Signaling for Rescue

Not part of the Rule of 3's

This priority is best started parallel to the Shelter / Thermoregulation priority.

Once you have a PMA
And have addressed the critical
First Aid issues.

Be ready to signal for help as you work on your shelter and fire.



If you are lost, hurt or stranded.

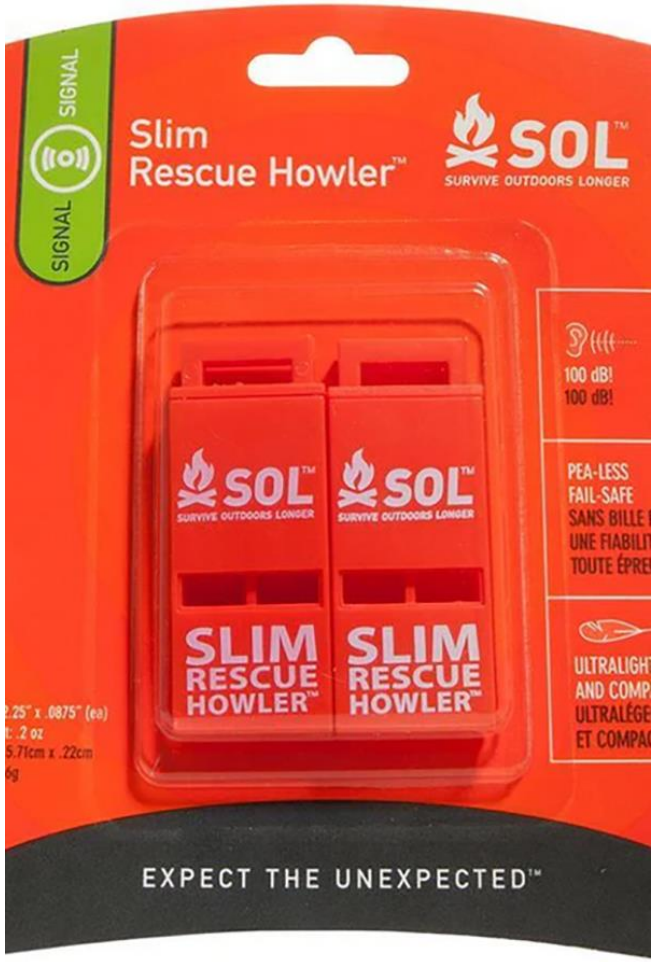
Simply throw your signal mirror and whistle around your neck.

As you work on thermoregulation, you can quickly get the attention of other hikers that may be passing by, especially useful, if they are too far to hear your voice.



• Types of Signaling:
- Audio
- Visual
- Electronic

• Universal Distress
- SOS - 3 blasts on a whistle - (SAR will respond with 2-Blasts)
- Whistle should be a “Plastic / Pealess” type
- Things arranged in a Triangle
- 3 of anything - 3 fires in a row

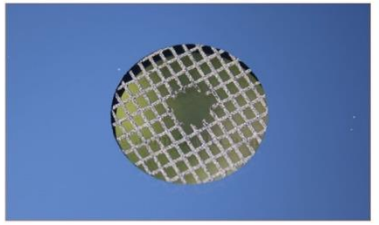


Ground to Air Signaling (a whistle won't work)

•Who are we signaling to - Small airplanes and helicopters (not commercial aircraft)
- Signal Mirror
- Signal mirrors with "Retro-Reflective" grids are recommended as the most accurate for signaling for rescue. A mesh screen coated with spherical beads work like a street sign that reflects the light from your car back toward you.
- You see a glow (a representation of the sun) on the grid - That's your aiming indicator.
-For mirrors without a retro-reflective grid: Use your hand to sight in the mirror

Signal Mirror Basics

Retro Reflective Grids



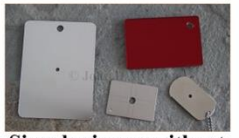
A mesh screen coated with spherical beads, works like a street sign that refelcts the lights of your car back toward you.



