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THE OUTDOORS AT YOUR DOORSTEP

THE SURVIVAL ISSUE

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GRAND CANYON

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SURVIVAL IQ

HOW TO
SIGNAL A RESCUE PLANE
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TREAT SNAKEBITE

SURVIVAL GEAR
WHAT WORKS,
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ATTACKED!
"A GRIZZLY BEAR
BIT MY HEAD"

**10 HIKES TO
FAMOUS DISASTERS**

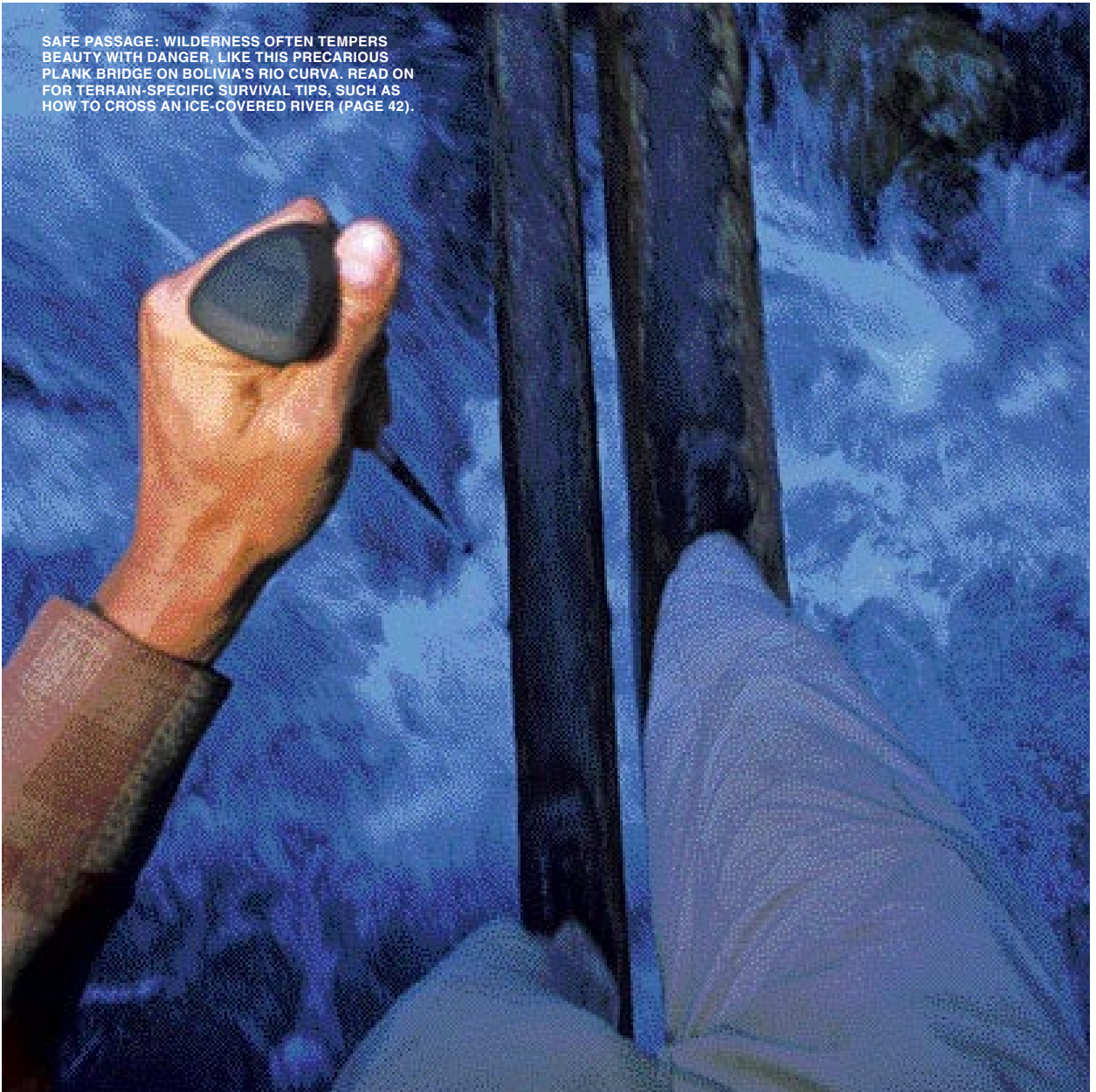
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SAFE PASSAGE: WILDERNESS OFTEN TEMPERS BEAUTY WITH DANGER, LIKE THIS PRECARIOUS PLANK BRIDGE ON BOLIVIA'S RIO CURVA. READ ON FOR TERRAIN-SPECIFIC SURVIVAL TIPS, SUCH AS HOW TO CROSS AN ICE-COVERED RIVER (PAGE 42).



