SURVIVAL
PROFICIENCY

Australian
Air Force Cadets

Cadet / Instructor Notes

Rewrite Edition, 1st May 2007

SURVIVAL (SVP)

(12 Periods)

SVP 1 Introduction to Survival AL: B Period(s): 1

a. Describe a survival situation.

b. Explain the following mnemonic

(1) S - stop and think
(2) U - undue haste makes waste
(3) R - remember where you are
(4) V - vanquish fear and panic
(5) I - improvise
(6) V - value life
(7) A - act according to the situation
(8) L - learn on your basic skills.

c. Describe the importance of the following mental attitudes in relation to survival:

(1) Common sense
(2) Tenacity
(3) Organising ability
(4) Patience
(5) Isolation and endurance.

d. State the need for physical fitness in a survival situation

SVP 2 Water Procurement AL: B Period(s): 2

a. State the way in which the body loses water through skin, urine, faeces, vomiting and describe the symptoms present at the onset of major water loss

b. State the methods of reducing water loss in relation to clothing, physical effort and travel.

c. Describe the following indicators of water contamination:

(1) Stagnant pools
(2) Discoloured water
(3) Milky sap in plants.

d. Explain the methods of water collection using:

(1) Vegetation
(2) Land run-off
(3) Sand dunes
(4) Cliff bases
(5) Dry river beds
(6) Dew, ice and frost
(7) Solar stills, and
(8) Transpiration bags

e. Describe the methods of purifying water using chemicals, filtration, pura-tabs and distillation.

f. Explain how game trails, damp soil, insects and birds can be used as indicators of nearby water sources.

SVP 3 Food Procurement AL: B Period(s): 1

Explain how the following food sources can be used in survival situations:

a. Emergency rations

b. Animals

c. Vegetation

d. Marine life.

SVP 4 Shelters AL: B Period(s): 2

a. State the purpose of a shelter.

b. State the general principles governing the siting of a survival shelter.

c. Describe the different types of survival shelters and the methods of construction.

d. Outline the types and construction of campsite facilities.

SVP 5 Fires AL: B Period(s): 2

a. State the principles of construction and use of fires made for cooking, warmth, signalling and morale.

b. Outline the procedures related to:

(1) Tinder preparation
(2) Wet weather fires
(3) Efficient use of matches
(4) The use of charcoal for fires, and
(5) Preservation of a fire

c. Describe the following common types of fire construction:

(1) Trench
(2) Pit
(3) Raised
(4) Reflected
(5) Signal.

d. Explain the precautions to be observed when lighting fires.

e. State the method of lighting fires using:

(1) Flint and steel
(2) Batteries
(3) Glass products, and

(4) Wood bow and drill.

SVP 6 Knots and Lashings AL: 2 Period(s): 1

a. Revise FCP 6.

b. Demonstrate the following knots and lashings:

(1) Reef knot
(2) Bow line
(3) Sheet bend
(4) Figure eight
(5) Rolling hitches
(6) Clove hitch.

SVP 7 Signalling AL: B Period(s): 1

Explain the following methods of signalling:

a. Fire

b. Heliographs

c. Ground to air codes (ICAO)

d. Flares,

e. Radio, and

f. Locator beacon.

SVP 8 Examination Period(s): 1

SVP 9 Examination Review Period(s): 1

SURVIVAL PROFICIENCY (SVP)
SVP 1 - SURVIVAL FIRST ACTIONS
1 PERIOD

Introduction

1001. A survival situation arises when some unforseen circumstance causes a disruption to your normal well being. It may happen through an accident, mechanical breakdown, a natural disaster like bushfire or flood, through someone becoming sick or injured or perhaps you just get lost in the bush. One dictionary definition states that to survive, means to continue to live, after a disaster or hardship. So survival is essentially, the art of staying alive and while generally this applies to all environments, the AAFC notes concentrate only on the natural / outdoor environment. The following mnemonic, made up of the word SURVIVAL, provides some useful guidelines. As you work through the notes and lectures, you will find that each point is explained in more detail.

S stop and think

U undue haste makes waste

R remember where you are

V vanquish fear and panic

I improvise

V value life

A act according to the situation

L learn the basic skills

Survival Attitudes

1002. In a survival situation, a positive mental attitude is essential in order to maintain both individual and group morale. Development of such an attitude can mean the difference between success and failure. Some of the factors which relate to a positive survival attitude are explained below.

a. Common sense; Don't over react to the situation you find yourself in, this often causes unnecessary mental stress and leads to wrong decisions being taken. Take time to think about what has happened, look around you, assess the situation and then make your decisions.

b. Tenacity; Take positive action to improve your situation and don't just accept that things look bad at the time. Take stock of the water and food supply and work out if you need shelter from the elements. Do something substantial about it no matter how simple, you can improve on it later.

c. Organising ability; Many people think that this trait only belongs to a few gifted individuals. This attitude is not acceptable for survival because you can't afford not to be organised. Whether on your own, or in a group, tasks have to be done, often at a given time of the day. Possible ways out of the situation need to be planned and also what you can do to assist search and rescue parties which may be looking for you.

d. Patience; Survival in the natural environment often involves a lot of waiting around. Waiting for water to collect in a solar still, waiting for an animal to spring a trap, waiting to be found and so the list goes on. The survivor must realise that this is normal in these unusual circumstances and accept it as such.

e. Isolation; Essentially, human beings are herd animals. That is, we naturally like social contact with other people and can become quite emotionally distressed if we are deprived of it. Added to this could also be the vastness of the environment, which may increase the feeling of isolation. A survivor needs to be aware that this state of mind is likely from time to time and must devise some activity or routine to counteract it.

f. Endurance; In a mental sense, this means don't become lethargic because of the routine nature of the situation and allow the brain to stagnate. Look for ways to improve your surroundings and remain alert to any chance of rescue or a way out.

Physical Fitness

1003. To say that a high level of physical fitness is vital to survival is merely stating the obvious. The fact is however, that the fitter you are the more enjoyment you will get out of what you set out to achieve in the first place. During the planning phase of your trip, hike, or whatever, thought needs to be given to the types of activities you are going to undertake. The chances are that you (and your group) will be doing things that you don't do in your normal daily life. Make allowances for this in your preparation and do some activity to increase your fitness. For example, if you are going to be doing a lot of walking with a pack on your back, train with gear similar in weight and design to that which you will take on the trip. Being physically able to cope, in a situation when things have gone wrong, will only increase your chances of survival and rescue.

SURVIVAL PROFICIENCY (SVP)
SVP 2 - WATER PROCUREMENT
2 PERIODS

Introduction

2001. Water is essential to life and all living things contain it. The average healthy human being can exist for up to three weeks without food, but only three days without water. Therefore, in a survival situation, water must be the first priority. Don't wait until you have run out of water before you start to look for it, conserve what you have and seek out a source as soon as possible.

