Pathfinder

WILDERNESS LIVING

Specialty

Resource Material

Wilderness Living
Specialty Activities

+ Denotes a campout activity component

p1. Know the possible dangers of eating edible native plants and be familiar with simple tests in determining a 'safe' edible plant.

p2.+ Be able to estimate the time during the day without the use of a watch.

p3.+ Find and identify a minimum of 20 useful plants.
- a. A minimum of 10 edible plants.
- b. 10 plants useful for medicinal purposes, dyes, tools etc

p4.+ Be able to estimate the time during the night without the use of a watch.

p5.+ Be able to light a fire without a match.

p6.+ Explain how animals and their habits can aid survival. Demonstrate principles of stalking and camouflage, and list animals you have stalked and tracked.

p7. Discuss the importance of water to survival and be familiar with where to find water sources.

p8. Have a personal survival kit of 15 vital items for backpacking and camping and know how to use each item.

p9. Be familiar with the construction of a solar still, and know at least three other ways of obtaining water from nature, including the transpiration method.

p10. List the procedures in a wilderness emergency such as being lost.

p11.+ Participate in a search and rescue operation using two way radio, help to care for the patient, build and carry a stretcher, and follow directions from the leader.

p12.+ Participate in a campout in which you have to construct your own shelter and furniture from natural material.

ACTIVITY P1

Know the dangers of eating edible native plants and be familiar with simple tests in determining a 'safe' edible plant.

OUTLINE

Discuss with the Pathfinders the necessity of eating a balanced diet when eating native plants, and discuss the precautions that should be taken when selecting plants to eat.

RESOURCE MATERIAL

Balanced Diet.

Food and water are essential for living. Under normal conditions a person cannot live longer than three days without water, but one can live ten days or longer without food.

Food, apart from its vitamins, minerals and trace elements, must contain proteins and carbohydrates. Proteins are the flesh builders. Carbohydrates are the energy makers - the fuels for your body furnace.

For every action you burn fuel. The more vigorous the action the more fuel you require, and the faster your body burns it. This fuel is supplied from the carbohydrates in your food. Your body can no more run without fuel than can the engine of a car if the petrol tank is empty. Your body stores up in its cells reserves of sugars, so that even if you have no food for your stomach, you can draw on these reserves and keep going for a short time. These reserves must however be replaced.

Your body also needs other food items such as salt and special minerals and vitamins, but in a natural diet most of these essential specialties are contained in the fruit and vegetables which we would eat.

It is possible to have a full stomach at every meal and at the same time to starve to the point of death. If you tried to live only on protein you might starve for carbohydrates, and correspondingly, you could be full of carbohydrates but starve for proteins. There should be a balanced proportion of proteins and carbohydrates, and the proportion is, roughly one part of protein to six parts of carbohydrates.

Another absolute daily essential is salt. Without sufficient salt there can be serious physical consequence. In tropical areas where there is great loss of

body salt through excessive perspiration, it is essential to eat salt, and maintain the salt content of the blood at a safe level.

Precautions.

Anyone who embarks on a hobby of eating native plants has a fascinating field of study, which may be marked by a few surprises. However, with good sense and care, little harm is likely to befall them. Unfortunately, there are few general guides to plant edibility which can be given.

Taste is one of the best indicators.

An unpleasant taste will protect most people from many poisonous plants but there is as well, some dangerous species which have no unpleasant taste.

There are two fairly common poisons in the vegetable world. Fortunately, both are easily identified by taste.

One has the taste of a bitter almond or peach leaf. This is *hydrocyanic or prussic acid,* a potent and highly dangerous poison which is often water soluble. When you find this taste in a plant, whether leaf, root, seed or fruit, suspect the plant as a source of food in the raw state.

If this poison is present, try boiling some of the plant, and then taste. If the 'almond' taste is no longer noticeable, then you may regard the plant as probably safe to eat after boiling.

It is unwise to eat a large meal of the plant after this test. It is far safer to eat a small portion, and then wait a half hour. If there are no signs of stomach ache, vomiting or sickness, then you can be quite certain that the food is now safe.

Poisoning can be serious. The symptoms of poisoning are stomach pains, nausea, and vomiting. Antidotes would be alkaline such as milk or soda (white ash from a fire is soda ash and would serve as an antidote mixed with water).

The other poison is recognised by a sharp stinging, burning or hot sensation caused by tiny barbs irritating the tongue, throat, lips and palate. This poison is an *oxalate of lime crystal.* It can be exceedingly painful, causing swelling of the tongue, throat and lips. In general, oxalate of lime crystals are not soluble in water.

If this poison is detected in a taste test of a plant, reject the plant out of hand. The poison cannot be removed and the plant is not edible.

Avoid any plant which is bitter or very acid or very 'hot'. The unpleasant taste is a certain danger signal.

Colour.

Colour provides no general guide except to the extent that some fruits are poisonous when green and unripe but harmless when fully ripe and coloured.

Milky latex or coloured sap.

Plants with a milky latex or coloured sap should be regarded with some suspicion since some families of plants with latex contain a high proportion of poisonous species; however, by no means are all these latex-bearing plants poisonous.

Animals.

Animals do not always provide a reliable indication of a plant's suitability for human consumption, although the more closely related the animal is to man the better the guide it gives. Insects are no use at all; lava of the common crow butterfly spends its life munching steadily through oleander leaves, one of which could kill a man. Birds provide a better lead but are by no means infallible: in some cases a poisonous part may be voided with out absorption by the bird; for example, the large blue fruit of the *Cerbera floribunda* are eaten by the cassowary but the poisonous seed passes through it, causing it no harm. Even though a bird may eat a fruit that is non-poisonous the flavour may be so unpleasant to human taste as to make it quite inedible. Marsupials, being close to humans, probably provide a better guide, but even here the example cannot be followed to closely; the koala's diet of gum leaves is not to everyone's liking. Monkeys are usually regarded as reliable indicators but they are absent from the Australian bush.

Chemical tests for plant substances which may be toxic.

Saponins: Thoroughly grind or pound a sample of the plant and shake vigorously with water. This is preferably done after boiling and cooling the plant. The appearance of a froth, stable for half an hour, indicates the presence of saponin. Some plants such as the red ash have such a high saponin content that their leaves may be used for washing the hands. The Aborigines threw rushed material of saponaceous plants into pools to stupefy fish.

Cyanogenetic glucosides: To test for these substances which release prussic acid when the tissue containing them are crushed, first prepare sodium picrate testing paper. Dip absorbent paper such as blotting paper or filter paper in a 1% solution of picric acid and allow to dry. Then dip briefly in a 10% sodium carbonate solution and again dry. Pound or thoroughly crush the plant material, eg. a few small leaves or part of a large leaf. Place the material into a small container such as a test tube or pill bottle. Moisten a strip of the test paper and insert it into the container, holding it in place with a cork or lid. In the presence of prussic acid the yellow paper will gradually turn orange-yellow or brick red, the change occurring within a few minutes to several hours depending upon the

concentration of the prussic acid. Peach leaves are good material to use to demonstrate a positive reaction to this test.

Many but not all cyanogenetic glucosides release benzaldehyde, the flavour of bitter almonds. These can be tested for very simply by crushing the material thoroughly, holding tightly between the palms of the hands for at lease thirty seconds and then sniffing. The odour of bitter almonds indicates the presence of one of these glucosides.

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Bushman's test for Edible native plants

1.Crush part of the plant and extract several drops of 'juice' and place onto the inner elbow. Wait for half an hour and if no reaction occurs proceed to the second test. If reaction occurs reject the plant as edible.

2.Crush part of the plant and place under your tongue. If no reaction occurs within a short period of time proceed to the next test. If a reaction occurs reject the plant.

3.Eat a small amount of the plant. If you are not feeling sick after half an hour than the plant is probably safe to eat in small amounts. If a reaction occurs reject the plant.

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Remember: your own body normally provides you with safeguards. First is the sight of the food. If it looks healthy and clean, it may be all right. The sense of smell is your next safeguard. If the food smells all right, you apply the next safeguard and taste it. If the taste is all right, the food is probably safe.

The principle of edible native foods is as simple as that.

Remember to be careful with nuts and seeds; and avoid the fungi. If you remember these rules you will undoubtedly be guided safely in testing and eating most plants which are palatable.

WILDERNESS LIVING

Wilderness Living Hand-out 1.

Precautions when eating native plants.

Bushman's test for Edible native plants

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ACTIVITY P2

Be able to estimate the time during the day without the use of a watch.

OUTLINE

It is important for the Pathfinders to be familiar with the method for estimating time with a compass. Present the information about the corrections and for estimating the time without a compass as a matter of interest but it is not required to be known.

RESOURCE MATERIAL

Time - The watch is the accepted means of measuring time, but the watch may out of action, and therefore it is necessary to have another method to estimate time.

Time is our means of measuring the intervals between events. The most regular event in our lives is the movement of the sun, and therefore for every day purpose time is measured by the sun's movement.

Time from the sun with a compass If you have a compass, time can easily be read from the suns position. This should be possible to within four or five minutes. Decide from your compass your true North-South line for the place where you are, and remember to make allowances for the magnetic variation from true north. Measure the number of degrees the sun is from this imaginary North-South line, and multiply this number of degrees by four to obtain the number of minutes. One degree is equal to four minutes.

For example, the sun is 34 degrees from the North-South line. It is morning because the sun is on the eastern side of the North-South line, 34 x 4 = 136 minutes before noon, or 2 hours and 16 minutes before noon, therefore the 'sun time' is sixteen minutes to ten.

This does not mean that it is 16 minutes to ten by the local clock, because there are two corrections to be made before local standard time can be determined.

A figure eight drawn to the proportions shown and with the four dates remembered when the meridian transit coincides with the mean time will give reasonably accurate corrections.

The top part of the figure eight is about one-third the size of the lower half. The horizontal line is divided into three five minute sections to the right and left, and the sides marked **PLUS** to mean that the sun is ahead of mean time. The left is marked **MINUS**, to indicate that the sun is behind the mean time.

The application of this 'Equation of time' correction will be required if you want to get accurate time from the sun.

Longitude correction The other correction you will have to make is to solar time is a correction for longitude. Time for clocks on various parts of the Earth's surface is called standard time, and is based on the longitude convenient for a large track of country.

In England, time is based on Greenwich, hence the term 'Greenwich mean time'.

In other large land masses such as Africa, America, Russia and of cause Australia, standard time may be defined as Eastern Standard Time, Central Standard Time, and Western Standard Time.

To make the necessary longitude correction you must know whether you are east or west of the meridian on which standard time is locally based.

If you are east, your sun will be ahead and you must deduct four minutes for each degree you are east of the meridian. If you are west, your sun will later than that standard meridian and you must add four minutes for each degree you are west.

For Tasmania, Victoria, NSW and Qld, the meridian of longitude on which standard time is taken is E 150^{o}. For the Broken Hill area of NSW the meridian of longitude is E 135^{o}, South Australia, Northern Territory, E 142.5^{o}, Lord Howe Island E 159^{o}.

Finding local time without a compass Knowing that the sun is at its highest point in the sky at midday, and that this point is on the North-South line means that by finding where this position will be, will give you true North.

True North can be found by using the shadow stick method as outlined in the Map and Compass honour notes.

It is apparent that if you can work out the North-South line from the method above, than you can work out the number of degrees the sun is off the North-South line and thereby discover the correct local time.

A mean of measuring degrees

Hand at full arm's length, fingers widely spread, the distance covered from the tip of the thumb to the tip of the finger is equal to about 22 degrees.

Hand at full arm's length, fingers widely spread, the distance covered from the tip of the little finger to the tip of the pointer finger is equal to about 15 degrees.

Closed fist at full arm's length, the distance covered between the two outside knuckles is equal to 8 degrees.

Fist at full arm's length, the distance covered between the end knuckle and the second knuckle is about three degrees. This can be the knuckle from either end of the fist.

Fist at full arm's length, the distance covered between the two inner knuckles is about to 2 degrees.