Survive Anywhere

Lost in a swamp? Pinned down on a peak? Our 4 experts will keep you alive. *By Jason Stevenson*

REALITY TV HAS IT ALL WRONG. The toughest foe you'll ever face is not some backstabbing fitness instructor from Ohio—it's the full fury of what nature can fling at you. From extreme temperatures to poisonous plants to stealth killers like hypothermia, the wilderness can be a harsh place for the unprepared. To even

the odds, we've enlisted the help of survival experts who have built their careers on expecting the unexpected. Take a virtual tour of four familiar backcountry environments—desert, wetland, winter, and above treeline—and learn how our specialists' knowledge can bring you home alive.

DESERT

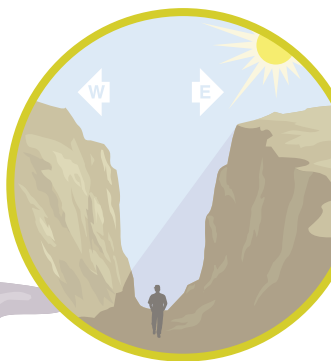
[THE SITUATION]

It started out as a pleasant late-summer dayhike in southern Utah—until you and your pal wandered off the trail. Now you're hopelessly lost, just when the sun is at its hottest. Survival guru Cody Lundin describes techniques for staying cool and finding water—your two most critical tasks in a desert environment.

1 [LOOK FOR SIGNS] Water collects at cliff bottoms, in shaded rock basins, and in cavities known as pot-holes. If you spot remnants of a mine, a settlement, or a stockyard, a water source—most likely a spring—is probably nearby. Remember to look up as well as down. Summertime monsoon rains usually dump in late afternoon in the Southwest, but they rarely last long, so you'll want a head start setting up a water-collection device.

[HIDE FROM THE SUN]

Because the sun arcs across the southern sky in our hemisphere, a north-south canyon provides more shade than one oriented east-west, and is more likely to contain water. You can also find shelter behind north-facing walls, in depressions, or under trees. Caught in the open? Hang a jacket over a shrub to create your own shade. Dip clothing in water to increase evaporative cooling.

**[STAY PUT IF YOU CAN]**

When lost in the desert, your best bet is to find a sheltered area with water access. Constantly signal for rescue. Avoid hiking during the heat of the day; instead, move in the early morning or moonlight. Don't split up—it's easier to spot two people than one.

2 [GO FOR THE GREEN]

A cluster of bright-green vegetation signals water is present, but not necessarily accessible. Cottonwood trees are visible for miles, but their extensive roots can tap sources 40 feet deep, so don't rely on them. Shorter Bermuda grass is more difficult to spot, but a lush patch is a good sign of water close to the surface.

[BUNDLE UP AT NIGHT]

To get through a chilly night, improvise insulation with dry grass, juniper duff, or leaves. Avoid windy and low-lying areas. Minimize conductive heat loss by reducing your contact with the ground. Huddle against a tree or rock; you won't sleep much anyway. Unless there is no natural cover, digging an underground shelter requires far too much energy and sweat.

[CONSERVE YOUR MOISTURE]

Hydration trumps hunger. Avoid protein—it requires too much liquid to metabolize. Ripe cactus fruit contains glucose and trace amounts of moisture. Mesquite pods have simple sugars. But if you get cold at night, eat an energy bar to warm up. You don't want to get hypothermic trying to avoid dehydration.