2002. The human body is seventy five percent water, it the body's coolant, is needed to eliminate wastes and toxins and is a conductor for nerve impulses. The fluids of the body are limited however and must be replaced to maintain health and efficient functions.

Water Loss from the Body

2003. In a temperate climate, with an average temperature of 23 degrees C and without any physical activity whatsoever, a person will continually lose water from the body through urine, faeces, perspiration and breath vapour at the rate of about 1 litre per day. As the temperature increases, so does the fluid loss, at about the following rate;

a. 27 ^{o}C = 1.8 litres
b. 30 ^{o}C = 2.6 litres
c. 33 ^{o}C = 3.5 litres
d. 35 ^{o}C = 4.7 to 5.3 litres

Symptoms of Major Water Loss

2004. A depletion of six to eight litres of body fluid in the average person can cause unconsciousness and probably death. Symptoms which indicate a major fluid loss are little or no saliva, swollen tongue, inability to swallow, nausea, muscle cramps, blurred vision, a lack of elasticity in the skin and diarrhoea.

Reducing Water Loss

2005. To reduce water loss from the body, the following precautions need to be taken;

a. Avoid unnecessary exertion, if you must travel or partake in physical activity, plan to do it in the early morning or evening.
b. Keep cool and stay in the shade, if there is no shade, erect a shelter to provide some.
c. Don't smoke.
d. Don't lie on hot ground or heated surfaces.
e. Don't drink alcohol as it takes fluid from vital organs to break it down.
f. If possible, eat carbohydrate foods (sugar, starch) rather than protein (meat, fish). Carbohydrates release water when broken down in the body, whereas proteins require water from the body for digestion.

Contaminated Water

2006. Care must be taken not to either drink or cook with, contaminated water. Water which is discoloured may be so because of chemical contamination (pesticides etc) or other

impurities in the soil. Water from stagnant pools usually has a scum floating on the surface and / or a foamy substance like soap bubbles around the edges. Stagnant water contains bacteria and other organisms which can cause severe illness and even death. Plants are a source of water, but those with a sticky, milky sap should be avoided, as some of these are extremely poisonous to humans.

Techniques for Obtaining Water

2007. When there is no ready water supply available, improvised methods need to be applied. The methods listed here are the most common techniques used in land survival situations.

Vegetation

2008. Different plants and parts of plants, will provide small amounts of drinkable water daily. Finding out which are the most suitable is largely a matter of trial and error, but well worth the experimentation.

a. Vines, with rough bark and shoots about 5 cm thick can be a useful source of water. Remember that some vines contain milky sap, which may be poisonous. The method for obtaining water from vines is shown at Figure 1.

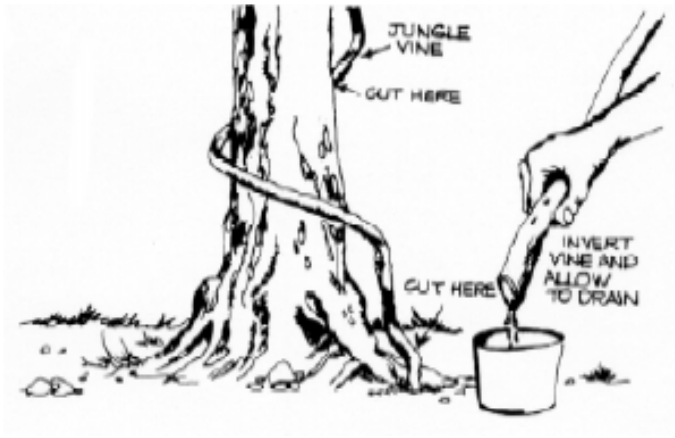


Figure 1 Water from Vines

b. Water collectors, such as cup shaped plants and those with cavities between large leaves, often collect and store dew and rain water. Ant trails and other animal activity may also indicate where water has collected in hollow logs or dead trees, this can be removed with a piece of cloth or a grass mop. See Figure 2.

Figure 2 Removing Collected Water

c. Roots, of trees are their main source of water supply. To tap into this supply, dig up the roots and cut them into lengths of about a metre. The cuts need to be at about 40 - 45 degrees to gain the best flow (never break or tear them as this prevents drainage). Place the roots in a drain trough as shown in Figure 3. Generally, roots found in gullies will yield more water than those from hill tops or slopes.

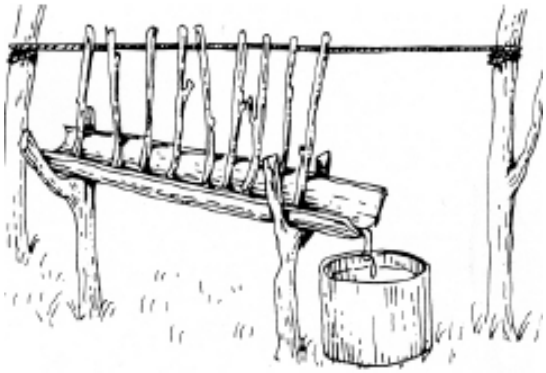


Figure 3 Water from Roots

d. Cacti, store water in both the fruit and the body of the plant. The best method of obtaining fluid from a cactus is to chop pieces from inside the large leaves and either suck out the liquid, or mash it to a pulp and drain or scoop off the water.

e. Palms, such as the coconut, nipa and cabbage palm, all contain a liquid which is very drinkable. To start the flow, bend a flowering stalk downwards and cut off its tip, see Figure 4. Every 12 hours, a thin slice can again be cut off to renew the flow. Using this method will produce up to 1 litre of water daily.

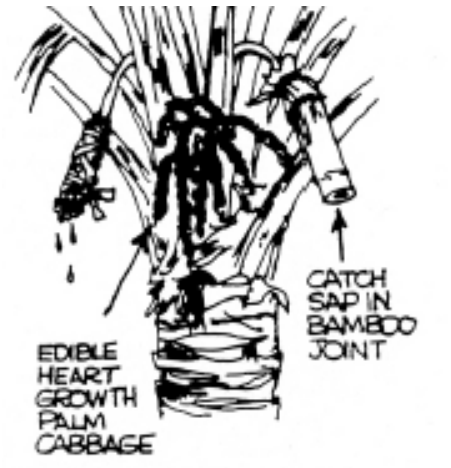


Figure 4 Water from Palms

Land Run Off

2009. Folds in the ground (both on the surface and below), make up of the soil, terrain and many other factors contribute to the way rain water and dew drains off the country side. For the survivor, locating and tapping this water supply can be difficult and time consuming, but must not be overlooked.