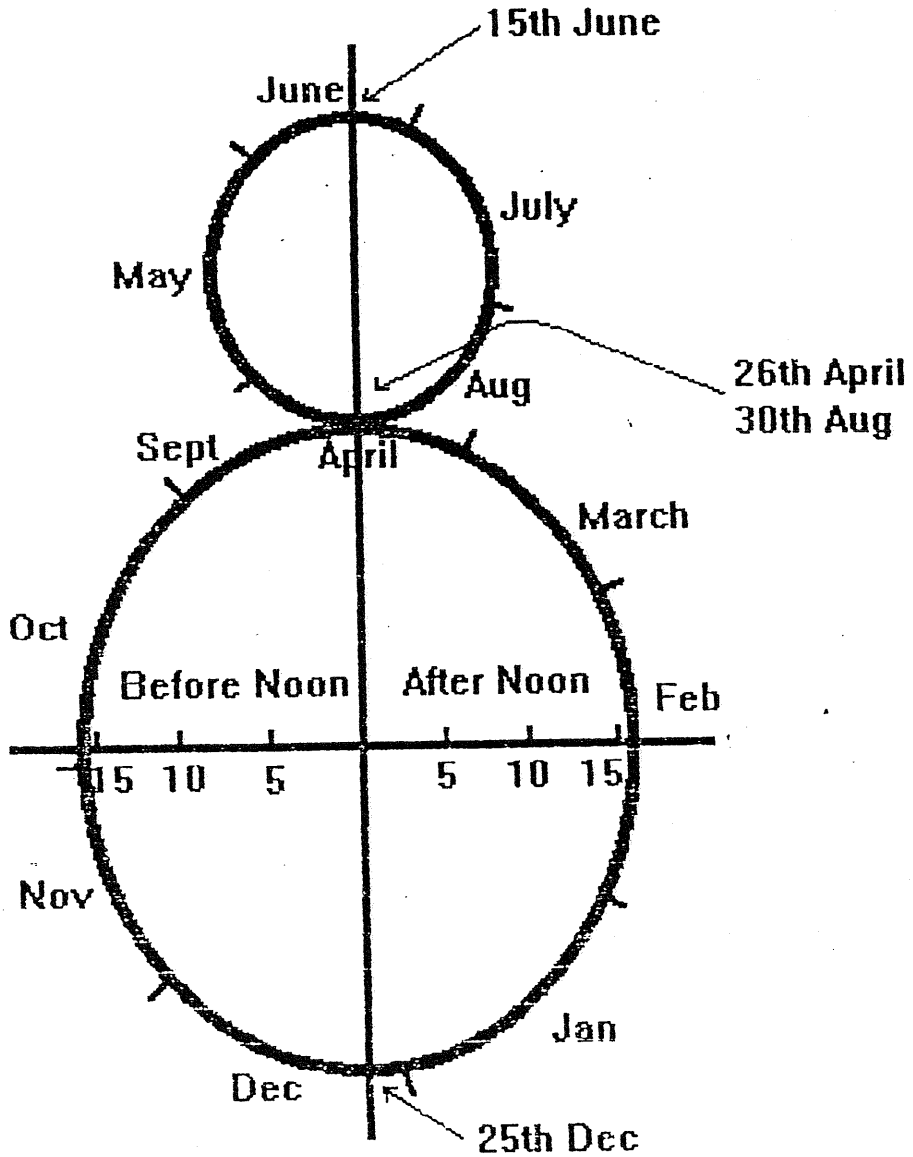
These measurements vary with individual personal dimensions and for accuracy should be individually checked with a compass.

WILDERNESS LIVING

Wilderness Living Hand-out 2.

Time from the Sun

Correction to Standard Time



ACTIVITY P3

Find and identify 20 useful plants.

a. A minimum of 10 edible plants.

b. 10 plants useful for medicinal purposes, dies, tools, etc.

OUTLINE

Present to the group, examples and pictures of edible/useful plants, noting the parts of the plants that are edible/useful and how they are prepared.

RESOURCE MATERIAL

Grasses, ferns and herbage.

Grass tips

The young whitish tips of all grasses are edible, and most are very palatable and tender. They can be eaten raw, and have a considerable food value. This also applies to bamboo, which is a botanically giant grass. The seeds of all grasses are edible, and a valuable protein source.

Ferns

The young fiddles of many of the ferns are regarded as being edible, but only a few are palatable, and many have a tendency to be sour. Bracken tips are edible, but are not recommended by some authors.

Herbage

Leaves from many forms of herbage are edible and very palatable. The plants specially recommended are *Tatragonia,* sometimes called the New Zealand spinach, and sometimes miscalled 'saltbush'. This plant grows along the sub-tropical coastal areas. It may be recognised by its light-green, slightly fleshy leaves and small yellow flowers. Tatragonia may be eaten raw or boiled. It is very palatable and has a fair food value.

Pig Face (*Mesembryanthemum*)

These are all edible raw and most have a high moisture content and a tendency to act as a mild purgative. Food value is low, but they can sustain life. Baked they are good food.

Pig Weed

This is edible and is good food.

Watercress

This grows in most of the fresh water courses, and along the edge of streams. It makes an excellent salad eaten raw, has a slightly 'hot' taste, and when freshly picked is crisp and nourishing. A word of warning! this plant often harbours fresh water snails, which is a host to some of the flukes and parasitic worms that can be found in our streams. Do not take chances, wash the leaves thoroughly before eating.

Stinging Nettle

These are edible and are very palatable, but, of course, they cannot be eaten raw. Boil them for 10 minutes before serving. Nettles are grown in gardens in France for food. They must be picked with caution as the poison spines can give a nasty sting.

Leaves

The leaves of many plants are edible, and very palatable, and can comfortably sustain life. The only test is to taste the leaf. If it is tender and pleasant to the palate and the danger taste of almond, bitter or extreme acid are not present, then you can eat a small quantity, and if there are no ill-consequences, then the leaves of that particular three or shrub are safe to eat, and will be good food. The leaves of most plants contain oil cells which gives the leaf its taste or flavour. This is generally most marked in the young leaves at the end of the branches.

Beware of all plants which have a coloured sap, white, red or black. Many of these saps are a danger signal, and some, particularly the white saps, can inflict painful burns to the skin or, if allowed in the eyes can cause blindness.

Fungi

All forms of fungi growth should be avoided. The food value is negligible, and unless you know for certain that a particular fungus is safe to eat, do not touch it. The fungus plants contain poisons which effect the nerves by causing paralysis.

Arctic Berries

In the cold climates most berries are edible. This is in contrast with tropical and sub-tropical areas, where the berries generally should be regarded as probably poisonous. In tropical areas the colour red is always a danger signal, and a good rile is to avoid all red berries. This does not apply to the colder climates, where almost all the red berries are edible. Poisons are liable to be present in berries and this general rule should be observed in regard to all unknown berries.

Seeds and Nuts

A few seeds contain deadly poisons, and these poisons may not always be detected by the palate. In general, a bitter, strong acid, or burning taste is a

general signal of poisonous contents. Any seed with these tastes should be avoided. The mere act of tasting will not affect you. The poison may be tasted but must not be swallowed. When you are tasting seeds to see if they are edible, you can spit out the portion you have tasted if it is unpalatable, and there will be no ill-effects.

Nuts, of course are seeds, but for this work they have been separated into a different section. Many nuts contain hydrocyanic acid poison. This is always detected by the palate, and in nearly all instances where it occurs it can be dissolved by either boiling or soaking the nut in water for 10 to 20 hours. Unless you know for certain that nuts are safe to eat, regard them with some suspicion and test by first tasting, and if tasting indicates no poison then eat a small quantity. If there are no ill-effects within an hour, the nut will be safe.

Roots and Tubers

Most of the roots and tubers are safe, but all must be boiled or given heat treatment in some way before they are digestible.

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List of some 'commonly' found edible plants

Sow or milk thistle	*- young leaves and shoots, raw/cooked*
False sasparilla	*- boiled leaves make a pleasant drink*
Wattle Flowers	*- mixed in battered fritters*
Wattle seeds	*- roasted*
Wattle resin	*- dried can be made into jelly*
Dandelion	*- leaves eaten raw roots cooked or raw*
Bottle brush	*- flowers sucked to obtain nectar*
Waratah	*- nectar eaten directly from flower or washed into drinking water*
Wombat berry	*- ripe fruit eaten raw*
Geebung	*- ripe fruit eaten raw*
Wild blackberry	*- ripe fruit eaten raw*
Scotch thistle	*- base of flower eaten cooked*
Dock	*- leaves eaten raw or cooked*
	- roots and leaves used for medicine
Stinging nettle	*- young leaf parts boiled*
Bracken fern	*- 'fiddle-head' eaten raw or cooked*
Tree fern	*- starch from top of trunk eaten raw*
Mistletoe	*- ripe fruit eaten raw*
Common reed	*- young shoots/root nodules eaten raw*

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WILDERNESS LIVING

Wilderness Living Hand-out 3.

List of edible Plants

List of some 'commonly' found edible plants

Sow or milk thistle	*- young leaves and shoots, raw/cooked*
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Tree fern	*- starch from top of trunk eaten raw*
Mistletoe	*- ripe fruit eaten raw*
Common reed	*- young shoots/root nodules eaten raw*

ACTIVITY P4

Be able to estimate the time during the night without the use of a watch.

OUTLINE

The activity leader must be sure that all Pathfinders are able to find the Southern Celestial Pole before presenting the rest of the information.

RESOURCE MATERIAL

The Southern Celestial Pole.

The Southern Celestial Pole (SCP) is the point in the sky in which all the other stars revolve. It is important because it is used to locate true south and in this case for telling the time.

In the northern sky, the Northern Celestial pole is designated by the bright star called the 'North Star'. But the SCP does not have any star in close proximity and therefore is not easily found.

The pointers of the Southern Cross belong to the constellation of the Centaur, and are known as Alpha and Beta Centauri. Beyond the end of the long arm of the cross, towards the SCP, is a group of four small stars called musca (the fly) and near it are the three bright stars of the Southern Triangle.

There is a fairly bright star on the other side of the SCP to the Southern Cross and approximately the same distance from the pole as the 'cross', this star is called Achernar.

Finding the Southern Celestial Pole.

1. Imagine a line drawn through the long arm of the cross and continue for a distance equal to four times the length of the cross. Where this line ends is the SCP.

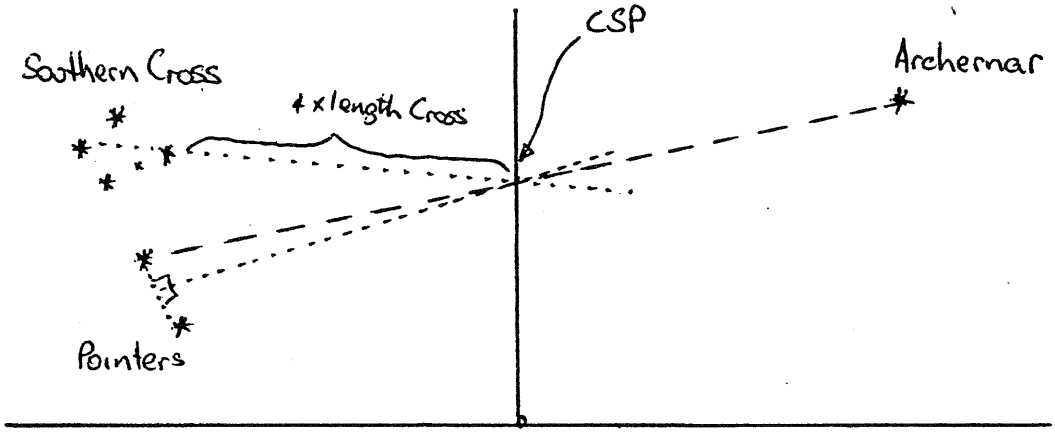
2. Imagine a line drawn between Achernar and the Pointer nearest the cross. Half way along this line is the SCP.

Finding the time.