3 [DON'T BE BLAND]

Color, contrast, and movement are essential for successful signaling. No mirror? Check your wallet—credit-card holograms are highly reflective. To be spotted from the air, make an X at least 5 feet across with rocks or gear that contrasts with the ground. Check your pockets for useful and/or shiny items such as plastic bags and foil gum wrappers.

[SHADE YOUR SKIN]

To prevent sunburn, rub charcoal powder from a burnt log onto your skin. It stays on for a long time and visibly wears off so you know when you're exposed again. Mud and dirt work, but not as well as carbon. The aloelike gel in prickly-pear cactus pads provides a marginal sunscreen. You can also use it to soothe a sunburn, but test it on your skin first for allergic reaction.

[FOLLOW THE ANIMALS]

To locate potential water, scan dry arroyos (riverbeds) for green vegetation along the outside banks of bends in the channel. Look for honeybees, songbirds, and coyote dig marks. Wherever you find these, scoop out a hole with your hands or a stick. If the soil gets moist, dig deeper. Use a plastic bag to collect the seeping water, or a cloth to soak moisture from the soil. Don't build a solar still—it's too complex, requires too much energy, and likely won't work.



FOR EVERY DESERT HIKE, EVEN A DAYHIKE, TELL SOMEONE WHERE YOU'RE HEADING, AND WHEN YOU'LL BE BACK.

THE EXPERT Cody Lundin is the founder of the Aboriginal Living Skills School, a wilderness-survival and primitive-living institute based in Prescott, AZ. He is also the author of *98.6 Degrees: The Art of Keeping Your Ass Alive*. (928) 713-1651; alssadventures.com

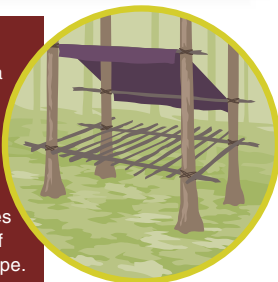
"DESERT SURVIVAL REQUIRES BALANCING MANY PRIORITIES. IF YOU'RE TOO BUSY LOOKING FOR WATER OR BUILDING A SHELTER TO NOTICE THE RESCUE CHOPPER, YOU'RE DEAD." CODY LUNDIN

WETLAND

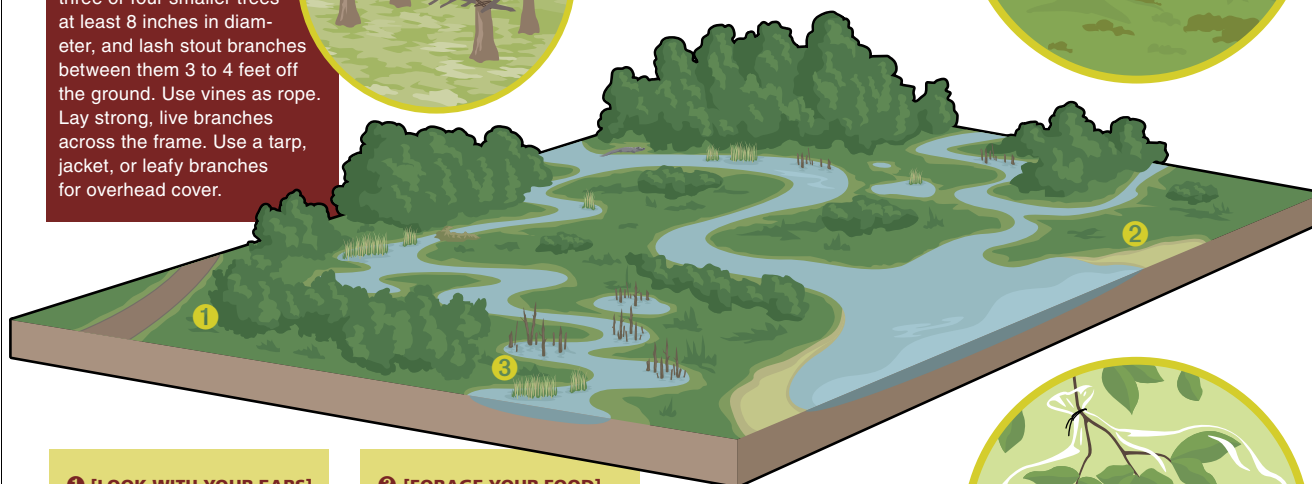
[THE SITUATION] During a dayhike at a coastal wildlife preserve, you leave the trail to bushwhack to an alligator pond. Confused by dense vegetation and numerous meandering waterways, you lose your way in the swamp. Here to guide you out of terra incognita is Eric Metzger, a former U.S. Air Force survival instructor who specializes in jungle terrain.

