EMERGENCY PREPAREDNESS WORKSHOP:

Shelter

Presented By: Jon Sherman


Home Sweet Home

Your Home is Your Shelter

- Disasters come in all shapes and sizes.
- Some may force you to evacuate your home or the area.
- Others may cause no damage to your home and pose no need for evacuation.
- In situations where your home is safe to inhabit, Stay at home!
- Your home has many amenities and is where you keep all of your supplies.





Need for Shelter

- If you are unable to stay at home, preparations should be made to keep you safe from the elements.
- A shelter may be needed when you evacuate your home and must protect you while you travel to your destination.
- Shelters may also be needed to keep you safe if your home is made uninhabitable while you wait for emergency assistance.
- We will look at several possible shelters that you might want to consider for various climates and conditions.

The Survival Rule of 3's

- The Average Human body can survive:

- 3 Minutes Without Air

- 3 Hours Without Shelter (in inclement weather)

- 3 Days Without Water

- 3 Weeks Without Food

Why Do You Need A Shelter?

- To keep you warm
- To keep you from over-heating
- To slow your loss of body fluids
- To protect you from:
  - The Elements (Wind, Rain, Snow, Sun)
  - Animals
  - Insects

Public Shelters

Public Shelters

- In large scale disaster scenarios where people are left homeless or forced to relocate, relief agencies, such as the Red Cross, often provide shelters to provide temporary hot meals and a place to sleep.

- Despite providing a great service to those in need, shelters often don't allow pets, lack privacy and can be loud and overcrowded.

- Let's look at a few examples of public shelters:


American Red Cross
American Red Cross

23,000 Sheltered at Houston Astrodome

Other Shelters

- You may decide a public shelter is not for you and you decide to fend for yourself. (Which you can because you're prepared!)
- You also may be forced to evacuate the area or no public shelters are available.
- In these scenarios, you'll need the supplies and the "know-how" to provide for yourself.
- Let's look as some other options:

Family/Friends or Hotels

- Shelter could be as easy as driving to another part of town or a nearby city and staying with friends or family or getting a hotel room.

Tents

- Those who enjoy camping may already have these great shelters. Those who don't should get one anyway.
- Tents protect you from the elements, insects and other creepy-crawlies.
- Tents are easy to setup and can be placed in your backyard if your house becomes uninhabitable and you don't need to evacuate the area.
- Tents come in various sizes, Small & Lightweight (Backpacking), Large & Bulky (Car Camping), Very Large & Heavy and Durable (Base Camps). Select a tent that best meets your needs.
- Practice setting up your tent so you are sure you have all the parts and you know how to use it when needed.
- Tents provide some privacy that public shelters don't offer.

Tents

Sleeping Bags

- Sleeping bags are a critical component of your preparedness needs.
- Many bags will keep you warm in below freezing temperatures.
- An insulated sleeping pad will help you stay off the cold ground and keep you warmer.
- It is more important what you have between you and the ground than you and the air.

RV's and Camping Trailers

- As long as the roads are passable and you have the means to pull one, a camping trailer makes an excellent shelter, provides much of the amenities of home and room to haul your supplies.

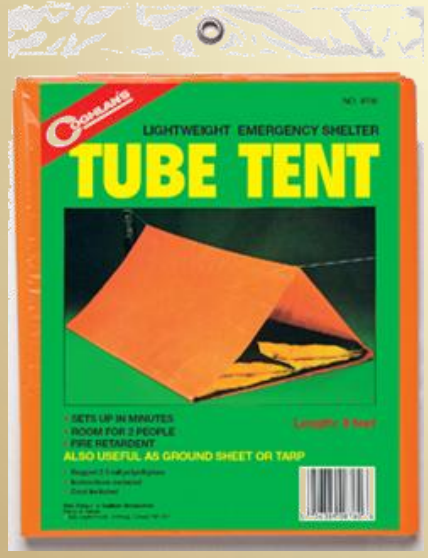

Evacuation Shelters

Evacuation Shelters

- Evacuation Shelters are any shelter that provide some level of protection from the elements while being portable enough that they can be placed in an emergency evacuation kit.
- These shelters are not ideal in most situations but do increase your odds of survival.
- Shelter is a critical component to all emergency evacuation kits.
- Please don't get a false sense of security that all your sheltering needs are covered by having one or two evacuation shelters. They may keep you alive the first night while you construct a more suitable shelter for the second.
- Lets look at a few examples:

Evacuation Shelters

- Tube Tent
  - A thin sheet of tubular orange plastic sheeting.
  - Run a rope through the tube to trees or other supports to form a tent.
  - Used as a barrier against wind chill and rain.
  - Cheap: $5-$8



Evacuation Shelters

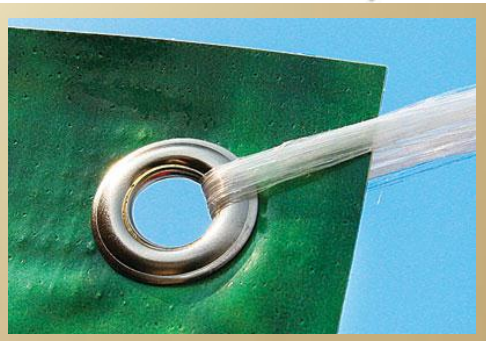
- Emergency Blanket or Space Blanket
  - A Mylar blanket used to reflect up to 97% of the users radiated body heat back to the user.
  - Sleeping bag shaped versions retain more heat.
  - Can be used as a barrier against wind chill and rain.
  - Can reflect heat from fire towards you.

Evacuation Shelters

- Bivvy Bag or Bivouac Sack
  - A minimalist shelter
  - A thin fabric shell that reflects back 90% of user's body heat.
  - 3.8 oz
  - Used as a barrier against wind chill and rain.

Evacuation Shelters

- Poncho
  - Versatile rain gear that can also be used to create a shelter.
  - Military versions are larger, durable, come with optional liners for warmth and have grommets for easy tying.



Evacuation Shelters

- Hammock
  - Keep off of hard, stony or soggy ground.
  - Keep away from the creepy-crawlies.
  - No loss of heat through ground conduction in cold weather.
  - No absorbing heat through ground conduction in hot weather.
  - Increased loss of heat through radiation.
    - Under-quilts available to reduce this.

Evacuation Shelters

- Tarps
  - Versatile
  - Many different sizes.
  - Excellent for covering shelters to increase weather proofing or to create large shaded areas.
  - Bring along plenty of rope.

Evacuation Shelters

- Plastic Sheeting
  - Versatile
  - Many different sizes.
  - Excellent for covering shelters to increase weather proofing or to create large shaded areas.
  - Bring along plenty of rope.

Evacuation Shelters

- Plastic Garbage Bags
  - Leaf Bags (Large 30-40 Gallon)

- Can be used as:
  - Poncho
  - Construct Lean-to Shelter
  - Ground Covering
  - Shade from Sun
  - Collect Rain Water
  - Build Solar Still
  - Melt Snow
  - Use to water proof socks/boots in deep water or snow.

Other Shelter Supplies

- Hat
  - Wide -brimmed for Sun Protection.
  - Wool Cap for reduced Heat loss
    - Wool maintains its insulating properties even when wet.
- Sunglasses
  - Reduces eye strain in bright light
  - Prevents snow-blindness
- Sunblock
  - Prevents sunburns.
- Lip Balm
  - Prevent chapped lips.

Other Shelter Supplies

- Mosquito Netting
  - In areas where bugs are an issue, Mosquito netting is a must to prevent bites and the annoying feeling.
  - Darker colored netting does not attract bugs as much as light colored material.
  - Bug Repellent is also a good idea to have on hand.


Building Shelters

Building Shelters

- Sometimes your evacuation shelters wont be suitable for the situation, or you just don't have them with you.
- Knowing how to build a shelter in an emergency can easily save your life.
- The most important building material for building shelters is your ingenuity.
- There are hundreds of shelter designs. Take a few minutes to scan your surroundings and pick one that meets your needs based on the materials at hand.
- Let's look at some important things to know before building your shelter and various shelter types for each climate.

Shelter Know-How

- Depending on climate, weather, conditions and the supplies you have on hand, the best shelter for your needs can vary greatly.