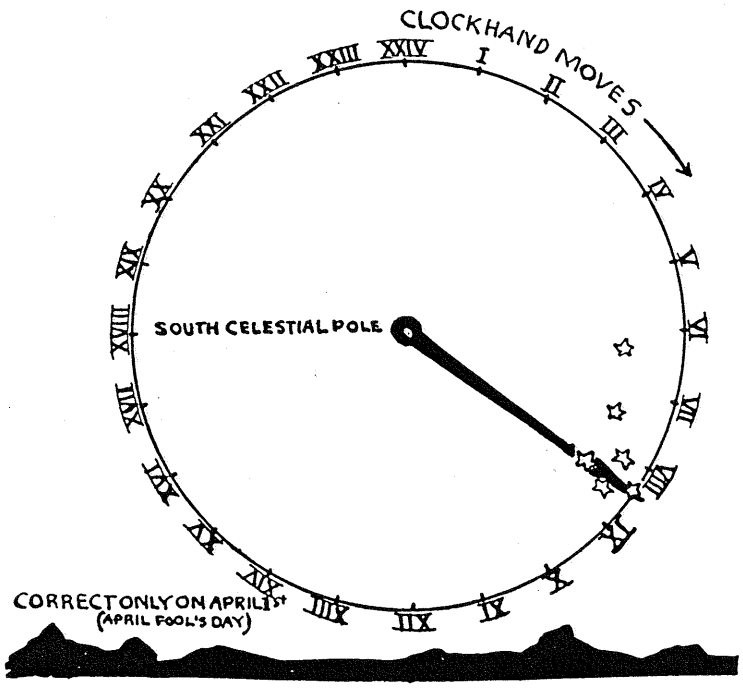
In the Southern hemisphere the stars appear to revolve clockwise about the SCP. The Southern Cross is the hour hand of a twenty four hour sky clock and the centre of the dial is the SCP. This clock is correct on April 1st (April fools

day), and thereafter it gains at the rate of 14 minutes a day or 2 hours a month, so that if it reads 8.20 on September 1st, it will be ten hours fast, (Sept. 1st being 5 months after April 1st) and therefore the correct time will be 10 hours before 8.20 which is 10.20.

Finding the SCP



Sky Clock



To go over that example one more time!

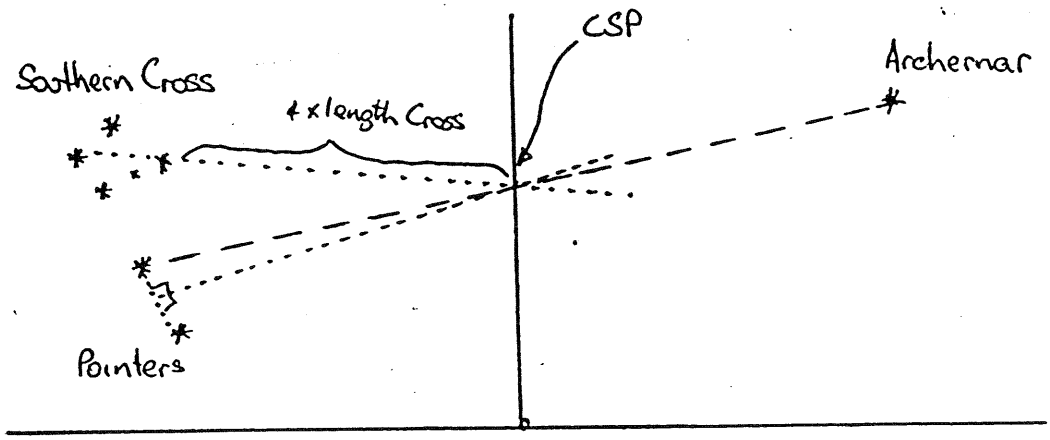
The hour hand of the clock with the Southern Cross at the tip, points to 8.20, and the date is the 1st of September. At this point we must remember that the sky clock is only accurate on April fools day (April 1st), and that it gains two hours for every month after that. September is 5 months after April therefore the sky clock has gained 10 hours on actual time. We then count back from the sky clock time (because it is fast) 10 hours. The correct time is 8.20 - 10 =10.20.

WILDERNESS LIVING

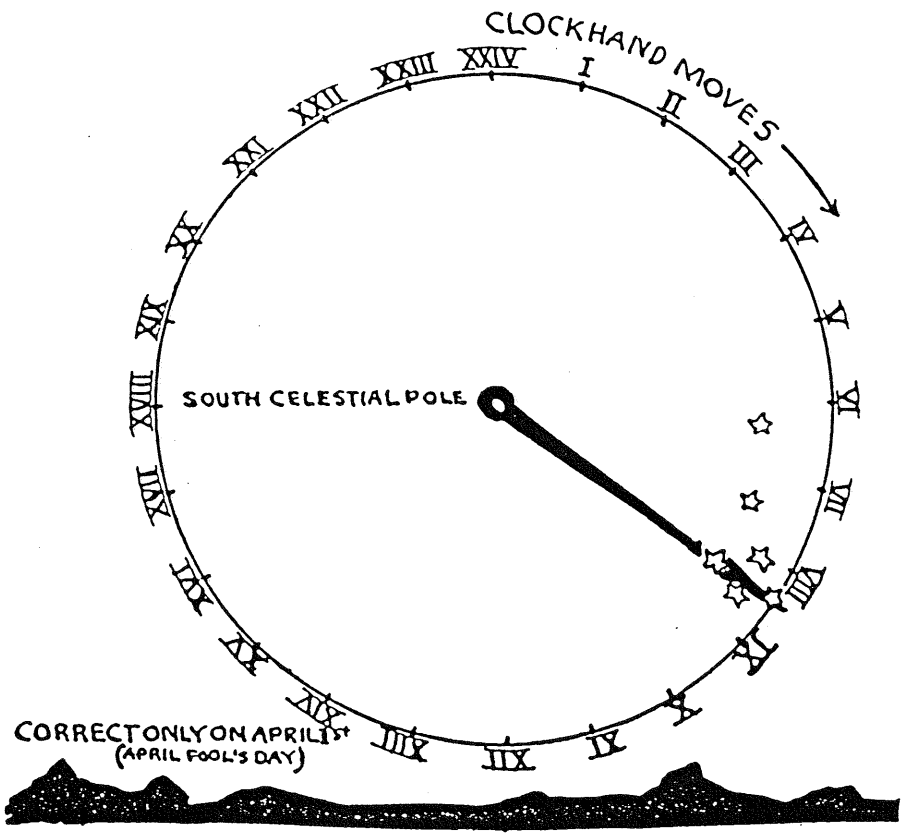
Wilderness Living Hand-out 4.

Time from the Stars

Finding the Southern Celestial Pole



The Sky Clock



ACTIVITY P5

Be able to light a fire without a match.

OUTLINE

Discuss with the Pathfinders the importance of having good tinder and then present some of the techniques that they can try on their camp out, to light a fire without a match.

RESOURCE MATERIAL

Direct Flame, using sugar and potassium permanganate (Condy's crystals). Take about one teaspoonful of sugar, and about half this quantity of potassium permanganate and mix together, and place in a follow cut in a piece of dry wood. This hollow must be big enough to hold the whole of the dry mixture. Round off a straight stick, about 1 to 1.5 mm thick and 300 mm long to a shallow point. Place this end of the stick in the powder and rotate the stick rapidly between the two hands. The mixture will burst into a slow flame. Several attempts may be necessary to obtain ignition. This method may not be effective in damp or cold weather.

Tinders and their Preparation

The principle required from a tinder is that it must be readily combustible and finely fibred.

A simple test of natural, that is unprepared, tinder should be made to discover which materials are suitable. To make the test, take a loosely teased handful of the material and place a coal from the fireplace into the material and blow. If the fire from the coal extends to the tinders it can be regarded as suitable.

Natural tinders are generally found in dry, beaten grass, finely teased bark, and palm fibre. Most of these coarse tinders are improved in their ability to take and hold a spark by being beaten and pounded until the fibres are fine and soft.

Natural fire-catching properties of tinders can be improved by the addition of a light dusting of very finely ground charcoal or, better still, being thoroughly scorched.

If saltpetre is available a little may be mixed with the charcoal before it is

added to the tinder, or the tinder itself can be soaked in a solution od saltpetre and water and allowed to dry before use.

Tinder impregnated with a solution of saltpetre and later dried must be carried in an airtight container. If carried otherwise the saltpetre will become damp with moisture from the air. With this, or other prepared tinders you always have an emergency means of getting fire.

Old cotton or linen rag, scorched black and teased, is among the best of all tinders. A pinch of this, placed where the spark will fall, is certain to take the spark and quickly become a glowing coal.

Using these tinders, lighting fire from spark is comparatively easy.

Striking a Spark

Flint and steel, of course, were the common method of lighting a fire before friction matches were perfected and no great skill is needed for their use. The synthetic flint used in a cigarette lighter is a considerable improvement on natural flint. A couple of pieces of synthetic flint pressed into a small piece of 'perspex ' make an excellent emergency firelighting outfit (heat the perspex and press the flint in while it is hot. Hold under cold water and the perspex will shrink on the flint and hold them securely).

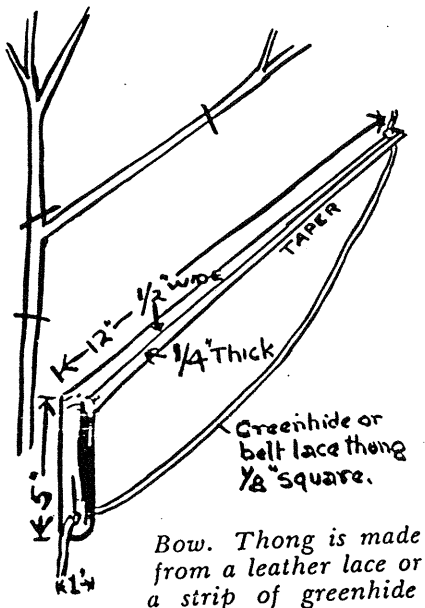
An alternative to flint and steel are two pieces of iron pyrite, which, when struck together, throw off a shower of hot sparks that will last for at least a second. Iron pyrite is a common crystalline formation, and not difficult to obtain. Iron pyrite and steel will also give a hot spark. Quartz and steel, or two pieces of quartz, will also strike off good sparks, but these latter stones are very much harder to use.

The sparks must fall on the tinder, which in turn, must be blown into a coal, and from the coal to a flame. Only a pinch of tinder is required when you are proficient with striking a spark

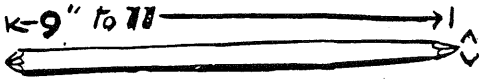
Fire by Friction

Firelighting by friction consists first generating a spark or tiny coal, and then nursing this (in tinder) to flame.

Firelighting by friction is most easily mastered by the rotation of a drill or spindle in a foot piece. The drill, with some native people is rotated between the hands but this requires considerable skill. Other primitive people rotated the spindle by the means of a bow and thong. This is the easiest method. The component, which should be prepared beforehand, are a bow, headpiece, drill and footpiece. The dimensions given below are a guide for size.

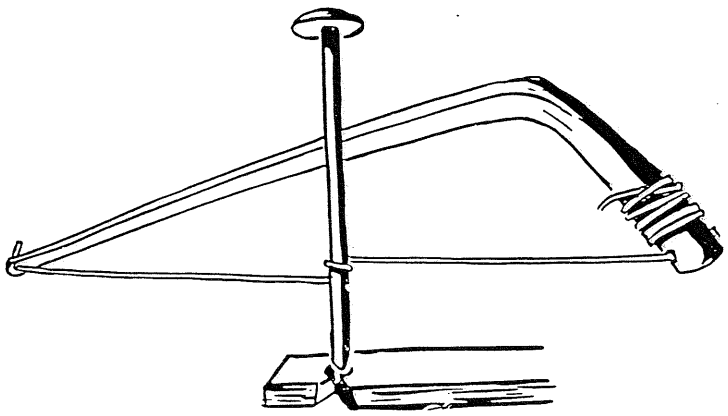


Bow. Thong is made from a leather lace or a strip of greenhide belt lacing.