[RAISE YOUR SHELTER]

If the ground is too wet for a debris shelter (see *Skills*, page 50), build a platform. Find two large trees, or three or four smaller trees at least 8 inches in diameter, and lash stout branches between them 3 to 4 feet off the ground. Use vines as rope. Lay strong, live branches across the frame. Use a tarp, jacket, or leafy branches for overhead cover.



[FIND FUEL] Your best bet is pitchwood, formed when tree sap collects in dead pine trunks and stumps. This waterproof firestarter smells like turpentine; cut small shavings to add to kindling, but don't overdo it, because this highly resinous wood burns hot and long. Also use dried tree moss, cattails, shredded cedar and cypress bark, and vines.



1 [LOOK WITH YOUR EARS]

In dense vegetation, your hearing is more useful than your vision. Listen for motor noises coming from roads and waterways, and go toward the sound.

2 [DIG A SEEPAGE WELL]

To find water along a saltwater beach, dig at the lowest spot behind the first large dune above the high-tide line. Sea oats or wild grasses mark the best spots. Excavate a hole 3 feet deep, and brace the walls with sticks to prevent collapse. Fresh water will slowly seep into the hole. Fill a plastic bag, and filter out sand and silt with a bandana before drinking.

3 [FORAGE YOUR FOOD]

A swamp is a survivor's supermarket. Most bunched berries (like raspberries and blackberries) are edible. Avoid white and yellow berries. Boiled pine needles make a tea rich in vitamin C, while the tree's inner bark and seeds from its mature cones are tasty snacks. Cattails, beech nuts, and the flowers of water lilies can be eaten. Boil grasshoppers, which are high in protein, as well as other insects such as ants, grubs, and crickets, to make them more palatable.

[PLAN BEFORE YOU ACT]

Once you realize you're lost, stop. Sit down, drink some water, and develop a plan for your own rescue. Focus on short-term goals, such as securing food, water, and shelter, several hours before the sun sets.

[FIND NATURAL INSULATION]

To keep warm at night, place moss, cattail down, or leaf litter between two layers of clothing (but beware of biting bugs). The more air space and loft, the warmer the insulation. On a dry surface, make a sleeping pad by stacking a foundation of sticks, and then layering heaps of leaf litter and moss. Build it up until it compresses to a foot-thick pad that protects you from the cold ground.

[TAKE A MUD BATH]

The only thing as common as biting insects in swamps is thick mud. Use it as sunscreen and bug repellent, or to cool down. Limit your sweating by walking slowly and taking frequent breaks. Also, don't be afraid to cool off in a water pool—just make sure an alligator hasn't already claimed it.



[COLLECT CLEAN WATER]

Most swamp water is full of nasty microbes. Boil it, or get pure H₂O from plants and precipitation. A transpiration bag collects plant condensation and can yield a quart of potable water a day. Place a plastic bag (clear is best) over a green leafy bush or tree limb and wait several hours. Employ several bags at once, and choose plants in direct sunlight.

MOST BUNCHED BERRIES (LIKE RASPBERRIES AND BLACKBERRIES) ARE EDIBLE. AVOID WHITE AND YELLOW BERRIES.