- A shelter designed to keep you warm in a blizzard won't be the same as one to keep you cool in a desert.

- Besides having a few basic supplies on hand such as a good sturdy knife, a lighter and strong rope it is important to be aware of what types of shelters you could possibly construct and how to build them.

Shelter Locations and Building Tips

- Survival is about being lazy. You want to gain the most benefit from something while consuming the least amount of energy.
- Look for an already existing shelter, caves, hollowed out trees, logs, rock over-hangs or anything that would make building a shelter that much easier.
- Climate, terrain, your physical condition, the size of your group, the length of time you will stay, your psychological condition and the tools and supplies you have available can greatly impact the type of shelter you choose to build.
- The 2 most important considerations to address are protection from the weather and insulation from the ground.

Shelter Locations and Building Tips

- Watch the weather. Build your shelter so you are protected on the windward side.
- Stay dry. Wetness leads to rapid heat loss. Exposure to a cold wind will cool your body faster than you can produce heat.
- Shelter your firewood.
- Build your shelter near a water source, building materials and firewood, if possible.
- Keep shelters small. They are easier to build, easier to heat and help you retain your body heat.
- Plan Ahead! Consider the time of day, on-coming weather and your energy level. Build your shelter before it gets dark, starts to rain or you become exhausted.

Shelter Locations and Building Tips

- Do not build a shelter…near lone trees, hilltops or other lightning prone areas.
- …on hilltops which are prone to more wind, fewer trees and other natural wind breaks.
- …on valley bottoms which are cooler (cold air sinks), too close to streams and washes are prone to flash floods.

- A flat protected area part-way up a hillside will be warmer and better protected from wind, rain, lightning and other dangers.


Snow Shelters

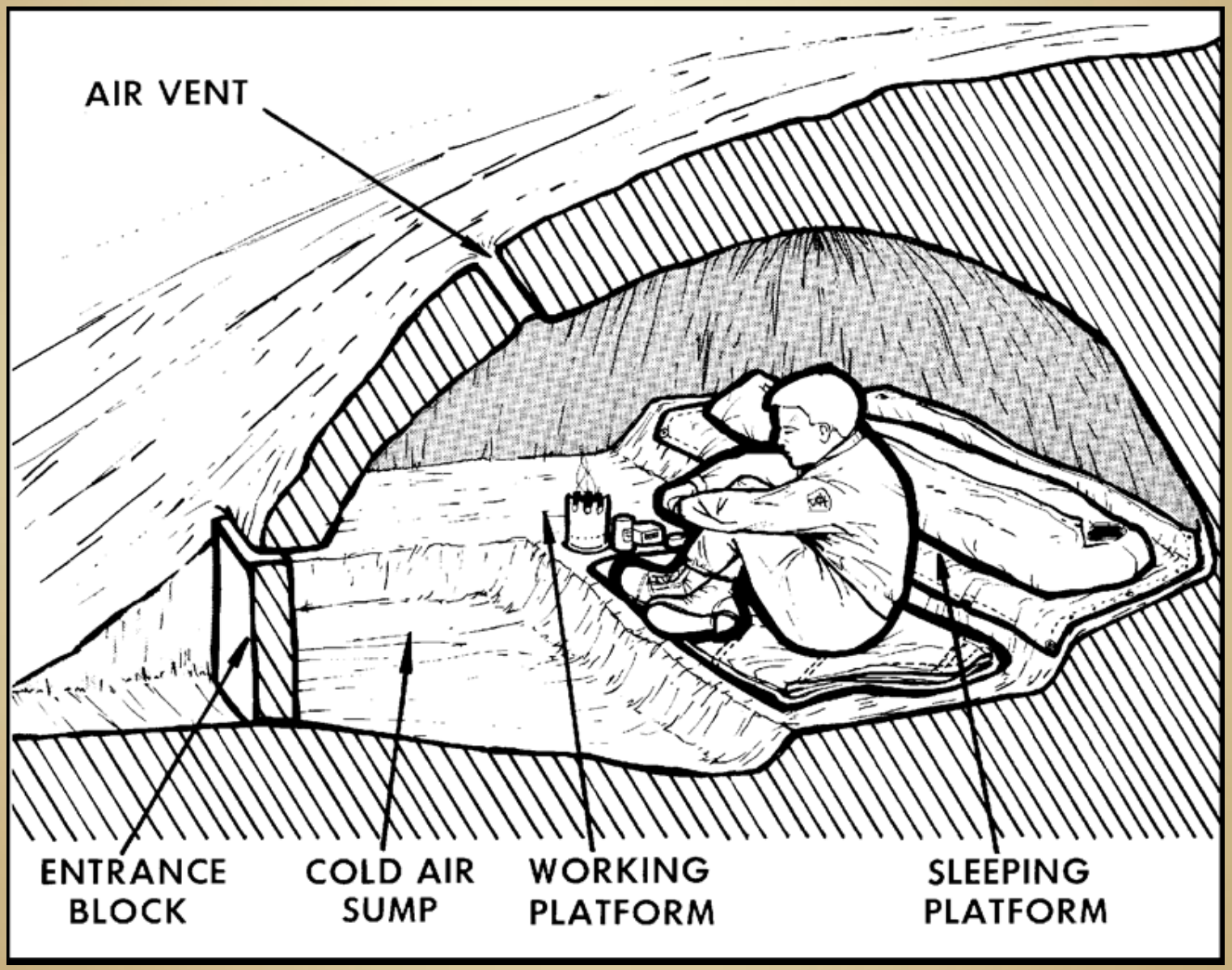
Snow Shelters

- Snow is an excellent insulator.
- Snow is 32º F. When the outside air is below freezing and with wind-chill even colder, Digging into a snow bank could be a great idea.
- In snowy conditions, don't travel, stop and build a shelter.

Snow Cave

- Requires a snow depth of 6’ or more.
- Tools are required for construction: Shovel and Saw are best.
- Dig into a snow bank and hollow out a cave with domed smooth sides to prevent drips.
- Walls and ceiling should be at least 18” thick. (18” long sticks inserted in the snow from the outside can help make sure your walls are not too thin.
- Keep it small so your body heat or a candle can warm the air on the inside. A candle can raise the inside temp. to 40-60º F.
- Snow caves can shrink so give yourself some extra room.
- Build a raised platform where you will sleep. (Warm air rises) and a cold air trough below the bench.
- Poke a hole through the roof to allow ventilation.
- Plastic sheeting, emergency blankets, pine boughs, etc on the elevated bench will help keep you warm and dry.

Snow Cave


AIR VENT
ENTRANCE BLOCK
COLD AIR SUMP
WORKING PLATFORM
SLEEPING PLATFORM

Snow Mound Cave

- Similar to a snow cave
- When the snow is not deep enough for a snow cave, a mound of snow can be built up and stomped down until compacted.
- Dig a tunnel from the leeward side and hollow out the center leaving at least 18” domed and smooth sides and ceiling.
- Include a raised sleeping bench and cold air trough.

