



Field Operation Manual

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INTRODUCTION

We undertake adventures in the outdoors for a multitude of reasons. Such adventures provide recreation, rejuvenation, and a chance to temporarily escape the pressures of our daily lives. The realities of an outdoor setting are tangible, the consequences real, and the successes earned. We travel with limited resources and often find ourselves in problem-solving situations that require our creativity and dedication. Venturing forth with groups offers the opportunity to learn experientially about each other and the world around us. While we cannot help but focus on forces larger than ourselves, we are also afforded the opportunity to look within and see ourselves in perspective.

Formal outdoor programming has enjoyed increased popularity at Reed College in recent years. Yet, by nature, there is a true wildness in this environment, and there are natural risks inherent in the adventures that we undertake. It is this field guide's intent; therefore, to offer guidance and guidelines for Student Leaders and employees hired to lead our outdoor programs, henceforth called Outdoor Specialists (O.S.). It is your responsibility to read and understand these guidelines. It is our hope that the guidelines help us work well with each other, be deliberate in how we manage risk, and not destroy the environment we love.

Please note these guidelines are not intended to be a substitute for, but for use in conjunction with, your exercise of reasoned discretion and good judgment. It is not a contract, a promise of employment, or a required treatment or course of action.

LEADERSHIP

Reed College strives to provide formal outdoor activities with well-defined leadership. An immense number of books have been written about the topic of leadership, and we think that our outdoor programs provide an excellent opportunity to explore what leadership means in a community such as Reed. There are two types of leaders described in this field guide: Outdoor Specialists and Student Leaders. Although leadership can take various forms, there should be an individual or a team that takes ultimate responsibility for requiring that risk is effectively managed, policies are properly followed, and the activity meets its intended outcomes. Leaders are ultimately responsible for what happens on the trips they lead, and should work with program management in all aspects of design, delivery, and evaluation of a given trip or event. Although leaders may wisely include the group in the decision-making process, leaders are responsible for much more than simply setting the stage for an activity or facilitating group consensus. The leadership role inherently creates a difference between being a participant and a leader; when done well a leadership role should look distinct but not distant.

We know that assuming leadership as a student takes considerable effort. Although there are many intrinsic rewards, we also search for ways as a program to reward our Student Leaders with opportunities for further growth. We also strive to hire exemplary professional leaders as Outdoor Specialists so they can serve as strong role models for how to work with people and carry oneself in the outdoors.

SCHOOL-SPONSORED ACTIVITIES

Seven major types of school-sponsored outdoor activities currently exist: Athletics, Fitness and Outdoor Program classes, Reed Outing Club trips, Gray Fund trips, Faculty educational outings, trips sponsored through Residence Life, trips by student groups financed by Senate, and trips sponsored as Student Activities. Student Leaders and Outdoor Specialists in any of the above activities should seek the guidance offered by this field guide. If you do not know the answers to questions or have doubts, please ask the Assistant Director of Athletics, Fitness and Outdoor Programs.

Planning and Activity Approval

All activities that are officially school-related or that have school funding should be well planned and approved. If you are planning a Reed Outing Club or Residence Hall-sponsored event, please go to the event planning and resources page of the ROC web site. Planning sheets are easily downloaded from the site. If planning a Gray Fund trip, work directly with the Assistant Director of Athletics, Fitness and Outdoor Programs.

Acknowledgement of Risk and Liability Release Forms

All participants in off-campus outdoor activities and/or who ride in a school van, including Student Leaders and Outdoor Specialists, must have signed an Acknowledgement of Risk and/or Liability Release form. These must be left with the Assistant Director of Athletics, Fitness and Outdoor Programs or at the community safety office prior to departure on the trip. It is best to have these signed well before the event. Forms need to be signed by a parent if a participant is under eighteen years of age. The activity must be listed correctly at the top of the form; you should not engage in activities that are not listed on the form, are not included in the title of the event, or for which there has been no prior planning.

Transportation Issues

Driving to and from activities or trips is often the most dangerous thing that we do. Leaders should plan on taking a school van. Only during rare occasions, and with express prior approval of the Assistant Director of Athletics, Fitness and Outdoor Programs, may personal vehicles be used for Reed-sponsored outdoor events. Leaders must arrange through facilities services their trip's van reservations and have a school-approved driver. It is always a good idea to have two drivers on trips when possible, as this allows you to better work with emergencies or fatigue; this is even more important on longer trips. Financing for van use must come from a Reed College organization.