Cliff Bases

2010. Occasionally, at the base of a rocky outcrop or cliff, a small but luxuriant growth of vegetation can be found. This is probably an indication that run off rain water has collected in a rocky hollow which has become filled with sandy loam. By digging down amongst the vegetation it is possible to find this runoff water.

Sand Dunes

2011. In coastal areas, fresh water can often be located by digging in the hollows on the inland side of the sand dunes. Sand hills trap rain water which has soaked through and then "floats" on the heavier salt water which has filtered through from the sea. It is therefore important to uncover only the top few centimetres of fresh water and not dig deeper into the sea water beneath. See Figure 5.

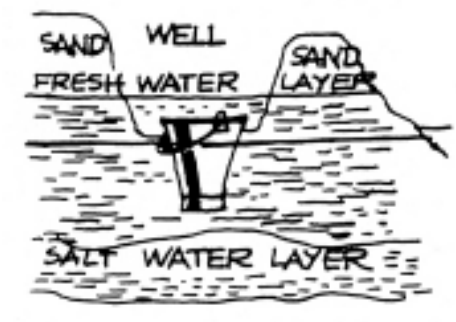


Figure 5 A Sand Dune Well

Dry River Beds

2012. Digging in dry river beds is often unproductive and you may use up more fluid than you gain. If the signs are favourable however, water may be found. Two indicators are in the concave bends of the banks as shown in Figure 6 and amongst healthy stands of river red gum trees.

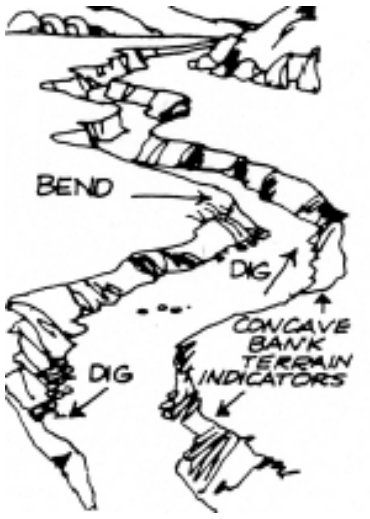


Figure 6 Dry River Beds

Dew, Frost and Ice

2013. Dew can be collected from any smooth surface such as a vehicle body or the hull of a boat or crashed aircraft, by using a piece of cloth and a container to squeeze the moisture into

as seen in Figure 7. A catchment can also be made with a ground sheet suspended flat between upright poles, or laid in a depression in the ground (also good for collection rain water). Dew can also be collected from grass and leaves but remember it must be done at first light, before the sun can evaporate it.

Figure 7 Collecting Dew from a Smooth Surface

2014. The easiest way to collect water from frost, is to wipe it from leaves and grass with a cloth and wring it into a container. In long grass, simply wrap the cloth around your legs and walk around in the frosty grass.

2015. Melted ice and snow will provide good water in most cases. Care must be taken that the snow or ice is not contaminated by chemicals or other waste products and if melting is to be done by heating in a billy, a small amount of water needs to be put into the billy to prevent the bottom from burning.

Solar Stills

2016. To construct a solar still, dig a hole in the ground about 90 cm in diameter and 45 cm deep. Place a billy or similar container in the centre of the hole and surround it with freshly cut vegetation. Cover the hole with plastic sheet or a ground sheet and cover its edges with soil, making sure that the sheeting is not tight. Now place a stone in the middle of the sheet, directly above the container, as shown in Figure 8.

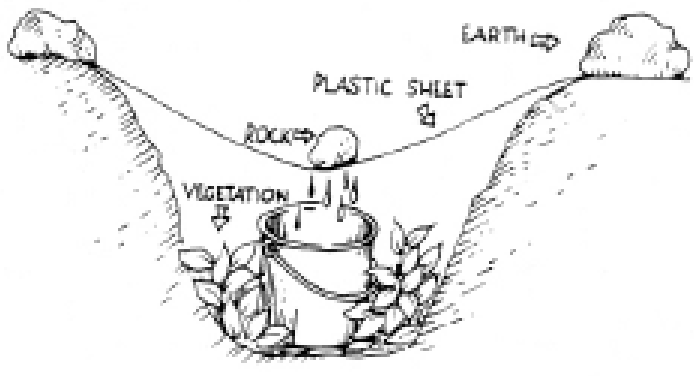


Figure 8 Cross Section of a Solar Still

2017. As the sun heats the still during the day, the air inside becomes saturated with moisture which condenses on the inside of the sheet and runs into the container. Waste fluids, including urine and dirty water may also be poured into the still, but make sure that it is put near the edges, away from the container. Depending on the quality and amount of vegetation available, each solar still will produce 1 to 2 litres of water daily.

Transpiration

2018. This method involves the use of living vegetation to obtain water. Place a clear plastic bag over a bunch of leaves at the end of a branch of a shrub or tree and tie or weight it down. The open end of the bag must be tied or taped as tightly as possible to the branch as seen in Figure 9. The moisture is drawn up from the ground and out through the leaves where it evaporates and then condenses on the inside of the plastic bag.

2019. Some precautions need to be taken when drinking water collected by the transpiration method. If it tastes bitter, or causes irritation to the mouth, don't drink it. If it is not bitter or irritating, drink a small amount and if no ill effects are suffered after about four hours, then that species is a safe supply of water.

Figure 9 Transpiration Bags

Purification of Water

2020. Thorough purification of drinking and cooking water is essential in a survival situation and usually involves a combination of methods. All ground water should first be filtered to remove any solids. This can be done through any available cloth and utilising charcoal from the fire. The sleeve of a long sleeve shirt, with a knot tied in the cuff, makes a very good improvised filter, as shown in Figure 10.

Figure 10 An Improvised Water Filter

2021. After filtering, the water can be left to settle and then the clear water taken off from the top. If available, a pinch of alum added to the water, will help to settle any suspended dirt particles. The clean water will then need to be boiled for about ten minutes, to destroy any dangerous bacteria or other organisms. An alternative to boiling is to use "Puritabs" at the rate of one tablet per litre of water. The water must be left to stand for ten minutes and this will destroy any water borne bacteria, including cholera and typhoid. Distillation will also produce clean water, but this is a long process involving boiling the water and collecting the condensation. The various methods are shown at Figure 11, but experimentation is necessary in practice to obtain the best results.