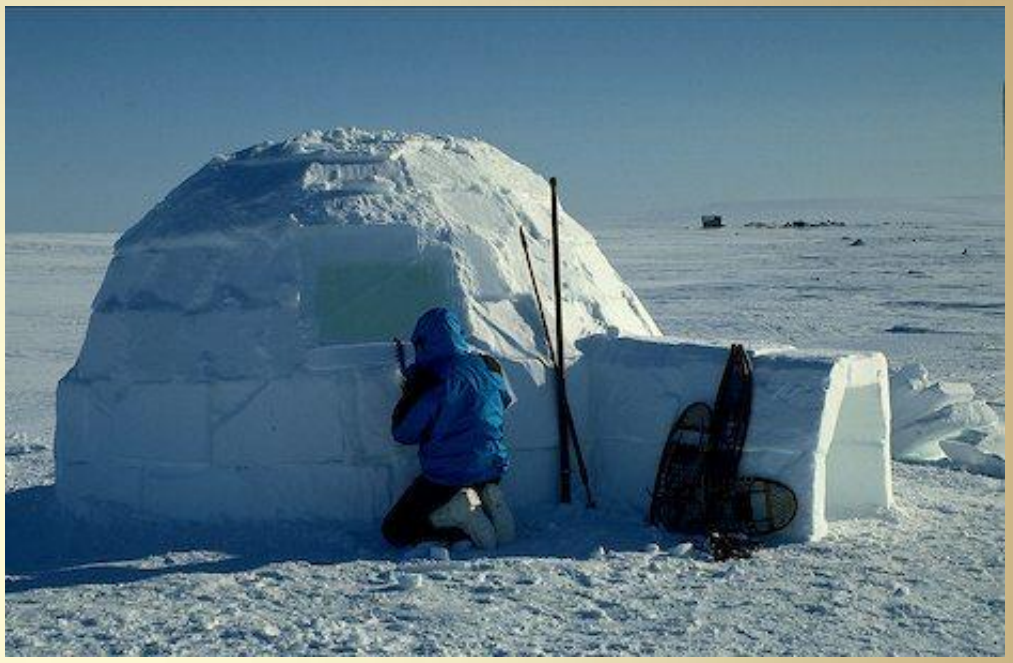
Snow Trench

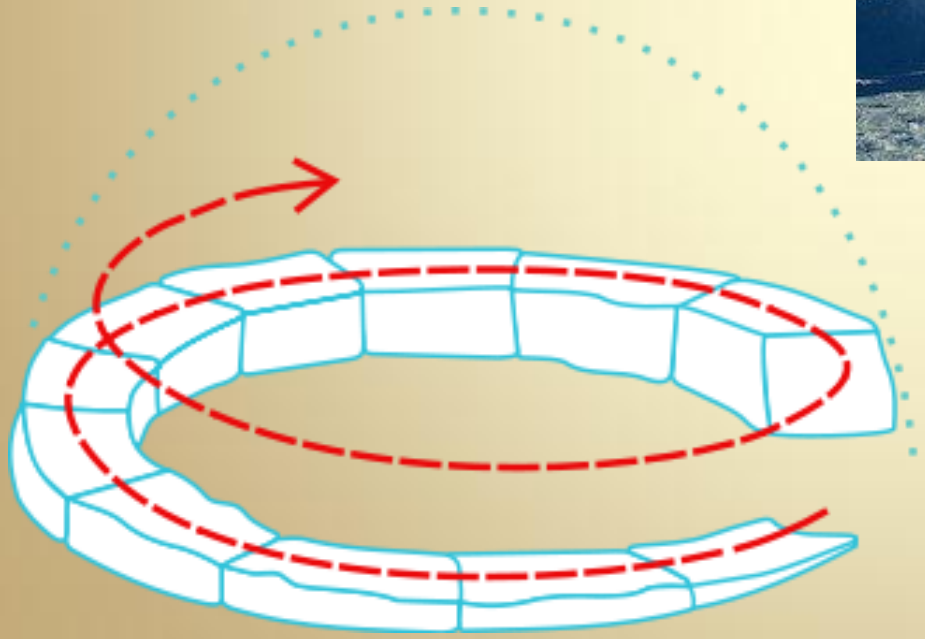
- A good, quick short-term snow shelter.
- Only works with snow that is firmly packed that will allow cutting blocks.
- Dig a trench wide enough for you to lay in and 8” - 12” deep.
- Cut a triangular foot block (the width of your trench) and place it upright outside of one end of the trench.
- Cut wide blocks and stack them in an “A” frame shape along the length of the trench.
- Poke a hole for ventilation in the roof.
- Line the inside with vegetation for insulation from the ground.
- Climb in and seal the door with snow or a backpack.

Igloo

- Requires a lot of time to build so, is best for stays longer than a couple of days.
- Tools are necessary. Including: Long Knife, Saw and Shovel.
- Difficult to build by one person.
- Blocks are cut from heavily compacted snow only. Other snow types will not work.
- Blocks are cut and positioned to spiral upward and inward so a dome is formed.

Igloo



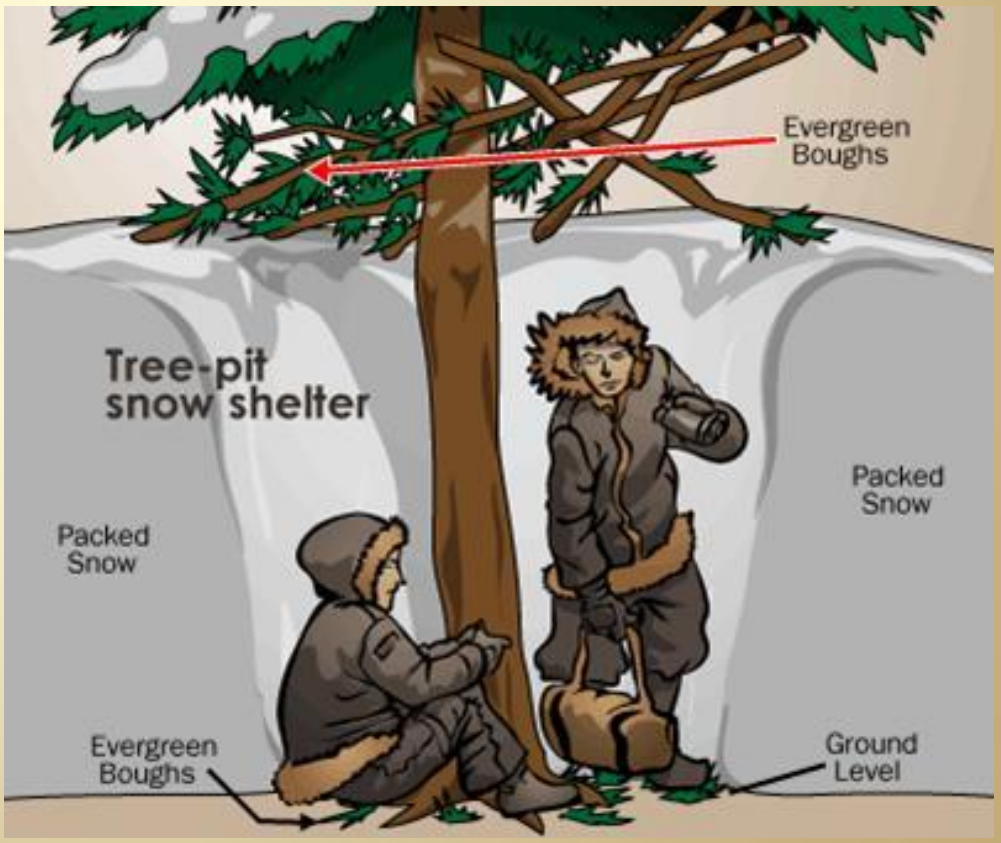


Snow Pit

- One of the easier snow shelters to build.
- Dig a hole in the snow at least 4 feet deep, all the way to the bare ground if you can.
- Line the pit with at least 6 inches of vegetation for ground insulation and comfort.
- Cover the hole with pine boughs and branches and then cover the roof with a thick layer of snow.
- Punch a hole through the top for an air vent.
- Tunnel through one of the sides to enter the shelter and plug the hole with snow.
- This shelter will even accommodate a small fire.

Tree Well Shelter

- Possible when snow levels are 2’ deep or greater
- A natural hollow exists around the trunk of a tree where its branches have stopped the snow from accumulating.
- This area can be extended if necessary and higher walls built up with snow.
- The lowest boughs can be cut to provide ground insulation or weaved with branches above to create more insulation above you.
- A fire built under the tree may cause snow to melt in the branches above so keep your fire away from your bed space.




Desert Shelters

Desert Conditions

- The need of shelter in the desert is not as urgent as in the extreme cold, however, high temperatures will soon cause a rapid loss of body fluids.
- Deserts very greatly in their terrain, from sand dunes, to badlands, no vegetation, to a variety of desert plants like we have here in the Sonoran desert.
- Some deserts have very large temperature changes from day to night, while others much less so.
- Deserts cover 1/5 of the land on Earth. Knowing how to build several type of shelters based on the variety of desert conditions could save your life.