You see a "glow" (a representation of the sun) on the grid. That is your aiming indicator.



Recommended signal mirrors with retro reflective grids



Signal mirrors without retro reflective grids

Ground to Air Signaling (continued)

- Flare
- Smoke Grenade
- 3-Fires arranged in a triangle or in a row
- Signal fire (works ground to ground as well)
    - Burn rubber in a snowy white environment to create black smoke
    - Burn leaves in a dark wooded environment to create white smoke
- Uses of natural materials like rocks laid out in an arrow or triangle that does not look like part of the natural environment (Contrast)
-Bright, contrasting colors (including High Visibility Clothing)
-Movement – This is more noticeable than something stagnant.
    - A breeze moving a signal or just manually waving a signal
- Flashlight / Headlamp (one that blinks is best)



Ground to Ground Signaling

Who are we signaling to? - SAR / Hikers passing by.

- Signal Mirrors
- Whistles - (Man made / Aluminum Soda Can / Leaf / Grass / Acorn Cap)
- Flagging Tape (can also be used as a “Breadcrumb” trail if you need to leave base)
- Smoke Grenade

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-Movement – This is more noticeable than something stagnant.

    •A breeze moving a signal or just manually waving a signal

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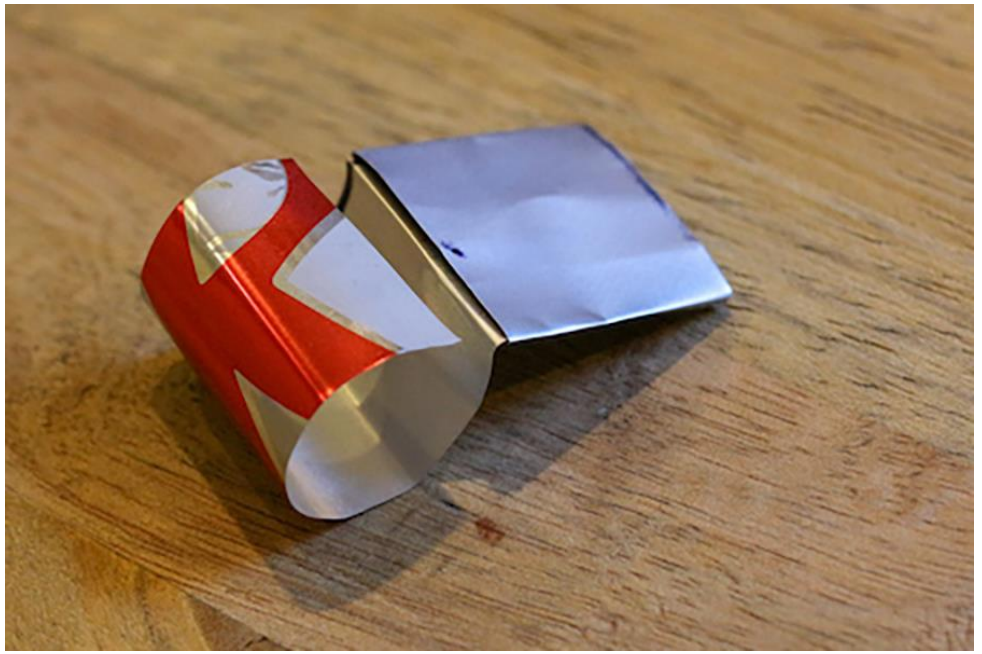

A brightly colored synthetic shirt (to contrast with the environment) can help with visibility, and help SAR find you!



Color – Bright Pink, Yellow or Blue will usually contrast with the environment.

Why Synthetic? – If you are hiking on a warm day and choose to wear a cotton shirt to aid in cooling you via evaporative heat loss, the cotton shirt may remain wet and cause hypothermia if the night cools off.

• Electronic (Besides the obvious cell phone)
- PLB (Personal Locator Beacon…..Some devices allow two-way communication, while others are one way SOS only.

