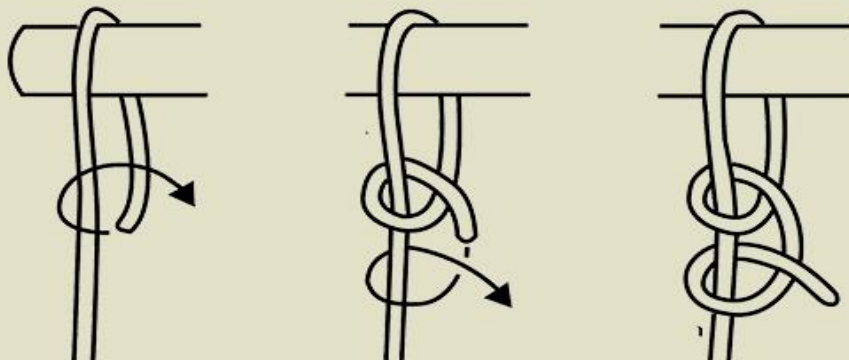


Wilderness Survival Guide



Peta Stange



WILDERNESS SURVIVAL GUIDE

PETA STANGE

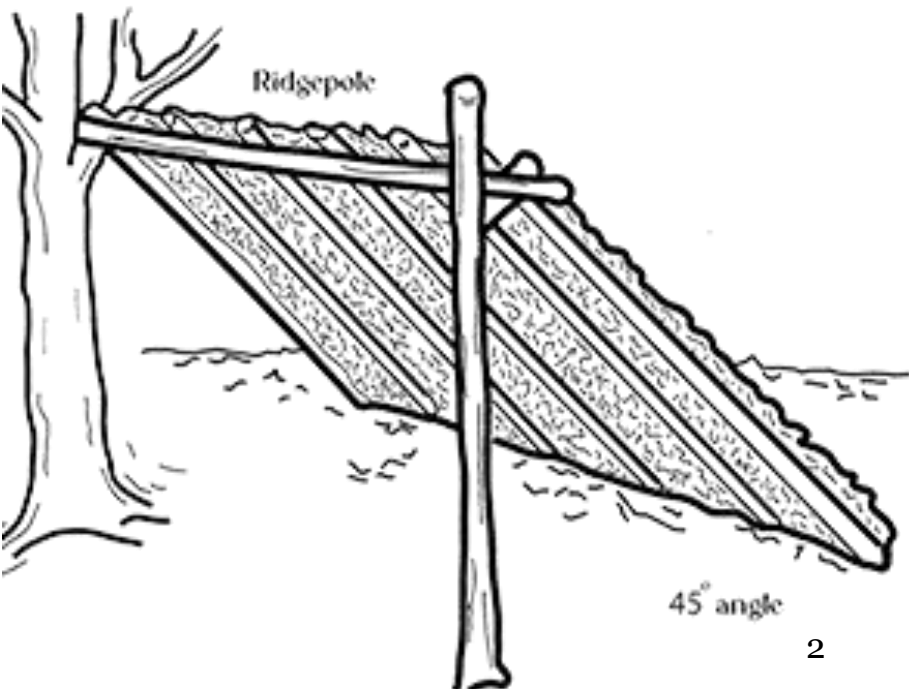


TABLE OF CONTENTS

1. WHAT TO PACK IN YOUR BACKPACK.....	7
1.1. List of Suggested Items.....	7
2. CUTTING TOOLS.....	8
2.1. Knife.....	8
2.2. Saw, Axe and Wedges.....	8
2.3. Sharpening.....	8
2.4. Knife Handling Tips and Safety.....	9
.....	9
3. CONSTRUCTING A SHELTER FROM NATURAL MATERIALS.....	10
3.1. Suitable Materials.....	10
3.2. Natural Shelters.....	10
3.3. Setting Up Camp.....	10
3.4. Constructing a Lean-To Shelter.....	11
3.5. Constructing an A-Frame Shelter.....	12
3.6. Constructing a Debris Hut Shelter.....	12
3.7. Other Types of Shelter.....	13
4. HOW TO MAKE A FIRE.....	14
4.1. Building a Fire.....	14
4.2. Igniting a Fire.....	14
4.3. Cooking Tips and Safe Eating.....	16
5. HOW TO FIND, DISTILL, FILTER AND PURIFY WATER.....	18
5.1. Finding Water and Staying Hydrated.....	18
5.2. Solar Water Distillation.....	19
5.3. Water Filtration and Boiling.....	20
5.4. Rock Boiling Water.....	20
6. NATURAL FIBERS.....	21
6.1. Plaiting, Reverse Twisting and Weaving.....	21

6.2.	Bark and Resin Harvesting.....	24
6.3.	Tying Knots	25
7.	HOW TO MAKE YOUR OWN TOOLS USING NATURAL RESOURCES.....	28
7.1.	Making a Wooden Bowl or Spoon Using Fire.....	28
7.2.	Waterproofing and Tanning Items.....	28
7.3.	Making a Barbed Spear.....	28
7.4.	Making a Torch	29
8.	FISHING WITH NATURAL RESOURCES	31
8.1.	Fishing Hooks and Fishing Line.....	31
8.2.	Fishing Nets	31
8.3.	Fishing Traps	32
8.4.	Stunning Fish	33
9.	HUNTING AND TRAPPING WITH NATURAL RESOURCES	34
9.1.	Animal Behavior	34
9.2.	Identifying Animal Tracks	34
9.3.	Identifying Animals Scats.....	35
9.4.	How to Make and Set a Snare.....	36
9.5.	Using a Net for Hunting	37
9.6.	Harvesting Bird Eggs	37
9.7.	Sustainable Use of Animal Carcasses.....	38
10.	EDIBLE INSECTS	39
10.1.	Common Edible Insects and Where to Find Them	39
11.	HYGIENE	40
11.1.	Natural Substitutes for Soap.	40
11.2.	Waste Disposal.....	40
11.3.	Personal Hygiene	41
12.	ORIENTATION AND NAVIGATION	42
12.1.	How to Read a Map	42
12.2.	How to Find South Without a Compass.....	43

12.3. How to Estimate Distances..... 44

12.4. Familiarizing Yourself in the Landscape..... 45

12.5. How to Estimate Daylight Hours 45

13. SAFETY47

13.1. Wilderness First Aid47

13.2. Safe River Crossing.....47

Being prepared before heading out into the wilderness is crucial. Packing the right equipment, having a sound understanding of the environment, and practicing some basic survival skills can make an excursion into the wilderness enjoyable, while still keeping things basic.

This survival guide can be used by a wide variety of people. Perhaps you are interested in foraging for edible plants or harvesting natural materials from the surrounding landscape, or maybe you would like to decrease your dependency on technology and artificial products. You might just want to get back in touch with nature and spend some quality time in the wild. This wilderness survival guide explores topics such as building a shelter, making a fire, cooking tips, weaving and making cordage, tying knots, fishing, hunting, trapping, filtering and collecting water, hygiene, navigation and safety, all using natural materials directly from the environment where possible.

This wilderness survival guide describes some of the basic skills that can be employed, as well as the natural resources that are available in any wilderness situation in North America. As you practice these skills and become familiar with the plants and animals in the landscape, your skills and abilities will allow you to turn your foraging day trips into extended camping trips into the wilderness.

A key theme in this survival guide is how to use the natural resources around you sustainably. By identifying and choosing the correct materials, your impact on the landscape can be minimized and future generation will be able to use the same resources and have the same experiences while in the wilderness.

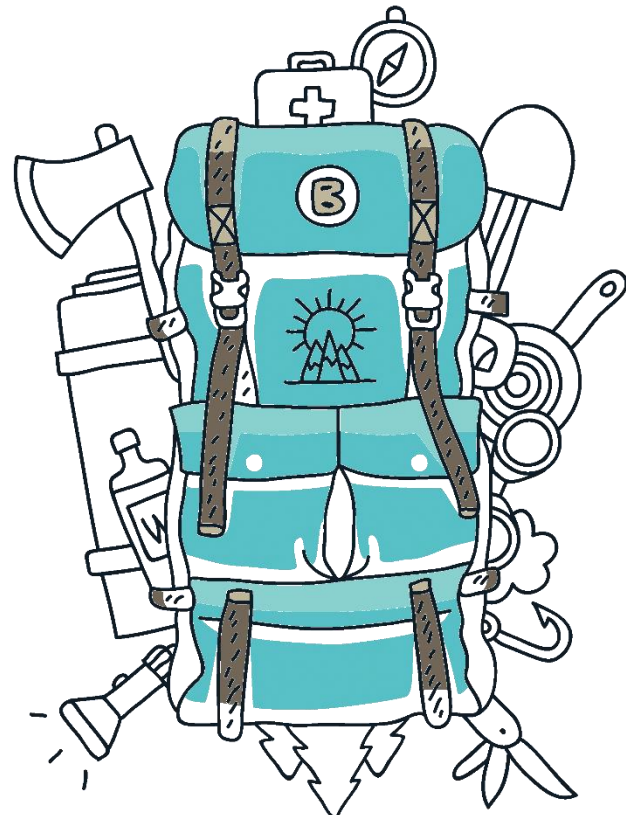
1. WHAT TO PACK IN YOUR BACKPACK

1.1. LIST OF SUGGESTED ITEMS

It's important to only carry the bare essentials to reduce your load while in the wilderness. For this reason, a backpack or rucksack is the first item to consider. It should be lightweight, waterproof, sturdy and comfortable, preferably with hip straps to make carrying loads easier.

Below is a list of suggested items that you may want to consider including in your backpack or rucksack;

- Spare clothes
- Work gloves
- Aluminum foil
- A small, lightweight cooking pot
- Folding saw
- Knife and sharpener
- Plastic trash bags to protect gear or collect rain water
- Non-lubricated condoms for water storage
- Rope or cordage
- A role of duct tape
- Sleeping bag or thermal blanket
- Emergency thermal blanket
- Hammock and tarp, tent or mosquito net
- Snare wire
- Fishing hooks and fishing line
- Compass and map
- First aid kit
- Lighters or flint



2. CUTTING TOOLS

2.1. KNIFE

A high carbon steel blade without a coating can double as an ignition source because of the sparks it can create when struck. An ideal length is between 4 ½ - 6 inches long with a flat edge along the spine. The knife and handle should be a single piece of steel for durability. In addition to a large sheath knife, a jackknife or pocket knife is often used for finer carving and skinning animals.

2.2. SAW, AXE AND WEDGES

If you plan on building your own shelter, then carrying a folding saw is a great option since they are compact and lightweight.

Carrying an axe increases the weight of your load, since it also means carrying wedges and a sharpening stone as well, but this option is also versatile since the axe can double as a hammer.

2.3. SHARPENING

Soak the whetstone in water for a few minutes before using it to sharpen cutting tools. Oil can also be used instead of water, but in a wilderness scenario, water is more practical since once you have used oil on a whetstone, water can no longer be used.

Lay the whetstone on a flat surface, hold the blade at about 10 – 20 ° angle from the whetstone and grind the cutting edge from base (closest to the handle) to tip. Flip the blade and repeat for the other side, again maintaining a 10 – 20 ° angle. Make sure to perform the same number of strokes on each side of the blade. Steady, even pressure is essential for a perfectly sharpened edge.

Use a coarse whetstone (800 grit) for sharpening burs or chips, a medium whetstone (1,200 – 1,800 grit) or diamond rod for heavy duty tools, and a fine whetstone (2,000 – 3,000 grit) for refining the sharpened edge. When you have finished sharpening with the whetstone, use a fine honing stone or honing steel to realign the cutting edge back to center. Finally, use a leather strap (strop) to polish the steel and apply some oil to protect the finish. Each time you increase the grit, you should double the number of strokes, for example, if you did 10 strokes each

side with the fine whetstone, then you should do 20 strokes on the honing stone and 40 strokes on the strop.

2.4. KNIFE HANDLING TIPS AND SAFETY

Never hold anything between your thighs while cutting. There is a high chance of slicing into your groin or femoral arteries which will result in extreme blood loss or even death. One method is to move the wood instead of the knife by setting the spine of the knife against your chest or knee, and gliding the wood along the blade to shape or shave it. In this way, if something slips, it will be the wood instead of the knife.

When cutting a green sapling with a knife, bend the sapling to create stress, then shear or beaver cut with the grain around the circumference of the bend.

Remove bark or create tinder with the back of your knife to preserve the cutting edge.

Always dry your knife before sheathing it and oil the blade to prevent it from rusting. If you have a leather sheath, a good way to maintain both it and the knife is to soak the sheath in olive oil for 24 hours and allow it to drip dry for a week.

Whenever using a knife or saw, ensure the area within two arm's length is clear of people and trip hazards. When handling or cutting rough or thorny materials, wrap some softer plant material around it to protect your hands.



