



Survival in the Great Out-of-Doors

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Field biologists and natural resource managers often find themselves working out in the country side far from services. If you get into trouble, there is often no one to rely on but yourself. As Sam Levenson so aptly put it, "When you need a helping hand, there's one at the end of your arm". Both your safety and that of those accompanying you depends upon your knowledge and judgment in dealing with the environment. Failure can have consequences ranging from unneeded discomfort to death. Taking care of yourself and others who may be with you is a serious business. Blisters on your feet or a sunburned face and arms, which start out as a nuisance, can become true medical emergencies or develop nasty complications later when you return home. Even small injuries such as a twisted ankle or bruised leg and strand you in the field. Risk taking is exhilarating in a casino, it is poor policy in the outback.

Having a comfortable and productive wild-land experience can be greatly facilitated by observing a few common sense suggestions:

Don't take unnecessary chances.

Running around the hill sides like a mountain goat may be loads of fun, but if you break your leg, you still have to get yourself out. Always allow for potential problems. As the boy scouts motto says "be prepared". I once broke a cross country ski in the back country and had slog through waist deep snow to get back to my car. It would have been wonderful to have had a pair of snowshoes!

Wear proper clothing.

Good stout boots that protect and support your ankles are wonderful for long walks. Long sleeved shirts are better than short sleeved shirts because you can always roll the sleeves up to cool your arms. You can't lengthen the sleeves of a short sleeved shirt when you begin to get sunburned. Wear long pants, not shorts. Wear a hat. A great deal of heat exchange in either cool or hot weather is from your head. Wool and some synthetic fibers are a world better than cotton clothing in wet cold weather because they remain a source of warmth, even if damp. Wet wool or polypropylene clothing can be wrung out and put back on. It will not be as nice as dry clothing, but will still keep you warm. An old sheep herder once remarked, "with wool, even when you are wet and cold, you're warm and dry". If you fall in creek when skiing or snowshoeing, you can even dry yourself off a bit by rolling in dry snow.

In many areas, especially at high altitudes, temperature can vary greatly across a day. It is not unusual for high deserts to be very hot during the day, then drop to freezing

at night. A good strategy is to dress in layers of clothes which can be added or removed as necessary to remain comfortable. In cold weather, pace yourself so that you do not sweat. Once you reduce your activity, you will quickly cool off and be cold and wet.

Be aware of your body signals.

You can quickly die in the field from either heat or cold. **Heat exhaustion** occurs when the body becomes stressed by loss of water and accompanying salts through the normal process of sweating. Dizziness, profuse sweating, and nausea are all signs of heat exhaustion. Sitting in the shade and drinking water to which a small amount of salt has been added are useful ways to deal with heat exhaustion. When you are active in hot weather, you should not wait to become thirsty before replenishing the water and salts lost in perspiration. It is generally better to regularly drink a small amount of water than to gulp large quantities when you begin to sense heat exhaustion coming on. Nausea associated with heat may sometimes be avoided by taking buffered salt tablets or putting salt in drinks to replace the sodium and potassium lost in perspiration. Many sports drinks contain salts as well as sugar. **Heat Stroke** occurs when your body temperature rises to the point that normal cooling mechanisms can no longer maintain body temperature. Respiration, which produces internal heat, increases as body temperature rises. Once past a critical point, your body may begin a rapid uncontrollable increase in temperature, often quickly culminated by death. Heat stroke is best recognized by noticeably high skin temperature accompanied by lack of sweating. People often become disorientated and can quickly lose consciousness. The only treatment at this stage is to externally cool the body as soon as possible. Pouring cool water over victims, packing them in snow, or any other way to quickly cool them is essential. Simply placing them in the shade is unlikely to save heat stroke victims.