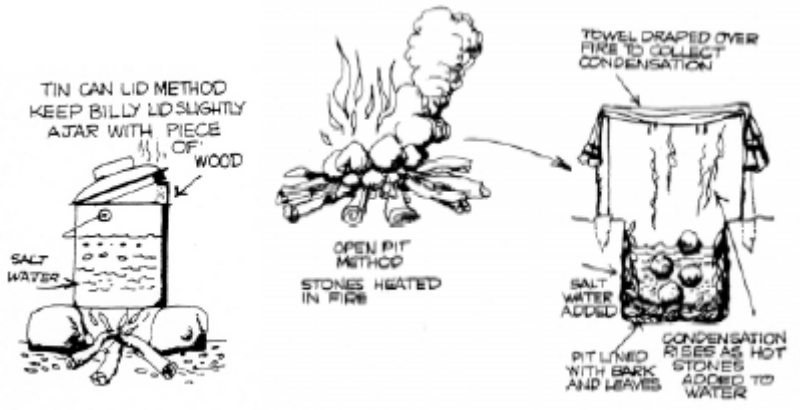


Figure 11 Distillation Methods

Animal Indicators

2022. It has already been mentioned in paragraph 2008 b. above, how a trail of ants may indicate a store of water in a hollow log or tree. The movements of other insects, birds and animals are also good water indicators.

a. Game trails, or those of domestic animals like sheep and cattle, radiate outward from a water supply. To find the water, either follow the trail downhill, or if on flat ground, measure the paces between two of the trails, in two locations along the trail, at about

500 metres apart. The water will be in the direction where the distance between the trails is shortest.

b. Birds, such as parrots, finches and pigeons, require water daily and usually drink at dawn and dusk. By plotting their movements, water can be located. Birds will fly low and straight when going to water and fly from bush to bush away from it, as they are full and need to rest frequently.

c. Other insect indicators are bees, which require water to manufacture honey and wasps, who use mud to build their nests. These insects may be followed to their water source, which may only be a soak or seepage which will then need to be dug out. Dragon flies, may flies and like species on the other hand, are never far from a good water supply.

Conclusion

2023. All of the methods and techniques mentioned in these notes, will produce palatable water in a survival situation. Some are more productive than others and it is largely a matter of time, space and the materials available as to which ones you use. In 1981, the RAAF Combat Survival Training Flight tested all of the standard methods and found that the transpiration method yields the most water for the least effort, an important factor in survival.

SURVIVAL PROFICIENCY (SVP)
SVP 3 - FOOD PROCUREMENT
1 PERIOD

Introduction

3001. Humans have been known to survive for up to three or four weeks without food and so, in a survival situation, it tends to rate fairly low on the priority list. Procurement of a regular food supply however, is important in order to maintain body heat, energy and essential functions.

3002. A food supply must contain the right combination of chemicals because an energy diet alone will not sustain the body in a fit and active condition. The five main food groups are as follows;

a. Carbohydrates, (bread, cereals, potatoes) help the body to use protein and fat.

a. b. Proteins, (cheese, eggs, meat and fish) are important for growth and tissue repair. If there is no intake, the body will break down and use its own protein from the muscles.

b. Fats, (cheese, butter, fatty meat and food oils) provide energy and heat and are utilised much slower in the body than other foods.

c. Minerals, (salt, potassium, calcium) are vital to maintain normal cellular functions.

d. Vitamins, (fruit, vegetables) are regulating chemicals necessary for growth and body function control.

Emergency Rations

3003. When planning a journey, or field activity of any duration longer than 36 – 48 hours, the possibility of a survival situation occurring must be considered. To estimate the type and quantity of emergency ration requirements, follow these guidelines;

a. Anticipate situations where the group may be delayed through injury, sickness, mechanical breakdown or other mishap.

b. Consider the reaction time for a search and rescue party to mobilise and deploy.

a. A realistic time is normally the morning following the day that the group is overdue, therefore, about 48 hours after your problem arises.

b. Estimate how long it will take a search party to reach your group, given that you could be at the extremity of your operational area and therefore furthest from any assistance. This calculation must be added to the reaction time mentioned in item 3003 b. above.

c. Water supply is a governing factor when determining the type of emergency rations you might require. In an area where water is plentiful, concentrated soups and dehydrated food at a rate of 600 to 900 grams per day, per person is ideal. Where water is sparse, rations should be of a type that requires little or no water to prepare, such as survival biscuits, cheese and the like. Other supplementary emergency rations should include dried fruit, glucose or barley sugar and energy chocolate.

Animals

3004. Animals provide an excellent source of nourishment, but in the wild are usually the most difficult to obtain because hunting and trapping skills need to be developed to a fairly high degree. A few methods are mentioned here but the subject is more thoroughly dealt with

in Advanced Survival (SVA) Lecture 2 Some animal food sources however, are fairly simple to locate without much knowledge of the environment and these include worms, insects, witchetty grubs, bird or reptile eggs and so on.

3005. Mammals and fish are the two best sources of meat but birds and reptiles must not be ignored. Fish can be either trapped, netted or caught with a hook and line. Mammals can be located by some of the following methods;

a. Animals usually go to watering points at dawn and / or dusk.

b. Look for signs where animals have been feeding or rooting up vegetation regularly.

c. Tracks, game trails and piles of droppings are good indicators of regular use of an area.

d. Some mammals live in holes and burrows which are often hidden or camouflaged. Determine if the holes are being used, again by looking for tracks or droppings near the entrance. Snakes also use discarded holes and whilst these are a good food source, take care when digging out.

Vegetation

3006. With the exception of the arid interior of the country, most scrub land and forest contains sufficient varieties of edible vegetation to sustain a survivor for some considerable time. One advantage which plant food has over animal food is that it is easier to obtain in regular quantities. From plants, the survivor can extract nuts, seeds, grain, tubers, roots, leaves, pith, bark, nectar and resins. More specific means of obtaining and preparing plant food is contained in SVA 4.

3007. Some edible plant groups and their characteristics are as follows;

a. Foliage, leaves and young shoots are rich in vitamins and minerals and are an easy source of food. They are more tasty cooked, but remember not to overcook, as this will destroy the vitamins.

b. Roots and tubers, are full of nutrition, particularly carbohydrates. These should be cooked thoroughly. particularly if there is any doubt as to their identity.

c. Fruits and nuts, are an important food source from the summer into late autumn. Nuts are particularly high in proteins and fats and fruit will supply vitamins and sugars.

d. Fungi, many varieties are edible and highly nutritious but, they must be positively identified as safe to eat because some are very poisonous and can even be deadly.

Marine Life

3008. Marine creatures and vegetation are a valuable source of protein, fats, vitamins and minerals. Some of the food available in both the fresh and sea water environments is contained here and again, is covered more comprehensively in SVA Lecture 5.