3. CONSTRUCTING A SHELTER FROM NATURAL MATERIALS

3.1. SUITABLE MATERIALS

A Hammock with a tarp is one of the most adaptable, smallest and lightest shelters to carry in a forest or woodland environments, but it is also possible to build a shelter from the natural resources around you.

When considering which natural materials to use to establish your camp or structures, target fast-growing, resprouting trees and plants. Avoid cutting down trees such as pine, cypress, oak, maple, palm, fir and aspen; the stumps will not resprout and the roots will die. Where possible, use sturdy, dead trees and branches that are already on the ground to construct any structures, as this will require the least amount of work and has the least impact on the environment.

3.2. NATURAL SHELTERS

Finding a natural shelter will depend on the type of environment you are in. It may be possible to find a cave, but always check for signs of other inhabitants by looking for any prints or scats first. Other natural shelters can include rocky outcrops or dense vegetation that provide wind protection. Alternatively, it may be more suitable to sleep elevated above the ground to avoid biting insects or saturated ground, in which case, an elevated platform or hammock in a tree may be preferred.

3.3. SETTING UP CAMP

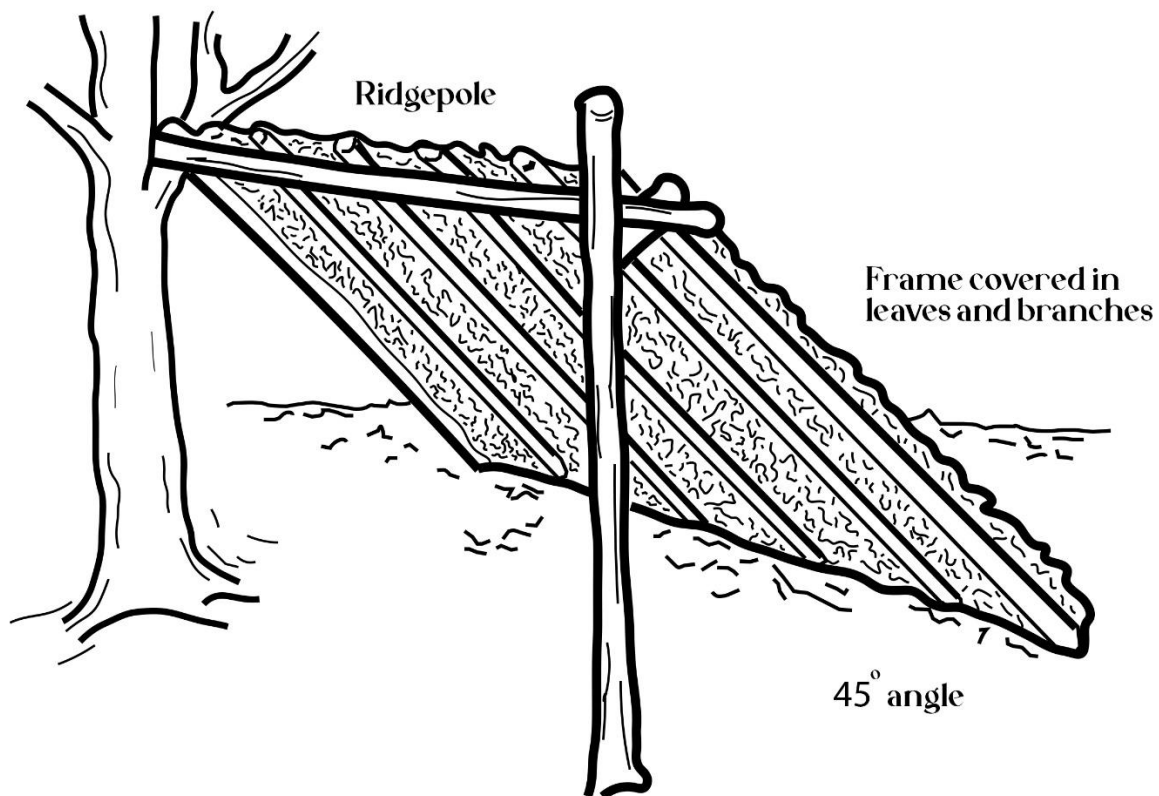
Finding a suitable location for a campsite will depend on the situation, but in most cases, you should target sites that;

- Are close to a clean water source.
- Have enough suitable wood to build a shelter and fire.
- Are close to natural resources for foraging, fishing and/or hunting.
- Are free of hazards such as dangerous branches, dead trees or poisonous plants.
- Are unlikely to become flooded or collect water during rain events.

- Are protected by the wind in cold weather or takes advantage of it in hot weather. Camping at the top of a ridge will be windier but will also be slightly warmer on still nights due to warmer air rising. A low depression will collect cold air during the night, but will also have less wind.

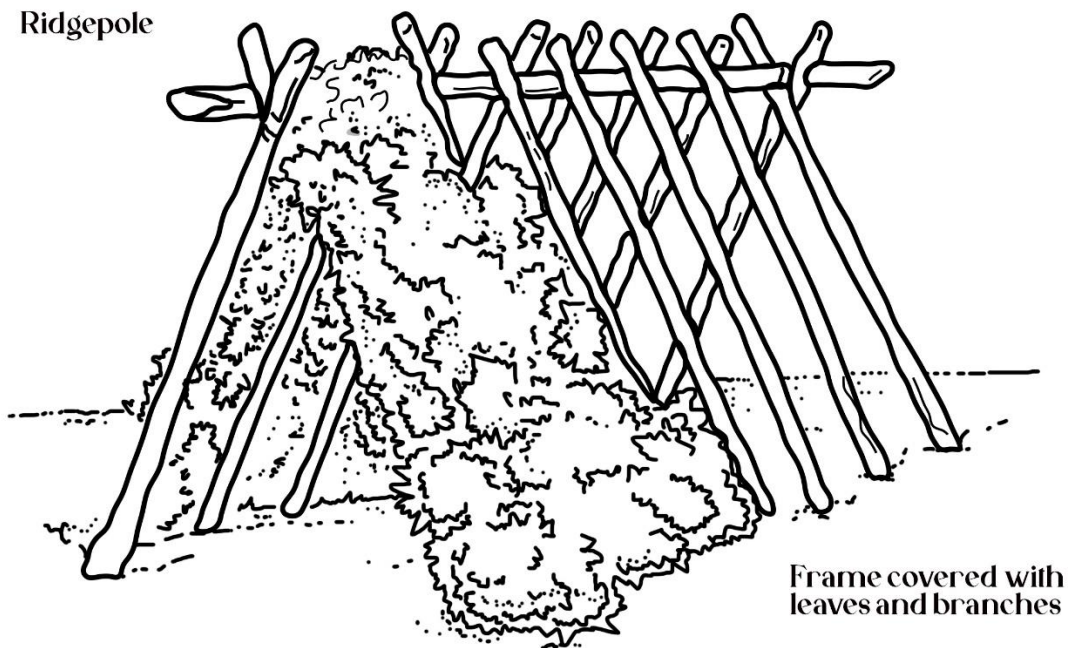
3.4. CONSTRUCTING A LEAN-TO SHELTER

In warm weather, a lean-to shelter is the easiest option. It requires a sturdy branch as a ridgepole that is approximately 6 foot (2 m) long and 3 inches (8 cm) thick that can be horizontally suspended about 3 – 6 feet (1 – 2 m) high in the fork of two trees. On one side of the ridgepole, lay smaller branches at a 45° angle from the ground to start creating a frame for the shelter. Finally, layer leaves or grass over the entire frame, working from the ground upwards. Slightly overlap each row, similar to laying roof shingles and point any foliage downwards to make it more water resistant. Larger leaves are better for this purpose, but they may need to be secured by covering them with smaller branches. Be sure to cover the entire frame, otherwise any rain that touches the frame will most likely end up dripping inside the shelter.



3.5. CONSTRUCTING AN A-FRAME SHELTER

In cooler or windy weather, an A-frame shelter will be a better option. This is very similar to the lean-to shelter, but it's enclosed on 2 sides instead of just one. It doesn't require the support from 2 trees, but does require some cordage or rope to build the A-frame. Again, make sure to cover the entire frame with leaves or grass from the ground up to avoid water dripping inside.

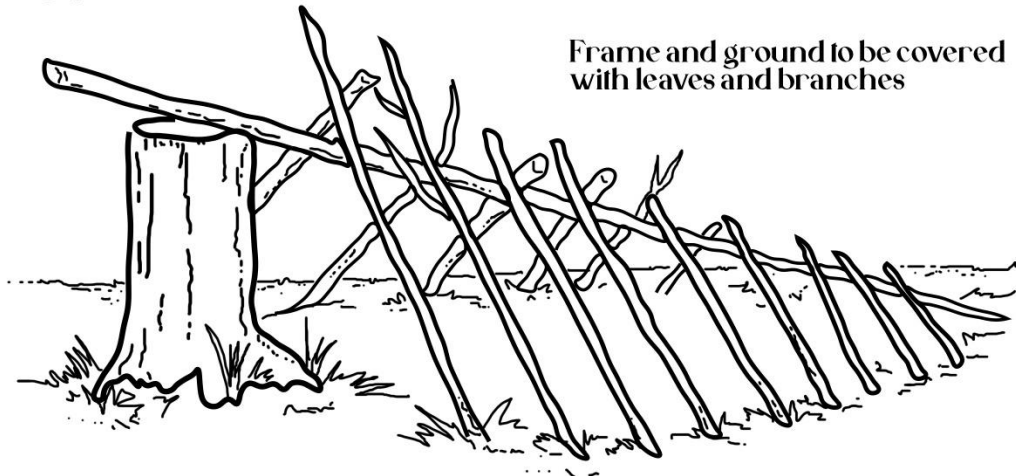


3.6. CONSTRUCTING A DEBRIS HUT SHELTER

In cold or miserable weather, a debris hut will shelter you the best, since this type of shelter tapers towards the ground and is enclosed on 3 sides, which will make it easier to maintain your body heat in this shelter. This shelter only needs to be 3 feet (1 m) off the ground and should only be slightly longer than your own height, so a long, sturdy ridgepole can be propped against a tree stump to start building the frame. Smaller branches are arranged on either side of the ridgepole and then leaves and grass layered on top. Insulate the ground with plenty of leaves, aiming for a bed of at least 4 inches (10 cm) once it is compressed. Laying an emergency thermal blanket over the bed of leaves with the reflective side up will make an

enormous difference in the amount of heat lost to the ground. Once in the hut, you can close up the opening in front with a backpack.

Ridgepole



3.7. OTHER TYPES OF SHELTER

A snow cave can be dug into the side of a hill to provide shelter. Build a snow bed that is raised off the floor of the snow cave and smooth the ceiling so that melting snow doesn't drip on you while sleeping.

In desert situations, it's important to conserve energy and water by sleeping during the day and being active at night. The simplest desert shelter involves scrapping away the hot sand to build a long pit to lie down in. When covered with a tarp or debris, this shelter will create shade with only a small amount of exertion.

In swamps and other water-logged areas, it will be necessary to build a raised platform off the saturated ground. A mosquito net is essential in swampy areas, otherwise sleeping high in the canopy will reduce the number of biting insects.

4. HOW TO MAKE A FIRE

4.1. BUILDING A FIRE

When building a campfire, consider the wind direction to avoid smoke blowing into your shelter. Remove any combustible materials (including the duff layer) in a radius of at least 6 feet (2 m) around the fire. Make sure there are no trees overhead. Place a ring of rocks around your intended campfire; this will reflect and absorb the heat of the fire as well as shelter it from the wind and prevent it from spreading out of control. Scoop out a depression in the middle of the campfire, pushing the dirt towards the ring of rocks. Stack 4 sticks in a square at the base of the depression, this will allow oxygen to flow while keeping the tinder raised off the ground. Next place small twigs and tinder on top of the square in a chaotic or random manner. Finally, arrange larger twigs and sticks in a teepee formation around the bundle of tinder and twigs, making sure to leave plenty of space between the sticks for oxygen to flow through. Ignite the tinder and add some more small sticks until the flames rise above the teepee. Once the flames grow tall, larger pieces of fuel can be added carefully so as not to smother the flames.

If you want a quick burning, high heat fire then use softwood species such as pine, willow, poplar, alder or cedar. For long lasting coals for cooking, choose hardwood species like ash, birch, walnut, oak and hickory. Only burn dry, old wood from the forest floor. Before leaving a site, your campfire should be cool to the touch to ensure no accidental re-ignition.