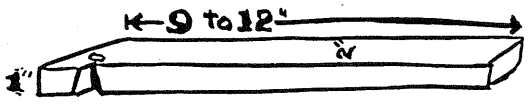


Drill.

To use a fire set, the drill is put under the thong, and twisted so that *the drill is on the outer side of the thong, and with that portion of the thong nearest the handle of the bow on the upper side of the drill.* This is important.

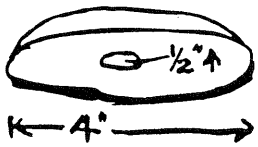


This is how the thong must be round the drill. If the thong is wrong way on the drill it will cross over itself and cut in a few strokes, also the full length of the stroke cannot be obtained.



Footpiece.

The foot piece has a shallow hole cut with a knife point into the upper side about half an inch from one edge. In this hole the drill is rotated. Into the edge of this hole from the nearest side, an undercut V is made. This should be at least 3 mm into the hole itself.



Headpiece.

The underside of the headpiece has a shallow hole bored into it, and this is lubricated preferably with lead(graphite) from a pencil. A smear of fat will also serve as a lubricant, or if this is not obtainable, wax from the ear can be used.

The correct body position for using the bow and drill is to kneel on the right knee, with the ball of the left foot on the footpiece to hold it firmly to the ground. Place the lower end of the drill in the hole in the footpiece, and the top end of the drill in the hole in the underside of the headpiece.

The left hand holds the headpiece. The wrist of the left hand must be braced against the shin of the left leg. This will enable you to hold the headpiece perfectly steady.

To learn to use a firebow it is advisable to learn to rotate the drill slowly. This is done by drawing the dow backwards and forwards. The thong round the drill will spin the drill. Only a light pressure is put on the headpiece. Very soon you will see smoke coming from the footpiece, and notice that a fine brown powder is being ground out. This is forming a dark ring round the edge of the hole. This powder is called "Punk". By examining it you can learn whether the woods you are using are suitable for firemaking.

The punk which will produce a glowing coal must feel slightly gritty when rubbed between the fingers, and then with more pressure it should rub gradually to a silky smoothness as soft as face powder. This testing of the punk is extremely important. If you do not know for certain that the woods you are using are suitable for firelighting always make this test first.

When you consider that you have mastered control of the bow and drill you can start trying to get fire. Place a generous bundle of tinder under the V cut. When the drill is smoking freely and you have the punk grinding out easily so that the V cut is full of it, put extra pressure on the headpiece and at the same time give twenty or thirty faster strokes with the bow. Lift the drill cleanly and quickly from the footpiece. Fold some of the tinder over lightly and blow gently into the V cut. If you see a blue thread of smoke continuing to rise, you can be sure you have a coal. Fold the tinder completely over the footpiece, and

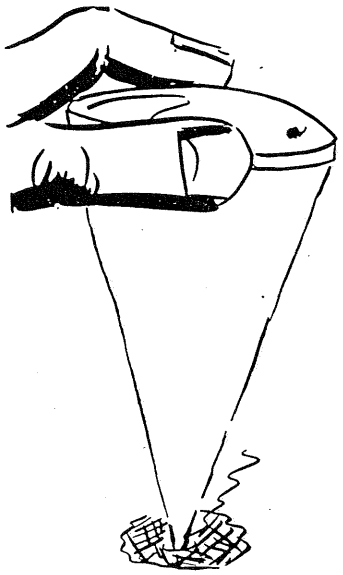
continue blowing into the mass. The volume od smoke will increase, and a few quick puffs will make it burst into flame.

A tip given by some authorities is to put a little charcoal or gritty material into the hole in the footpiece. The claim is made that this enables more punk to be ground out, and the spark to be obtained to be obtained more quickly.

Suitable woods for the footpiece and drill (the same wood should be used) includes willows and some of the non-resinous pines.

Fire from a Magnifying Glass

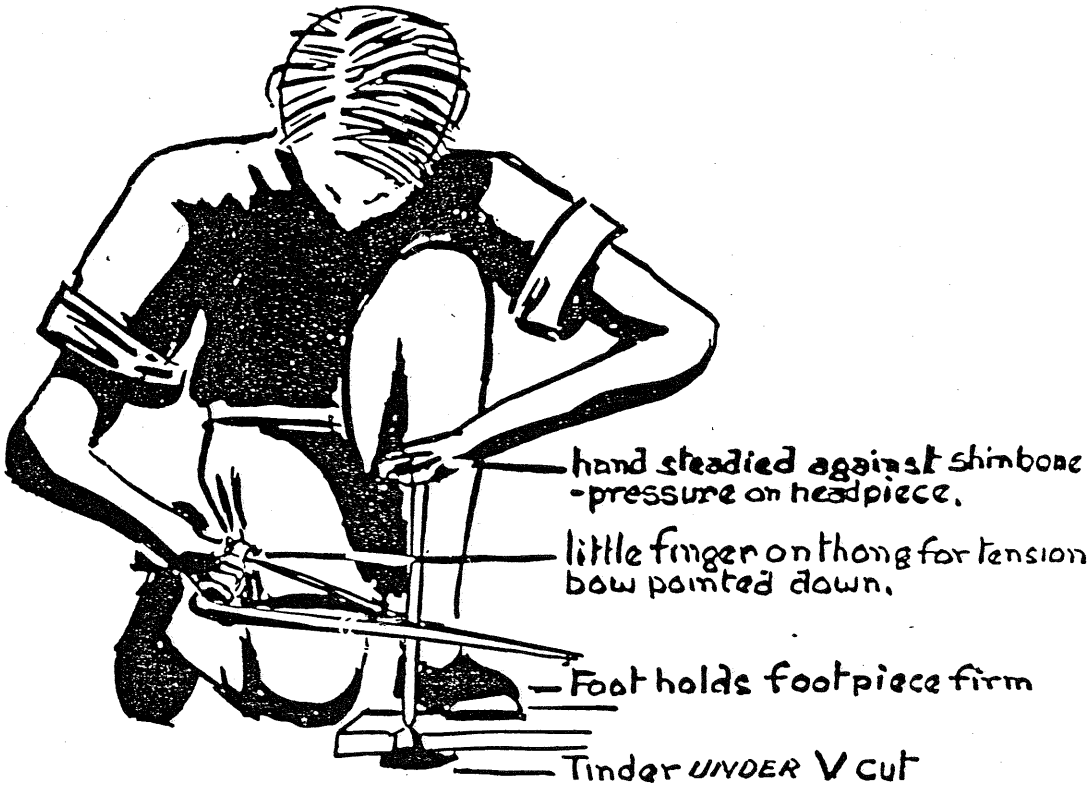
Almost everyone at some tome or other has focused the sun's rays concentrated by a magnifying glass onto a piece of paper or cloth to make it smoke. Lighting a fire with a magnifying glass calls for a ball of tinder with the inner core of extra fine material. Onto this outer core the sun's rays are focused, and when the finer tinder is smoking freely, it simply requires blowing to produce flame. A concave mirror is even better than a magnifying glass. Powdered charcoal at the focal point will help the tinder to take more easily.



WILDERNESS LIVING

Wilderness Living Hand-out 5.

Fire by Friction



The correct position to hold the various parts of the fireset.

ACTIVITY P6

Explain how animals and their habits can aid survival and, demonstrate principles of stalking and camouflage, and list the animals you have stalked and/or tracked.

OUTLINE

In the activity period allocated to the club hall discuss with the Pathfinders the habits of animals that can aid survival. On the camp out sessions practice the principals of stalking and concealment. Make some plaster casts of animal tracks that you have tracked.

RESOURCE MATERIAL

Animal habits that can aid survival

The greatest way in which animals can aid survival is as indicators to the presence of food and water. This is not a fool proof indicator however, especially for edible plants, therefore the normal precautions for eating of native plant parts must still be observed. All animals, birds, insects and even reptiles require water and for this purpose they are good indicators.

Many different forms of life are indicators of water in the near vicinity. The bee must have water. The mason fly, that big yellow and black hornet-like creature, requires mud and water for the tunnel where it stores the spider it has paralysed. Pigeons and all grain eaters need water but flesh eaters such as the crow and the hawks and eagles can go without water for long periods. By knowing something of the nature of the insects, birds, animals and reptiles you can often find their hidden stores of precious water.

Bees in the area are a certain sign of water. Rarely will you have a hive of wild bees more than five to six kilometres from fresh water. A bee flies a kilometre in 7 minutes. You can be sure that if you see bees you are not far from fresh water, but you will probably have to look for further indicators before you actually find the water supply.

Mason flies are large, hornet-like creatures and are a certain indicator of water. If you see a mason fly building in an area you can be sure that you are within a few hundred metres of a soak of wet earth.

Ants require water, and if you see a steady column of small black ants climbing a tree trunk and disappearing into a hole in the crotch it is highly probable that there will be a hidden reservoir of fresh water stored away there. This can be proved by dipping a long straw or thin stick down the hole into which the ants are going. Obviously if it is wet when you draw it out there is water there. To get the water do not on any account chop into the tree, doing this will allow the water to escape. If the hole is very small, enlarge it with your knife point at the top.

Finches are grain eaters and water drinkers. In the dry belt you may see colonies of finches and you may be certain that you are near water, probably a hidden spring or permanent soak.

Wild pigeons are a reliable indicator of water. Their manner of flight tells the experienced bush person the direction of their water supply. If they are flying low and swift they are flying to water, but if their flight is from tree to tree and slow, they are returning from drinking. It is obvious then that the direction of water can be discovered by observing the pigeons' manner of flight.

Mammals Nearly all mammals require water at regular intervals to keep themselves alive. Even the flesh eaters must drink, but animals can travel long distances between drinks, and therefore, unless there is a regular trail you cannot be confident of finding water where you see animal tracks.

Stalking and Concealment

Use the skills of this activity for observing animals and birds, photographing them or use in a game with other Pathfinders.

In stalking there are a few important rules you must follow. They apply whether you are stalking an animal or trying to outsmart another unit during a game. The first of these rules is *consider yourself watched at all times from all sides*. Actually no one may be watching, but if you imagine that there's somebody there, you will be more careful in your movements, more alert. You will see them before you are seen yourself. The second rule is *Move slowly and silently*. Any quick or sudden movement may immediately give you away. On the other hand, by moving slowly,stepping carefully so that no twigs are broken underfoot and no dry leaves crumble, you can get close without being noticed. In walking through grass, bring the heel down first. On hard ground and rock, it is the other way around. Here you put down each foot toe first to get a firm and quiet footing. Lift your feet high at all times, well off the ground, and keep your balance on the rear foot as you bring the other foot forward. Knowing how to walk is particularly important at night.

The way you hold yourself depends on your surroundings. If you are far

from the object, among trees and high bushes, you can advance carefully in an upright position. If the bushes are low - crouch. Closer to your quarry proceed at a cat creep. Eventually you may have to worm along in a flat belly crawl to get very close.

Keep your eyes on the quarry every minute of the time, so that the moment it looks in your direction you can 'freeze' - that is keep perfectly still right where you are.

You can usually stop a sneeze by pressing two fingers against the side of the nose, a cough by pressing your Adam's apple.

Stalking Rules

1. Consider yourself watches at all time from all sides.
2. Darken you white part, such as face, hands etc, or cover them.
3. Camouflage your hat with leaves.
4. Put yourself into a position to look like a natural object, as a rock, tree etc
5. Cover yourself with leaves, sticks etc.
6. Never look over an object but around it.

Stalking games

1. *Sleeping Bushman* A blind folded Pathfinder sits on the ground guarding an object at his feet. The object is to stalk up to him, take the object and back away without being heard. If the sleeping bush man hears you and points directly at you, it puts you out of the game or perhaps to restart and try again.

2. In fields or woods organise two sides and have them take turns infiltrating through others' lines without being seen.

Animal Tracks

Finding tracks in the forest litter, in undergrowth or in grassy clearings is extremely difficult, and you must look for places without vegetation, preferably where the ground is soft enough to take an imprint. Muddy places and firm, sandy areas often yield good tracks. Creek banks, roadside dust, dried out puddles, claypans and beaches are good places to look.