Use of Alcohol, Tobacco, and Other Recreational Drugs

These substances must not be used on Reed Athletics, Fitness and Outdoor Programs and/or outdoor trips. Alcohol and other recreational drugs cloud the mind in an environment where clarity of thought is extremely important. Leaders are asked to do what they reasonably can to ensure participants neither possess nor use these substances. Unauthorized searches, however, should not take place. If the Student Leader(s) and/or Outdoor Specialist suspect a participant is violating this policy, responses may include: appealing to the honor principle and in-house judicial process, destroying the substance in front of the group, and/or removal of the offending party or whole group from the field.

Smoking is also prohibited on trips. Smoking tobacco is a fire hazard and has the potential for alienating many members of the group. Coffee and tea, on the other hand, are allowed.

NON-TECHNICAL ACTIVITIES

This section of the field guide is dedicated to working with the physical risks and environmental impact of hiking, backpacking, bicycle riding, and other activities that might be considered non-technical. Despite labeling them “non-technical,” there is still risk of harm such that good direction is still important. Although the nature of the activity may be less risky than mountaineering or whitewater kayaking, hiking and backpacking also have risks such as stream crossings or careless cooking. Please take time to review all the following guidelines and considerations before embarking on your trip. You should note that we generally have integrated both environmental and risk management considerations under specific topics in the hope that these are easier to find for future reference.

Minimum Impact Overview

As a program, we believe in the intrinsic value and beauty of the places we visit. We also believe our presence has the potential to impact that environment both ecologically and aesthetically. We strive to minimize our presence in terms of the number of people and things we bring into the backcountry, and also in terms of the things we may want to take with us from the backcountry — such as wildflowers or rock samples—to help maintain the environmental integrity of the places we visit.

Significant research exists describing that over 80% of campsite damage is done by the first 20% of traffic, and that once stripped of vegetation, a trail or campsite will remain 80% extinct unless actively left fallow (and ideally re-sown). (Source: Hampton & Cole, *Soft Paths: How to Enjoy the Wilderness without Harming It*, Stackpole Books, 1995.) With this in mind, Student Leaders and Outdoor Specialists should be very mindful of managing the group’s activities to ensure that, where possible, these activities are taking place in already high-use areas. Leaders should also be familiar with, and adhere to, all federal and state guidelines and legislation regarding the use of backcountry and wilderness areas. Group travel, whether on-trail or off-trail, should conform to the spirit of the minimum impact and “Leave No Trace” practices.

Proper Equipment

- All trips should have either a pre-trip meeting or distribute an equipment list designed specifically for that trip’s activity. At a pre-trip meeting, Leader(s) should bring examples of the required or recommended equipment.
- If certain equipment is mandatory for a trip, the Leader(s) should clearly state such requirements — and be prepared to refuse a participant a place on a trip if that requirement is not satisfied.
- Wherever possible and appropriate, participants should be made aware of the “layering system” — whereby emphasis is placed on combining a series of thinner, breathable insulating layers to allow participants more flexibility in their comfortable temperature range and equipment use.

- With few exceptions, cotton clothing *should be actively discouraged* or even prohibited for trips due to its poor thermal qualities and high weight once wet.
- In the interest of making trips as accessible as possible to all members of the Reed community, trip leaders should encourage participants to check out equipment from the Backpack Co-op and provide participants with alternative equipment choices to which they may already have access. For example, while a synthetic pile sweater may be optimal for a trip because of its weight and thermal ability when wet, a wool sweater often provides a sensible alternative.

Travel

While traveling, a group is often moving through a variety of environments. Rock, snow, dense brush, and stream crossings all have particular hazards; if Leaders fail to alert people to the hazards of each environment, risk is increased. People are often physically pushed, and when tired the mind is not as alert and bodies do not respond as well. One of the most significant hazards is the possibility that an individual or part of the group gets lost.

Travel, Risk Management Considerations:

- *Travel Together.* To assure group gear is readily available, emergencies can be either avoided or swiftly dealt with, and that the group can be genuinely responsible for each and all of its members, the group should travel together. The distance between participants can vary with the terrain, but generally, everyone should be able to communicate with everyone else. Leaders should convey to participants that everyone in the group shares a responsibility to clearly communicate their needs to the rest of the group regarding the group's pace, foot care, water breaks, etc. Trip leaders will stop regularly for rest and food/water breaks.
- *Separating Groups.* The group may separate into two parts in some situations, provided each smaller group has a pre-designated Outdoor Specialist or Student Leader, as well as a qualified first aid person (such as Wilderness First Responder) *with a first-aid kit.* A contingency plan needs be agreed upon whereby the two groups will come back together and what will happen should one of those groups fail to make its meeting spot. Generally, the most acceptable time for a group to split is when part of a group wants to remain in camp, while the other part of a group wants to do a short hike or activity.
- *Lost and Alone Training.* Within the first 20 to 30 minutes of hiking Leaders should teach some version of "Lost and Alone" training (i.e., discuss appropriate steps to consider if one is lost or separated from the group before the group or individuals have the opportunity to be separated or lost). *It is essential* this information be communicated to the group before participants are allowed to disperse. Leaders should stress the importance of staying in the same area and being visible and heard. If the group might have the opportunity to disperse, all participants should carry whistles. Participants should be well aware that in the event a participant becomes separated from the group, he/she should: 1) stop where he/she is, 2) remain calm, and 3) blow three short blasts on their whistle every minute until he/she is relocated by the group. Participants should also be made aware that if they have been lost for a couple hours it is important to place themselves in an area where it is easier to see and hear (clearings and hilltops), and wait patiently.

- *Staying Away.* Leaders (Outdoor Specialists and Student Leaders) should instruct participants to be at least a body's length away from the edge along precipices when possible. Many people have died or have been seriously injured by inadvertently tripping while next to a cliff edge. If your designated route makes you feel uncomfortable, please consider alternatives that will permit you and the rest of the group to safely avoid objective hazards such as these.
- *Hunting Season.* In hunting season, all participants should wear orange vests and/or brightly colored clothing.
- *Livestock.* When passing horses or other stock on the trail, give them plenty of room. Step off-trail to the downhill side and stand quietly in one spot to avoid spooking them.

Travel, Environmental Considerations:

- Try to avoid high-use areas at high-use times.
- Travel quietly. Excessive noise minimizes the possibility of seeing wildlife and negatively impacts other people who also may be seeking a backcountry experience.
- *Except during hunting season,* minimize the wearing of brightly colored clothes.
- When the terrain is safe and/or durable enough to permit this take trail breaks off-trail.
- Avoid excessively disturbing the environment by not building cairns, blazing trees, or picking flowers.
- Respect animals' need for peace. Observe them from downwind, avoid any sudden movement, and never chase or charge any animal. Fight-or-flight responses in animals can have serious physiological effects upon their ability to prepare for and recover from winter hibernation.
- Pets should not accompany groups.
- Walk single file within established trails. Walking outside the tread breaks down the trail edge and widens the trail. Heavy mud areas on the trail should *not* be avoided, and can be made more comfortable with tight, properly fitting gaiters.
- Shortcuts through switchbacks cause unacceptable damage and erosion and should be avoided.
- When faced with multiple trails, use the most prominent to facilitate the regeneration of the other worn paths.
- When finding routes off-trail, avoid fragile areas such as wet places, meadows, steep unstable soils, cryptogamic desert soils, and shallow alpine soil where a single misstep will cause severe, long-term damage.
- Try to concentrate group travel on durable surfaces, such as rock, sand, and snow, or other non-vegetated surfaces.
- When traveling off-trail, encourage the group to disperse slightly to avoid creating new trails in pristine areas.
- If you cannot avoid entering an area with fragile soil types, require the group to walk in single-file and step in the preceding person's footsteps.
- When descending loose scree, move slowly rather than scree running or scree skiing. Both of these latter activities, while fun, create significant erosion, as well as are inherently more risky.
- *Safety considerations should nevertheless take priority over minimum-impact practices.*

General Hiking Considerations:

- Discuss who sets the pace. Consider having the slower people lead, and/or rotating leaders. Good indicators for a reasonable group pace would be that a conversation could be maintained at all times while hiking. The group should be able to hike the majority of the day, take frequent breaks, and not be exhausted at the end of the day.
- Stress the importance of regular rhythmic breathing.
- Especially for longer trips, discuss energy-efficient techniques like the rest step which involves placing all your weight momentarily on your bone structure rather than relying on your musculature by trying the following: walk as flat-footed as possible to avoid taxing the muscles in the calf and foot. Swing the foot into the next step, lifting the foot as little as necessary. Lock the knee with each step allows your weight to settle on your skeletal structure rather than relying on your muscles for support. The steeper the terrain, the shorter the step and the longer the rest between steps.
- The object of rest stops is to *prevent* exhaustion, not *because of* exhaustion. In order to make rest stops efficient consider giving each rest stop a purpose — such as instruction, foot-care, grabbing a snack, etc. Consider how frequent and how long each rest stop should be. Establish a set rest time in specific hiking intervals (e.g. “We’ll hike for an hour and then rest for 10 minutes.”) Communicate these goals with the group. Help the group coordinate its activities during the rest stop. To avoid unscheduled stops, keep the group on-task with all the various items the group should be thinking about during each break, including putting on or taking off clothes, drinking, eating, urinating, fixing feet, etc. Choose protected spots that are well off the trail, but with durable soil or vegetation. In cold weather, consider maintaining a slower, steady pace to reduce the chill of frequent rest stops.