Where possible, collect dry tinder whenever you see it and store it in a water-proof container or wrap it in an oiled cloth. Tinder is best collected from bark with high amounts of flammable resin and oil, such as birch and pine bark. Birch bark can easily be shredded and fluffed up for excellent tinder. Pine resin tends to gather in the forks of trunks or towards the base of standing dead trees. Tinder can be made by rubbing the back of a knife blade against dry wood. A feather stick is another form of tinder which can be fashioned by carefully shaving a branch with a knife blade.

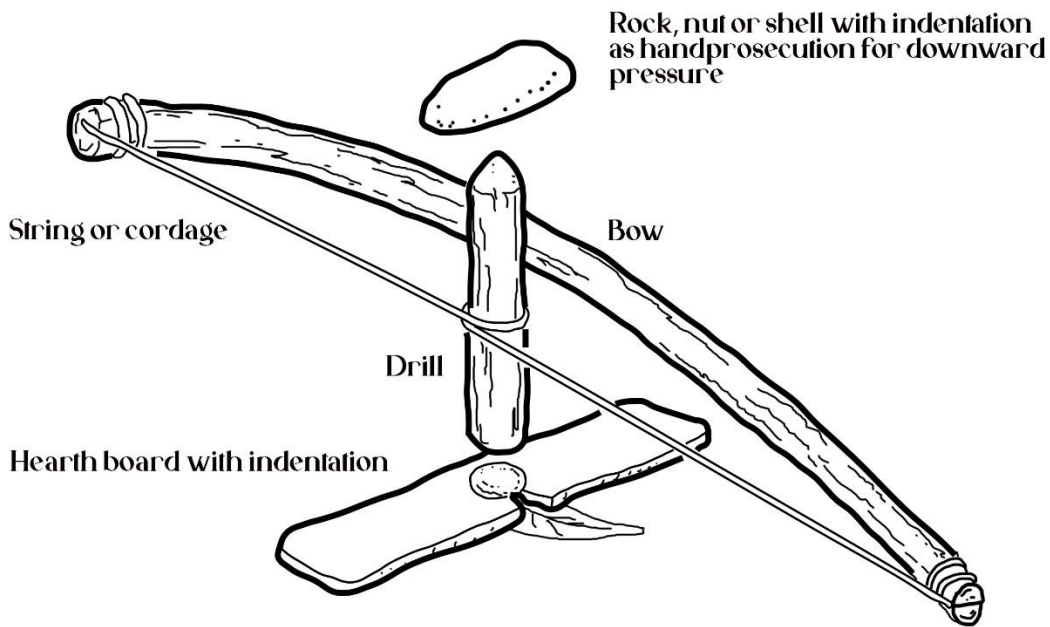
4.2. IGNITING A FIRE

It's recommended to carry at least 2 reliable lighters; preferably not refillable ones, since these tend to leak more gas. In colder weather, lighters should be kept close to the body to keep them warm.

In a survival situation, some types of quartz, chert or flint can all be used to strike against carbon steel to make a spark, but this method works best when trying to ignite charred materials, since the temperature of the spark isn't as high compared to the sparks from a ferrocerium rod (although the ferrocerium rod can require more maintenance). When striking a flint or rod, use a loose-jointed wrist motion. Once the sparks cause the tinder to smolder, lightly blow on it until it bursts into flames.

If you have a sealable tin, you can make your own charred tinder to make igniting fires easier. Simply place some dry leaves, grass, bark, twigs or cloth into the tin, close the lid tightly and place it in the hot coals for 10 – 15 minutes. Allow the tin to completely cool before opening to prevent the charred materials from igniting. This charred tinder is easily ignited by a few sparks from a flint against the spine of a carbon steel knife.

Where possible, practice igniting a fire using a bow drill. This requires finding two pieces of very light, dry wood; one a little thicker than your thumb and about 9 inches (23 cm) long to act as the drill, and the other a wider, flatter piece approximately 1/2 inch (1 cm) thick to act as the hearth board. It's important that these two pieces of wood are completely dry but soft – you should be able to scratch the wood with your nail. Use your knife to create a small indentation on the hearth board for the drill to sit in. The final component is the bow itself. This should be made from a sturdy stick, preferably green and approximately 3 feet (90 cm) long (or a rib bone from a large deer or elk). Ideally the bow should have a slight bend in it and must be strong enough to tie a piece of string or cordage to each end to make a bow. A rock, piece of wood or hard nutshell in the palm can protect your hand while applying downward pressure to the drill while still allowing it to spin. Ideally, this should have a slight indentation as well, to stop the drill from slipping out. To start, loop the string once around the drill and stand the drill in the indentation in the hearth board. Place the hearth board on the ground and use your foot to secure it so that your hands are free to hold the drill and bow. With a rock or shell in one hand, apply pressure to the top of the drill and slowly begin to push and pull the bow with the other hand, making sure to use the entire length of the bow to create enough dust and fine fibers. It's important to slowly create this dust first, before attempting to produce friction for ignition – otherwise you create only heat without any actual fuel. Once the dust and fibers have started to accumulate, you can increase the speed of the bow to increase the friction. The friction will eventually turn the dust into tiny coals, which can be carefully transferred to a tinder bundle or charred material for quick and easy ignition.



Coals can be transported by wrapping them up in sage leaves; sage leaves tend to smolder instead of ignite.

You can also use a magnifying glass or lens to concentrate the sun's rays onto a dry tinder bundle. This method is most effective on sunny days when the sun is overhead.

Burning dried animal dung, coconut husks or dried cattail leaves will help to repel mosquitos, otherwise being elevated 10 - 25 feet off the ground will reduce the number of mosquitos.

4.3. COOKING TIPS AND SAFE EATING

Always wait for the flames to die down so that you are only cooking on coals. Alternatively, add a narrow trench to your round fire pit to make a keyhole fire pit. This will allow you to continue to feed the flames of the main fire in the circle, while giving you a narrow trench to drag coals into to cook on simultaneously.

Boiling meat and making a broth out of it is often the most efficient way to cook meat while maintaining the nutrients, but smoking meat preserves it so that it can be stored for longer. Meat smoked overnight will last approximately a week. When

smoking meat, heat and flames should be minimized and using slightly green or damp hardwood will produce plenty of smoke. In hot, sunny weather, thin strips of meat can be dried in the sun until the strips are dry and crunchy.

The meat from any scavenger animals (for example, buzzards and boars) should be well boiled to remove any parasites, and the crop should be removed from birds when processing them for food. Also, do not eat the brain or spinal cord of any animal due to the risk of neurological diseases.

In general, any fish that is less than 2 inches (5 cm) long can be eaten whole. All freshwater fish in North America are edible once cooked.

All reptiles are carriers of salmonella on their skin so it's essential to cook lizard, snake and turtle meat well and wash your hands thoroughly after handling them. Do not eat box turtle as this meat contains toxins that are not destroyed by cooking.

Avoid eating plants that emits an almond smell; this is usually a sign of cyanide compounds. Milky sap is also a sign of toxicity and often seeds inside a pod will not be edible unless heavily processed. Many three-leafed plants are poisonous and purple, pink or black tipped grass grains may contain a harmful mold or bacteria. All water plants must be cooked to remove any harmful bacteria.

Wrap food in 3 layers of burdock leaves (or any other edible large leaves) and place on the coals to cook. Crush and leach acorns and other bitter food to make them more palatable.

Use a green stick or branch to skewer food over the fire. A dry, flat rock placed in the fire or coals is a great way to fry food without a pan.

5. HOW TO FIND, DISTILL, FILTER AND PURIFY WATER

5.1. FINDING WATER AND STAYING HYDRATED

When searching for a water source, often there is a change in vegetation as you get closer to water; thinner or smaller leaved plants will give way to broader and fleshier leaved plants, or the tree canopy will become thicker and taller. In drier environments, a natural line of trees may indicate a watercourse.

Digging for water is time consuming and energy intensive, but may be the only option in some dry environments. The best places to dig for water include;

- In dry river beds, especially in low depressions or near concave riverbanks
- At the bottom of valleys and gorges, especially at the base of cliffs or rocky outcrops
- Under green vegetation in an otherwise dry landscape
- Behind the first sand dunes at a beach

Many tropical plants can provide water. Shake green bamboo and sugarcane; the stems that sound like they have water inside can be bent over and the top sliced off to harvest the water. Banana and plantain trees can be cut down and a bowl formed in the stump to collect the water from the roots for approximately 4 days. Some hanging vines can be sliced at the base and punctured at the top to allow the water inside to flow downward.

Desert plants that can provide water include the pulp from barrel cacti, prickly pears and aloe vera. Use a knife to slice away the prickles.

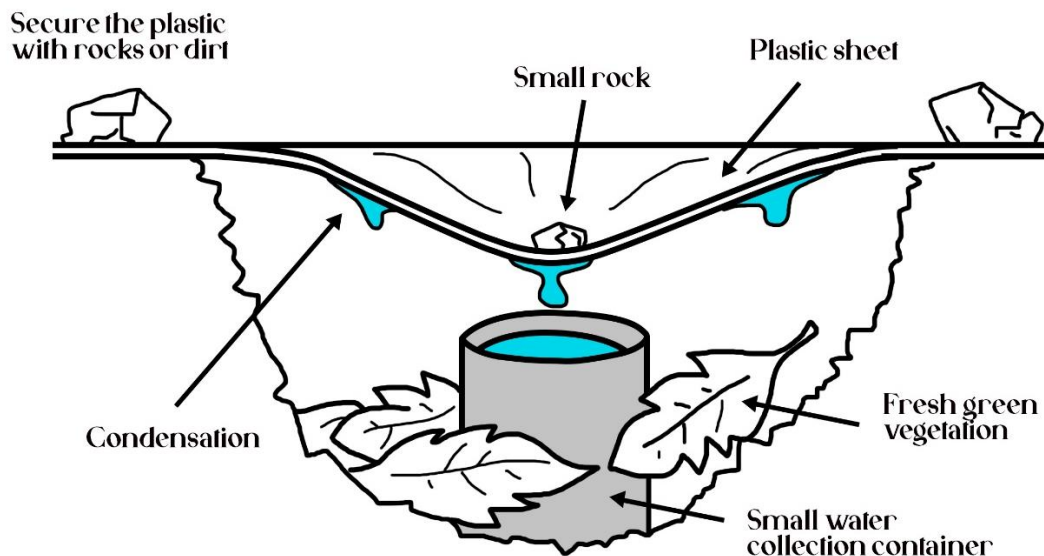
Some tree species such as birch, maple, walnut, hickory and sycamore trees can be tapped for drinkable liquid. Bore a small hole on the sunny side of the tree trunk and insert a hollow reed or stick into the hole to allow the liquid to run out. For best results, bore the hole through the bark and then 2 – 3 inches further into the wood, preferably either below a fork in the trunk or above a large root ball at about head height. Large, old trees will not produce as much liquid as developing ones. Sycamore trees are best tapped from mid-winter, whereas maple, walnut and hickory should be tapped from late winter. Birch trees can be tapped from the start of spring, just before the buds start opening.

If water is scarce, then try to minimize exerting yourself, especially in hot weather. Do not rely on the sensation of thirst to dictate when to drink. This method will result in drinking only two-thirds of your daily water requirement. Take constant sips of water throughout the day instead. The color of your urine will indicate whether you are dehydrated or not; the darker the color, the more dehydrated you are.

5.2. SOLAR WATER DISTILLATION

Freshly collected rain water can be drunk without any filtration or purification required. Rain water can be collected on large leaves that funnel into a clean container.

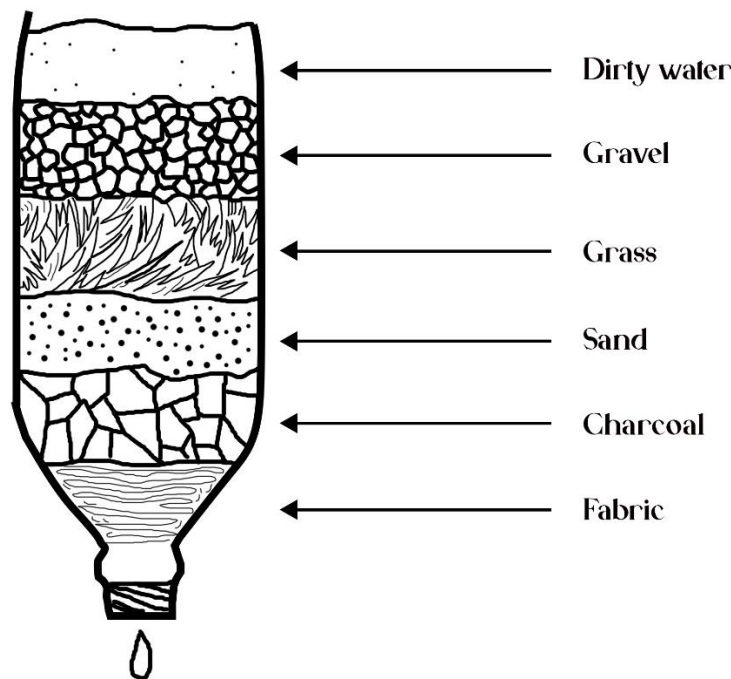
Water can also be slowly distilled on sunny days from green leafy material or dirty/salty water in 2 ways: Dig a pit and fill with fresh, green, leafy material or dirty water. Place a small collection container in the middle of the pit then cover and seal the top of the whole pit with plastic, making sure to secure the plastic thoroughly. Place a small rock on top of the plastic directly over the container and as the water from the leaves or dirty water evaporates, it will condense on the plastic and trickle down into the container in the middle of the pit. Alternatively, you can tie a plastic bag tightly around some green leaves while they are still attached to the tree or plant. This water does not require boiling, so can be drunk straight away.