•Spot - Globalstar - 48 Mini Satellites - Purchase device & Subscription (2-way com)
•In Reach - Iridium - 77 Satellites - Purchase device & Subscription (2-way com)
•Zoleo - Iridium - 77 Satellites - Purchase device & Subscription (2-way com)
•ACR - Sarsat - 70 Satellites - Purchase device no subscription - (SOS only)









Can you use a smartphone for emergency signaling?

Newer smartphones can connect to satellites

- Not as rugged as dedicated PLB's (personal locator beacons)
- Coverage is limited to supported countries
- Battery life of a smart phone is considerably less
- Not waterproof
- Needs to be pointed to the satellite
- No automatic "breadcrumb" tracking

- No additional cost using a smartphone
- Personal Locator Beacons need a monthly subscription plan



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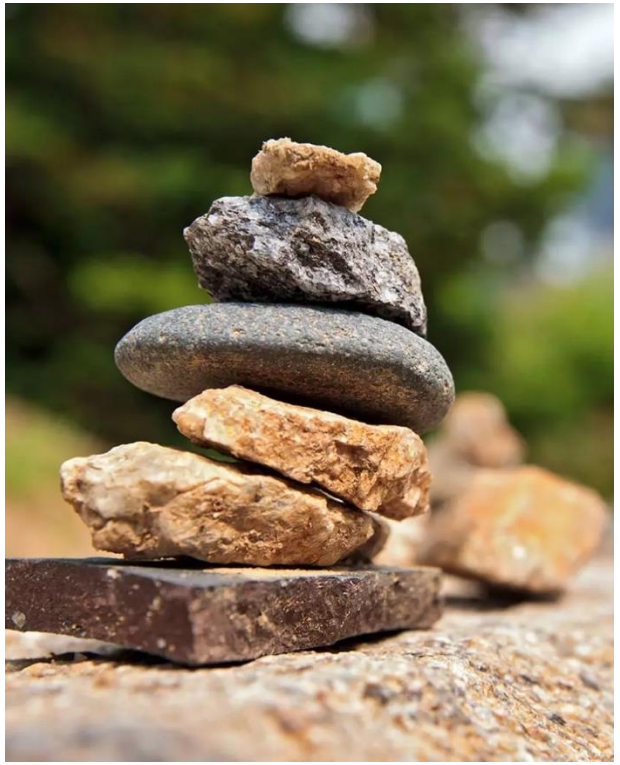
Newer Apple Watches can connect to Satellites for emergency signaling as well.





• Signaling to SAR aircraft in an open field - It could take several hours for “boots on the ground” rescue personnel to arrive - your shelter could be far from the open field where you signaled to the aircraft.

Leave a “Breadcrumb” trail so SAR can locate you:
- Rock Cairns
- Ground Markings that contrast with the ground surface
- Flagging Tape (super lightweight and easy to put into a survival kit)

Sleep
Not part of the
Rule of 3's

• This priority is addressed via your "Thermoregulation" priority. While it may seem sleep is not a necessity in a wilderness survival situation, it can be vital. Sleep deprivation can cause you to make bad decisions. Not sleeping the first night may not be much of an issue, however two nights of sleep deprivation can start to cause issues that may make your attempt at survival much more difficult. Lack of sleep causes:



- Confusion & Memory issues
- Hallucinations
- Headaches
- Blood Pressure issues
- Irritability
- **General bad decision making**

3 Days without “Water”

Less time in a very dry or hot environment

How much water should you carry?

- Time of year

- Water availability on your route of travel

- Your ability to carry the weight - water weighs 2.2 pounds per liter (which is appx 34 ounces).
- A 3-liter water bladder weighs 6.6 pounds (excluding the bladder)

• What types of water containers to carry?

- A metal water bottle or metal cup allows you to boil water.
- Inexpensive disposable water bottles usually can accommodate a “Sawyer” type filters, as well as allowing you to use the SODIS method (see below)
- You can boil water with hot rocks in a yucca stalk. (you will need fire)
- You can boil water in a plastic bag with hot rocks. (you will need fire)

• Methods of making water safe to drink: Filtration / Disinfection / Purification

- Straw Types / Squeeze Types (sawyer / befree / Grayl) / pump types
- Chemical - (Iodine / Chlorine / Chlorine Dioxide) (Chlorine Dioxide is best)
- Boiling
- SODIS method - Using PET bottles (polyethylene terephthalate) in direct sunlight for 6 hours which pasteurizes the water.