Fresh Water

3009. With the exception of a few tropical species, all fresh water fish, crustaceans and shellfish are edible. Care must be taken however, to ensure that fresh water mussels and the like are not contaminated by foul water or sediment and even then, must be cooked thoroughly, to destroy any parasites which can cause stomach disorders in humans. Avoid fresh water weed unless you can positively identify it as safe to eat. All blue- green algae is poisonous. It floats on the surface and will contaminate other food sources, never eat it, or anything which has come into contact with it.

3010. Fish can be caught by hook and line, speared, trapped or stunned. A few designs for improvised fish hooks and spear heads are shown in Figure 1.

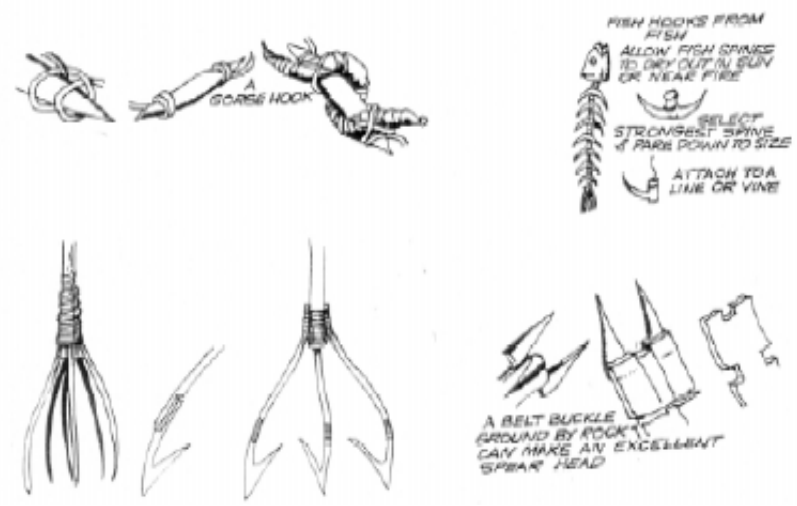


Figure 1 Fish Hooks and Spear Heads

3011. A simple fish trap can be made using a hollow log. Plug up one end of the log, bait it and anchor it so that the open end is secured towards the surface, see Figure 2. The trap is best left overnight and then pulled up quickly (open end first) early in the morning. Check inside the log carefully for any small fish or yabbies which may be hooked up on splinters.

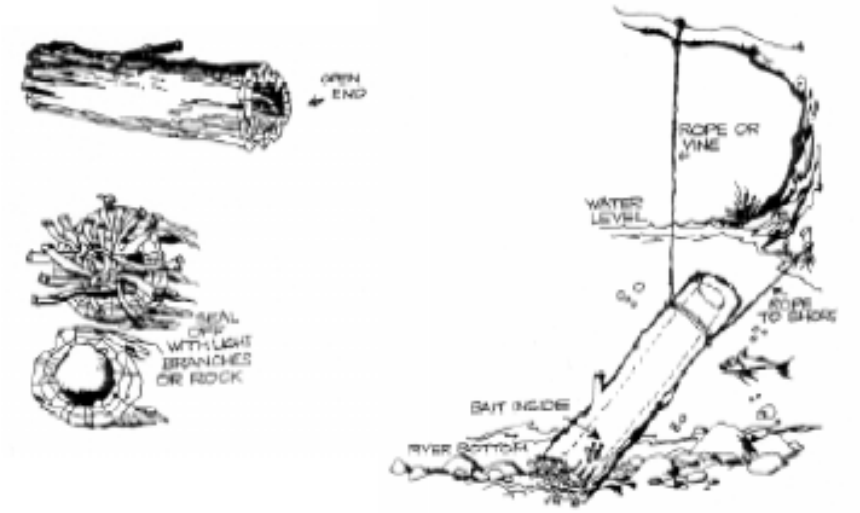


Figure 2 A Log Fish Trap

3012. Small fish can be stunned in shallow water using a club or stick. One Aboriginal method is to select two hard stones (about the size of tennis balls) and stand at about knee deep in the water. Next, fill your mouth with small pieces of food, such as crumbed biscuit or cooked tubers. Hold the rocks under the water about 30 cm apart and let the food particles fall from your mouth. When enough fish have been attracted to the food, crack the stones together and scoop out the stunned fish (you have to be quick).

3013. Crustaceans can also be caught using either a baited trap or line. The most common are the yabby and fresh water cray, shown at Figure 3. These should also be thoroughly cooked to destroy any parasites.

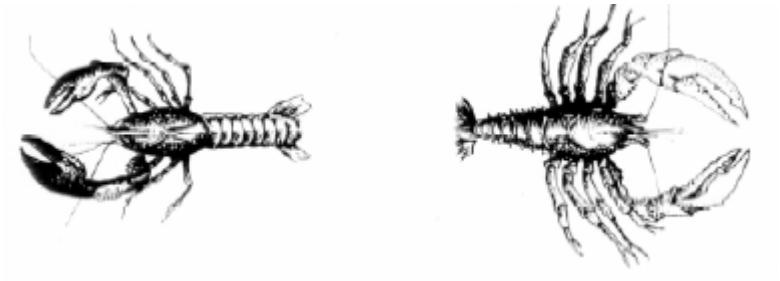


Figure 3 Yabby (left) and Fresh Water Cray

Sea Water

3014. The sea and shore line provides an abundance of food from all five of the major food groups. Most seafood is edible but extra care needs to be taken than with fresh water as more species are toxic to humans of poisonous. Only eat or handle those creatures that you know to be safe.

3015. Salt water fish can be caught and trapped using similar methods as for fresh, but because the sea is tidal, there are some simple additional options. Rock pools provide a natural trap for fish and other marine animals. An artificial tidal fish trap can also be constructed between high and low water marks using rocks, nets or stakes driven into the sand. One simple design is shown in Figure 4.