Caves and Over-Hangs

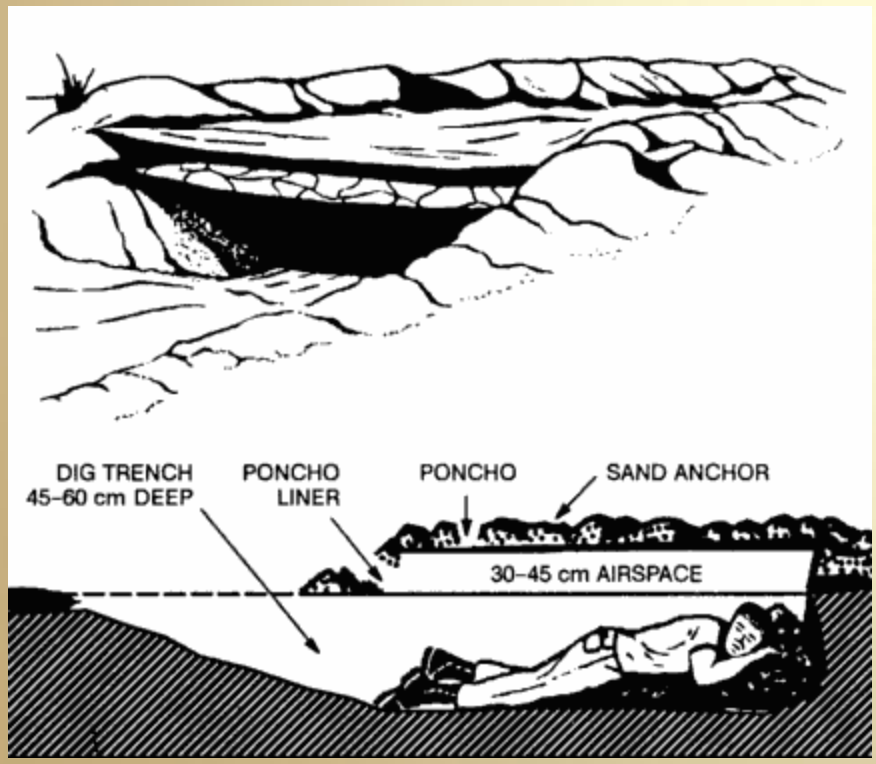
- In many Deserts where limestone makes up much of the landscape, caves and outcrops are very common.
- These can be used for shelters or at least provide a staring point for improving it.
- Desert creatures also enjoy the shade so be careful, snakes, scorpions and other unfriendly creatures might be nearby.

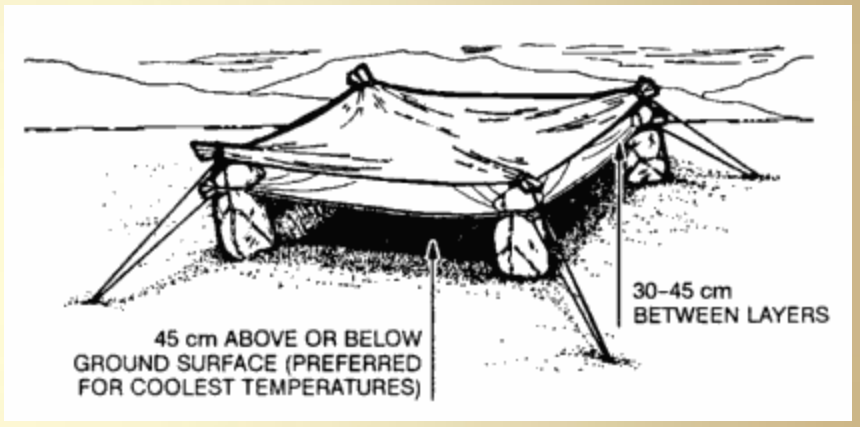
Desert Shade

- Shade in a hot desert can be 20º F cooler than in the sun.
- Shade can be made by stacking rocks or thatching together grass or scrub brush.

Desert Shade

- If you have a tarp or poncho, you can dig a hole and cover it.
- 12″ or more below the surface will be much cooler than at the surface.





Desert Breakdown

- As long as your engine still works, you have fuel and your exhaust system is not obstructed, you can use your heater or A/C to heat or cool your vehicle.

- Cars are great at blocking wind and rain but are poorly insulated so they are not ideal shelters.

- If you just need protection from the wind or rain, you can stay in your vehicle.

Desert Breakdown

- If temperatures are high, it is best to stay with your vehicle but not in it. It will be much cooler outside.
- A tarp, if you have one, will provide some shade.
- Place something between you and the ground. A couple inches of insulation can reduce the heat exchange by 30º F or more.
- Ground temp. is much higher than air temp.
- If no tarp is available, dig a hole under your car and climb in the hole.
- Don't Leave your car, it is easier to spot than a lost person.

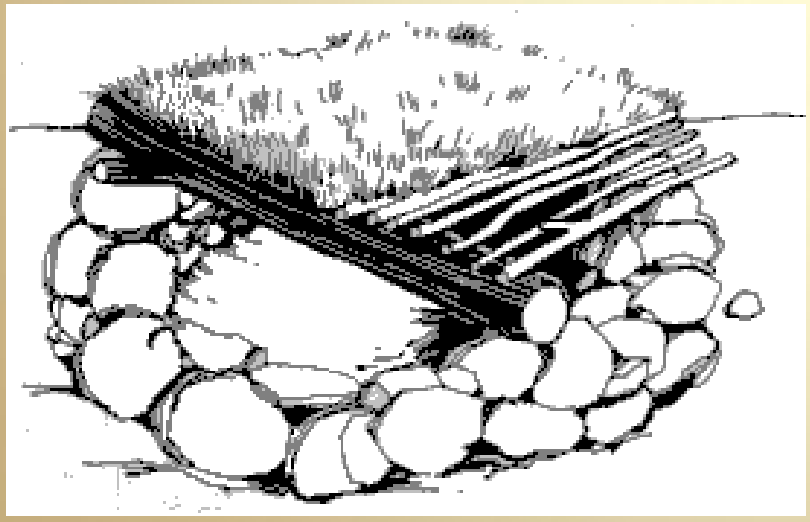

Grassland Shelters

Grass Insulation

- Collect bunches of dry grass or leaves.
- Tuck pants into socks and shirt/jacket into pants.
- Stuff the grass/leaves into your clothes until you look like a super-stuffed scarecrow.
- The extra insulation can keep you warm if you are unable to build a shelter.

Grass Shelters

- Turf (or moss) can be cut into rolls like sod and laid across roofs for waterproofing or cut in blocks and stacked to form walls.



Grass Shelters

- Burying yourself in a large pile of grass, leaves or foliage makes a warm shelter.
- Add some sticks or boughs on top to keep it all from blowing away.