The best tracks are found early in the morning, before the wind blurs them and the sun dries them out. They are also easier to see in slanting light. Later in the day, when the sun is higher in the sky, the details tend to flatten out.

Plaster Casts

1. Place a piece of cardboard in a circle around the footprint. Make the cardboard a couple of centimetres high and out earth around the outside so that the plaster will not leak out.

2. Place some plaster of Paris in a bowel and run in water until it has a consistency of a thick, sloppy soup. Add more water or plaster until it is just right.

3. Pour the mixture over the foot print, taking care not to let any air bubbles in, and allow the plaster to harden (about 15 to 20 minutes).

4. When it is hard, remove the cardboard, turn the cast over and wash or brush the soil from the footprint. This is the mould.

To make the cast

1. Grease the top of the mould with an even layer of grease or vaseline and place another circle of cardboard around the mould and extending a couple of centimetres above the mould.

2. Pour another batch of plaster mixture into the mould.

3. When this hardens, separate the two and trim the edges of the finished cast with a knife. You have a *positive* cast of the animals footprint.

WILDERNESS LIVING

Wilderness Living Hand-out 6.

Stalking Rules

1. Consider yourself watches at all time from all sides.
2. Darken you white part, such as face, hands etc, or cover them.
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ACTIVITY P7

Discuss the importance of water to survival and be familiar with where to find water sources.

OUTLINE

Discuss the importance of maintaining body fluid and how to ration the loss of body fluid and its effect on survival. Following this discuss the construction of a solar still. It might be exciting to build a solar still on one of your camp out.

RESOURCE MATERIAL

Water is involved in some of the most fundamental processes in the human body and in a survival situation it is even more important than food. Some people survive for weeks without food, but in some circumstances your life expectancy without water may be no more than two or three days. The reasons for this is becomes clear when you understand the part water plays in your body.

The main functions of water in the human body are to transport food to the body cells, help remove waste from them, act as a medium in which chemical reactions occur, and reduce the heat of metabolism. The quality and concentration of water in the body is important.

Water is also a kind of cooling unit for the body. It helps to control the heat of the body's metabolic processes by absorbing large quantities of heat with comparatively small increase in temperature. It also protects the body's chemical process from big fluctuations in pressure, acidity and chemical composition.

The body is constantly losing water. It loses it continuously in the form of perspiration from the skin and respiratory tract. It also loses it intermittently in the forms of urine, faeces, sweat, vomit and even blisters.

Perspiration helps cool the body as it evaporates from the surface of the skin and in average conditions may lose about 850 ml of water a day by perspiring. His urine loss decrease from (up to) a litre down to 300-400 ml when not provided with drinking water. If he is on an ordinary mixed diet, he may excrete about 70 to 140 ml in his faeces. But he can lose much more than this if he is suffering from diarrhoea, or if his sweat glands are activated. A person sweating in a humid environment may lose up to 3 litres an hour; some

working in 43°C may lose about 6 litres in a day. Moreover, sweating may continue even when the body is seriously dehydrated. A person may also lose large amounts by vomiting and smaller amounts through blisters resulting from severe sunburn. Thus an average person living in equable conditions may need only about a litre of water a day, if allowance is made for that made available by the combustion od food, whereas someone indulging in strenuous exercise or working in a hot climate may require several times that amount.

A person sitting exposed in an open boat in the tropics for 24 hours may lose up to 6 litres of water, mostly as sweat. That person could die of dehydration within 3 days if no more that a litre of water a day is available. If a person is walking in the tropics, his body may lose more than 14 litres, mainly sweat. More than two million sweat glands, which work unnoticed in the body at normal temperatures, increase their activity when it becomes overheated and large amounts of water may be lost as the sweat evaporates and cools the body.

It is clear that the water taken in by the body is not stored there. Water is consumed and excreted throughout the day and the body is continually balancing the amount of water it contains. When water is drunk it is absorbed into the blood-stream. If too much water is drunk, some is withdrawn by the kidneys and is passed as urine. If too little is available, the body begins to dehydrate. One of the functions of the kidneys is to help maintain this balance. To survive, a person must balance the loss od water by taking in corresponding amounts.

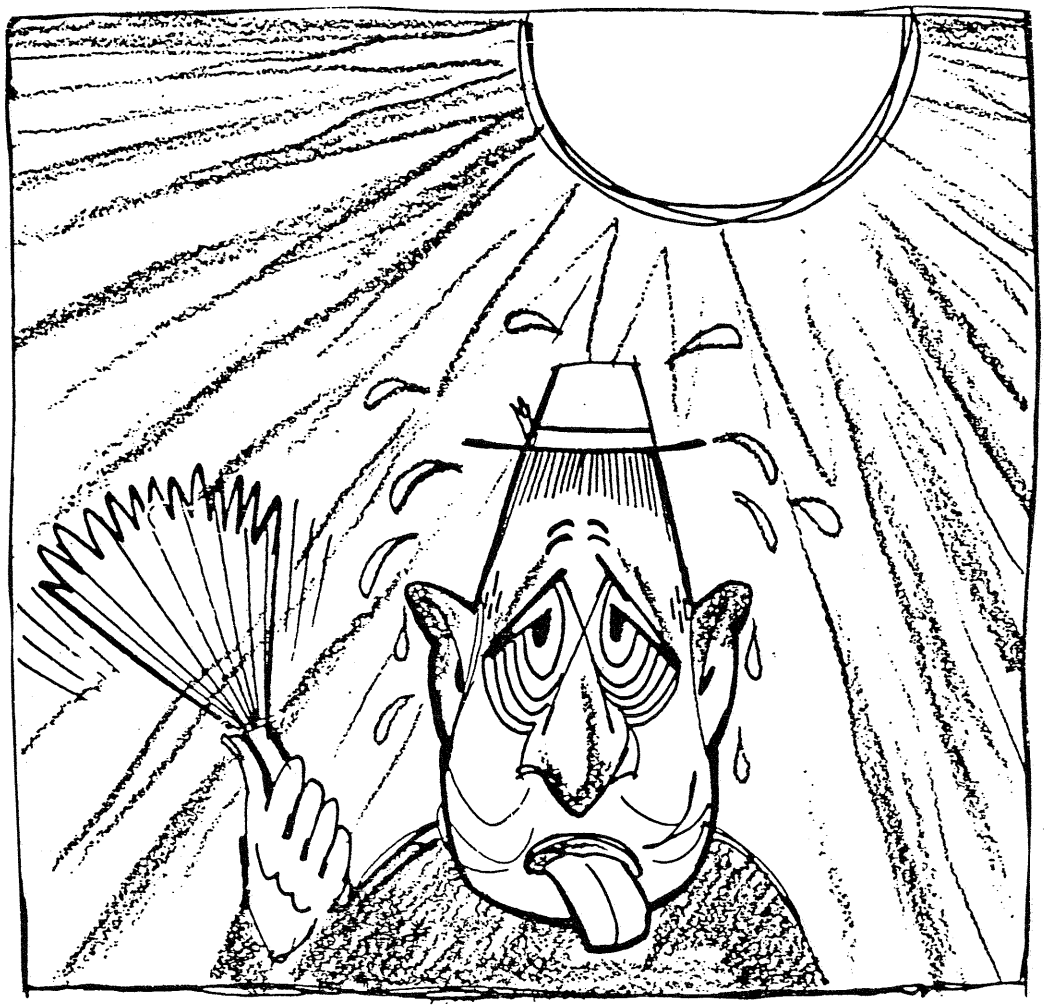
In an equable environment a person may need only about a litre of water a day whereas a minimum of 4 litres a day may be needed in a hot desert. But those 4 litres can be made to go further if certain basic conservation practices are followed. The best way to conserve your water is to control your sweating. The rule is: Ration your sweat, not your water. To do this:

- Keep your clothes on so that your perspiration evaporates slowly and you get the maximum cooling effect. Loosen the clothing at the neck, waist, wrists and ankles to give maximum ventilation.
- Wear light-coloured clothing if possible, because it reflects the sun.
- Cover as much as your body as possible to avoid sunburn, as blisters cause loss of water.
- Do as little as possible and stay cool as possible.
- Stay in the shade during the day and reserve necessary physical action for the night. A person standing still in hot sun needs three times as much water as someone standing still in the shade.
- When you move, move slowly.
- Try not to rest on the ground. The temperature may be 16°C cooler 300 mm above the ground than it is on the ground.
- Take advantage of cool breezes.
- If you are at sea, keep your clothing wet.
- If you have sickness tablets, use them to prevent vomiting.

Just as there is the problem of finding food in the bush, so too is there a problem of finding water.

WILDERNESS LIVING

Wilderness Living Hand-out 7.

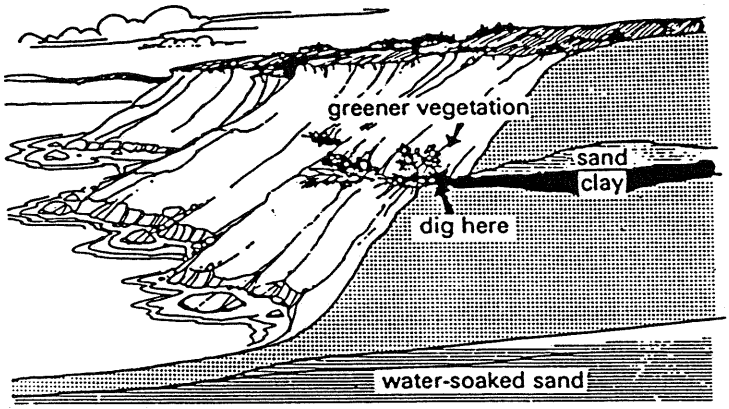


RATION YOUR SWEAT . . . NOT YOUR WATER

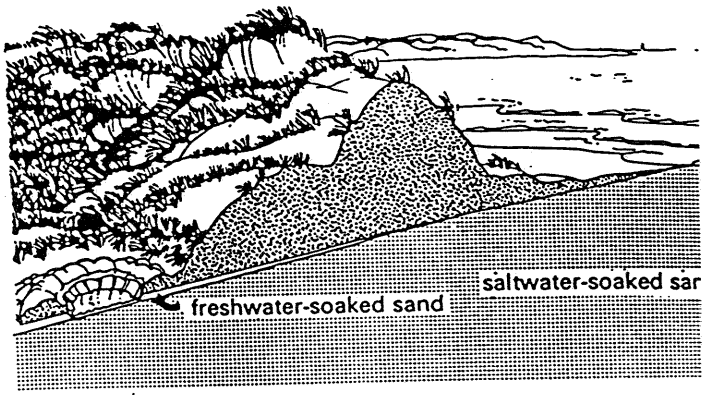
WILDERNESS LIVING

Wilderness Living Hand-out 8.