Hypothermia occurs when your body is unable to generate sufficient heat to maintain its normal internal core temperature. Shivering is an early sign of cold stress. Cold or burning sensations in the extremities such as toes, fingers, and ears, occurs as your body restricts blood flow to them in an attempt to conserve energy in the body core. Such sensations should be taken seriously, as frost bite may follow. As your body cools, respiration rate declines, your physical strength declines, and your judgement may become impaired. One of the insidious things about hypothermia is that your ability to recognize your predicament and to take rational action is lacking when you most need it. People often feel exhausted and sleepy. Laying down and going to sleep is a poor choice because it reduces metabolic heat generated by physical activity.

The best way to avoid hypothermia is to be active and to stay dry and out of the wind. You are trying to reduce heat loss while favoring heat production. Layers of clothing including an insulation layer near to your skin and a wind/water barrier on the outside are a good combination. A large plastic garbage bag is a very versatile resource for keeping warm and dry. It can be used as the outer layer or as a ground cloth when you sit down to rest. Once someone is noticeably hypothermic, they

generate insufficient heat to rewarm themselves efficiently without some source of outside heat such as a fire, the body heat of other people, or a nice warm bath. Although most moderate hypothermia victims recover fully when rewarmed, it is a serious condition that demands immediate action.

Anoxia - Mountain Sickness occurs when your respiratory system is not able to deliver sufficient oxygen to critical organs such as the brain. Sensitivity to the reduced atmospheric pressure at high altitudes varies considerably among people. The first symptoms of altitude sickness - loss of energy, a slight cough, a slight headache - may appear between 8000-9000 ft elevation for unacclimated people. Although most severe cases occur for mountain climbers or field biologists working at very high altitudes (above 14,000 ft), the problem can be life threatening for vulnerable people even at lower altitudes. Death most often results from heart-lung failure as a result of fluid buildup in the lungs and chest. The best way to avoid mountain sickness is to move up in elevation in a series of stages, with a day or two between each stage to allow your body to adjust to the new pressure. People displaying well developed symptoms of altitude sickness should be moved down to lower elevation as quickly as possible.

Take sufficient water.

A person can easily drink more than 2 quarts of water on a hot day. Water is more important than food. Most of us can survive a week or more without food, but only a day or two without water. Many diseases and parasites are water borne. Wildlife as well as humans may be local reservoirs for contamination of water sources. Avoid drinking out of surface sources of water. Even if they are far from civilization and look clean, they may not be free of fecal contamination from wild animals. If possible, boil and/or filter all water prior to drinking it. If you must find water, remember that "water runs down hill". There is often water within digging distance at the bottom of dry stream beds, just above the surf line at the ocean, and at the edge of sand dunes.

Don't try to "live off the land".

There are many tasty things to eat out in the field. There are also lots of very distasteful and toxic things out there. If you are not sure about your identification of a plant, animal, or mushroom, don't eat it. You can live for several days without food. Eating the wrong things can make you sick, thus reducing your chances of survival more than going hungry for a couple of days would. If you must eat unfamiliar plants, avoid plants with milky sap or wooly leaves, those which leave a tingling sensation in the mouth or lips, those which taste bitter, and those which insects and other herbivores obviously are avoiding. When trying a novel food, it is always wise to eat a small amount initially, then wait to see what happens. Humans have a well developed regurgitation response as a way to deal with unsuitable foods.

Know where you are.

Good road maps and USGS topographic maps are available for most parts of the United States. Many maps are now readily available to load into hand held GPS

units. It is always advisable to have a paper map with you in case your battery goes dead or the GPS stops working. Maps are especially useful when you relate ground reference points such as mountain tops, rivers, lakes, and roads to your current position. Be aware of where you are at all times. Note reference points on the way in, so that you can find your way back out. A common strategy in traveling over large distances is to head toward a very visible object in the direction you want to go. Once you arrive there, you locate another visible reference point and head that way. This prevents wandering aimlessly around in circles. This same approach is very useful in cities where water towers, distinctive tall buildings, and church steeples provide references which can be seen from far away. A compass can be very useful for determining directions. Remember that a magnetic compass may not work near large iron objects such as vehicles. Also remember that GPS signals may be blocked by mountains, dense forests, or other natural obstructions, leaving you without a location fix in rough country. In planning trips, always allow a bit of extra travel time for rest stops and other contingencies. The average walking speed is about 2-3 miles per hour in easy country. Walking speed is a lot slower when traversing very steep or rough country. Slogging up a steep hill can be a real exertion, but going downhill is often more dangerous. Many mountain climbers die on the way down, not the way up the summit. Coming down, they are tired, gravity is encouraging them to move quickly down the hill, and their center gravity is slightly behind rather than directly over their feet. All this is conducive to a fall.