Water treatment while hiking, camping, and traveling

When visiting places with unknown water quality, treat water to make sure it's safe to drink. **Boiling water is the most reliable way to kill germs.** If you cannot boil your water, the next best option is to use a filter (especially if water is cloudy) and then use another treatment method. Follow instructions on the treatment product's label, including the contact time for disinfectants. This guide can help you decide which treatment method or combination of methods to use to make your water safe to drink.













TYPE OF GERM	BOIL (for 1 min., or 3 mins. at elevations above 6,500 feet)	FILTER	PURIFIER	CHLORINE TREATMENT (disinfectant)	IODINE (disinfectant)	CHLORINE DIOXIDE (disinfectant)	COMBINING FILTER AND DISINFECTANT	UV LIGHT USED IN CLEAR WATER
BACTERIA *(such as Campylobacter, Salmonella, Shigella, E. coli)*	✓	✓ 0.3 micron or smaller filter	✓	✓	✓	✓	✓ 0.3 micron or smaller filter, plus disinfectant	✓
VIRUSES *(such as norovirus, hepatitis A, enterovirus, rotovirus)*	✓	✗	✓	✓	✓	✓	✓	✓
PARASITE *Giardia*	✓	✓ Filter certified for "cyst" and "oocyst" reduction	✓	!	!	✓	✓ Filter certified for "cyst" and "oocyst" reduction, plus chlorine dioxide	✓
PARASITE *Cryptosporidium*	✓	✓ Filter certified for "cyst" and "oocyst" reduction	✓	✗	✗	!	✓ Filter certified for "cyst" and "oocyst" reduction, plus chlorine dioxide	✓

Centers for Disease Control and Prevention
National Center for Emerging and Zoonotic Infectious Diseases

Learn more: www.cdc.gov/healthywater/drinking/travel/backcountry_water_treatment.html

✓ **EFFECTIVE**—will remove or kill this type of germ

! **SOMEWHAT EFFECTIVE**—may remove some germs of this type, but water could still be unsafe

✗ **NOT EFFECTIVE**—will not remove or kill this type of germ

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Natural Sources of Water in an emergency.

- **Sea Water** - Too much salt in the water, it can kill you, however if you are stranded at sea sip in very small amounts (no more than 32oz a day), it could possibly save your life, but you will not be healthy when rescued!

- **Sea Water** - Distillation will make it safe to drink.

- **Snow / Ice / Rain**.... Melt and filter before drinking. Pollutants are picked up from the air and should be filtered out if possible. Use your tarp to collect rain water.

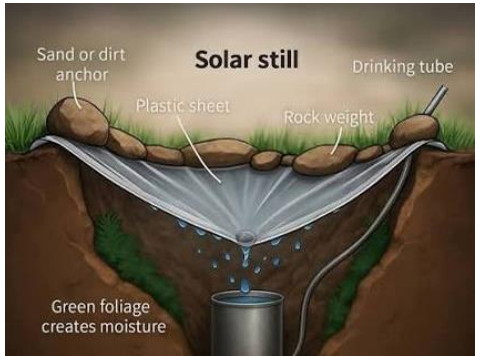
- **Transpiration Still** (clear plastic bag tied to a leafy tree branch).

- **Solar Still** - Add Vegetation / Urine / Sea Water - <u>Hard work, sometimes little or no return</u>. Can be a "Net Loss"

- **Morning Dew** - Tie bandanas to your legs walk through safe vegetation (no poison Oak or other unsafe plants) then wring bandanas out into a bottle.









Well, it works in cartoons!