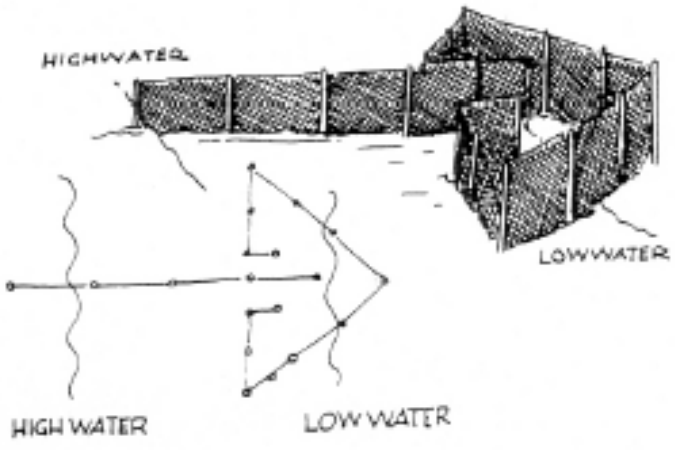


Figure 4 A Tidal Fish Trap

3016. The Australian coastline provides a large variety of edible shell fish, many of which can be easily collected at low tide. A few of the more common types are described below and illustrated at Figure 5.

a. Cockles, are found in weedy tide pools and after cooking, either in the coals or boiled, can be hooked out of their shells with a piece of wire or a thin stick.

b. Pipis, can be easily dug up along the wave line on a sandy beach. They need to be thoroughly cleaned of sand particles by firstly removing the gut sack and then rinsing in fresh or clear salt water.

c. Mussels, attach themselves to rocks which are exposed at low tide and can be prised off with a knife or sharp stick. They can be eaten raw, stewed in their own juices on the coals or boiled.

d. Razor clams, will be seen poking up out of the sand in shallow water at low tide.

a. Open them up with a knife, remove the gut and then eat them raw or cooked as for mussels.

e. Abalone, attach themselves to rocks amongst weed or kelp in reasonably deep water below the low water mark. They have a very strong foot muscle and need to be prised off the rocks with a knife. Before cooking, tenderise the meat by beating it with a stick and then cut it into thin strips. Cook the abalone for about 30 seconds only, any longer and it will become very tough and leathery.

f. Sea urchins, can be picked up in under water kelp beds or rock crevices. They must be handled with care as the spines may snap off in the skin and cause infection. The edible part is the roe which is eaten raw or lightly fried. Cut the top off the sea urchin, rinse it in sea water and just scoop out the roe.

g. Oysters, grow in clusters on rocks which are often exposed at low tide. They can be eaten raw straight off the rocks or cooked the same as for muscles.

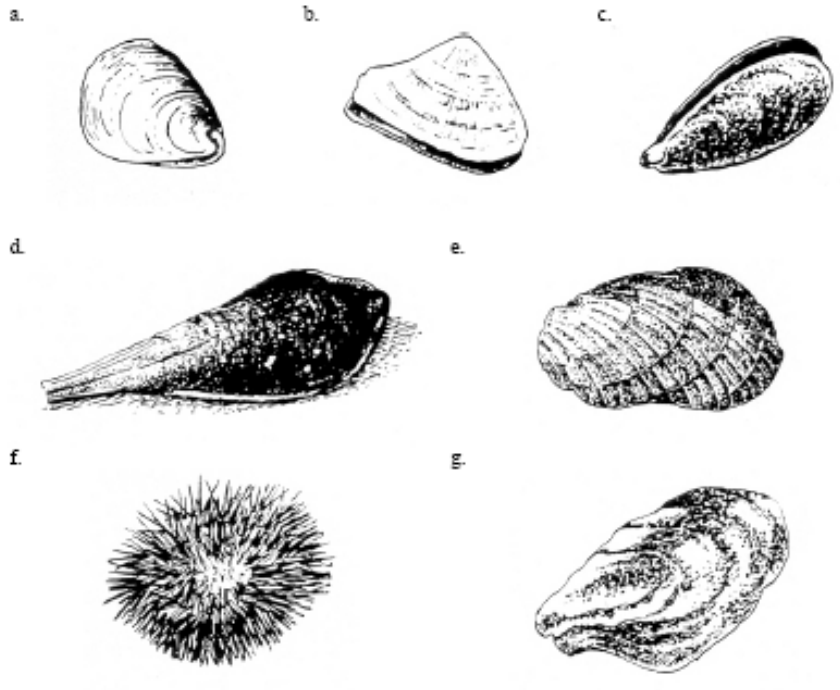


Figure 5 Edible Shell Fish

Seaweed

3017. Seaweed is a valuable source of vitamins and protein, some varieties in fact, contain as much vitamin C as oranges plus a reasonable amount of iodine. It can be eaten raw, boiled or fried and can also be dried out and stored for later consumption. Most types will keep for 2 to 3 months without losing too much nutritional value.

3018. The two most common edible seaweeds on the Australian coast are the green leafy variety known as sea lettuce and the red type which is more abundant in the tropics. These are illustrated at Figure 6.

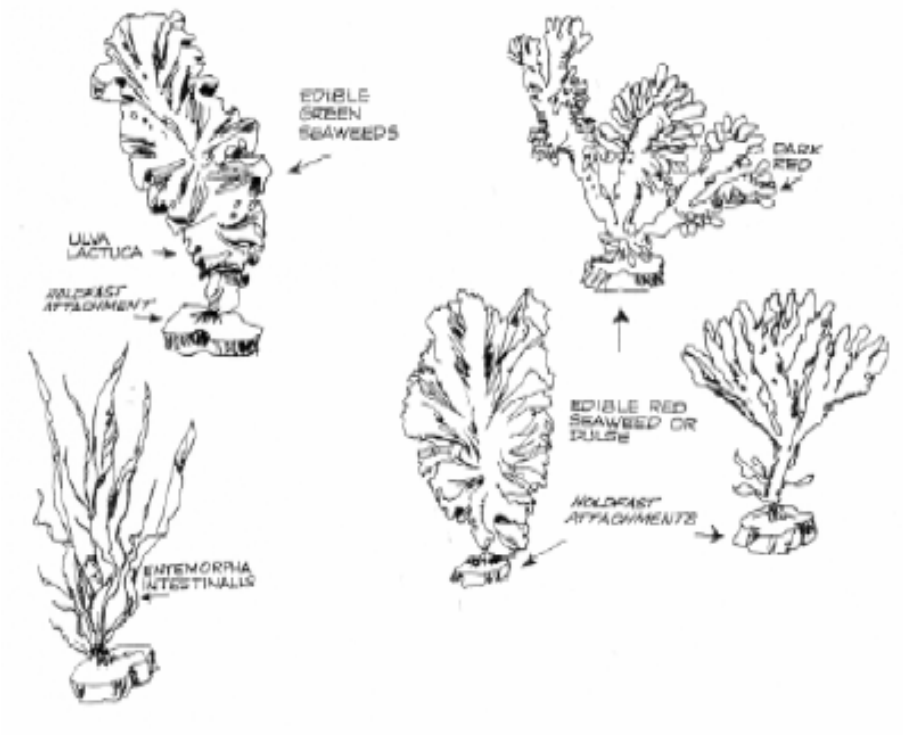


Figure 6 Edible Seaweeds

3019. The best way to cook seaweed is to boil it until it is tender (about 10 to 20 minutes) and then lightly fried to improve the taste. It can also be mixed with other food and cooked that way. To start with, be careful of the amount you eat as some seaweeds, especially the red variety contains a chemical laxative, so it is wise to test how your body reacts to it.