If you get lost, don't panic.

Few people die of “getting lost”, most die from poor choices made while trying to find their way out. Prior to every trip, you should tell someone where you are going, when you expect to return, and when to assume that you require assistance. This can be someone at your home, a friend who is not going with you, or the desk manager at a hotel. Please be sure to check back in when you return safely. If you become injured or lost, the smartest thing may be to **stay with your vehicle** or in a place where you will be easily visible to rescuers. Don't leave your vehicle unless you have a pretty good idea of where you are and where you intend to go. If you try to hike out, a good plan is often to follow the road back out. If you are away from a road, head downhill as this will lead you to water, and people tend to live near water. Following a stream will almost always eventually lead to civilization. Starting a smoky fire will often get the attention of fire prevention folks. But, please do not start a forest or range fire just to get help! You can also use the position of the sun, moss growing on the north side of trees, etc to select a line of march. However, these approaches aren't very useful in dense humid forest. Be aware that many “trails” which you might encounter may be wildlife trails worn by deer, elk, mountain goats, bears, or other large native mammals. They may not necessarily be going towards help. Hiking around a bend in a trail in dense brush and coming snout to snout with a black bear can be a very memorable experience.

Treat animals with respect.

Any large animal can seriously injure you if it is provoked. Animals are most likely to attack if they are defending young, a concentrated food source, or breeding

territory. Even deer have been known to attack and kill people. Bears, mountain lions, and other large predators generally avoid people. Making lots of noise will help animals locate and avoid you. However, there are cases of bears, mountain lions, and crocodiles actively hunting and killing people as food. In dealing with a wild animal, it is essential to quickly determine if aggression is based upon fear, territoriality, or predation. Be cautious near obvious ambush spots such as well used trails, dense clumps of cover, overhanging rocks, and water holes. If you see a predator disappear and reappear several times, it may be stalking you. Animals protecting territory or their young are best dealt with by backing away slowly while avoiding eye contact and other aggressive gestures. In confronting potential predation, your best strategy may be to appear as large and dangerous as possible without appearing openly aggressive. Stand upright, extend your arms, and back slowly away. Do not attempt to run away, as this will often initiate a predator/prey response.

There are few poisonous snakes in the Pacific Northwest. However, lizards and snakes can and do inflict a painful bite if provoked. Leave them alone. The puncture wounds from snake bites often become infected. Our most common poisonous snake is the western diamond back rattlesnake. Rattle snakes are pit vipers that can sense heat as well as motion and smell. Given a chance, they will generally try to defend themselves by escaping or coiling and rattling rather than aggressively attacking humans. Their bite contains both a strong neurotoxin and a cocktail of digestive enzymes. A rattlesnake bite poses an immediate danger of death from the neurotoxin and a secondary probability of loss of the tissue near the bite. It is not uncommon for bitten dogs to lose the struck leg. Snake bite kits are probably better than nothing, but do not rely on them as an effective treatment. Bitten persons should seek medical help immediately!

Learn to recognize wasps, bees, and hornets. Hornets will sting without provocation, especially near the end of their life cycle in late summer and fall. Wasps and bees rarely sting unless provoked. Because they are diurnal creatures, they are seldom a problem at night. You can avoid confrontations with wasps and yellow jackets by cooking and eating before sunrise and after night fall.