5.3. WATER FILTRATION AND BOILING

If possible, collect water from clean, flowing streams or rivers then filter and boil the water for at least 5 minutes. If the water is cloudy, allow the water to settle, then decant and filter it through some fabric before boiling it. Filtered water still needs to be boiled to remove any harmful bacteria and viruses.

It's possible to make a water filter by layering fabric, charcoal, sand, grass and gravel in a makeshift funnel to filter water. Filter the water at least 5 times. Water can also be filtered through cloth, coconut husks or even dried and ground up fruit peels.



The inner bark of Oregon grape (*Mahonia aquifolium*) was traditionally left overnight in drinking water to cleanse it. The high concentrations of berberine in the bark can kill many types of microbes.

Water purification tablets are also a reliable way to make filtered water drinkable when boiling is not possible.

5.4. ROCK BOILING WATER

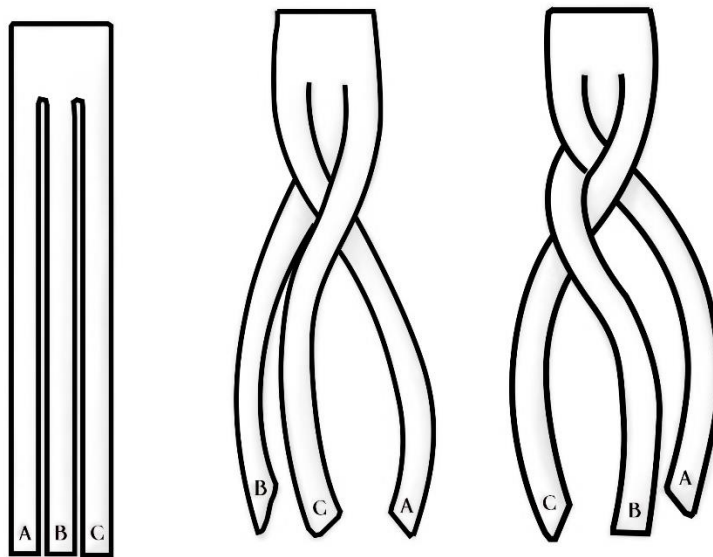
If you don't have a metal container to place over a fire to boil water in, you can fill a wooden bowl with water and drop hot rocks from a fire into the water to boil it. This requires quite a few hot rocks to keep the water boiling for 5 minutes.

6. NATURAL FIBERS

6.1. PLAITING, REVERSE TWISTING AND WEAVING

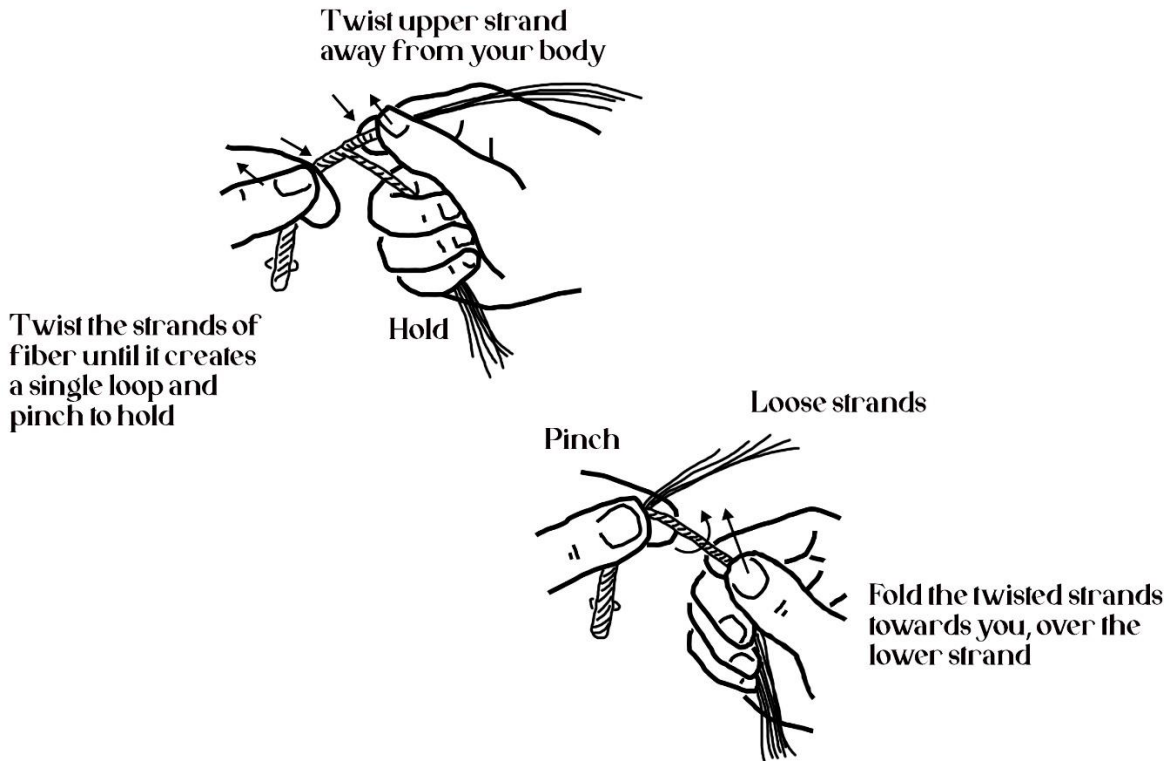
Making cordage or rope requires dry plant materials only, whereas weaving uses either fresh, green materials or soaked, dried materials.

Some natural weaving and cordage materials include reeds, sedges, bamboo, grasses, vines, creepers, palms and roots. More specifically, strips of yucca, flax and cattail (*Typha spp.*) leaves make great cordage and rope when dried and plaited. To do this, simply tie 3 strips of leaves or other plant material in a knot at one end, then take the outer right strip “A” and cross it over the middle one “B”. Then take the outer left strip “C” and cross it over the middle one “A”. Repeat this motion and tie a knot on the end to secure it.



When making cordage from plant material, it's possible to work with dry materials, such as dogbane, milkweed, fennel, stinging nettle, thistles or other fibrous plants such as princess tree (*Paulownia sp.*). Split the stems to remove the outer bark and the inner pith core to access the long fibers between these two layers. Other fibers can be harvested from the inner bark of hickory and poplar species. These fibers can be reverse twisted into a strong rope or cord. To do this, first you twist the strands of fiber until they create a single loop or kink roughly in the middle. Pinch the two strands of fiber at the loop between your left index finger and thumb so that you have an upper and a lower strand. Next, use the index finger and thumb on the right hand to twist the upper strand away from your body, then, while

holding the twist, use your middle finger to help you fold it down towards you, over the untwisted lower strand. Shift your pinch along the twisted cord to secure it and repeat by twisting the upper strand.



If you want longer fibers you can splice (twist) another piece to the end, just make sure the splices are not next to one another, as this will create a weak point in your rope or cordage.

Knowing how to weave a small basket for carrying food or other items is a handy skill to know when in the wild. A large variety of plant materials can be used for weaving and what you choose will depend on its availability, abundance and what it will be used for. The sturdier the plant material and the tighter the weave, the sturdier the end product will be. If possible, harvest new stems from deciduous trees while there are no leaves present.

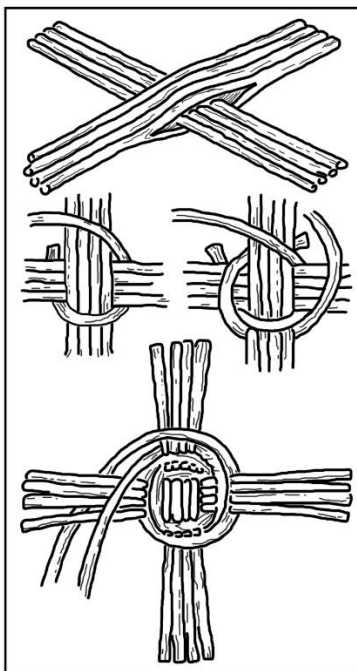
Willow stems approximately 3 – 4 feet (90 – 120 cm) in length are one of the best materials to make a basket once they have been dried and subsequently soaked in water. To weave a willow basket, start with 8 stems approximately 1 foot (30 cm) long which will form the base of the basket. Split the middle of 4 of these stems so that you can insert the other 4 stems through them to form an “X” shape (otherwise it’s possible to lay them on top of each other and bind the “X” with cordage).

Insert the thin tips of 2 long willow stems into the split stems to anchor them and then fold them back on themselves and begin to weave all 4 base stems together to secure the “X” shape. Complete 2 rows around the “X”.

Next, spread the 8 stems in the “X” so that they resemble the 16 spokes of a wheel. Continue weaving but now weave each of the 16 spokes individually until the base is finished. Splice in new willow stems as needed and keep the weave as tight as possible.

To weave the sides of a basket with 16 base spokes will require 32 uprights. For this, insert the thick end of a willow stem into each side of the base spokes and bend them upwards to make the uprights. The next 3 woven rows are used to secure the uprights, space them out evenly and set the shape of the basket: Insert the thin end of a stem into the base weave to the left of an upright and repeat 2 more times so that there are 3 stems ready to weave around the uprights.

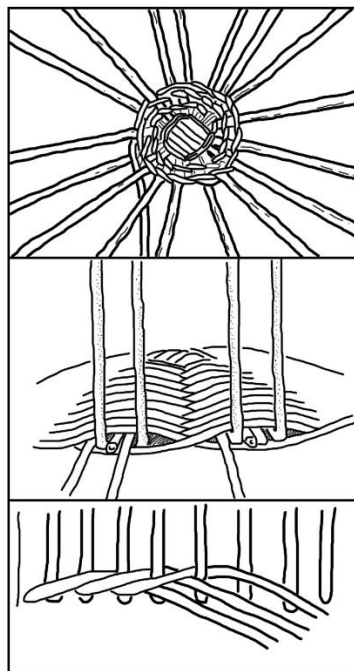
Pull each upright into position first, and then weave the left-most stem over the top of the other 2 stems and then behind the next free upright so that the stem points diagonally towards the base. Repeat, always bringing the furthest left stem over the top of the other 2 stems and then behind the next upright, keeping the rows tight together. Continue weaving and splice in more stems as needed. Finish the basket by weaving the ends of the uprights back across themselves.



Split the middle of 4 stems and insert the remaining 4 stems

Insert 2 long stems and weave all 4 stems together to secure the “X” shape

Complete 2 rows around the “X”



Spread the 8 stems in the “X” so that they resemble the spokes of a wheel

Weave each of the 16 spokes individually

Bend the stems upwards to make the uprights

Insert thin end of a stem into the base weave to the left of an upright 3 in total

Weave the left stem over the top of the other 2 stems then behind the next free upright

It's possible to make both a needle and thread from agave plants by delicately slicing around the needle-like tip of the leaf, and then carefully pulling out the long, connecting strands of fiber from inside the leaf and twisting them into a strong sewing thread.

To get the most amount of fiber out of plant material like agave, flax, iris, plantain or yucca, use a method called retting, which involves soaking the leaves in water for 3 – 5 days to make it easier to scrape the flesh away from the fibers.

Shoes, hats, floor mats, walls, roofs, belts, hammocks and fishing nets can all be woven from plant material.