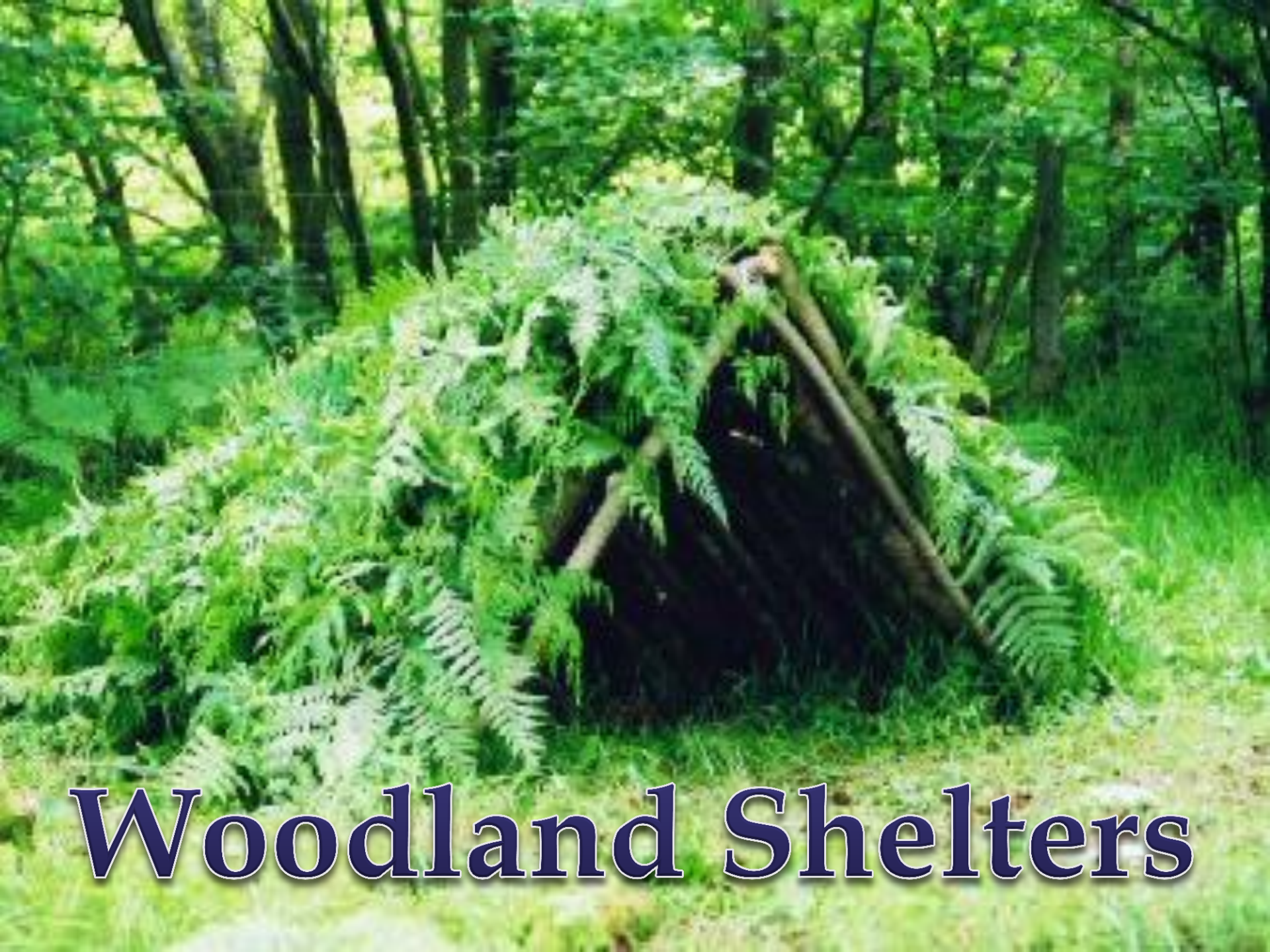
Grass/Mud Shelters

- Mud mixed with grass can be used to make bricks for a longer-term shelter.

- Mud can also be used to cover a stick structure to form an adobe like shelter.

Thatched Hut

- Long grass can thatched together to make blankets, mats, walls or roofing.
- Available sticks or mud can add support to your structure.

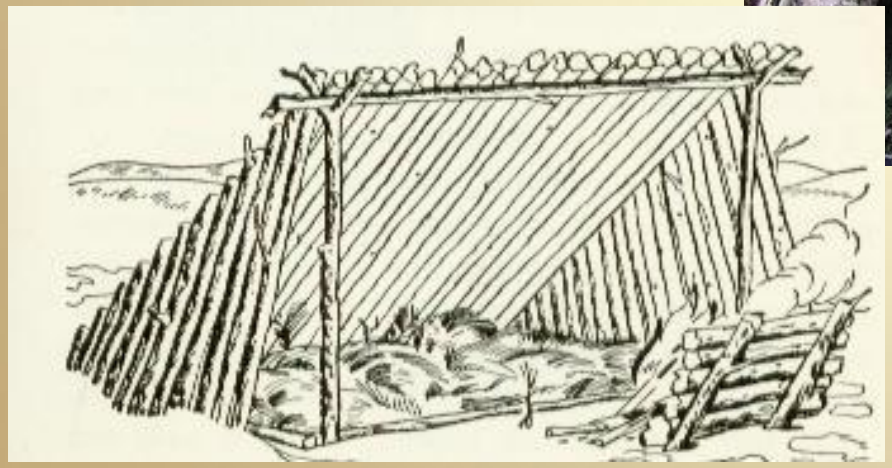

Woodland Shelters

Lean-To

- The most common and one of the easiest shelters to build.
- A Lean-To consists of a horizontal ridge pole 3′ to 8′ high with a closely fitting layer of branches running diagonally from the ridge pole to the ground at a 45º angle.
- Sides can be also be added.
- Grass, foliage, turf or mud can be added on top of the roof to increase protection from the wind and rain.
- Lean-To shelters do not retain heat well. A fire can be placed in front of it to increase warmth.

Lean-To

Source: www.jackmtn.com



Fire

- Adding a fire can make many shelters more pleasant.
- Always carry with you the means to start a fire.
- Building a reflecting wall on the opposite side of your fire from your shelter will help reflect additional heat from your fire towards you and your shelter.
- Using a reflecting wall means a smaller fire can be used and less firewood is needed.
- You can make a reflecting wall by:
  - Weaving together green sticks
  - Use your mylar reflecting blanket
  - Wall built stacking rocks. These warmed rocks can also be brought into the shelter at bedtime to radiate heat. Burying them under your bed space can keep the ground warm for hours.

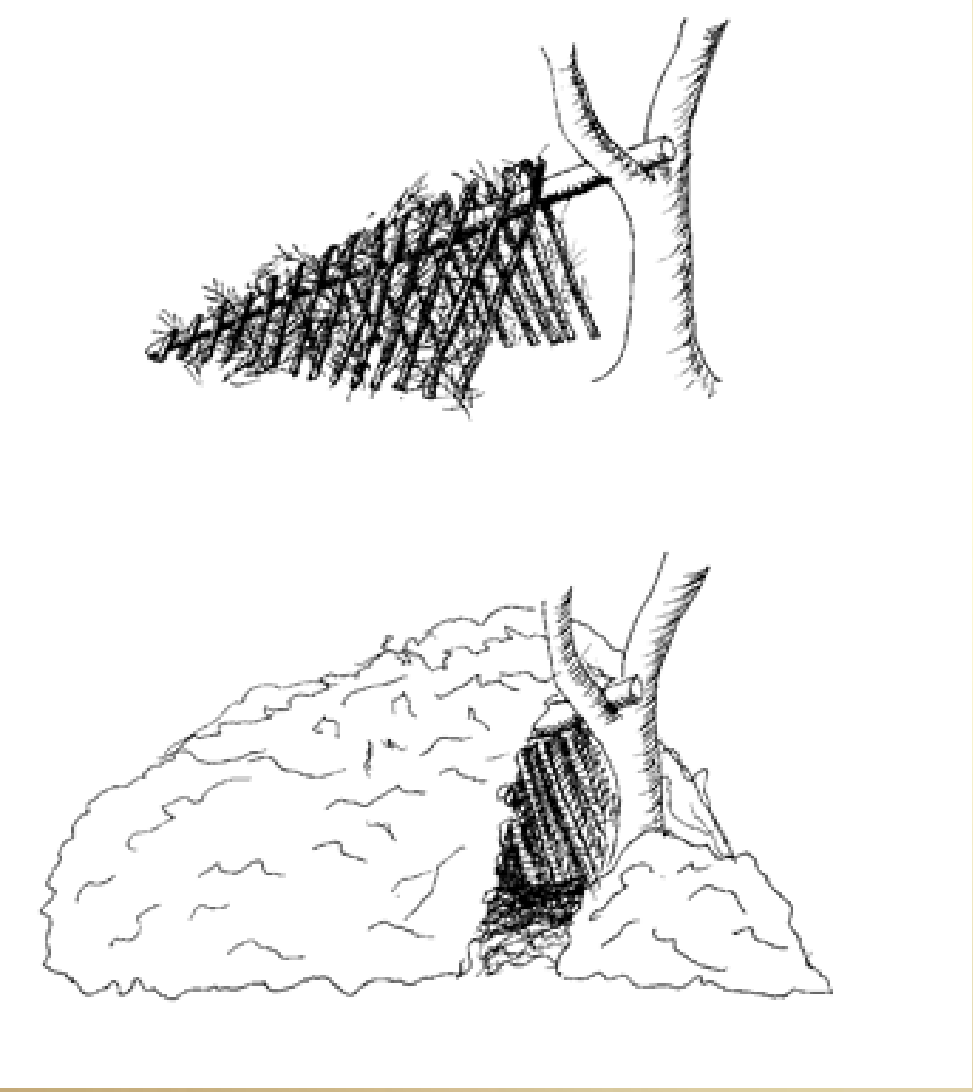

Wall reflects heat from fire towards your shelter

Debris Shelter

- A debris shelter can be made using any shape structure and then covered with 4’-6’ of leaves, grasses or boughs.