THE EXPERT Eric Metzger is president of Global Principles Survival School in Panama City, FL, which serves military and civilian clients. Every GPSS teacher is a certified U.S. Air Force Survival, Evasion, Resistance, Escape (SERE) instructor. (850) 722-7870; globalprinciples.com



"SWAMPS GET VERY COLD AT NIGHT. ANY TIME YOU'RE COLD AND WET, YOU'RE AT RISK FOR HYPOTHERMIA. DRY YOUR CLOTHES BEFORE NIGHTFALL, AND PREPARE A SHELTER ON HIGH GROUND." ERIC METZGER

[THE SITUATION] Sometimes, solitude—a romantic tent site several miles off-trail—has its price. When you and your sweetheart wake to a raging blizzard that has buried your route back to the main path, you pack up anyway. Now, whiteout conditions have you stumbling in circles. You can get back home—if you take the advice of survival expert and former U.S. Air Force instructor Greg Davenport.

1 [GO AROUND ICE] Cross a frozen river only if there are no other options. Choose the shortest gap between banks, and avoid bends where the water is likely deeper and the ice thinner. Before crossing, undo your hipbelt, loosen shoulder straps, and grab a stout branch to help distribute your weight.

2 [WALK ON SNOW]

Postholing through deep drifts can tire you out and soak you with sweat and slush. Jury-rig snowshoes by cutting live evergreen boughs 2 to 3 feet long. Secure the branch ends to the midsoles of your boots using rope or shoelaces, allowing the needles to float behind your heels and create extra lift.

3 [FOLLOW THE BREADCRUMBS] A GPS device—in the hands of a knowledgeable user—can be a lifesaving tool in a wintry mix of poor visibility, snow-covered trails, and overcast skies. You can backtrack waypoints during a whiteout, preprogram multiple escape routes, and bush-whack with confidence. Batteries drain faster in the cold, so pack extras. (Hint: Lithium AAs last longer than alkalines).

[TRY PLAN B]

Never leave for a trip without establishing an emergency escape route to the nearest road. If you lack a compass and map, but know there's a highway to the south, use these techniques to estimate cardinal directions and get oriented. During the day, use the stick-and-shadow method to find east and west (see *Skills*, page 48). At night, find the North Star by locating the Big Dipper's pointer stars on the edge of its ladle, and following their length five times over.

[SHIELD YOUR EYES]

Protect against snow blindness by packing a pair of UV-rated sunglasses. If you forget them, improvise using duct tape, tree bark, extra straps, a bandana, or any material wide and long enough to cover both eyes. Cut small horizontal eye slits and tie the goggles around the back of your head.

[AVOID LOW SPOTS]

The ideal shelter spot is a flat ledge two-thirds of the way up a south-facing ridgeline. This location catches the morning sun and typically sits above the coldest air and heavy underbrush. If possible, backtrack to your original campsite, because it offers a known waypoint to help retrace your route to the trail.

[DRINK UP] Dehydration is a stealth killer in winter because people don't associate fluid loss with cold weather. In fact, your body uses massive amounts of water just to keep warm.

[SIT TIGHT] During a blizzard or when visibility is nil, hunker down and ride it out. If you don't know which direction to go, stay put—you'd probably just get more lost. Dress in adequate layers and pitch a tent. No tent? Dig a snow cave or seek shelter under a tree (learn how to make a

tire pit shelter in *Skills* on page 50 or a snow cave on page 86). If you leave your tent, place trail markers such as broken sticks to help you find your way back.

[PROTECT YOUR HANDS] Numb fingers are no better than stumps when tackling simple campsite tasks. Keep your hands covered at all times, and put on mittens when you don't need manual dexterity.

[STAY TOGETHER] An uninjured and mobile pair of hikers should not

split up. You can comfort each other and reduce stress. Huddling together will make both of you warmer. You can brainstorm solutions and split the work. And two sets of eyes are better at recognizing key landmarks.

[NEVER STOP SIGNALING] As soon as you're sure you're lost, start signaling; there could be other hikers in the vicinity. You should be carrying a whistle and a signal mirror.

BLOW THE WHISTLE IN THREE SHORT BURSTS EVERY 5 MINUTES. IF THE SUN IS OUT, FLASH THE HORIZON WITH YOUR MIRROR.