6.2. BARK AND RESIN HARVESTING

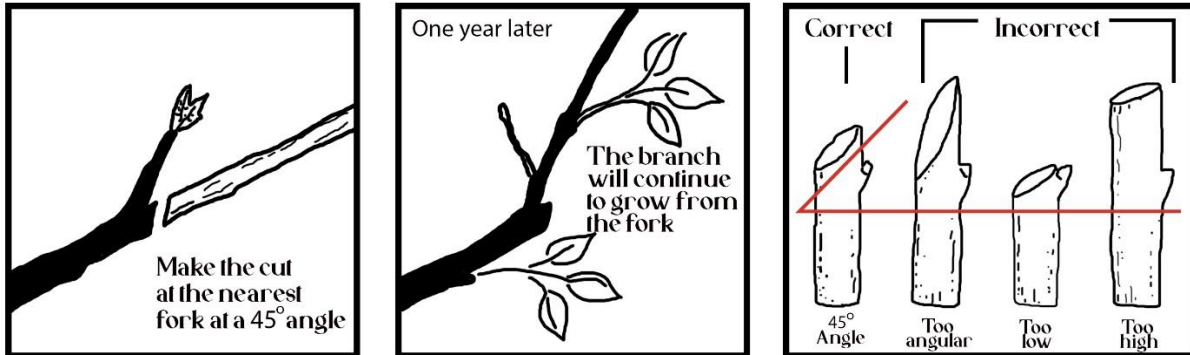
Harvesting bark from fast-growing, resprouting trees is more sustainable than harvesting from slow-growing species that don't sucker or resprout after being cut down. Ideal tree species for sustainable bark and wood harvesting include willow, elm, mulberry, cottonwood, fig, poplar, tulip and weedy tree species such as tree of heaven and tamarisk.

The best time of year for bark harvesting for most of these tree species is in spring when the amount of resin and bark production is at its peak. Do not remove too much bark from a single tree. Minimize damage by cutting vertical strips of bark and keeping any horizontal cuts to a minimum. This will prevent the tree from being ringbarked and dying.

In many cases, bark fibers can be plaited or reverse twisted into cordage, but it is also possible to harvest large sheets of bark from entire branches and limbs that have recently become detached or broken off the main tree and are therefore still green. Only strip bark sheets from branches and limbs, since there is a very high risk of killing the tree when entire sheets are removed from the trunk.

Even when done correctly and only the outer bark is harvested, it will still take about 10 years for the tree to recover and there is also the risk of pests and diseases entering the tree and killing it slowly during that time. Sheets of bark are useful for making water or storage pots, since they can be sealed with resin or pitch.

When harvesting green branches or stems from a living tree, make the cut at the nearest fork on the branch at a 45° angle. This will ensure a clean cut that will reduce the risk of becoming infected by pests and diseases and the branch will continue to grow from the fork, causing minimal impact to the tree.

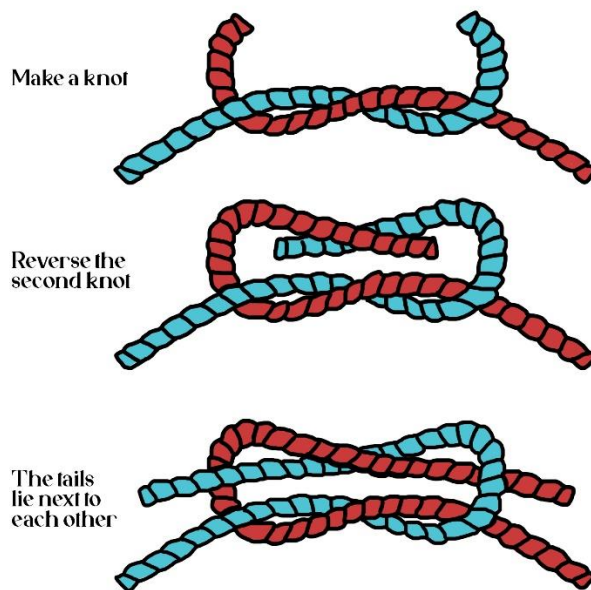


To harvest resin or gum from a tree with minimal damage, thinly slice the bark diagonally. Always cut less than 20% around the circumference of a tree to avoid ringbarking it.

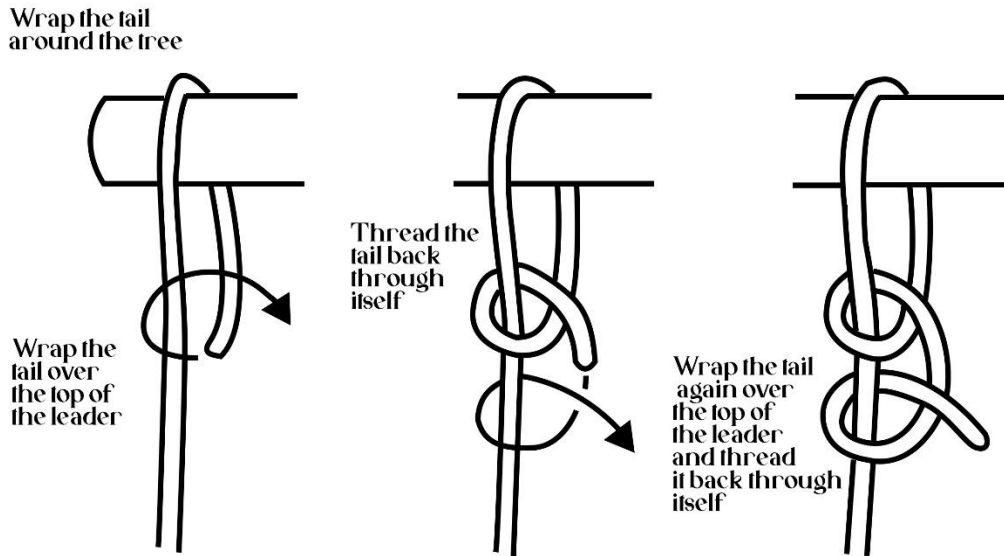
6.3. TYING KNOTS

In some cases, a simple knot will suffice, but some situations may put a lot of force on a knot, which will make it impossible to untie again. Below are a few knots that are secure but can still be loosened or adjusted. When describing how to tie knots, the “leader” is the long length and you tie the knot at the opposite end, called the “tail”.

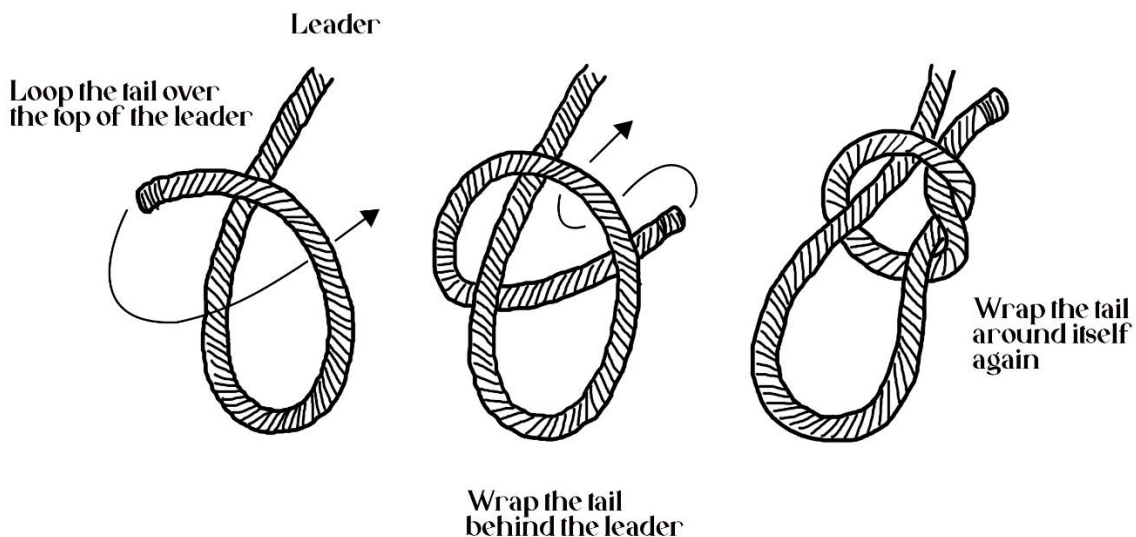
A square or reef knot is the easiest way to tie two ropes together. It’s possible to loosen them again by pushing the the tails back towards the knot. Start by making a simple knot, and then make a second knot, making sure to reverse the direction of the knot so that the tail of each rope lies next to itself.



The easiest way to tie a rope to a tree or post is with 2 half-hitch knots. It is also a self-tightening knot that is easy to re-open. Start by wrapping the tail once around the tree, then wrap the tail over the top of the leader and thread it back through itself. Next, wrap the tail again over the top of the leader and thread it back through itself a second time.

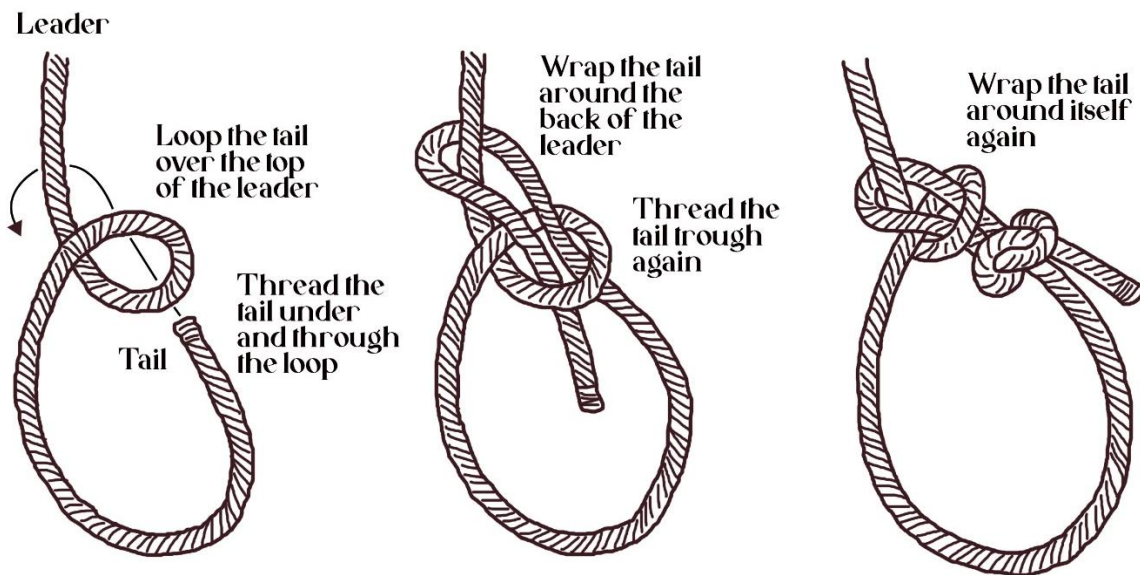


A slip knot is a simple, adjustable knot that can also be used to make fishing nets and to finish other knots by securing the tail. Start by making a loop with the tail over the top of the leader, then wrap the tail behind the leader and around itself again. Pull on the leader to untie the knot.



A bowline knot is handy in emergency situations since it forms a static loop or handle that can take a reasonably heavy load (like someone standing or pulling on it) without slipping, while still being able to untie it afterwards.

Start by making a loop with the tail over the top of the leader, then thread the tail under and through the loop. Wrap the tail around the back of the leader and thread it through the original loop again so that it lies next to itself again. Finally, secure the tail with a slip knot by wrapping the tail around itself.



7. HOW TO MAKE YOUR OWN TOOLS USING NATURAL RESOURCES

7.1. MAKING A WOODEN BOWL OR SPOON USING FIRE

To make a wooden bowl or spoon, start with a large piece of wood that has a flat, cut surface; this will be the top of the bowl. Place a few coals on the middle of the surface and gently blow downwards, so that the heat of the coals scorches the surface. As the coals burn downwards, it will start to create an indentation. Occasionally scrape the coals away and chip away any charred materials, then repeat the process. Eventually the indentation will become a bowl or spoon.