SURVIVAL PROFICIENCY (SVP)
SVP 4 - SHELTERS AND CAMPCRAFT
2 PERIODS

Introduction

4001. The purpose of a shelter is to provide shade and protection from the wind, rain and other elements. A shelter can also give you a safe, dry storage area for your food and equipment.

Siting a Survival Shelter

4002. When selecting a site, either for an overnight bivouac or for a more substantial camp, the following principles need to be considered.

a. Try to have all the facilities you need close to your site so as to minimise energy loss.

b. Stay off high, exposed ground, move lower down and find a sheltered spot, but not in the bottom of a valley as they could be damp, contain cold air and be prone to overnight frost.

c. Choose an area with a good supply of fire wood and building materials for your shelter and bedding.

d. The site should not only be protected from the elements, but also from wild animals, insects, reptiles, bushfire, flood and so on.

e. Be near a good supply of water, but stay clear of game trails which may lead there.

f. If possible, the site should be easily seen by any search and rescue party or aircraft which may be out looking for you.

Types of Survival Shelters

4003. The type of shelter you build will depend on what equipment you have, if any, and what materials are available to you. If you have nothing to build with, consider looking for a natural shelter such as a cave, rock overhang, crevice or a large hollow log. Just make sure that there are no other inhabitants in residence by having a good poke around inside or by smoking it out. Make sure to check for smaller creatures as well, such as scorpions, centipedes, spiders and wasps.

4004. A quite comfortable shelter can be made out of almost anything, all you need is a bit of imagination and inventiveness. When building it, keep in mind what you want it to provide you with and how long you are likely to need it. Annex A, shows a good cross section of ideas, materials, construction methods and places which would provide natural shelter.

Bivouac Facilities

4005. When organising the camp site, pay attention to the normal procedures you would follow even if you weren't in a survival situation. All of the usual rules of hygiene and waste disposal as detailed in the AAFC Fieldcraft Basic notes still apply.

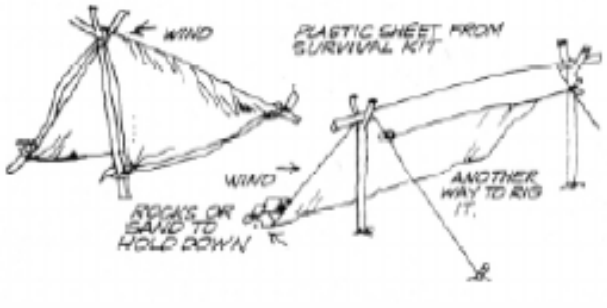
a. Ensure that the water collection point is well upstream from the washing, bathing and ablution area .

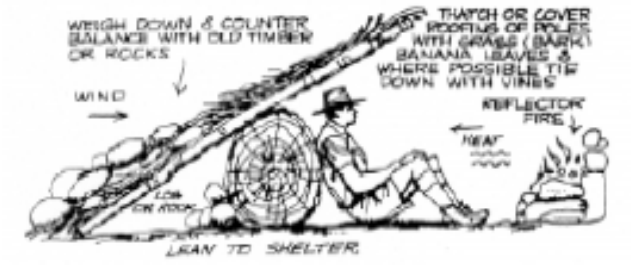
b. Latrines should be downhill from the camp and preferably downwind so that flies aren't blown into the camp. Put the latrine well away from your water supply, but not so far from camp that people find it inconvenient to use.

c. If there is any rubbish that can't possibly be recycled for something, it should be either burned or buried well away from the camp.

ANNEX A TO
SVP 4

SURVIVAL SHELTERS





SURVIVAL PROFICIENCY (SVP)
SVP 5 - FIRES
2 PERIODS

Construction and Use of Fires

5001. To make a fire, first build a pile of tinder out of small leaves, shredded bark fibres, wood shavings or similar material as mentioned below. On top of this, loosely pile thin dry twigs for kindling and then over the whole thing, build a pyramid of larger sticks, about the thickness of your thumb. Once the largest sticks are alight you can then pile on larger timber, gradually building the fire up to what you require. Remember that a fire needs air, so don't smother it by piling on too much large material at once.

5002. In a survival situation, fires are generally required for three purposes, warmth, cooking and signalling. The construction of signal fires is covered in Lecture 7 of the Survival Proficiency course but descriptions of the other two are dealt with here.

Preparation of Tinder

5003. Tinder can be made from any material that requires a minimum of heat (the best needs only a spark) to ignite it. Some very good tinder materials are shredded and teased stringy bark fibres, wood shavings, fluff from clothing , pulverised pine cones and pine needles. Animals can also provide excellent tinder in the form of bird down, which can be either found in their nests or plucked from dead birds and then, a form of saw dust can be found, where insect lava and witchetty grubs have been boring into dead timber. Whatever you find for tinder, it must be kept dry and ready for use. It is a good practice to carry your tinder supply in a waterproof container, like a tin or bag.

Wet Weather Fires

5004. The major problem in wet weather would seem to be the availability of dry timber. This however, is not really as difficult as it seems, just follow a few basic principles. First, build some sort of structure to keep your wood supply dry once you have collected it. Don't take your fuel off the wet ground as it will probably be water-logged. Instead, use dead timber from standing trees. Many Australian native plants (eucalypts and sheoak trees etc) usually have dead limbs on living trees which can be knocked off or pulled down with a rope. This wood will only be wet on the surface and all you have to do is shave or split it to expose the dry wood underneath. Only do enough to get the fire going , the rest can be dried out using the fire. If dry kindling is a problem, make up some fuzz sticks as shown in Figure 1.

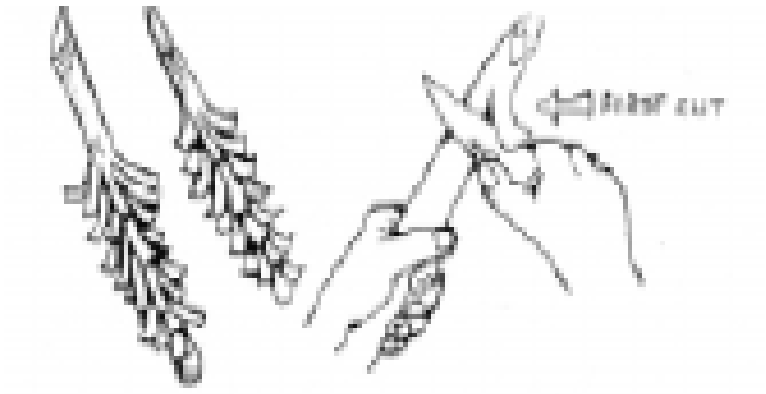


Figure 1 How to make a Fuzz Stick

Use of Matches

5005. Matches are a valuable resource in a survival situation and must be used as economically as possible. You may need to light your signal fires in a hurry and matches are best for this, so try and use matches only as a last resort for other types of fires, there are plenty of alternatives, even if these take a bit more effort. You can conserve and preserve your matches as shown in Figure 2, by the following methods.

a. When lighting a fire, use your matches to set light to a bunch of dry grass or similar and then use that to light your fire in various places, rather than use several matches for the same purpose.

b. Split your matches to produce two for one. This needs to be done with extreme care so as not to crush the head.

c. Coat your matches with candle wax if you have it. This will protect the matches and all you need to do is scratch it off with your thumb nail when you need them.