How to find water sources

- Climb to a high spot and have a look around for water sources.
 • Notice possible bodies of water: Streams, Lakes, Rivers, Ice, Snow
 • Look for riparian trees and vegetation (the emerald green trees)
 • Go down hill - water flows down so you may find water by going down, however, it sometimes exits via rock seep crevices prior to flowing all the way down.
 • Watch the animals - most go to a water source at least once daily. Birds fly low on the way to a water source.

What other resources have you found when you have found a water source?

• Plants - Edible & Medicinal plants / plants and trees to use for friction fire, shelter & weapons.
• Animals (animals can be a food source)

• **Ration your sweat** - In the desert, travel early morning & twilight. Shade up and rest during the heat of the day.

• **Ration your water** - Two schools of thought:
1) *Never ration water* - it's better to have it in your body than in your backpack.
2) *Ration your water* - Your body can only absorb appx 1 quart per hour, so drinking more than that is just waste.

A few other suggestions on finding water



Tinaja



Dig for
water beneath
the surface



Natural Springs



Blue-Green Algae

(Cyanobacteria)

Harmful Blooms

Standard water filters can remove the physical blue-green algae (cyanobacteria) cells,

but they generally cannot remove the dangerous toxins (cyanotoxins) those algae release into the water


KEEP FILTERS FROM
FREEZING
Sawyer
HydraPak
Kestrel
- 33.7
3000

Some General Areas of Concern in the Wilderness











Scorpions

- Scorpion stings are very painful, but only the bark scorpion is dangerous.

- What to look for:
-Immediate pain and burning around the sting site
-Numbness or tingling occurring later

- What to do:
-Monitor Breathing
-Wash the sting area with soap and water
-Give pain medication
-Seek medical attention for severe reactions



Note: Fatality rate for Bark Scorpion stings < 1% for adults, higher for infants, small children and elderly.

Black Widow Spiders

- Only Females Bite.

-What to look for:
-Sharp Pinprick, followed by dull numbing pain
-Two small fang marks (seen as tiny red spots)
-Severe abdominal pain
-Bites on arms can produce severe chest pain (mimicking a heart attack)
-Headache, Chills, Fever, Heavy sweating, Nausea, Vomiting



-What to do:
-Clean the area with soap and water
-Apply cold to the area
-Seek medical attention for severe reactions

Note: Fatality rate for Black Widow Spider Bites is 1-1/2%

Brown Recluse Spiders

-What to look for:
-Mild to severe pain within 2-8 hours
-Blister develops within 48-72 hours, becomes red, bursts and takes on a bulls-eye appearance.
-Nausea, Vomiting, Headache, Fever

-What to do:
-Clean the area with soap and water
-Apply cold to the area
-Seek medical attention for severe reactions





Note: Fatality rate for Brown Recluse Spider Bites is <1%

Bee Stings / Wasp Stings / Fire Ant Stings

-What to look for:

-**Usual** Reactions
-pain, redness, itching

-**Worrisome** Reactions
-Hives, Swollen Lips/Tongue, Tickle" in throat, Wheezing

-**Life-Threatening** Reactions
-Blue/Gray Skin Color
-Seizures or Unresponsiveness
-Difficulty Breathing (about 60% to80% of anaphylactic deaths are caused by an inability to breathe).



Note: Regular Insect Repellents do not deter Bees, Wasps or Fire Ants

Bee Stings / Wasp Stings / Fire Ant Stings…Continued

-What to do:

-Call 911 for any life-threatening conditions
-Remove the stinger*
-Wash with soap and water
-Apply Cold to the area
-Give pain medication & Antihistamine
-Hydrocortisone cream 1%
-If stung in the mouth area, suck on ice to help prevent swelling



* Traditional advice warned against using tweezers out of fear that squeezing would pump more venom into the skin. However, modern clinical studies analyzed by organizations like the National Institutes of Health show that the venom sac continues to pump automatically, so removing it instantly via any method prevents the most harm.

Tick Bites

-What to look for:

-No pain initially exists (the tick can go unnoticed for days)

-Red area around the tick means the skin is punctured and the tick is feeding

-An engorged tick means an increased risk of disease transmission

-May cause rash, fever and chills

-Varies from a small bump to extensive swelling and ulcer



-What to do:

-Remove the Tick with a tweezers or Tick Tool. Gently pull up until the skin “tents” and the tick releases.