THE EXPERT Greg Davenport is the founder of Simply Survival, a wilderness education program. He is also a former U.S. Air Force Survival (SERE) instructor and author of six survival books. He lives in Stevenson, WA. (509) 427-4022; gregdavenport.com

"WHEN I WORKED ON THE NORTH SLOPE OF ALASKA, MY CLINIC STARTED MANY MORE IVS ON DEHYDRATED PEOPLE IN WINTER THAN IT DID DURING THE SUMMER." GREG DAVENPORT

ABOVE TREELINE

[THE SITUATION] While attempting a multiday ridgeline traverse in late autumn, your group of three gets caught in a sudden snow squall. Freezing and disoriented, you seek shelter behind a rock outcropping—but your friend falls and severely twists his ankle. Mountain-rescue pros Brian Wheeler and Bob Brownback explain what to do next to get everyone down safely.

[DESCEND SAFELY]

If you decide to head down, find the safest route—not the fastest one. Ridges are less steep and offer better footing than slides and gullies. Remember the compass bearing of your descent; you may need to retrace your steps later. Build rock cairns as markers for your route. Stay together and walk side by side during your descent, to prevent rockfall injuries.



[HUNKER DOWN] If you have to wait out a storm, seek shelter from the wind. Find a boulder or rock overhang, or stack rocks to create a windbreak. Avalanches and cornices (snow overhangs) shouldn't be a problem in fall, but they can be in winter and spring. Pitch a tent if you can, and get cold or injured people into their warmest clothing and sleeping bags and insulate them from the ground.



1 [CHOOSE YOUR REFUGE]

Identify a common meeting point before you descend or as it comes into view. Seek a sheltered valley or slope with water, fire-building materials, and a clearing likely to be visible to rescuers. Beware: As you descend, cell-phone reception will probably diminish.

2 [READ THE TERRAIN]

Fatigue, lack of trails, and poor visibility all increase the odds of navigation errors above treeline. Orient yourself using prominent peaks and landmarks. Maintain a running conversation about terrain features such as boulders and ridges to help everyone remember the path. Share routefinding responsibilities—more eyes and brains decrease the odds of getting disoriented.

[ADDRESS INJURIES EARLY]

Be proactive. Treat the injured hiker for hypothermia and shock *before*

symptoms develop; high elevation and bad weather may accelerate the onset of these conditions. Provide hot liquids, sugars, and food to prevent the victim from getting lethargic or unresponsive. Digestion generates metabolic heat that the body needs to warm up and move again.

[CALL FOR HELP]

A sprained ankle isn't normally life-threatening, but ridgeline exposure can turn any injury into a hypothermia crisis that requires rescue. Before you call, determine your position as best you can. If you have a GPS, write down your coordinates, in case it fails. Ask the dispatcher to repeat the coordinates back to you. Turn off your unit when not in use, and keep the batteries warm to extend their life.

[MELT THE WETTEST SNOW]

Drink more at higher elevations. Wet, heavy snow and frozen, crusty layers produce more meltwater than light powder. Don't melt snow in your

WHILE HIKING IN EXPOSED OR DANGEROUS AREAS, IDENTIFY A SERIES OF **SAFE ZONES** THAT OFFER PROTECTION OR ESCAPE ROUTES TO LOWER ELEVATIONS.

mouth; place it on a black trash bag or in a zipper-lock bag or water bottle (see *Skills*, page 50).

[MAINTAIN CORE TEMPERATURE]

The human body produces heat two ways: through movement and by metabolizing food. If you can't move, you should eat. But don't chow down when you have limited water. Always ration food, but never ration water.



THE EXPERTS Brian Wheeler (right) is president of the Northwest School of Survival in Sandy, OR, where Bob Brownback is an instructor. The school specializes in backcountry training for corporate and military clients as well as the general public. (503) 668-8264; nwsos.com

"IT'S OK TO DESCEND FROM A RIDGE INTO AN UNKNOWN VALLEY TO ESCAPE DANGEROUS WEATHER. SOMETIMES YOU NEED TO GET MORE LOST IN ORDER TO BE ADEQUATELY SAFE." BRIAN WHEELER