Campsite Selection

Campsite Risk Management Considerations:

- Avoid placing camp and especially pitching tents beneath or in a potential fall zone of dead or destabilized trees. Watch out for these ‘widowmakers’—dead branches (or whole trunks) that might fall into a tent in high winds or stormy weather.
- In addition to its visible aesthetic impact, avoid placing campsites in high exposed areas — for example, on ridgelines or cliff-tops. With the possibility of thunderstorms, avoid pitching tents such that they become the most prominent feature and thereby attract lightning strikes. Turbulent weather may blow your campsite off its exposed site.
- Avoid placing a campsite in the fall line for either rock-fall or snow avalanche. Pay attention to topographical features like steep treeless faces or cliffs, gullies, chutes, or couloirs that may directly funnel debris.
- Especially with the possibility of heavy rain, avoid pitching camp in a potential floodplain, drainage, or low spot.

Campsite Environmental Considerations:

- In the event that a trip is using a maintained campsite, participants should use existing tent areas, tent platforms, or latrines to minimize peripheral damage to the site.
- Endeavor to locate the various components of the campsite on durable surfaces least affected by the physical presence of the group — for example, making camp on a bare rock shelf is preferable to camping on top of a thick layer of duff, which is in turn significantly better than camping in a grassy, alpine meadow (where soft soils and leafy grasses are easily trampled).
- Once in the campsite area, encourage participants to change into soft-soled footwear to minimize the possibility of ground damage from heavy, hard-soled hiking boots.
- Shoes should be worn, unless you are in camp. The leader may decide that it is prudent for students to wear shoes even while in camp. Please keep in mind that cut and/or punctured feet are both an incredibly common injury, and one that greatly hinders the group's ability to travel.
- When possible, group campsites should be split into *three distinct zones*: a sleeping area, a kitchen area, and a latrine area. Ideally, there should be at least 50ft between these areas. Having three distinct areas offers a number of things that may need to be negotiated and compromised in the event of a not-entirely ideal site:
 - Keeping all food and body waste in distinct areas away from sleeping participants minimizes the possibility of potentially serious animal interactions;
 - Especially if a site is to be used for more than one night, a distinct latrine area offers privacy and minimizes incidental foot traffic that may damage fragile soils or groundcover.
 - Try to avoid a campsite within 200ft of any water source in order to avoid the possibility of any kind of waste product running off an inclined slope into a water source and to minimize any negative impact on a possible wildlife-drinking site.
- When leaving your site, strive to leave absolutely no trace of your presence. This should involve the following:
 - 1) Even in high use areas, and within reason, endeavor to pack out all garbage (not merely your own).
 - 2) In the event that you are at a high-use area with several fire rings, attempt to eradicate and erase all but the single-most major of these.
 - 3) Break down and scatter any non-permanent structures, such as lean-tos or shelters. This includes the destruction of all snow structures, which become increasingly unreliable with age.

Fires should only be used in emergencies such as the following:

- When a participant is severely heat-challenged and hypothermic;
- When there is a total and complete stove failure, and when there is insufficient food available to eat uncooked to permit the group to hike out;
- When a fire is being used as an emergency beacon for rescue purposes.
- Rare exclusions to this fire rule may be granted if the leadership gains approval from the Assistant Director of Athletics, Fitness and Outdoor Programs or the Ranger Station prior to the departure of the trip.

Cooking & Cleaning

Believe it or not, cooking meals is one of the most common activities in which people experience injuries on outdoor trips. Traffic through “kitchens”, cutting with knives, lighting stoves, and being near large pots of boiling water on unstable stoves all create their own problems.