- The sheer thickness will make it water proof and retain your body heat inside.

Variations on the Same Theme



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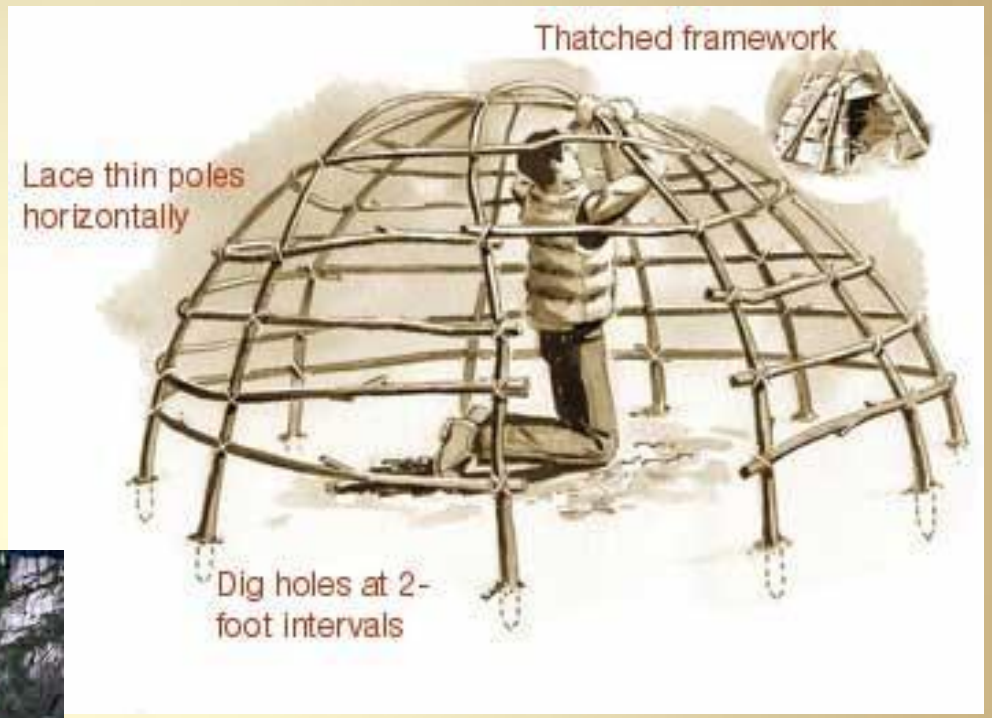
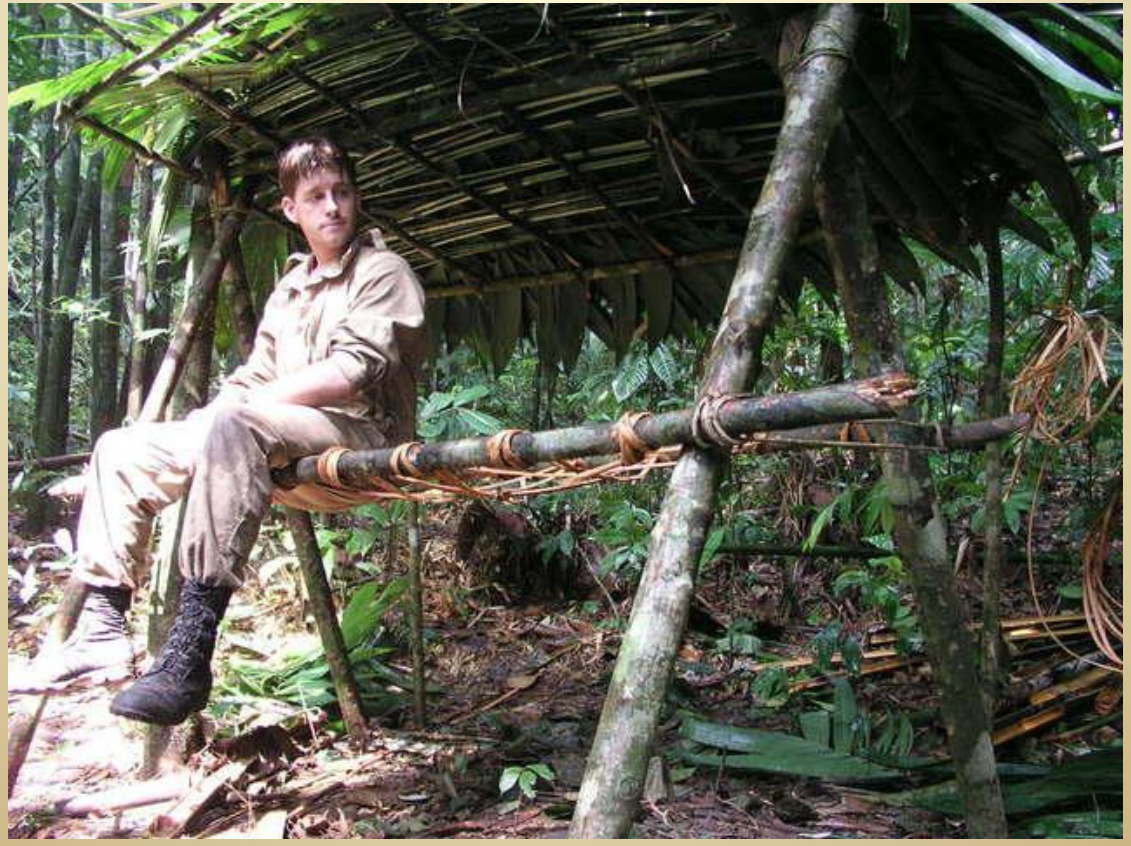



Jungle Shelters

Swamp Bed

- A raised sleeping platform keeps you away from insects and other creep-crawlies.
- The bed is supported by a two “A” frame structure.
- The overhead cover protects from persistent jungle rains.




SHELTER IN PLACE
QUALITY MULTI-PURPOSE CONSTRUCTION AND AGRICULTURAL GRADE
PLASTIC SHEETING
PLASTIC SHEETING
CONTRACTORS
INDUSTRY
HOME OWNERS
AGRICULTURE

Shelter-In-Place

- In some scenarios, such as the release of chemical, biological or radiological contaminates, it may be best for you to, or you may be instructed to, shelter-in-place.

- Shelter-in-place is a precaution to keep you safe indoors when something in the air outside is not.

- You may be notified to shelter-in-place via radio or television or if you see large amounts of debris in the air.