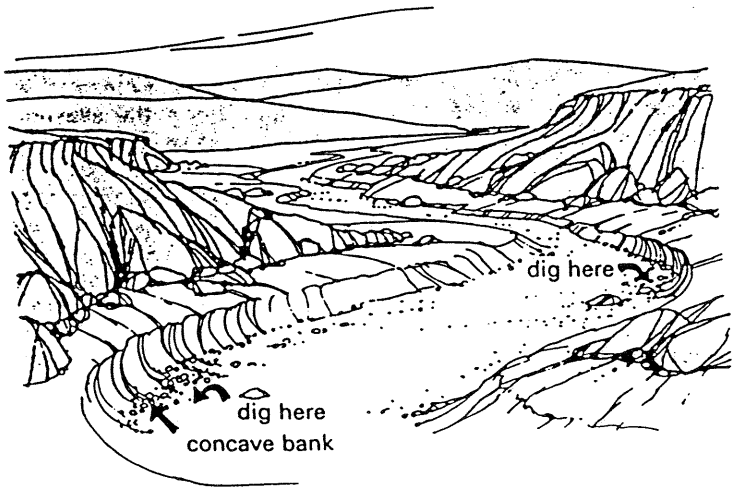
Finding Water



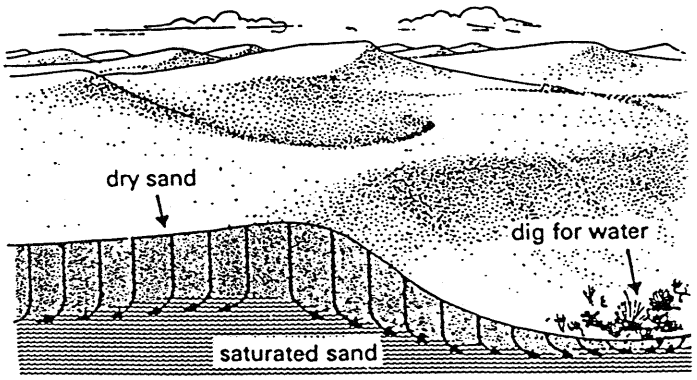
Water may be held in a strip of sand above clay



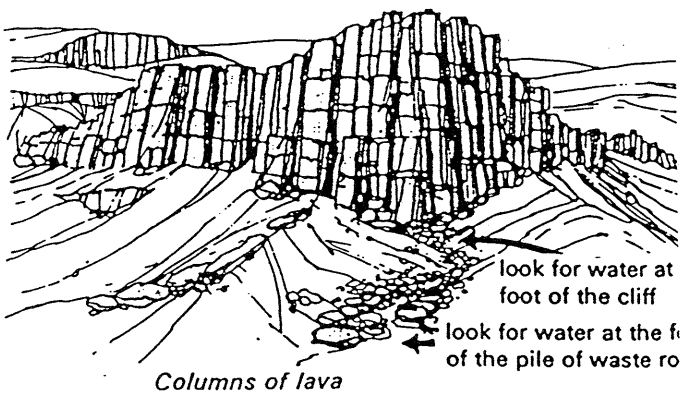
Dig behind first sand dune



Dry river bed



Dig at lowest point between sand dunes



Columns of lava

ACTIVITY P8

Have a personal survival kit of 15 vital items for back packing and camping and know how to use each item.

OUTLINE

Discuss with the Pathfinders the importance of having a survival kit and then ask the Pathfinders to suggest some types of survival equipment. Draw up a survival equipment list as they are suggested. Display and discuss the use of the equipment suggested, making sure to discuss at least 15 items.

RESOURCE MATERIAL

Survival Kit

The survival kit is an essential part of all camping equipment. It contains all the equipment that may be required in the case of an emergency while on a camp. Generally speaking the survival kit may not always be in the form of equipment in a special container or pouch, although this is desirable for at least some of the equipment, but may be spread throughout the entire pack. Some survival equipment will double for equipment that is used extensively during the camp, but it is still part of the survival equipment. Not all the survival equipment will be used on each camp, however if you do not have the equipment available for an emergency when it happens, then you could be in trouble. That is why this equipment is grouped into the classification of survival equipment.

Survival Equipment

Map

The map is an essential piece of equipment. It should be placed in a position with your gear that is easily accessible for quick reference. Maps allow you to pin point your position when you are not sure where you are.

Compass

The compass is another essential piece of equipment that doubles as survival equipment. Apart from its obvious use of locating your position and direction finding, the orienteering compass contains a small magnifying glass, which at a pinch, can be used to start a fire.

Torch

Torches should always be taken on a camp out. They are invaluable for moving about the camp at night, but more importantly, can save a life if that day hike takes longer than you thought and you are caught out in the dark. The batteries of the torch should always be put in upside down when the torch is not in use. This stops the batteries from going flat if the torch is accidently turned on while you are carrying it in your pack.

Batteries

Batteries are heavy but an extra set of batteries for the torch should be placed in the bottom of your pack. Batteries don't last forever and you could find your batteries are flat before you really need them. Always make sure that your new batteries fit the torch that you have taken on the camp.

Matches

Matches are important for starting your cooking and/or warmth fire. Two sets of water proof (green heads) matches should be taken on every camp. These matches in turn should be placed in a water tight container and stored in different parts of the pack. Even water proof matches strike better when the are dry.

Candle

A very useful piece of equipment. A small piece of a house candle can serve for emergency lighting or as a fire starter when natural materials are wet.

Hat

Hats are an essential piece of equipment as well as being a piece of survival equipment. Its obvious use is for protection from the sun but it is also used for protection from the cold, wind and rain.

Personal First Aid Kit

All campers should take a small personal first aid kit as part of their survival kit. It should contain all the essential equipment and medication that you might require for yourself on a camp.

Needle and cotton

These are part of your repair kit and are useful for repairs on clothing, tents, flies, packs etc. It can also be used for medical repairs if the situation arises.

Wire

As with the needle and cotton, wire is part of your repair kit. A small piece of thin gauge wire can save a pack if it breaks.

Whistle

Used for communications in some camping activities but is used for giving distress signals in an emergency situation such as being lost. Three blasts from a whistle is a distress signal.

Pocket Knife

A small, folding blade is all that is required. Has a thousand uses when on a camp. Large sheath knives are dangerous - the carrier can be arrested for carrying a concealed weapon - and are not necessary in the bush.

Rope

20 metres of light gauge rope is all that is required. May be required as a guide rope, securing tents and flies, and for moving equipment (ie packs) up and down rock faces etc.

Money

A small amount of money including coins should be taken in case you need to make an emergency telephone call, or for you to catch a train in an emergency, or for you to buy your well deserving leader a drink when he/she gets you back safe.

Emergency set of clothes

A complete set of clothes should be prepared in a water tight bag. This set of clothes can be the set of clothes that you plan to wear on the last day of the camp. There is no fun being caught in the rain and then having no dry clothes to put on.

Note Pad

This can double as a log. Can be used for leaving messages of intended action in the case of emergencies for the rescue group to find.

Pencil

The note pad is no good without something to write with. A small pencil is better than a pen. A pen has the problem that it might leak all through you pack, if a note written with a pen gets wet the ink will run where pencil can still be read if wet, and if the pencil breaks you can sharpen it with your pocket knife. You cannot use a pen once it is broken.

Signalling mirror

Used for giving distress signals in an emergency situation.

Stericaps

These are used for the purification of water. These are essential when the quality of the water is suspected and boiling of the water in not an option. There several different type available from your camp supplier.

Sunburn Cream/lip salve Prevention is better than the cure.

WILDERNESS LIVING

Wilderness Living Hand-out 9.

Survival Kit

Items found in a survival kit.

Map
Compass
Torch
Batteries
Matches
Candle
Hat
Personal first aid kit
Needle and cotton
Wire
Whistle
Pocket knife
Rope
Money
Emergency set of clothes
Note pad
Pencil
Signalling mirror
Stericaps
Sunburn cream/lip salve

ACTIVITY P9

Be familiar with the construction of a solar still, and know at least three other ways of obtaining water from nature, including the transpiration method.

OUTLINE

Discuss some of the ways of obtaining water from nature. Where possible give demonstrations or use diagrams.

RESOURCE MATERIAL

Water from Trees

Probably the simplest way of obtaining water in the bush is by plastic bag. Heavy-duty clear plastic bags, approximately 1 metre square are a good size to carry. Slip the bag over a branch of foliage and seal it tightly around the branch. Then when the sun shines it draws the water from the leaves which condenses on the plastic and runs down to the point at the bottom of the bag. This method will get approximately 1 litre of water every four hours. Keep changing to the other branches and put it over as many leaves as you can.

This method is based on the principle that all trees and shrubs have water locked away in their roots, trunks and foliage. Trees grow by taking up water from the soil and conducting it up into trunk and leaves by capillary attraction. Sunlight acts on leaves and through photosynthesis carbon dioxide and oxygen are used and oxygen and water vapour are given off. This can be collected. Choose the greenest, most luxuriant leaves and place a rock inside the bag before sealing it, so that the water will congregate at the lowest part of the bag around the rock. Even cloudy days will allow the process to continue.

Another simple way to obtain water is to pull up any green plants on the ground, or leaves off the trees, and put all of these in an onion bag with the big mesh. Then place this bag inside a plastic bag and hang it out in the sun. The sun will draw the water from the plants and condense on the plastic. By putting the plants and leaves in the onion bag first you avoid the leaves and juice getting into the water. If you don't have an onion bag just tie all the foliage together with wire or string and suspend it in the plastic bag. Seal this up and let the sun do its work. Make sure the bags you get are clear plastic and heavy duty. Black plastic garbage bags are no good. This bag can be moved into the best sunlight during the day or taken to another place with only minimal disruption to the process. The advantages are that you can cram more foliage into the one bag, an dmobility is possible. The results are not as good though. The water collected tends to be greenish as stripped leaves are prone to giving up oil.

Before using any of this water, you must perform the 'taste test' because of the possibility of ingestion of saponins and cyanide-producing substances and toxins such as plant alkaloids.

* If the water tasted has extreme bitterness or causes irritation to the mouth, do not drink it.

* If there is no bitterness or irritation to the mouth, swallow a mouthful and wait four hours. If there are no ill effects, the water can then be drunk in small quantities.

If you are able to dig up roots or cut down small trees, you have some access to water. Needless to say, such measures should only be undertaken in an extreme emergency. In many wilderness areas vegetation and wildlife are protected and to be left undisturbed. The water roots of a tree follow the level of the water table in the soil. These roots are generally from 300-600 mm under the soil's surface and run almost parallel to the ground. If the roots are found, they can be pulled and levered up. They are then cut into sections and the end closest to the trunk is put into a container. Gravity will force a lot of the water from the root. The cuts across the root are best done on a slant to allow for exposure of the greatest surface area to atmospheric pressure and the most effective area from which the roots can drain. If the non-draining end is sealed with a glob of clay and the root gently heated then more water can be driven out, but at the risk of pushing out and liberating saps and resins as well.

Small trees or saplings can also be used, preferably those without any centre hardening or "heartwood." The ideal size may be 150-200 mm diameter. Again the tree is cut slantwise into sections and the topmost section inverted into a container and allowed to drip. Small sections will allow more water to be collected in a shorter time.

The liabilities of these methods are the amount of work needed to chop roots or trees and the types of tool available to do the cutting. Often suitable tools are not carried in a backpack.

In eucalypt forests it is the trunk of the tree which yields water, not the roots. Choose a sapling which is tall, vigorous-looking, and has a big crown of leaves, with a diameter of about 13 cms at the butt. Cut if off close to the ground and again just below the side branches at the top, using a slanting cut in the latter case.

It has been shown that water passes up the trunk to the leaves, so to obtain water from a sapling it must be turned upside down. This is made easier if the butt is wedged in a fork on another tree and the smaller end held over a container, as this eliminates the strain of holding a heavy pole in an upright position.

If a sapling of the right species has been selected, beads of water will appear on the cut surface of the wood and drip into the container. When the flow ceases, cut the sapling in halves, reject the thicker portion, and the flow will start again. when this ceases in turn, cut it in half again, knock the bark off the thicker and end of what was the top section when the tree was standing, and blow down it to force out the last

of the water. A 3.5 metre sapling should yield up to 600 millilitres of clear and almost tasteless water. As is the case with roots, most water is obtained at sunrise, least if the middle of a hot day. In the latter case, if one is badly in need of a drink and turning the sapling upside down, cutting it in halves, and blowing down it have yielded only a few drops, some very gummy-tasting water can be driven out by clay sealing the last piece and heating in a fire.

No water will be obtained from the saplings of any species of tree if they show clearly defined annual growth rings when cut. It will come only from those which are sapwood right through.

Obtaining Water From Roots

If the tree or bush is small, a heavy push against the trunk causes the ground to crack above a root. In the case of a bigger tree, the position of the roots may be indicated by slight ridges in sandy soil. If the soil carries grass the course of each root is marked by lines radiating from the trunk on which little or nothing grows.

Dig in one of these spots about a metre out from the trunk. At any depth from a few centimetres to half a metre you will find the root which yields water. It is never very thick, it ranges from the size of a thumb to that of a man's wrist. The bark is smoother than that of other roots, it does not send out a lot of side branches, and it is even in thickness, with little or no taper. It does not dip sharply under the ground but runs more or less parallel to the surface.