Kitchen Risk Management Considerations:

- All cooking should be done in a designated kitchen area. In an effort to reduce traffic through the kitchen area, and thereby reduce the possibility of accidental burns or fires, effort should be made to identify designated cooks for each meal and that alternative activities are available for the other participants to avoid crowding the kitchen area.
- Proper stove use should be taught to the group or each designated cook and monitored.
- No one should be seated by a stove in such a way that if the pot spills hot water or food would end up in a lap or on a leg.
- Fuel bottles should be packed separately, ideally in a seal-able plastic bag. Leakage into sleeping bags, clothing, or especially food, could create a potential emergency situation.
- NO cooking should be done in a tent due to extreme fire or asphyxiation risk.
- *Only in an emergency* should cooking occur under a tent vestibule, sleeping tarp, or awning. Cooking under fully elevated group tarps is okay.
- To avoid animal depredation, especially from large mammals such as bear, all food, garbage, and toiletries should be stored outside participants’ tents or shelters. Especially in bear country, all of these items should be hung in a bear bag.
- If a bear-bag is to be used, locate a suitable tree and string it *in the daylight*.
- When cleaning pots, scrub with biodegradable soap and rinse. Dishes should be rinsed to remove any soap or detergent that may cause stomach unrest and diarrhea.
- Designated cooks should wash their hands with either a biodegradable soap or a water-free hand-sanitizer.
- Encourage participants to portion out communal food like GORP into individual baggies — and ask participants to share by pouring into each other’s hands.
- Because it is likely for bacteria and viruses to spread on a multi-day trip (3+ days out) and cause potentially serious medical problems *in the field*, please make an even greater effort to maintain group hygiene.
- Discourage participants from sharing water bottles.
- Discourage participants from sharing eating utensils.

Kitchen Environmental Considerations and Helpful Hints:

- Plan menus according to size and activity level of group to ensure that too much food is not cooked. Uneaten food cooked in water is heavy to carry.
- Once all pots have been rinsed, pass the wastewater through a sump screen. The solid food waste on the screen should then be packed out with the group garbage. Plan menus according to size and activity level of group.
- Bring water to the pots to be cleaned, not vice versa. This minimizes the possibility of accidentally contaminating the water source.
- Encourage students to eat or drink everything in their cups/bowls. Using hot fluids to dissolve and dilute solid food waste is a good strategy to do this.

- If possible, plan menus so the more strongly flavored meals are later, so that if a student chooses to use a single eating/drinking container, all their meals are not flavored with the first day's curry.
- When possible, buy menu items in bulk.
- Reduce packaging waste by disposing of cardboard boxes and, if necessary, consolidating ingredients together. Tear off the preparation instructions and include with the repackaged ingredients. Anything you pack in should be packed out.
- Packaging all the components of a meal together makes it easier to find when needed.

Water Purification

Ensuring an adequate water intake by participants requires attention; proper water purification is essential to making sure that group health is not detrimentally affected. Drinking three to four quarts in warm weather when exercising should be a baseline minimum for participants. Inadequate hydration contributes to a broad spectrum of symptoms and effects, ranging from headaches, nausea and grumpiness, to an inability to effectively regulate the body's temperature in either heat or cold, compromising the body's ability to withstand hypothermia and heat-related disorders.

In order to avoid potentially serious illness from Giardia, bacteria, and/or viruses, all backcountry water should be treated with one of the following methods:

- *Chemically.* Using iodine tablets, such as Potable Aqua. Add 2 tablets per quart of water, and loosely cap the bottle. Wait 5 minutes, invert the bottle, and ensure that the threads for the bottle cap are coated in treated water. Wait another 30 minutes before drinking. The colder the water, the longer you should wait. You may want to mitigate the mild taste of iodine, drink mixes (such as Gatorade) or vitamin-C tablets may be put in the water — *but only after the water has been treated for 30 minutes*. This treatment alone may not kill cryptosporidium.
- *Boiling.* While there is some debate within the outdoor education field as to how long to boil water, and indeed what constitutes 'boiling,' the following guidelines should be followed on Reed College trips. Untreated water and/or snow should be boiled from cold and brought to a rolling boil and maintained for 1 minute. A rolling boil is evidenced by bubbles of air consistently rising from all across the base of the pot. If necessary, stir the water to ensure that boiling water is being spread throughout the pot. The speed, with which a pot will come to a boil and the size of the bubbles in a rolling boil, will be altered by altitude and ambient temperature. Try to ensure that the stove and pot are effectively shielded and insulated in cold weather. An old license plate or a chopping board can serve as both insulation and a stabilizing base-plate in snow. Before boiling snow for water, add a small amount of water in the pot to accelerate the melting process and to avoid burning the pot.
- *Filters.* Filters work well for personal or small group trips where a limited amount of water needs to be produced with a minimum of exertion on the filter itself. If using a filter on a trip, be sure to verify the filter is able to remove all the possible kinds of parasites, bacteria, and viruses you may encounter on your trip. (The majority of filters, for example, *do not* remove viruses.) In the event of filter failure, ensure you are familiar with the other methods of water purification and have the means to perform at least one of them. When filtering water, be very careful to avoid placing the water bottle with

treated water in an untreated water source. Otherwise, you will need to purify your water bottle using one of the other two methods outlined above. When filtering water, be very careful to avoid contaminating the treated water outlet on the filter with untreated water. If this happens, you will need to purify your filter using one of the other two methods outlined above.