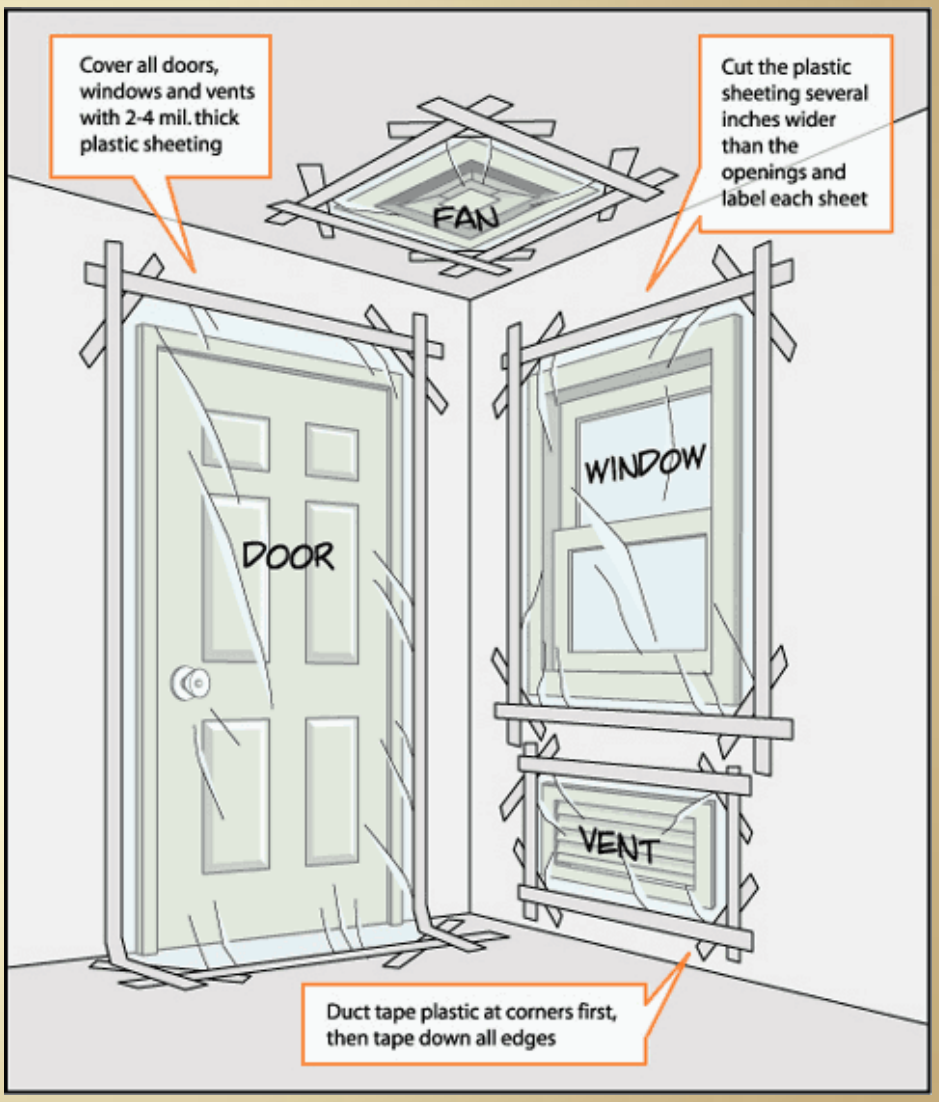
Shelter-In-Place

- Procedures:
  - Stay calm.
  - Take your family and pets inside your home or other shelter and remain there.
  - Turn on a television and radio for information and instructions.
  - Close and lock all windows and doors.
  - Turn off all air conditioners, fans, vents and heating systems, etc. that draw in outside air.
  - Close the fireplace damper.
  - Go to the highest room above ground (NOT YOUR BASEMENT) with the fewest windows and doors.
  - Take your EMERGENCY SUPPLY KIT with you to this room.
  - If necessary, place damp towels in the cracks under the doors. Tape around doors, windows and exhaust fans or vents. Use plastic to cover windows, outlets and heat registers.
  - Use the phone for emergency calls only.

Source: http://www.nkepc.org/docs/sip_v9a.pdf

Shelter-In-Place

- Procedures (Continued):
  - If necessary, children at affected schools will be sheltered there. Parents should NOT go to the schools to pick up their children unless advised to do so by local authorities.
  - Stay inside this room and listen to your radio or television until local authorities tell you the emergency is over OR you are told to evacuate.
  - When local authorities announce the end of the emergency, ventilate your home by opening doors and windows and go outside for a while.




CAPACITY
FALLOUT SHELTER

Nuclear Fallout Shelter

- Nuclear incidents are survivable, whether it is Dirty bombs, nuclear detonations from terrorist groups or ICBM's (Inter-Continental Ballistic Missiles) from rogue states.

- Preparedness is key to weathering the storm, but fortunately, little is required to greatly improve your odds of survival.

Nuclear Fallout Shelters

- Most people would survive the initial blasts because they won't be close enough to the one or various "Ground Zeros".
- Unfortunately, most people will not be prepared to survive the radioactive fallout that will soon follow.
- When a nuclear device explodes, a huge fireball is created. All material within range of this fireball are vaporized including dirt, buildings, etc…
- These fine particles mix with the radioactive particles and are thrown into the air.
- Over the next several hours, this radioactive dust (fallout) will fall to the ground or be carried by the wind up to 300 miles away.
- Fallout can contaminate anything it touches including food, water and people. Plus it emits dangerous amounts of radiation that, in high enough doses can kill you.

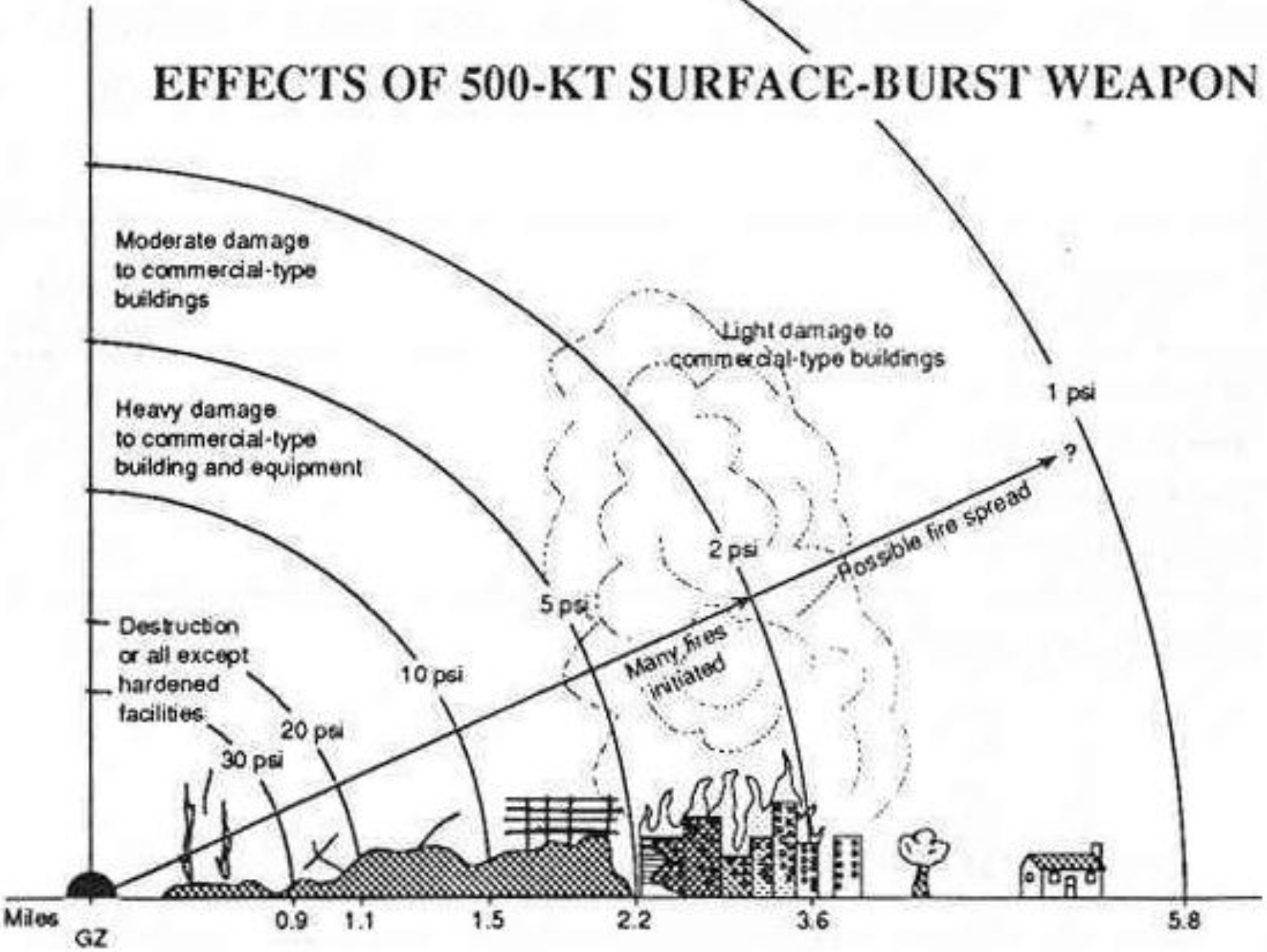
Nuclear Fallout Shelters

- Example:
  - The National Planning Scenario #1, an originally confidential internal 2004 study by the Department of Homeland Security, demonstrated the above survival odds when they examined the effects of a terrorist nuke going off in Washington, D.C.. They discovered that a 10 kiloton nuke, about 2/3rds the size of the Hiroshima bomb, detonated at ground level, would result in about 15,000 immediate deaths, and another 15,000 casualties from the blast, thermal flash and initial radiation release. As horrific as that is, the surprising revelation here is that over 99% of the residents in the DC area will have just witnessed and survived their first nuclear explosion. Clearly, the good news is most people will survive the initial blast.