7.2. WATERPROOFING AND TANNING ITEMS

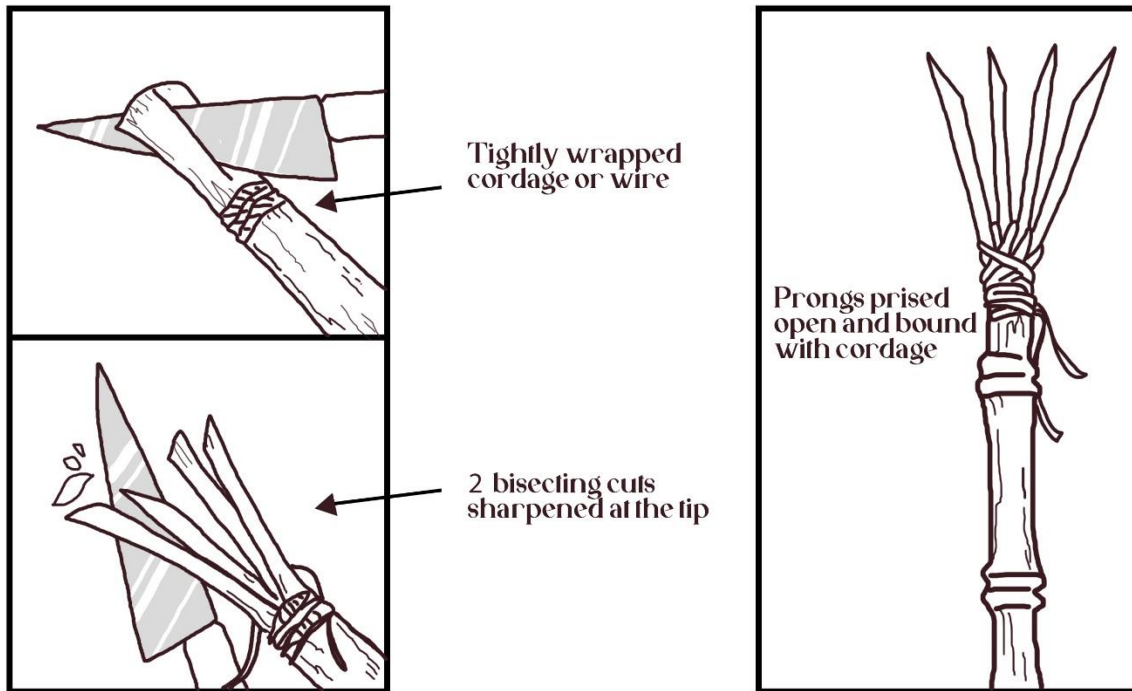
A mixture of 2-parts beeswax with 1-part rendered fat will help to make fabric and tarps water repellent. Simply rub the mixture thoroughly into the material. Otherwise, use warm pine resin, which is especially effective at sealing seams and repairing shoes and equipment.

A large number of natural resources can be used to tan leather. This includes soaking oak bark in water, using animal brains, salt, smoke or urine.

7.3. MAKING A BARBED SPEAR

A four-pronged pinning spear is one of the most versatile types of spears. It is an easy tool to make from natural resources and can be used for fishing and hunting small prey like rodents, frogs or reptiles. Any spear can be modified to include barbs from plants or even bird talons.

Start with a green branch that is slightly taller than your own height. Ideally, it should be straight, about 1 inch wide and have any knots or rough spots removed. Tightly bind some cordage or wire about 10 inches (25 cm) from the thicker end of the branch. This will stop the branch from splitting any further. Baton your knife to make 2 bisecting cuts so that it splits into 4 sections. Holding the 4 sections tightly together, carve the tip into a point. Next, wedge 2 smaller sticks into the bisecting cuts to prise them open. To make the spear tips stronger, place the split tips into warm white ash. This will draw out the moisture without burning it, which will make it stronger (although you may need to re-bind the cordage after this process).

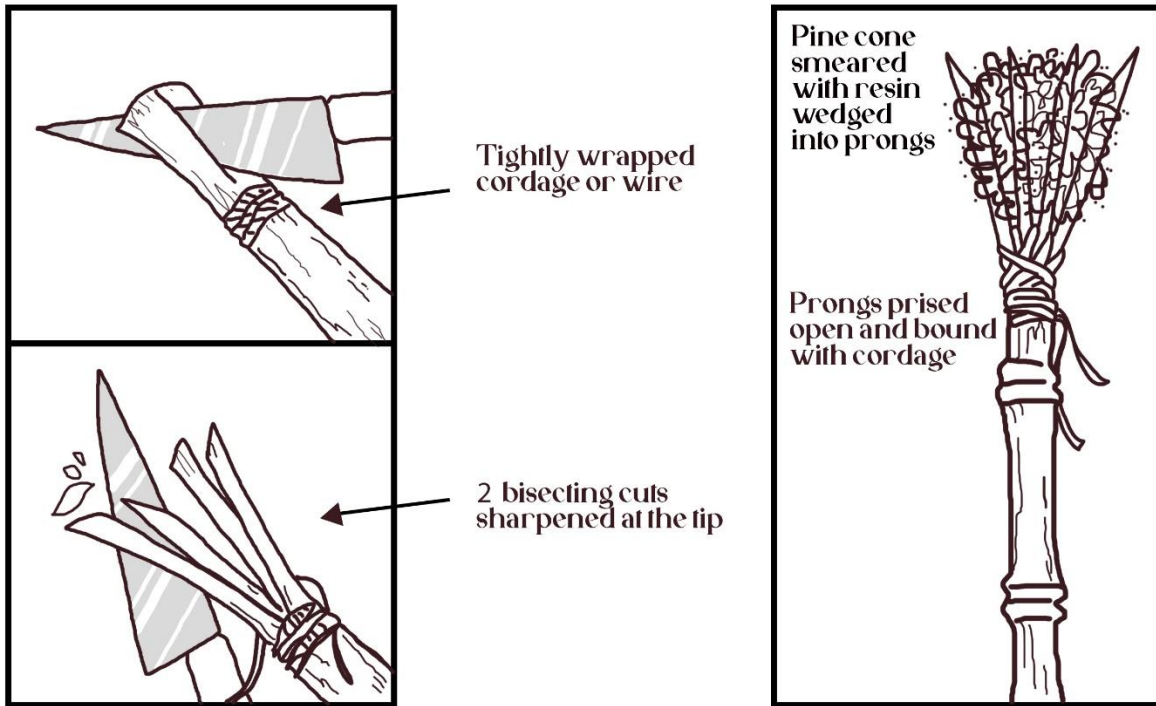


7.4. MAKING A TORCH

One of the simplest ways to make a torch is to pick a long stalk of cattail with a dry flower head. Soak the flower head in either oil, animal fat, cooking grease or warm tree resin and hang it upside down to drip dry for an hour. A well soaked cattail torch can last an hour or more. Once the flames have died down, the flower head will hold heat and continue smoldering, which makes it a great way to carry an ignition source to the next camp or another fire.

A torch can also be made by soaking old rags in animal fat, cooking grease, oil or tree resin and then wrapping or tying this tightly to a green branch.

Pine cones smeared with resin will burn for at least 15 minutes. To make a handle for the pine cone, choose a sturdy, green branch that is about the width of your wrist. Split the end of the branch into 4 sections with 2 bisecting cuts, approximately 8 inches (20 cm) deep. Wedge the smeared pine cone into the split branch and it's ready.



Birch bark is naturally high in oils but even if it is tightly wrapped onto a green branch, there is still a high risk of dropping hot embers so this method should only be used in wetter environments or seasons.

8. FISHING WITH NATURAL RESOURCES

8.1. FISHING HOOKS AND FISHING LINE

Barbs for a fishing hook or spear can be made from any tough, thorny plant, such as locust trees, hawthorn, silverthorn, firethorn or agave.

A hook can also be carved from wood or a shattered bone, or even fashioned from the legs of stick insects or praying mantis.

Fishing line should be lightweight, thin but strong. Dried animal sinew or tough plant fiber that has been plaited or reverse twisted can be a good substitute for nylon line.

8.2. FISHING NETS

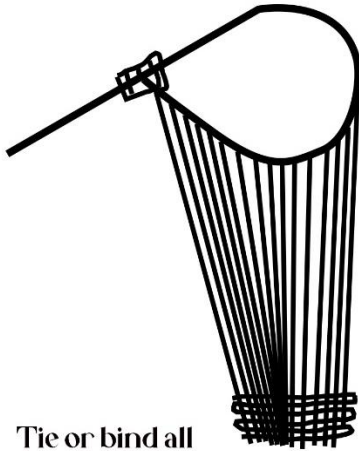
A fishing hand net can be fashioned from spider webs. First, cut a 6 foot (2 m) long branch and strip the leaves off, making sure the branch is green and flexible enough to create a large loop which will be the frame of the net. Loop the branch and tie it with some vine or other cordage to secure it.

Next, walk through the forest or woodland and sweep up the spider webs on both sides of the frame. An effective fishing net will require at least 30 spider webs in order to catch small minnows, crayfish, frogs and tadpoles.

To weave a sturdier hand net from plant fiber (reeds, vines or thin strips of bark, for example), first start with a flexible, green sapling or branch which is tied into a loop to make the frame.

Tie about 20 – 30 strips of your chosen plant fiber to the loop and tie or bind the other ends into a single knot at the bottom. Next start weaving more plant fiber in the opposite direction to make a loose net.

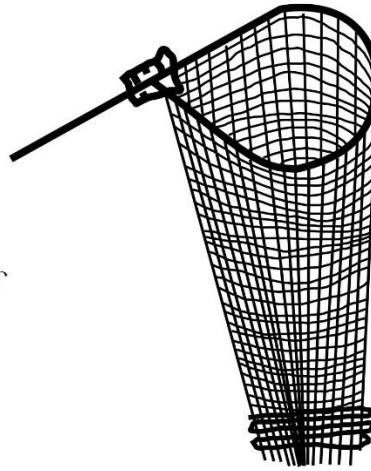
Flexible, green sapling or branch tied into a loop to make the frame



Tie about 20-30 strips of plant fiber to the loop

Tie or bind all the ends into a single knot at the bottom

Weave more fiber in the opposite direction to make a loose net

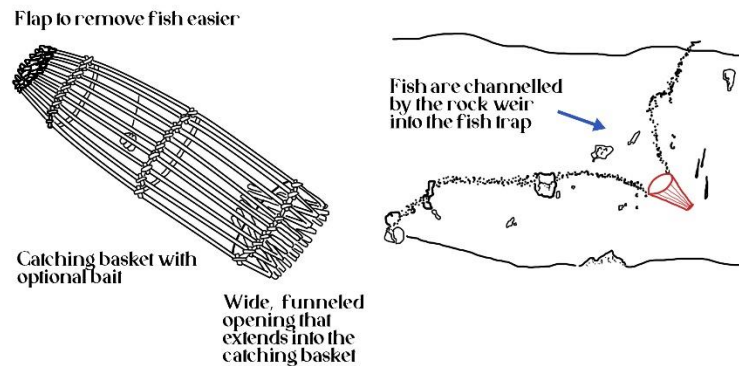


To weave a casting net, it's better to use a diamond formation instead of a square formation and to use thinner cordage. This is achieved by creating a row of loops that are interconnected with the next row of loops and secured at every join with a slip knot.

8.3. FISHING TRAPS

V-shaped rock weirs and fish traps work in combination to help concentrate fish into confined, shallow waters, but should only be constructed in survival situations, since weirs are illegal in most States. When using this technique, be sure to disassemble the weir before moving on so that fish can move freely again.

Fish traps can be woven from sticks, bamboo, reeds and branches to make a wide, funneled opening that catches the fish in a basket behind it. When making a fish trap, make sure the funnel extends at least a third of the way into the catching basket to ensure the fish can't find their way out again. Ideally the end of the basket should have a flap to remove the fish easier.



8.4. STUNNING FISH

There are many wild plants that can be ground up and added to a slow stream, pool or even rock pool to stun or paralyze fish for easy collection. This method is particularly effective when used in combination with rock weirs and fishing nets. These include;

- Stalks and leaves from Indian hemp (*Apocynum cannabinum*)
- Yellow buckeye fruit (*Aesculus octandra*)
- American pokeweed leaves or berries (*Phytolacca americana*)
- Bark or green nut shells of black walnut (*Juglans nigra*)
- Jack in the pulpit leaves (*Arisaema triphyllum*)
- Goat's rue (*Tephrosia virginiana*)
- Coralberry root (*Symphoricarpos orbiculatus*)
- Dove weed leaves (*Croton setigerus*)
- Any plants that are high in saponins, such as the soap plants listed in Chapter 11 can also be used to paralyze fish in slow moving or still water.

It's also possible to concentrate fish in a small, shallow area and hit the water above them with a large branch to momentarily stun them.