Make a slanting cut through the root, grasp the free end in the left hand, and with the right hand pushes the digging stick under it and use it as a lever. The soil lifts and cracks as the root comes up like a rope. You may get 5 to 10 metres of it before coming to the spot where the main root branches into many small ones. Water from the hair-like rootlets enters these roots by osmotic pressure. This water travels along the root to the trunk, then up the trunk to the leaves. Using a slanting cut to get a quick flow, divide the root into half-metre lengths, the end of each piece which was nearest to the trunk is placed downward and the water drained out, because this is the natural direction of the flow.

Dew collection

In barren areas where there are no trees, it may be possible to collect sufficient moisture from the grass in the form of dew, to preserve life. One of the easiest ways of dew collection is to tie rag or tufts of grass round the ankles and walk thought the herbage before the sun has risen, squeezing the moisture collected by the rags or tufts into a container. Many early explorers saved their lives by this simple method.

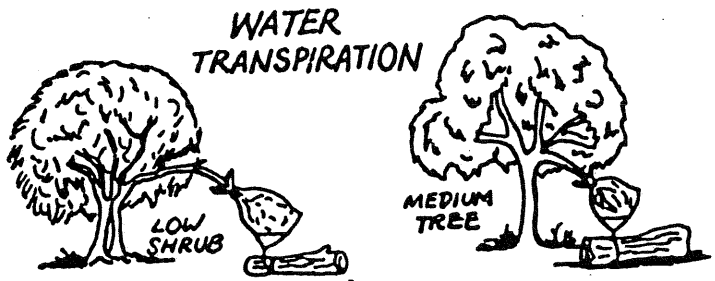
Water on the coast

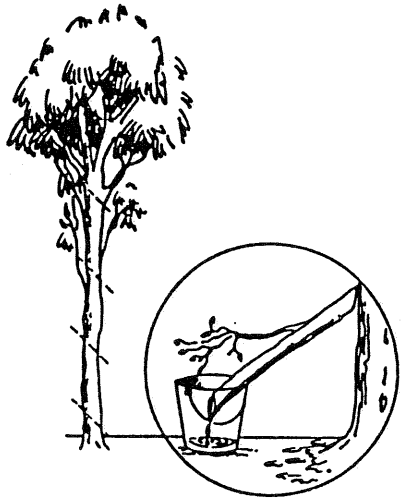
Fresh water can always be found along the sea coast by digging behind the wind-blown sandhills which back most ocean beaches. These sandhills trap rainwater, and it floats on top of the heavier salt water which filter in from the ocean. Sandhill wells must be only deep enough to uncover the top 25 mm to 50 mm of water. If dug deeper, salt water will be encountered and the water from the well may be brackish and undrinkable. It will be notices that the water in these wells will rise and fall with the tide, it is therefore better to dig these wells at high tide.

Condensing salt water

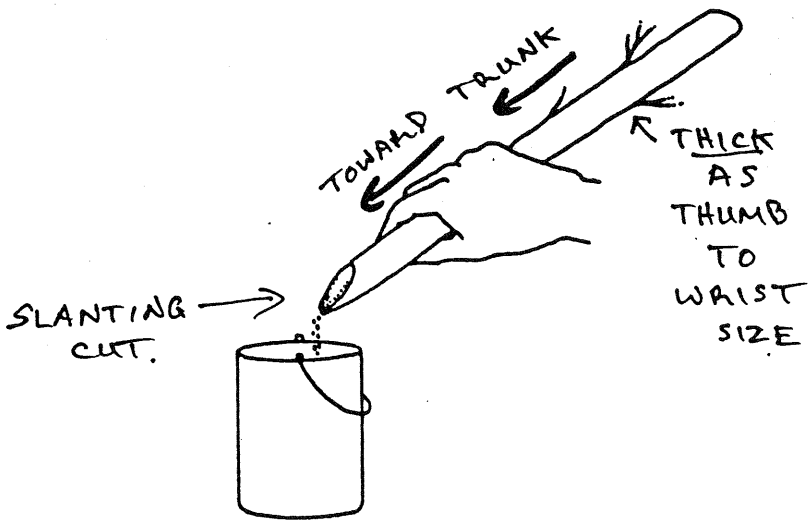
It is possible to condense sea water without special equipment and obtain sufficient fresh water for drinking purposes.

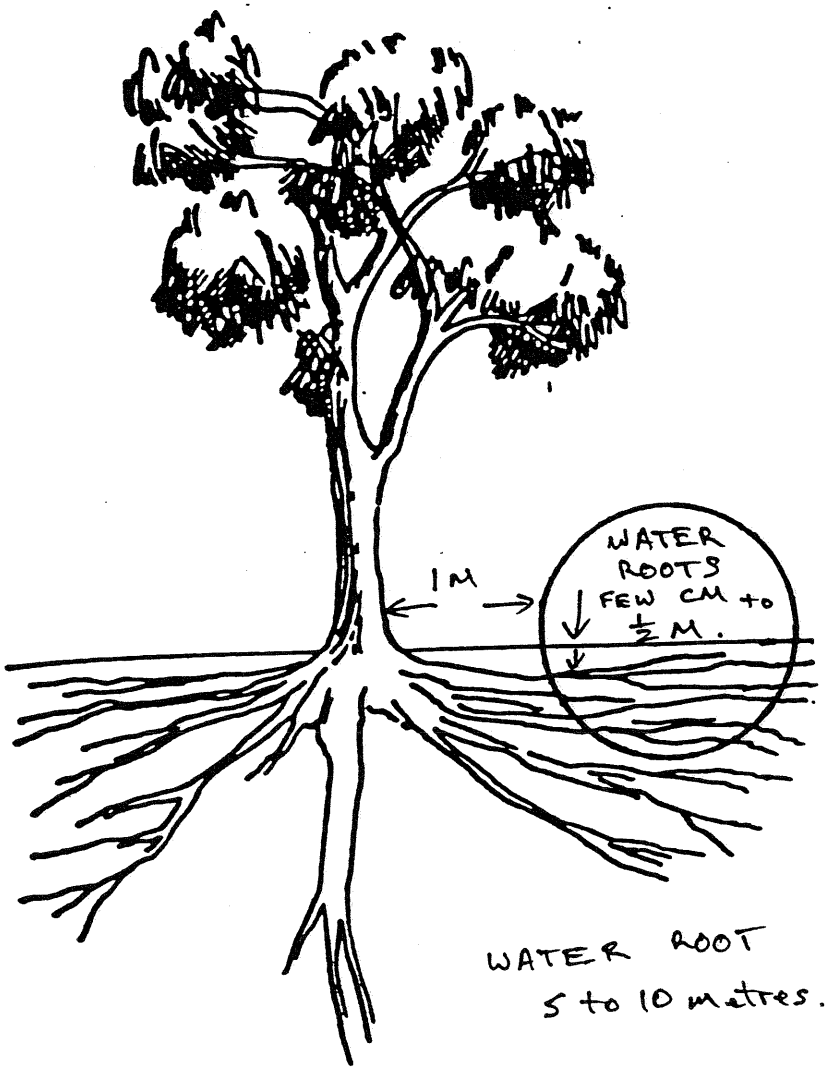
A hole is scraped in the ground and the salt water is put into the hole. A fire is built, and stones are put into the fire to heat. These, when hot, are put into the salt water, which boils and evaporates. The evaporated water is soaked up in a towel or thick mat of clothes. In time this will literally become saturated, and may be wrung out, yielding a fair quantity of fresh drinking water. Once the cloth is damp and cool the collection of water vapour is fairly rapid.





Water from trees Water may be collected from a young tree by cutting sections of the trunk and placing the foliage end into a receptacle. Slant cuts ensure more water in less time.




WATER
ROOTS
FEW CM to
½ M.
1M
WATER ROOT
5 to 10 metres.

The solar still

The basic principle of the solar still is that of evaporation, transpiration and condensation. The water is actually condensed from the earth by a simple process, requiring only a few materials.

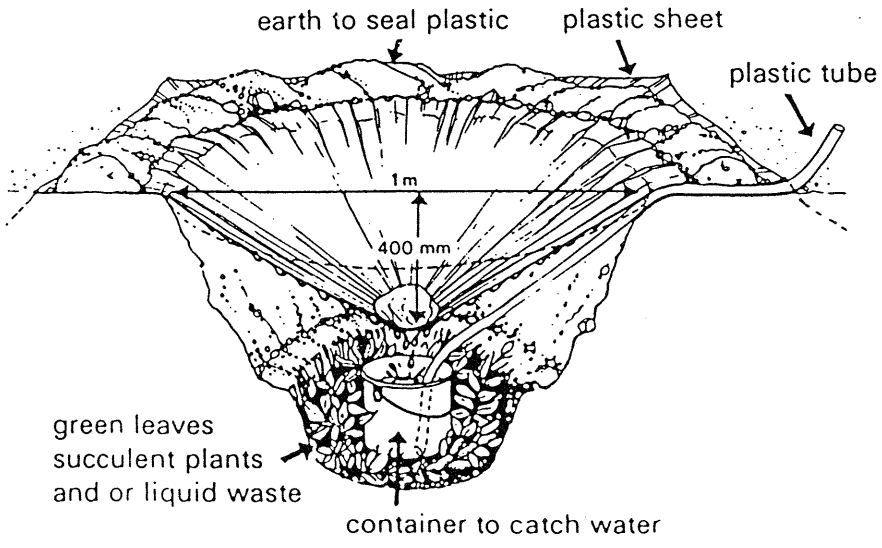
First dig a hole in a position where the sun can shine on it all day. The hole should be about 1 metre square and about 450 mm deep with sloping sides. Place a sheet of plastic over the hole and make sure that the plastic entirely covers the hole, you can enlarge the hole but you cannot enlarge the plastic.

Before sealing the plastic sheet in place over the hole with some dirt or sand from the hole, place a large container in the base of the hole. If green plants are available, place these in the bottom of the hole as well. Also any waste water, including urine, can also be added to the base of the hole. A plastic hose should be placed into the bottom of the receiving container running up and out under the plastic sheet, this is so water can be removed from the container without disturbing the still.

The plastic is then sealed and a small rock is placed in the centre of the plastic making a depression in the plastic over the collection container.

The concentrated heat of the sun's rays draws any moisture from the ground. The moisture condenses on the underside of the plastic and slowly dribbles down the slopping surface to the centre of the plastic sheet. The stone placed on the top of the plastic sheet over the collection container causes the water to drip into the waiting container.

The Solar Still

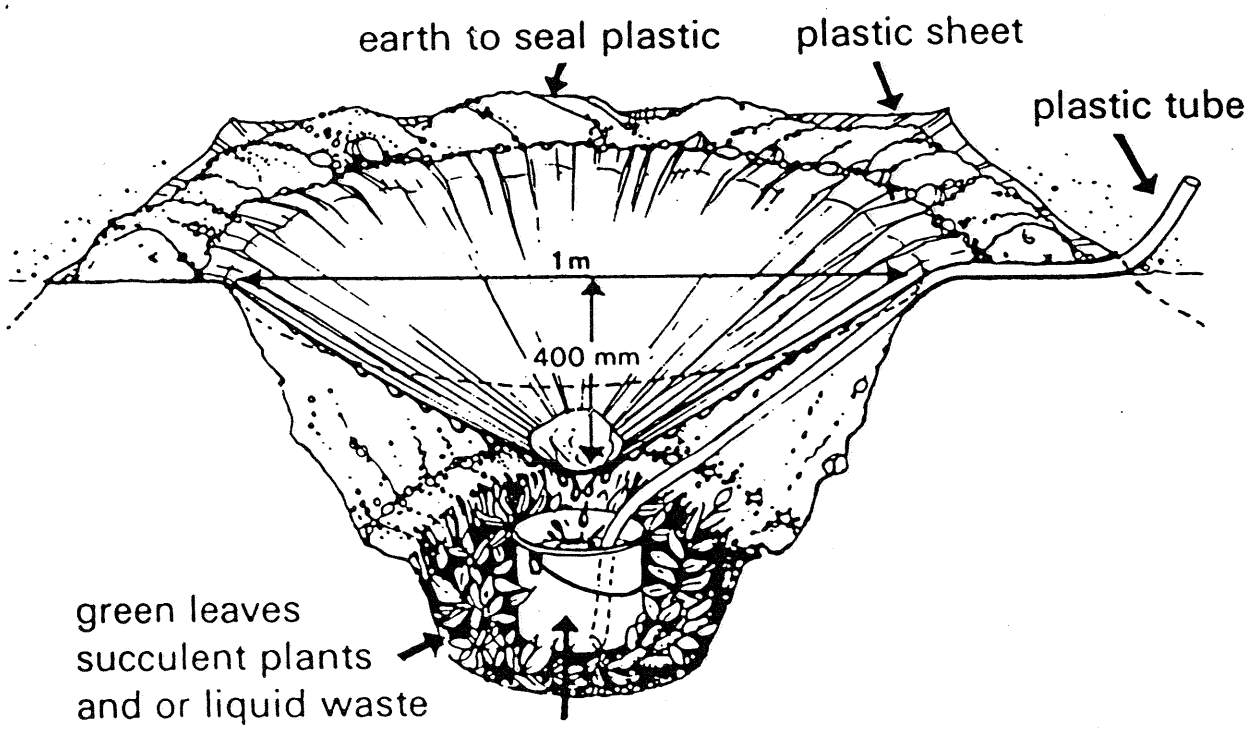


Solar still

WILDERNESS LIVING

Wilderness Living Hand-out 10.