Nuclear Fallout Shelters

- However, that study also soberly determined that as many as another 250,000 people could soon be at risk from lethal doses of radiation from the fallout drifting downwind towards them after the blast.
- The good news is that this much larger casualty numbers from radioactive fallout is largely avoidable, if you are prepared beforehand.

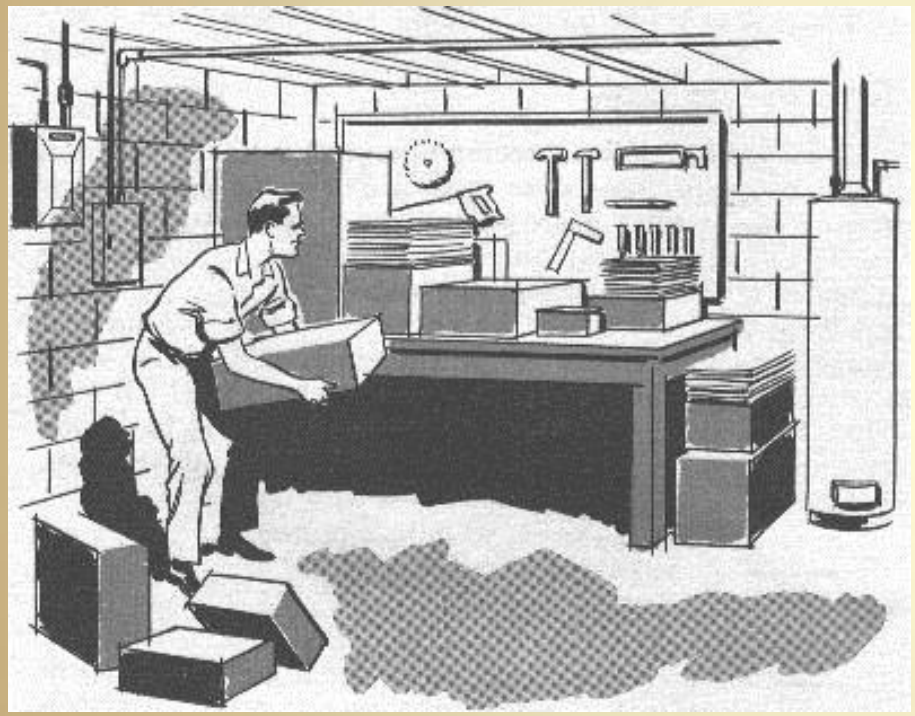
EFFECTS OF 500-KT SURFACE-BURST WEAPON



Nuclear Fallout Shelters

1. Decide if you are staying or going. Do not evacuate unless you have somewhere safe to go and that the roads will be clear.
2. Divide tasks and move quickly. You may only have a few minutes to a couple hours to prepare your supplies and shelter depending on your distance from ground zero
3. Gather your supplies (Food, Water, Sanitation) to your shelter area.
4. Build a shelter in the center most room (basement if possible) in the house putting the most distance between you and the radiation emitting dust that will settle on your home and yard. Add as much mass between you and the fallout. Heavy furniture, Water barrels, food storage, books, sand bags, etc..
5. Stay in your shelter at least 2 days. The longer you stay inside, the less rads you will be exposed to. 14 days is best or wait or the “all clear” announcement on the radio.

Nuclear Fallout Shelters



Radioactive Decay

- Radiation decays quickly.
  - About 90% of the most deadly Gamma radiation has decayed after 7 hours.
  - 90% of the remaining 10% decays within 48 hours.
  - After 14 days only 1/1000th of the radiation remains.
- After 2 days short time outside of your shelter is possible but not advised.
- The more you are exposed to radiation, the more sick you will become.

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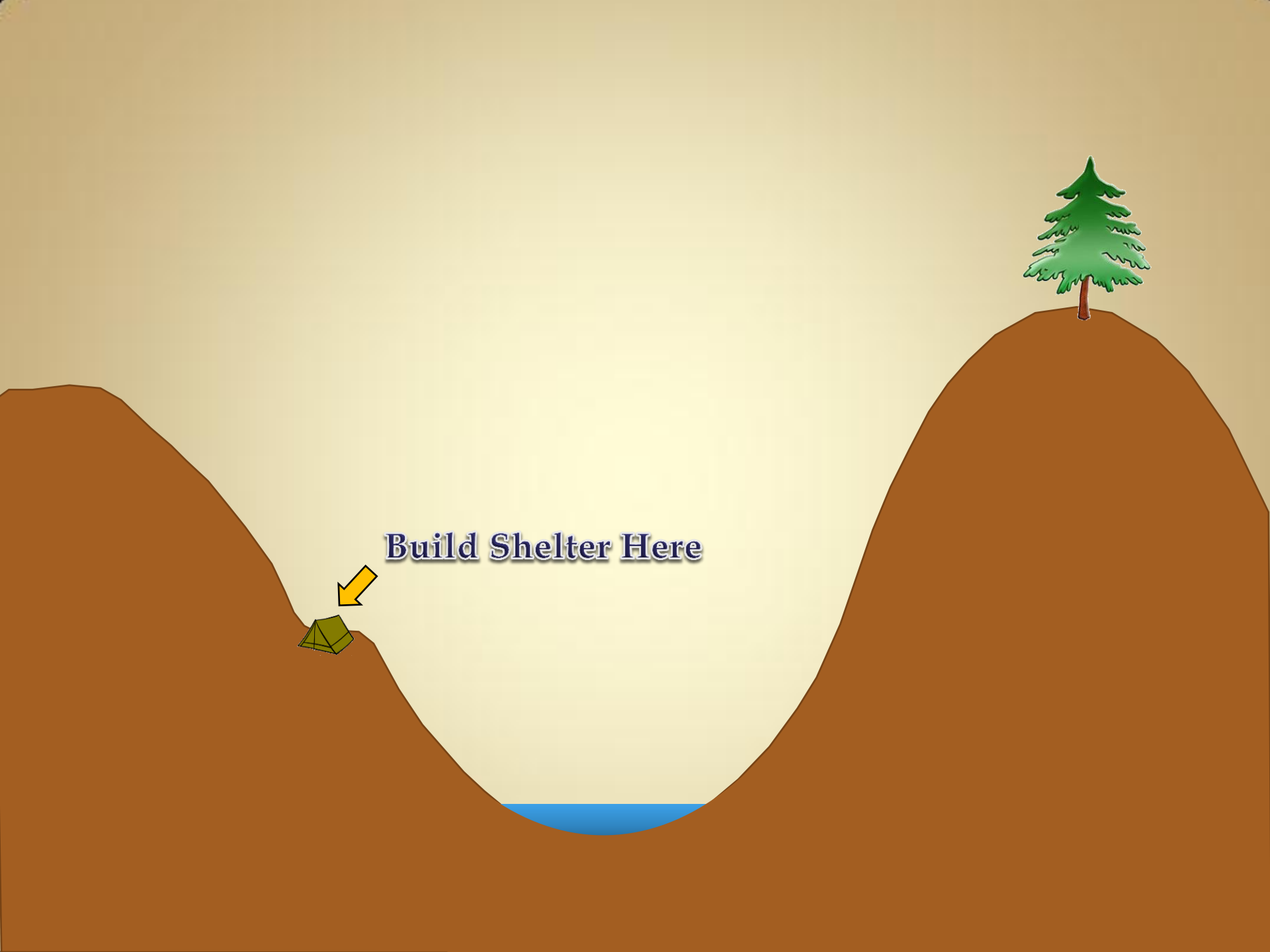
Emergency Preparedness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