9. HUNTING AND TRAPPING WITH NATURAL RESOURCES

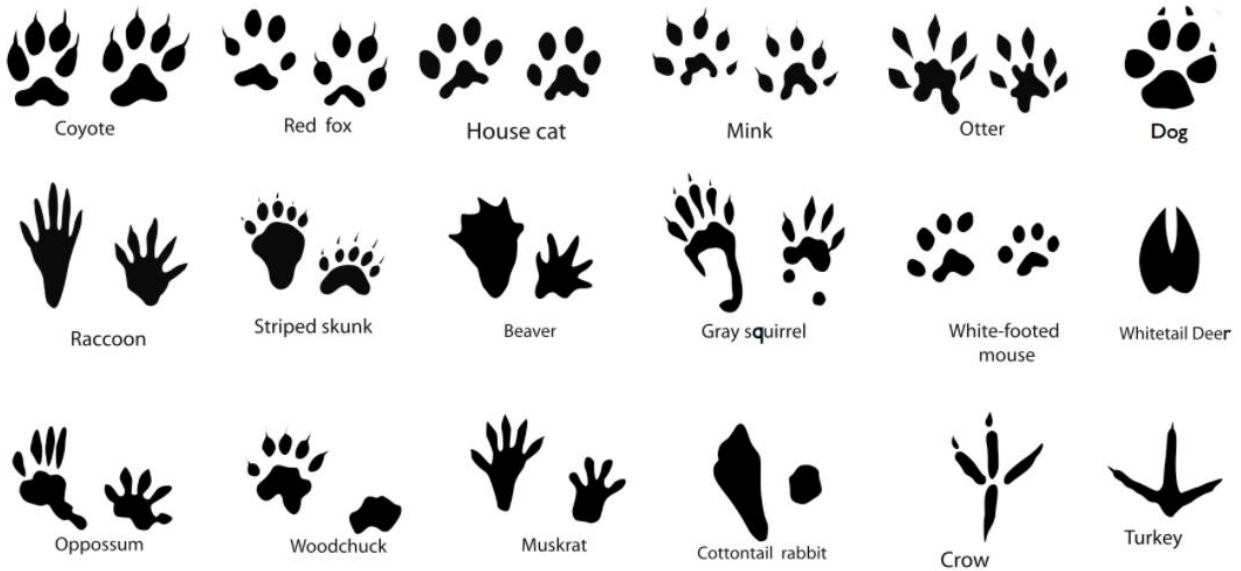
9.1. ANIMAL BEHAVIOR

Animals can potentially guide you to water sources and even food sources. Most birds and many mammals such as pigs and rabbits tend to drink and eat at dawn and dusk, whereas deer tend to drink in the late afternoon and evening before feeding.

9.2. IDENTIFYING ANIMAL TRACKS

When attempting to identify animal prints, take note of the length and width of the stride, as well as the size of the print itself. Larger animals will generally leave larger and deeper prints. Below is a brief description of a few common animal prints;

- Dogs, foxes, wolves and coyotes have 4 toes and may leave a slight claw print as well.
- Cats also have 4 toes, but won't leave any claw prints due to their retractable claws.
- Chipmunks, squirrels, rabbits and hares all have 4 small front toes and 5 toes on a longer hind foot.
- Weasels, badgers, otters, skunks, minks and bears all have 5 toes, usually with obvious claw prints as well.
- Deer, Elk, cows, sheep, goats, pigs and moose all have a pair of pointed toes. Deer, goats and pigs may also leave a print of their dew claws either directly behind the pair of pointed toes, or in the case of pigs, slightly to the outside.
- Raccoon and opossum prints look similar, but raccoon prints look like baby hand prints with small claws, whereas opossum prints are much more spread out with an opposable hind toe and only has claw prints on the hind feet.



9.3. IDENTIFYING ANIMALS SCATS

One way of knowing what kind of animals are in the area is to identify any scats (feces) that you find.

In general, animals are grouped into what type of diet they have; herbivores, carnivores and omnivores. Herbivore scats will only contain grass and plant matter such as nuts and seeds and are often clusters of bean or ball shaped scats. Herbivores that have multiple stomachs (ruminants) like deer and goats digest the plant material better, so their scats are shiny and dark in color. Carnivore scats will mostly contain bones, fur, feathers, fish scales or insect shells and tend to be tapered at one end of a cylindrical shaped scat. Omnivore scats may contain anything, including worms and the shape depends on their diet at the time.

Badgers, water voles, rabbits, hares and pine martens return to the same latrine on a regular basis.

Birds and reptiles often produce white stained or colored scats.

Mammal Scat of North America



9.4. HOW TO MAKE AND SET A SNARE

It's important to find some suitable placements to set up multiple snares. Look for game trails, faint tracks, burrow openings or any digging activity to help you decide on the placement of the snares. Avoid disturbing the area too much and if possible, mask your scent by covering the trap and your hands with mud when handling the snare. Otherwise, holding the snare in smoke for a few minutes will help to mask any scents.

If you are using natural fiber or nylon fishing line, remember that some animals will be able to chew through these types of materials.

A wire snare with a swivel attached is the best choice for a snare, since the wire can't be chewed through and the swivel prevents the wire from getting a kink and potentially breaking.

To make a snare, simply tie a small loop on one end of the cord or wire, then feed the other end through it to make a larger loop that acts as a noose when an animal walks through it.

The easiest way to set a snare is to anchor the end of the snare to a tree or stake in the ground, then use twigs and branches to hold the noose up. Strands from spider webs can also help to hold the snare open.

To catch squirrels, place a long branch or log against a tree and set multiple snares along the length of it, making sure that the snares are set far enough away from the tree or other branches so that the caught squirrel can't get a foothold anywhere.

A snare can also be modified to include a long handle to catch roosting birds or small mammals.

Check your snares at least 3 times a day to minimize any stress to the animal and quickly kill anything that you have caught.

9.5. USING A NET FOR HUNTING

A woven net can be utilized in many hunting situations.

A net can be held across a rabbit hole to catch them after they are flushed out. Make sure to close all but two entrances to the burrow, then hold the net over one entrance and blow smoke down into the other to flush them into your net. Alternatively, you can flush them out with a ferret or snake.

Frogs are easier to catch with a sturdy net by plunging it into the mud in front of them as they swim away. Avoid brightly colored frogs, tree frogs, warty textured toads or ones with "X" markings.

9.6. HARVESTING BIRD EGGS

It's possible to harvest eggs from the wild sustainably by always leaving at least 3 eggs in the nest which you should mark with a pen, charcoal or juice from a berry.

The bird will lay more eggs to replace the lost ones, which you can continue to collect, and the original marked eggs will be able to continue to develop without impacting on their hatching time.

9.7. SUSTAINABLE USE OF ANIMAL CARCASSES

The whole animal can be either eaten or used. Bones make excellent tools for skinning, fishing and chiseling or can be made into spear points and sewing needles. Intestines can be used to make cordage. Sinew can be made into thread or bow strings once it has been dried and the fibers split. The brains can be used to tan the hide. The fat can be used to waterproof many items or rendered down and filtered to make soap and tallow. The stomach or bladder can be used to store water or stretched over a rock and dried into a bowl. The hooves can be cooked in water to produce gelatin. Anything left over can be used as bait.

10. EDIBLE INSECTS

10.1. COMMON EDIBLE INSECTS AND WHERE TO FIND THEM

There are a large number of common insects across North America that are not only edible, but also nutritious. Below is a short list of edible insects that you can easily identify and forage for:

- Ants can be found in all environments and they can be collected with a sweet bait or by putting a stick in an anthill. Boiling is the best method to cook them as this neutralizes their acids.
- Roly poly or wood louse are very common in damp, decaying leaf litter or under rocks. They can be roasted or fried and has a slight shrimp taste.
- Grasshoppers, crickets, cicadas, katydids and locusts can be roasted or fried once the legs, wings, antennae and head are removed.
- Larvae can be found in old, rotting logs and then skewered and cooked over some coals.
- Bees can be toasted or roasted once the stinger has been removed.
- Termites can be eaten raw, but you must be quick once you open their nest.
- Aphids can be eaten raw and their taste depends on what plant they are feeding on.
- Earwigs are best toasted and eaten whole. They are often under logs and rocks.
- Dragonflies can be caught with a spiderweb net close to water. Remove the wings before cooking them.
- June bugs are attracted to light, so can be lured easily. Lightly fry or roast them.
- Stinkbugs can be soaked in water to remove their stink chemical, otherwise you can eat them raw.
- Stick insects are also edible once cooked. Their legs can be used as delicate hooks.

In general, an insect may not be safe to eat if it is brightly colored, hairy or emits a strong smell. Most hard-shelled insects should be cooked first, whereas most soft-bodied insects can be eaten raw.

11. HYGIENE

11.1. NATURAL SUBSTITUTES FOR SOAP.

Many wild plants have high concentrations of saponins which lather up when mixed with water and can be used as soap. These include;

- crushing yucca leaves and roots,
- boiling bracken rhizomes (*Pteridium aquilinum*),
- crushing the bulb of soap plant (*Chlorogalum* spp.),
- saltbush roots,
- crushed and boiled leaves and flowers from clematis,
- the soaked seeds of horse chestnuts (*Aesculus hippocastanum*), lychee fruit and other *Sapindus* species,
- crushing or boiling the roots from the noxious weed soapwort (*Saponaria* spp.),
- boiling the stems and berries from Buffaloberry (*Shepherdia rotundifolia*)

Ash or sand can be mixed with water and used as a substitute for soap, otherwise soap can be made by mixing animal fat with lye or potash. First, slowly cook the animal fat down to render it, making sure to add water to the bottom of the pan to stop it from sticking. This will take approximately 1 – 2 hours and will need to be stirred constantly. Next, make lye by filtering water through ash from a fire. Mix 2-parts of the rendered fat with 1-part of lye, bring it to a boil and then simmer until it thickens into soap.

Snow can be scrubbed onto the body and wiped dry for a quick wash.

11.2. WASTE DISPOSAL

Be sure to burry any human waste about 10 inches (25 cm) deep and at least 200 feet (60 m) from any water source.

The soft leaves from mullein (*Verbascum* spp.) and woolly lambs ear (*Stachys byzantina*) plants are multipurpose; they can be used as bandages, toilet paper, napkins or inner shoe soles to cushion your feet. Other natural alternatives for toilet paper include large leaf aster (*Eurybia macrophylla*), sage leaves, mallow leaves and thimbleberry leaves (*rubus parviflorus*).

11.3. PERSONAL HYGIENE

It's also possible to clean your teeth with white ash from the fire and warm water. Natural fibers can also be used as floss. Cavities should be thoroughly cleaned and packed with any number of medicinal plants, such as ginger, garlic, beeswax, cocoa leaves, onion, pine resin mixed with ash, echinacea or willow bark.

Smoke can neutralize odors. It's a great option for airing out socks and clothes and can help with body odor when washing isn't an option.

Clothes and sleeping bags can be shaken and aired in the sun for 2 hours to prevent infestation and mold.

Always keep your feet dry by changing socks throughout the day. Instead of stuffing damp socks into your pack, clip them to the outside of your pack while hiking.

Ticks can transmit diseases so perform a full body inspection on a regular basis, especially if you are sleeping on the ground. The number of ticks will be concentrated where large mammals sleep or rest. Tuck your pants into your socks and shirt into your pants to prevent them getting on your skin. If you find an attached tick, cover it completely with pine resin or fat to suffocate it. This will make removing it easier.

12. ORIENTATION AND NAVIGATION

12.1. HOW TO READ A MAP

Even with modern technology, it's crucial to know how to read a map correctly. The most direct route isn't always the easiest, so being able to interpret a map can help you plot the best route.

BROWN LINES = CONTOUR LINES

These lines show how steep the landscape is; the closer these lines are together, the steeper the slope. They also provide a vertical distance and elevation above sea level; each line represents a difference in altitude of 20 -40 feet, depending on the scale of the map. The numbers associated with contour lines are the number of feet above sea level. Brown lines running north to south indicate a slope facing either east or west. A peak is shown as a round shape, depending on the shape of the peak.

BLUE LINES AND AREAS = WATER COURSES

The thicker the line, the larger the water course is. Ponds and lakes are also blue.

GREEN AREAS = VEGETATION

The darker the green, the thicker the vegetation.

BLACK LINES = MAN-MADE STRUCTURES

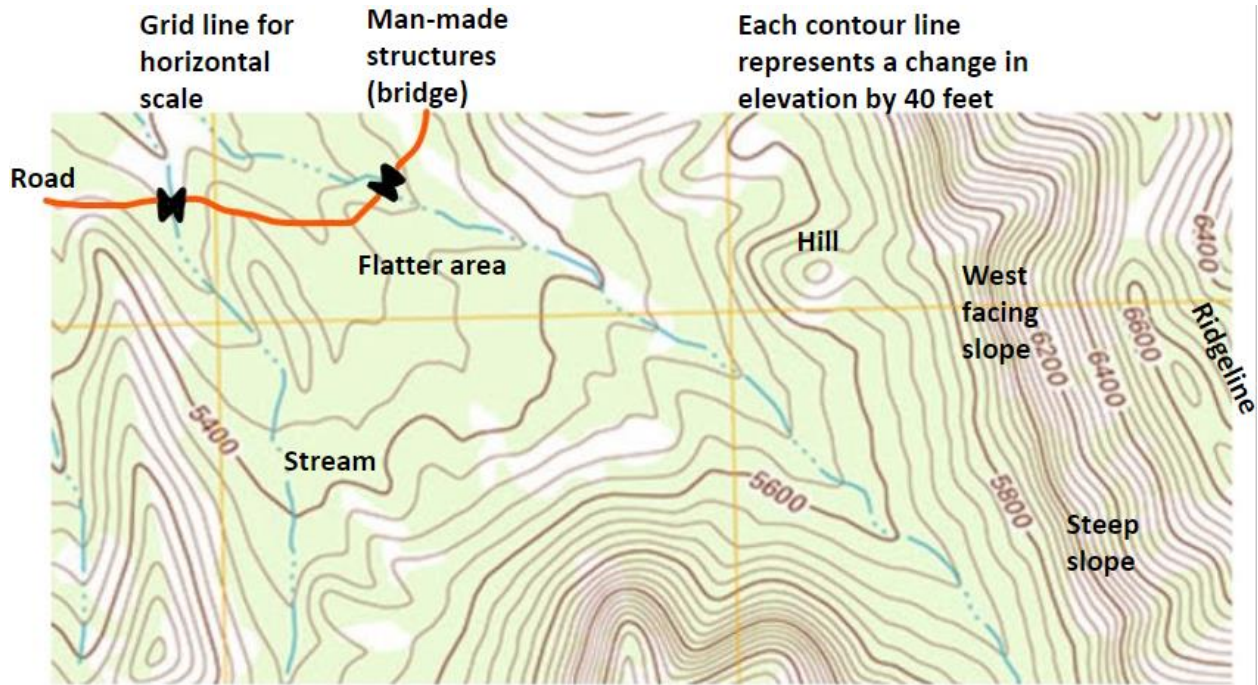
Could indicate a building, fence, bridge, electricity lines or other man-made structures.