-Do not use a match, fingernail polish, petroleum jelly, gasoline or twist out.

-Wash with soap and water

-Apply Cold

-Seek Medical Care if you can not remove the tick or if it was engorged.

Snake Bites - (Pit Vipers) Rattle Snake / Cottonmouth aka Water Moccasin

-What to look for:
-Two small puncture wounds
-Swelling within 10-15 minutes (can involve entire extremity)
-Discoloration and blood-filled blisters
-Possible nausea, vomiting, sweating and weakness



-What to do:
-Seek medical attention immediately (911 is best)
-Encourage the person to remain calm and as still as possible
-Remove any tight jewelry or tight clothing from the bitten part

Snake Bites – Coral Snakes

-What to look for:

-Absence of immediate symptoms is not evidence of a harmless bite.

-After several hours: Nausea, vomiting, sweating, tremors, drowsiness, slurred speech, blurred vision, swallowing and breathing difficulty.



-What to do:

-Seek medical attention immediately (911 is best)

-For an arm or leg, apply a snug (not tight) pressure wrap, distal to proximal, then immobilize the limb with a splint.

"Red touches Black - Venom Lack"… "Red touches Yellow – Kill a Fellow"

•**Mountain Lions:**
Attacks are extremely rare, less than one per year in all of North America.

Mountain lions are crepuscular, so even seeing one during the day would be extremely rare.



•**Wolves:**
Wolf attacks on humans are extremely rare
(above 0 but far too low to calculate).

<u>Unless</u> the wolf has rabies, which attacks their central nervous system and causes them to lose their fear of humans).



Black Bear Encounters

•**What to do:**

•Do not run

•Stand your ground but avoid eye contact (seen as a threat)

•Make yourself look big

•Make Noise, this helps make you more human than prey

•Back away slowly, while keeping the bear in sight



Brown Bear/Grizzly Bear Encounters

-What to do if the bear is not charging
-Do not scream or make sudden movements
-Do not run
-Back away slowly, while keeping the bear in sight
-Talk Calmly as you back away

-What to do if the bear is approaching or charging
-Stand your ground, do not run, do not make eye contact
-Use bear spray when the bear is within 30-60 feet away
-Appear larger or group together (if you are in a group)
-If the bear attacks
-Play Dead, lay stomach down, protect your neck,
legs spread, backpack on.
-Last resort...Fight back
-Change your underwear





Brown Bear/Grizzly Bear Encounters



Polar Bear Encounters

- What to do
- Take all steps as with a Grizzly Bear encounter
- Except….Do Not Play Dead


10 FT
9 FT
8 FT
7 FT
6 FT
5 FT
4 FT
GIANT PANDA
AMERICAN BLACK BEAR
ASIATIC BLACK BEAR
BROWN BEAR
POLAR BEAR



Brown Bear
Grizzly / Kodiak

Lightning

If you notice your hair standing on end, you are close to being struck by lightning
Get into a building (or inside a car), if possible. ***These are the safest places to be!***





Extremely Dangerous:

•Mountain Peaks or ridges, especially the windward side
•Open Valleys or Hills
•By lone tall trees (“Side Splash” Potential)
•Small Caves
•On the water

Lower Risk:

•Within a stand of low trees - crouch down with most of your weight on the balls of your feet
•A sleeping pad under your feet can help insulate you from ground current. Ground current accounts for about half of all lightning deaths.
• Avoid “Side Splash” by having your group spread out.

According to the CDC

• Odds of being struck by Lightning is one in a million.
• In the U.S. 20 to 30 deaths per year from lightning strikes
• Only about 10% of people struck are killed, however, long-term disabilities are common.

BACKCOUNTRY LIGHTNING RISK MANAGEMENT

No place outdoors is safe from lightning. Lightning is an objective hazard. Your behavior can reduce the risk of that hazard harming you.