Human Waste

Even if it is in the parking lot before you hit the trail, avoid an uncomfortable moment by talking about the details of going to the bathroom in the natural environment. Naturalize the process by being open about expectations. Encourage participants to wash their hands with either biodegradable soap or hand-sanitizer afterwards. Three factors should shape your decision regarding the optimal way to dispose of human waste:

- Minimizing the chance of water pollution;
- Maximizing the rate of decomposition;
- Minimizing the chance of others finding it.

If a latrine or outhouse exists, use it!

- Your toilet-area should be at least 200ft from any water source.
- It should be on flat ground to avoid run-off.
- Especially in higher-use areas, cat holes are an appropriate alternative that dissipate the possibility of discovery and, while slower, dispersing solid waste in a number of individual cat holes offers faster decomposition than concentrating it in a single, larger cat hole or latrine. Cat holes should be at least six inches deep — the depth of the blade on an orange trowel — and the remnant soil should be mixed into the solid waste to assist the microbial decomposition of the feces. Two inches of topsoil should cover the cat hole and the surface disguised to hide the site.
- In an effort to minimize the use of toilet paper in the field, emphasis should be given to natural alternatives — such as smooth rocks, pinecones, moss and lichens, and snow. Since toilet paper decomposes significantly slower than solid waste, if used the user should pack it out in a seal-able plastic bag.
- Their owners should also pack tampons out — however, in order to minimize the possibility of blood-borne pathogens, as well as their attractiveness to certain animals, these should be double-bagged.
- It is best to urinate on rocks and other durable, non-vegetated areas.
- Urinating on vegetation or into soft soil is not directly harmful, but animals are frequently attracted to the salts in urine and will scratch and dig to uncover them.

Lightning

There are three primary ways lightning travels:

- *Direct Hit*. This means being struck by lightning directly. Lightning takes the easiest path to the ground. Direct hits usually strike the tallest object in a particular area. If a person is victim of a direct hit, the current is apt to be so large as to be fatal.
- *Ground Current*: When lightning makes a direct hit to the ground, its current does not immediately dissipate and disappear. It seeks the paths of least resistance across the earth's surface and disperses along these — ideally seeking wet surfaces like lichen-covered rock, drainages, water-filled cracks and fissures, root systems, and wet ropes. Talus fields

and dry ground are, therefore, less likely to conduct electricity. Ground current is sometimes conducted across a “spark gap”. This occurs when the electrical current jumps across a gap in a natural feature, such as a small cave or rock-feature. While it might seem sensible to get out of the rain to avoid the possibility of hypothermia, placing oneself in the gap formed by a shallow cave mouth is far riskier. Ground currents are generally weaker, hence the importance of participants assuming a correct lightning position to minimize the effects of the current passing through the body.

- *Splash*. After hitting an object lightning may react in much the same way water reacts, splashing off of a surface in a multitude of directions.

Lightning Procedure:

When lightning comes within five miles (25 seconds between the flash and the sound) the group should move into lightning procedure.