RED LINES = ROADS

The thicker the line, the larger the road.

YELLOW GRID LINES

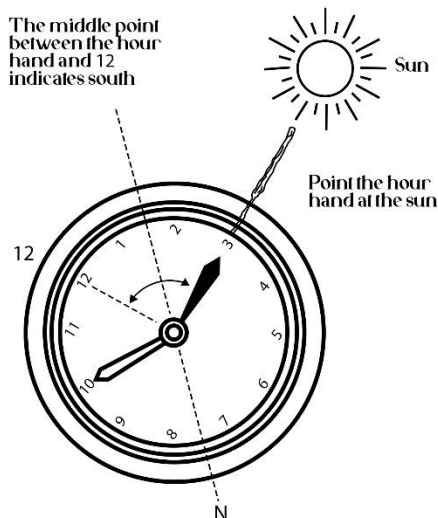
These grid lines indicate the horizontal distance, which will depend on the scale. For example, on a map with a scale of 1:250,000; 1 inch on the map equals 4 miles. Whereas, on a map with a scale of 1:24,000; 1 inch on the map equals 2,000 feet.



12.2. HOW TO FIND SOUTH WITHOUT A COMPASS

The sun and the moon can help to determine direction. In the northern hemisphere, when you look at the sun in the morning, this is southeast. Looking at the sun at noon is south and, in the afternoon, indicates southwest. This means that shadows will point north at noon. Drawing a line from both of the moon's crescents down to the horizon will indicate north.

Alternatively, you can use your wristwatch to find south. Point the hour hand at the sun, the middle point between the hour hand and 12 indicates south.



On cloudy days, the vegetation can be a good indicator for direction, since plants tend to have bushier growth on their southern side in the northern hemisphere. The stumps of felled trees may also help to determine direction, since the growth rings will be wider on the side facing the equator. Vegetation tends to be denser on north-facing slopes in the northern hemisphere.

It's possible to make your own compass if you have a thin strip of metal, like a sewing needle or the metal clip from a pen. Stroke the needle repeatedly in one direction through your hair to magnetize it. Next, place a leaf on the surface of a bowl or puddle of water and carefully place the magnetized needle on top of the leaf. The needle will align in a north-south direction.

12.3. HOW TO ESTIMATE DISTANCES

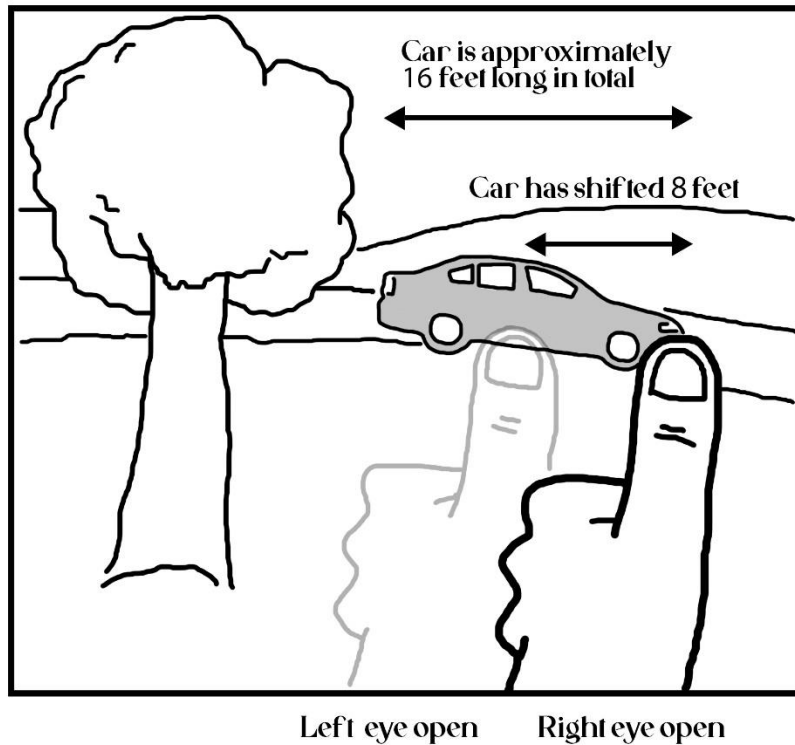
If you have a map, the scale at the bottom and grid lines will give you a good estimate for distances, but don't forget to consider how steep the landscape is by counting the number of contour lines to calculate how much up or down hill travel is required.

On a flat landscape, it is approximately 3 miles to the horizon. This distance increases as you rise above sea level and can be calculated by figuring out what your elevation is from the contour lines on a map, then using the following formula;

$1.22 \times \text{the square root of your elevation in feet} = \text{distance to the horizon in miles}$

For example, the average elevation across the United States is 2,493 feet. Therefore, on average, the horizon is approximately 61 miles away.

Another method of estimating distances is to use the thumb method. This can only provide a rough estimate and relies on knowing the length of a fixed object (a car, shed, animal, gate or building) to calculate distance from. For example, if you see a car parked in the distance, you know that the car is approximately 16 feet long. Hold your thumb up at eye level and keep it still. Close one eye and align the edge of your thumb up with the edge of the car. Then switch eyes while keeping still. Your thumb will have appeared to have shifted to one side of the car. Measure the distance that your thumb has shifted, in this case, half a car length so about 8 feet. Multiply 8 feet by 10 to calculate how far away the car is from you (80 feet away).



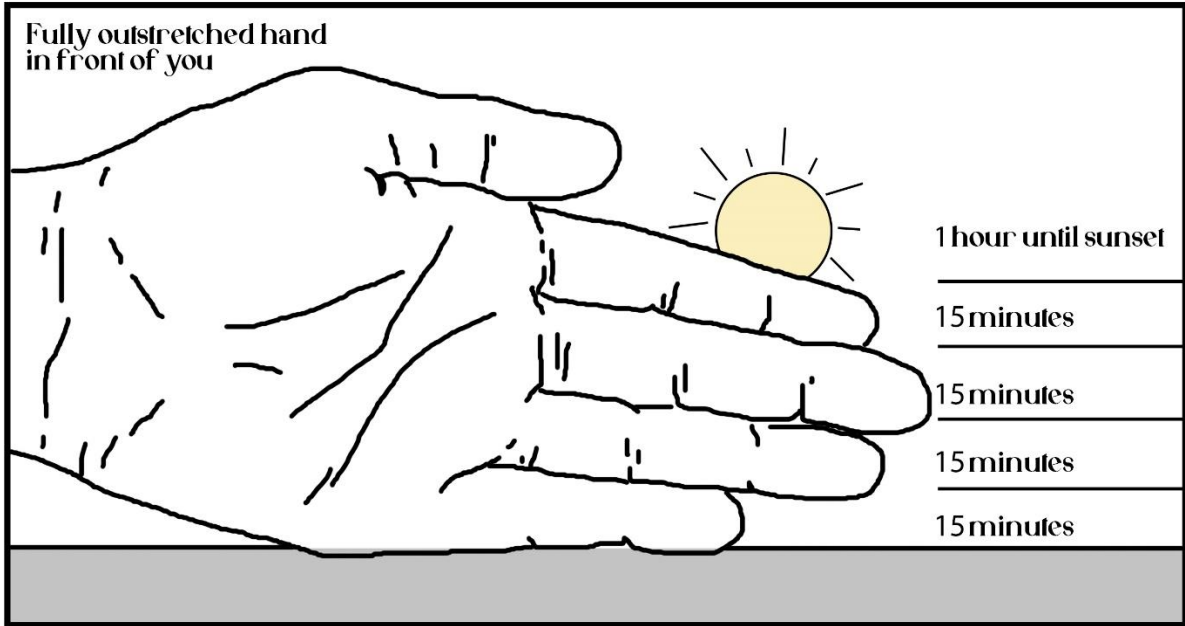
12.4. FAMILIARIZING YOURSELF IN THE LANDSCAPE

Familiarize yourself with an area by finding an obvious landmark and using this as a visual aid to return to each time. At the start, make sure to stay within sight of your chosen landmark. Eventually you can increase the distance away from your camp as you become comfortable with navigating and orienting yourself.

One way of helping you return back to camp from exploring a new area is to snap a twig or rip a leaf every 30 – 50 feet (10 – 15 m) along your trail at about eye level. These minor disturbances can help to guide you back the way you came over shorter distances.

12.5. HOW TO ESTIMATE DAYLIGHT HOURS

To estimate the number of daylight hours left without a watch, stretch your hand out horizontally in front of you. The number of hands (excluding the thumb) you can fit between the sun and the horizon are the number of daylight hours left. Each hand is an hour, and each finger is 15 minutes.



13. SAFETY

13.1. WILDERNESS FIRST AID

Make sure your first aid kit includes a needle and thread and possibly some activated charcoal pills.

Pine resin makes a good adhesive and fresh new bark can be stripped off smaller branches to make sticky plasters. Warm pine resin can be mixed with charcoal and fine plant fibers to create pitch. This pitch can be applied to wounds while still warm.

Some natural sources for bandages from the wild can include plantain leaves, sphagnum moss, mullein leaves, cattail flower spikes and leaves and lambs ears.

Elevate the wound and apply pressure to reduce bleeding, clean the wound with clean water, apply an antiseptic poultice and cover with a bandage or leaves. A sock with a thumb hole cut into it makes an easy arm bandage.

Spruce trees such as conifers, fir, cedar and tamaracks produce a lot of smoke when burnt, so can be used to signal across long distances. However, this smoke is not appropriate for smoking food.

Always notify someone of your plans, including the location, intention and a return date and time. The international distress signal is always in groups of three; three signal fires or rock piles in a triangle formation; three flashes of a light or mirror or three shouts or whistle blows followed by a long pause and then repeated.

13.2. SAFE RIVER CROSSING

When preparing for a river crossing, pack all of your belongings into a single, tight, waterproof bundle. Plan to cross the river at a 45° angle downstream instead of straight across. Make sure it's possible to remove your backpack quickly just in case you lose your footing.

In fast moving, shallow water, find a branch that equals your own height that is approximately the same thickness as your wrist. Use the branch to cross the river by placing one end upstream and slightly in front of your feet while wedging the other end against your chest. This way, the branch at your feet will break some of the current while the other end will help to stabilize you as you cross.

In slow moving, deep water it may be more suitable to build a raft for your belongings. This can be achieved by lashing a few small pieces of dry wood or bamboo together, or stuffing a sack with plant material and tying it up tightly.

Avoid crossing in fast moving water that is above the knees. Avoid any large obstacles or water eddies which indicate a submerged object and cross upstream of a sandbar so that if you lose your footing, you will be swept towards the sandbar. Do not cross a river near a waterfall or heavy rapids.

In cold weather, consider building a raft to avoid getting wet. Vines, heavy cordage and rope can be used to lash some dry logs together. Target low density, light wood that will float easily such as pine, cedar, conifers, fir, alder and ash trees.

Now that you have learnt some basic survival skills, you can put them into practice and adapt them as you see fit. Being able to apply these skills to a broad range of circumstances requires flexibility and creativity, so the more you practice them, the easier it will be to adapt them to each situation.

Of course, sharing what you have learnt with other outdoor enthusiasts is a great way to refine and broaden your skills. In doing so, you may also encourage others to venture out into the wilderness and learn about the world around them in a sustainable way.