The Solar Still



Solar still

ACTIVITY P10

List the procedures in a wilderness emergency such as being lost.

OUTLINE

Discuss with the Pathfinders what to do in the emergencies outlined following and then discuss the surface to air rescue signals.

RESOURCE MATERIAL

There are hazards to life in the bush, just as there are hazards at home, but there is little to fear. Instead, the dangers on the road getting to the start of the camp are usually greater than those experienced once walking on your own feet. Safety in te bush is a little more than a matter of common sense. This activity draws the attention to some of these hazards, following the adage that to be forewarned is to be forearmed.

Escape routes.

When planning a camp one of the essential things that must be planned is escape routes. This is particularly true for mobile type camps. An escape route is a route that is take in the case of an emergency. It may or may not be the same as the route that you were following before the emergency arose. It is a route that will remove the camper to 'civilisation' as quick as possible by the shortest distance. For a mobile camp several escape routes may need to be worked out. At a certain point on the trek it may be faster to go on than to go back. This decision needs to be made before the camp starts. Escape routes are used in the case of accidents, fire, sickness, bad weather etc.

Bushfire.

The Australian bush is well adapted to fire but, nonetheless, fire still remains a severe hazard to fauna and flora, as well as to humans. Bushwalkers should therefore be aware of how to survive if confronted with a fire.

If you are caught in a bush fire your chances of survival are excellent provided you take the correct action. try to assess carefully what is happening: how close is the fire front, how fast is it moving and in what direction. What are your escape routes or refuges? Above all plan your action and don't panic. If you commit the following rules to memory they should become an instinctive part of your behaviour.

Heat is the main problem. It causes body overheating which can easily

lead to states of utter exhaustion and collapse. Radiation is the principal method by which you receive the heat but, like light, it travels in straight lines and is greatly impeded by opaque materials such as rock, metal, wood, earth and clothing. It can also be reflected.

It is therefore vital to shield yourself from radiated heat and to desist from panic or flight, that both sap strength and cloud judgement.

Fire Survival Rules

Shield from radiation. Use every means at your disposal to cover all exposed skin. Long clothes should be used if available and wool is the best material. Reflective rescue blankets are useful but avoid the plastic outer skin from coming into contact with yours. Protect the top of your head from falling cinders.

Asses your position. Don't enter flames that are more than 1.5 metre high, or that are more than 5 to 10 metres deep, or when the undergrowth is very dense. Decide what gear is needed and be prepared to jettison the rest if its weight will hamper you.

Don't run or delay. Resist the temptation to run unless your chance of escape is clearly quite high. Don't run up hill, you will get tired and fire moves faster uphill.

Take refuge. If near a car or building go inside, close all doors and windows. Lie face down on the floor and cover yourself. Petrol tanks seldom explode. Alternatively, seek the barest ground or a culvert, large log or rock to shelter from the heat of the fire. Lie face down. Bury yourself if possible. A running stream or pond is good, but reject elevated water tanks. Stay out, avoid panic and wait for the fire front to pass.

Back burn. Light a back burn, 5 to 10 metres long, if you are trapped by a high deep wall of flames.

Limit breathing. Lower your breathing rate when smoke is dense and await the arrival of the frequent pockets of air. The air nearest the ground is the freshest and coolest.

Flooded Rivers.

Fast moving water with flotsam is usually dangerous. If the water is flowing faster than a walking pace it is probably unsafe to cross when the depth is much over the ankle. Err on the side of caution as things can happen very quickly. It may be better to wait a day or two than not get home at all. An alternative to waiting might be to walk upstream where the river is smaller. The decision of whether to cross is made by considering the following:

* Speed of the water
* Bottom of the river - shingle is easier to walk on than smooth gibbers.
* Temperature of the water - risk hypothermia if cold
* Experience of the party

It is usually best to wear shoes to avoid hurting your feet, but heavy boots can be dangerous on a long swim.

Wading rivers. Walk side on to the current. Use a pole, about 3 metres long, to feel for depth and also as a staff for support upstream. Alternatively, two or more people can link arms at the elbow for mutual support, or cross arms over the shoulder to grasp the pack straps. If the water is above waist height it may be better to swim.

Swimming. Don't try to struggle across, but allow yourself to be carried down stream as you work your way across. From your selected landing site, your point of entering the water should be upstream three to four times the width of the river. Considerable support is obtained from the pack which will float quite high. It is usually best to place the pack in the water to support the arms and chest, while the legs do the kicking. A pack can also be worn on the back, allowing a sort of backstroke action.

Rope. Large ropes are seldom carried in the bush and their use for river crossings can be quite dangerous, either because they are hard to hold on to, or because it is easy to drown at the end of a snagged rope, or because using them is a slow and sometimes process. Don't tie people onto a rope.

Electrical storms.

The following places should be avoided during an electrical storm: the top of hills or ridges; locations near an isolated object like a tree in a clearing; caves, overhangs and cliffs. To avoid ground electricity flowing through your body, minimise the number of contact points you make with the ground and keep them as close as possible. Therefore, don't lie down. Sit with your hands in your lap, knees drawn up near the chin and your heels close to your body. Theoretically, you should squat on one leg.

Distress signals.

The signal of distress is three signals: three sounds, three cooees, three smoke puffs, three smoke columns, three fires, three flashes from a mirror or torch. If flashing a light from the sun, moon or torch, hold up a thumb at arm's length in the line of sight to the target. With the other hand, hold the mirror or torch near your eye. When the light shines on your thumb it is shining in the correct direction. Ground to air codes should be at least 2.5 metres long and placed 3 metres apart in the most open position available, even if a little remote

from the camp. Clothing, sleeping bags, tents and timber can be used, but try to ensure that the colour is in contrast with the round.

GROUND TO AIR VISUAL CODE

message	*code symbol*	*message*	*code symbol*
Require doctor serious injuries	I	Probably safe to land here	
Require medical supplies	II	Require fuel and oil	L
Unable to proceed	X	All well	LL
Require food and water	F	No	N
Indicate direction to proceed	K	Yes	Y
Am proceeding in this direction		Not understood	⅃L
If in doubt use international symbol		S O S	

A pilot acknowledges signals by rocking the plane from side to side, or flashing green lights. A complete right hand (pilot's) circuit, or red flashing lights means your message is not understood.

WILDERNESS LIVING

Wilderness Living Hand-out 11.

Emergency Procedures

Fire Survival Rules

Shield from radiation. Use every means at your disposal to cover all exposed skin. Long clothes should be used if available and wool is the best material. Reflective rescue blankets are useful but avoid the plastic outer skin from coming into contact with yours. Protect the top of your head from falling cinders.

Asses your position. Don't enter flames that are more than 1.5 metre high, or that are more than 5 to 10 metres deep, or when the undergrowth is very dense. Decide what gear is needed and be prepared to jettison the rest if its weight will hamper you.

Don't run or delay. Resist the temptation to run unless your chance of escape is clearly quite high. Don't run up hill, you will get tired and fire moves faster uphill.

Take refuge. If near a car or building go inside, close all doors and windows. Lie face down on the floor and cover yourself. Petrol tanks seldom explode. Alternatively, seek the barest ground or a culvert, large log or rock to shelter from the heat of the fire. Lie face down. Bury yourself if possible. A running stream or pond is good, but reject elevated water tanks. Stay out, avoid panic and wait for the fire front to pass.

Back burn. Light a back burn, 5 to 10 metres long, if you are trapped by a high deep wall of flames.

Limit breathing. Lower your breathing rate when smoke is dense and await the arrival of the frequent pockets of air. The air nearest the ground is the freshest and coolest.

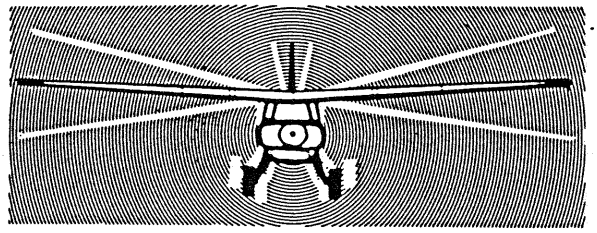
WILDERNESS LIVING

Wilderness Living Hand-out 12.

Emergency Procedures

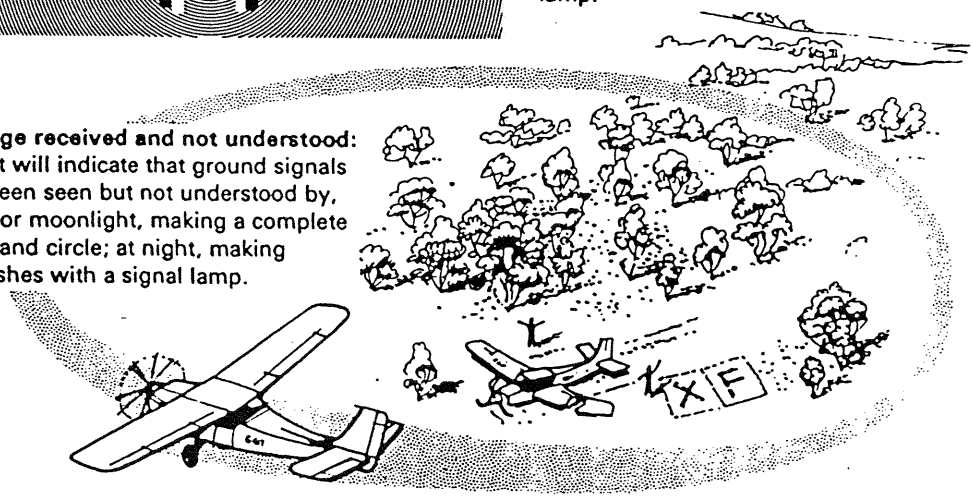
Ground to Air Visual Codes

message	*code symbol*	*message*	*code symbol*
Require doctor serious injuries	I	Probably safe to land here	△
Require medical supplies	II	Require fuel and oil	L
Unable to proceed	X	All well	LL
Require food and water	F	No	N
Indicate direction to proceed	K	Yes	Y
Am proceeding in this direction	↑	Not understood	JL
If in doubt use international symbol		SOS	



Message received and understood: Aircraft will indicate that ground signals have been seen and understood by, in day or moonlight, rocking from side to side; at night, making green flashes with signal lamp.

Message received and not understood: Aircraft will indicate that ground signals have been seen but not understood by, in day or moonlight, making a complete right-hand circle; at night, making red flashes with a signal lamp.



Standard aircraft acknowledgments

ACTIVITY P11

Participate in a search and rescue operation using two way radio, help to care for the patient, build and carry a stretcher, and follow directions from the leader.

ACTIVITY P12

Participate in a campout in which you have to construct your own shelter and furniture from natural material.