- To minimize the potential of a *direct hit*, GET OUT OF HIGH AREAS! In the event that such a move cannot be *safely* accomplished in sufficient time, take advantage of prominent natural features like rock pinnacles or, less preferably, trees. Lightning is more likely to hit a large feature than a person standing near it if the feature is significantly taller than the person, and the person is within a horizontal distance half the vertical height of the feature. This is called the “cone of protection.” If the person moves out further than the “cone of protection,” lightning is as likely to hit them than the feature. HOWEVER, if a person is too close to the feature, they may then be susceptible to ground currents from a direct hit on the feature. Although the “cone of protection” theory has recently come into question, experts recommend relying on topographical features rather than trees, and allowing a zone of protection with a radius of at least 100ft to maximize the possibility that a ground current would disperse before hitting the person in the “cone.”
- To minimize the effects of ground currents, adopt a crouching position to minimize the distance from one body part to another. This will be difficult to maintain for long periods of time. Sitting is also better than standing if you can no longer crouch. Crouch or sit on insulating or non-conductive material such as ensolite pads or dry coiled ropes. Wearing your raingear will help protect you from both ground currents and the ensuing storm. It is important to assume a correct lightning position to minimize the effects of the current passing through the body. For example, current passing from hand to hand will go through the critical areas of the heart, lungs, and spinal cord, yet the same current will be far less potentially damaging passing from foot to knee. This is why the crouch is the most effective position, and why hands should be kept off the ground and off the head.
- It is essential the group be dispersed in order to mitigate the chance that the ground current from a particular strike affects everyone. By dispersing, a group may be better able to resuscitate an individual whose heart has been stopped by ground current. If the group is in an area of high lightning danger, individuals should *not* huddle together to wait out the storm. In dispersing the group, the leader should nevertheless ensure that she or he can maintain visual and/or verbal contact with all members of the group.
- *Do not* lie on the ground.
- *Do not* hold your head.
- *Do not* put your head to the ground.

- In the event that you can smell ozone, hear a crackling or buzzing in the air, or see St. Elmo's Fire or a blue glow or corona around an object, GET OUT OF THE AREA. This indicates the high possibility of a ground strike.

Swimming

Swimming should only be done on non-technical trips with the prior approval of the Assistant Director of Athletics, Fitness and Outdoor Programs. This should only be done when the designated trip leader is acting as a Lifeguard, in areas without moving water, and in areas that have been thoroughly surveyed for hazards before group use. Immersion in non-moving mid-thigh deep water or less is not considered swimming; this may carefully be enjoyed by all. Please keep in mind that high mountain lakes and tarns are our drinking supply; hence these are questionable areas in which to swim. If a rinse is desired, have folks take water away from the supply, thereby filtering all the grime, sunscreen, and insect repellent, before it gets washed into the water source.

Stream Crossing

Crossing mountain streams can be extremely dangerous; please approach them with caution. If there may be considerable risk if a mistake is made, you have a very good reason to pick an alternate route, even if it is the one you just hiked. Look carefully at your map: is this really the best spot to cross this stream? If you are having trouble assessing conditions, be conservative. Give consideration to stream crossings when planning your route, especially in the spring when water is often running high.

- Brief the group to stop at all stream crossings and to deliberately cross them as a group. All hip belts on backpacks should be undone while crossing in order that people can "ditch" their packs should an emergency dictate removal.
- It is best to wear water shoes or bare feet and cross in streams than cross on narrow or unstable features high above. Consider the implications of a slip or fall.
- Think about how you can support individuals with a hand-line or other group members, if necessary. People may be moved across at different times than the packs.
- You may choose to use pairs and triads as support when crossing streams that require walking in the streambed.
- If the water is copious and muddy, you should not cross.

TECHNICAL ACTIVITIES

Rock Climbing/Bouldering

- An Outdoor Specialist should directly monitor-climbing activities at all times.
- All gear should be inspected for excessive wear or danger signs.
- Helmets should be worn at all times while climbing or belaying, unless on an indoor wall. It is advisable to designate specific areas within a climbing site where helmets are worn.
- Helmets should be worn for all fourth and fifth class travel.
- A back-up belayer/rope handler should be employed unless the Outdoor Specialist can ensure people have requisite skills, attention, and dedication for belaying one-on-one.
- No person should lead-climb unless specifically approved for this by the Assistant Director of Athletics, Fitness and Outdoor Programs. In this case leading should always be done on

climbs well below a person's actual leading ability. Generally this should only be an Outdoor Specialist who is being belayed by someone proficient at belaying lead climbers.

- All climbs should be set up with multiple, solid, independent anchors. The standard set-up includes at least three solid anchors independently linked to two opposing locking carabiners using separate pieces of 1" tubular webbing.
- If using bolts for top-rope anchors, these should be inspected thoroughly prior to use. If you doubt their integrity, pick another anchor or climb. A lower bolt may also be clipped for redundancy.
- A figure eight follow through tied directly to the harness should be used for all climbers.
- All student rappellers must use a separate belay. One may belay a rappeler using either a figure eight or a bowline on a coil that is also attached to the rappeler's harness. When rappelling single pitches for the sake of the experience, or during a participant's first rappel, it is highly encouraged to use a munter on a mule quick release system.
- No person's feet should go higher than six feet while bouldering. Spotting should be taught and used while bouldering.
- On rare occasions and with prior approval of the Assistant Director of Athletics, Fitness and Outdoor Programs, students may follow an Outdoor Specialist on a short multi-pitch route. Naturally, the Outdoor Specialist needs to lead well within their capability, and the participant follower needs to demonstrate they are adept at belaying a leader and catching lead falls. This team should be monitored in the event they need further assistance. The team needs to have climbed enough together to witness each other's skills, instead of simply talking about their respective climbing ability.
- Use good judgment! If you have a gut feeling or intuition that you should or should not be doing something, please pay attention to that feeling. Please do not let the enthusiasm for the experience overshadow your independent good judgment.
- When Bouldering climbers must have crash pads and (2) spotters to offer a safety when potential falls might exist.