Biting flies, knats, and mosquitoes can be a real nuisance. Their bites may become infected or directly transmit disease. You can deal with them by: avoiding the time and place that they are active, wearing protective clothing, or using insect repellent. Since many biting insects are associated with water, avoiding their breeding grounds is always a good idea. For example, eating lunch next to a small mountain pool or shallow lake is a sure fire way to find mosquitoes and black flies. Acacia tortilis is called the “fever tree” in East Africa because it grows near damp spots. People camping under the tree often contracted malaria. In boreal muskeg, it is wise to tie a string around your pant legs, just below your boot tops to prevent biting flies from crawling up your pants. Many biting insects are weak fliers. They do not fly in high winds and you can escape from them by waking quickly away. Covering yourself with protective layers of clothing during the day and with a mosquito net at night is

helpful. Some biting insects are day feeders while others are night feeders, so the nature of attack may differ from day to night. Not all parasites fly! Chiggers, ticks, and leaches sit on vegetation and wait for you to brush by them. It is advisable to strip off at least once a day for a “tick check”. There is some controversy about the effectiveness of herbal insect repellents. Chemical repellents containing DEET are generally effective. The general advice seems to be that the more DEET, the more effective the repellent. I find that mosquitoes do not seem to like cigar smoke.

Always carry a small survival kit.

I carry the following items:

A plastic butane lighter and small wad of steel wool to start fires, a whistle and mirror to signal for help, a space blanket for shelter, a large plastic garbage bag, a piece of string, a Swiss army pocket knife, and a small first-aid kit containing antiseptic ointment, chapstick, Band-Aids, aspirin, and a bottle of insect repellent. In some areas, such as tundra and mountain meadows, the biting flies and mosquitoes may be so thick that they present a real health hazard! Of all these items, the most important are the butane lighter, the plastic bag, the pocket knife, and the whistle. Don't leave home without them! In case you are wondering about the whistle, ask yourself how long you can call for help, and how far can your calls be heard compared to blowing on your whistle?

Seek Local Knowledge.

Ask someone familiar with the area about local conditions. Advice about how to deal with external parasites (chiggers, mosquitoes, ticks, biting flies) or internal parasites is quite useful. Reports of current road or trail conditions and any military or law enforcement activity helps you prepare for what's ahead. Marijuana growers often booby trap their grow areas. Take any warnings seriously. If you come across a tended marijuana patch or a Meth lab, get away as fast as possible. Many growers fear theft and competitors more than the police. So, don't sneak around! If you see something that looks unusual..... it may be a booby trap. Don't be the booby.

Respect the weather.

Weather can change fast, especially in areas prone to thunderstorms. Never camp in the bottom of a drainage area such as an arroyo or creek bed. As many people drown in the desert as die of thirst. Don't be the highest point around during a lightening storm. Lots of people are struck by lightening in the U.S. every year. Hiding under a tall object such as a tree may also not be very smart, as you may be in the shock zone if it is hit by lightening. Trees may also be blown over in high winds. Trees are very heavy. It hurts when they fall on you.

Use your comparative advantage - Avoid becoming a victim.

Humans are not particularly fast or strong. We lack effective claws or teeth for fighting off other predators or for overpowering large prey. It is a pretty unfit predator or potential meal who can not out run us in a fair race. We lack fur and other morphological or physiological adaptations to deal with harsh environments. Our competitive advantage is that we are generalist omnivores who can eat a wide

range of foods and that we are good problem solvers. That is, we are smart. We use behavior to overcome our physical and physiological limitations. ***We need to be thinking all the time***... When you are in deep trouble...there is always time to consider solutions. Use your knowledge to avoid trouble. A smart person does not camp in the bottom of an arroyo, under large trees which are liable to blow down, on an ant hill, near a wildlife trail, or next to a water hole. Animals displaying bright patterns or colors may be warning you that they are toxic, bite, sting, or have some other effective defense. Leave them alone. When in trouble always remember two things:... ***Don't Panic***... and ***think before you act***.