-tool
- Hygiene Kit
- Water Purification Tablets
- Water Bottles
- Layers
  - Base layers top/bottom
  - Midlayers
  - Fleeces
  - Soft Shell Pants/Jacket
  - Puffy
  - Hat
- Sun Hat
- Gloves
- Buff
- Socks
- Rain Shells
- Sleeping Bag
- Sleeping Pad
- Sun Glasses
- Sunscreen/lip balm
- Watch
- Head Lamp
- Four Essentials
  - Compass
  - Lighter/matches
  - Ankle Brace
  - Medical supplies
  - Repair kit
  - Weather band radio
  - Cordage
  - Emergency rescue
    - Whistle
    - Signal mirror
  - Insect Repellent
• Fuel for stove
• Lightweight Tent
• Bear Barrel
• More Four Essentials
  o First Aid
    ▪ Altitude Medication (Diamox)
    ▪ More trauma and minor wound care
    ▪ BSI gloves
    ▪ Splint
  o Fixing Gear
    ▪ Cam lube
    ▪ Small, fine brush for cleaning gear
  o Navigation
    ▪ Map
    ▪ Guidebook
  o Communication
    ▪ Spot Device

BORROW

• Spot Device (exp department)
• Goal Zero Solar Panel
• Climbing protection
  o Although I have a pretty good baseline from my own personal gear, my partner and I will consolidate/combine our racks in order to be fully prepared for whatever the routes may require.
This list will help me to prioritize, streamline and expedite the gear gathering process for my expedition. It is not a static list, but rather will be a tool that I frequently refer back to as my research continues. What may seem like a superfluous piece of gear to me now, may later become a necessity based off of new information I have yet to learn. As such, my gear list will be changed and amended throughout the process until it encompasses the full spectrum of gear I feel best suits my goals and objectives.
Bibliography for Senior Exp


- Climate Prediction Center. Average October-December (3-month) Temperature Rankings During ENSO Events.


• "Define Strength, Power & Muscular Endurance." LIVESTRONG.com, LIVESTRONG.com, 21 Oct. 2013