Mountaineering

For our purposes, mountaineering includes travel on or under steep snow slopes where avalanches may be a factor, glacier travel, any time when an ice axe is necessary or prudent, when rope-work is necessary, or spending extended periods of time on snow above timberline.

- All Outdoor Specialists must consult with the Assistant Director to discuss the educational outcomes and risk management particular to their trip.
- Avalanche danger generally should be assessed as low to very low in the terrain being traveled. Exceptions involve transceivers and snow analysis as an integral parts of the experience, and should take place in no more than moderate terrain.
- Participants must have participated in a "snow school" session to learn travel and self-arrest skills before the need to employ those skills arises.
- All participants should have adequate equipment. Warm clothes, raingear, water, food, and a whistle and compass are a minimum.
- A first aid kit, extra food, stove, pan, shelter, ground tarp, ensolite pad, shovel, and sleeping bag should accompany groups on snow summit attempts.
- Participant to Specialist ratios should not exceed 5:1. This may need to be as low as 3:1 for certain activities.

- As with pure rockwork, all snow and ice rope-work needs multiple, solid, independent anchors. The standard set-up includes at least three solid anchors independently linked to two opposing locking carabiners using separate pieces of 1” tubular webbing.

Rafting/ White Water Kayaking

All rivers and runs must be approved in advance by the Assistant Director or Director of Athletics, Fitness and Outdoor Programs.

- Specialists must be familiar with the run on which they are teaching or guiding.
- All Specialists must consult with the Assistant Director of Athletics, Fitness and Outdoor Programs to discuss the educational outcomes and risk management particular to their trip.
- If a Specialist deems it too risky to undertake a run or continue down a river for any reason, then the team should play it conservatively.
- All Outdoor Specialists must wear a functional PFD, helmet, river knife, and whistle.
- All participants should wear a fully fastened PFD while on the water, whistle and safety helmet.
- When practical, a swim assessment in a pool setting should be done prior to a trip or class that spends a good amount of time on or in water. This 150-yard swim is generally not used as an admission requirement, but gives the Specialist(s) a good idea of a participant’s comfort in water.
- Boats should support each other on the water in a way that they can communicate with and lend support to one another in times of difficulty.
- Rescue and repair kits should accompany all Reed College rafting trips. This should include over 100’ of rope capable of being used for advantage systems, prussiks, carabiners, 1” tubular webbing for anchors, a patch kit, and an air pump. Additional supplies may be required from the agencies with whom we work.
- Specialists must give all participants a thorough safety talk before embarking on the water. This should at a minimum include: general hazards, person overboard, swimmer’s position, foot entrapment, strainers and holes, high side, and an understanding of how to catch a throw bag.
- Planned swims or person-overboard drills should only take place in areas deemed appropriate by the Specialists.

Sea Kayaking, Canoeing, Sailing, SUP and Other Water-Based Activities

- All Specialists must consult with the Assistant Director of Athletics, Fitness and Outdoor Programs to discuss the educational outcomes and risk management particular to their trip.
- All participants should wear fully fastened PFDs while on the water.
- All Specialists must wear a functional PFD, knife, and whistle.
- When practical, a swim assessment in a pool setting should be done prior to a trip or class that spends a good amount of time on or in water. This 150-yard swim generally is not used as an admission requirement, but gives the Specialist/s a good idea of a participant’s comfort in water.
- If conditions such as water flow, wind, or surf height are substantially different than anticipated for a given activity, a thorough assessment should be done with regards to the viability of achieving the educational outcomes while managing the risk of the activity. The Specialists may decide to include the Assistant Director of Athletics, Fitness and Outdoor Programs in this decision-making.

- One activity on the margins of being classified as water-based is fishing. Fly-fishing in slow moving current may be undertaken without a PFD provided the water level is not over the participant's knees, and that there is good run-out from the area in which they are standing.