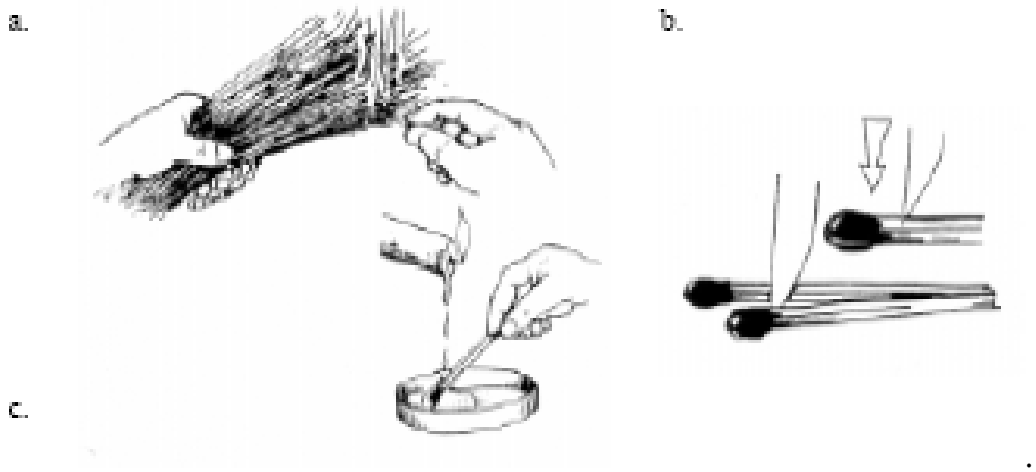


Figure 2 Conservation and Preservation of Matches

Using Charcoal

5006. A charcoal fuelled fire will provide a more even heat for cooking than ordinary wood. To make a charcoal fire, start as you normally would and just substitute charcoal for timber after the kindling has caught fire. Keep adding charcoal until you have a constant glow going (usually about an hour) and then it is ready to cook on. Some hints for cooking with charcoal are as follows.

a. For grilling, use a shallow layer of charcoal and a deeper one for roasting.

b. To increase or decrease the heat, just move the food nearer or further from the fire, there should be no need to alter the fire itself.

c. If you have to splash water onto the charcoal, do it away from the cooking as it will cause a burst of steam which is likely to spray ash all over the food.

d. Never pour inflammable liquids onto a charcoal fire, it will explode in your face.

Types of Fire Construction

5007. The selection of a site for the fire place needs to be done taking a few factors into consideration. Points to look at are, what the fire is to be used for, the wind direction, whether the ground is wet or dry, the type of fuel available and so on. Several types are listed below,

but many other combinations can be devised to suit the situation and the survivor must be prepared to do this.

Trench Fire

5008. The trench is dug about 30 X 90 cm either side and about 30 cm deep plus the depth of a layer of rocks which line the bottom, see Figure 3. Because the fire is below the ground, it is reasonably well sheltered from the wind. The trench fire is mainly for cooking purposes and even when it has died down, the hot stones in the bottom will provide an excellent griller.

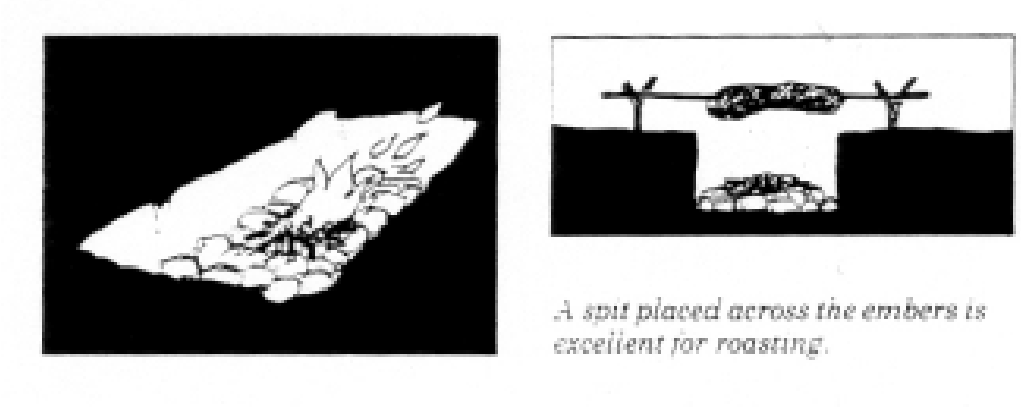


Figure 3 A Trench Fire

Temple (Raised) Fire

5009. This type is useful when the ground is so saturated that you can't light a fire on it, or for some other reason you need the fire to be up elevated. Figure 4 shows a diagram of a temple fire and it will be noted that it is a fairly simple construction. Green timber is used to make the platform and the hearth on which the fire is built, is made from a thick layer of clay or mud.

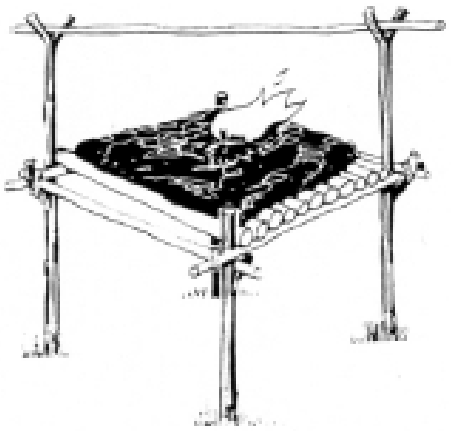


Figure 4 A Temple Fire

Cooking Pit

5010. This form of cooking is more labour intensive than other methods, but it does produce excellent results. Some will know this as either a ground oven, or by its Maori name, *Hangi*. To make a hangi, dig an oval shaped pit about 60 cm deep and lay tinder and kindling in the bottom. Lay dry logs across the top of the pit and build up layers of stones (about softball

size) and logs on top of that. The fire is now lit and the logs will gradually burn, heating the stones. Eventually, the whole lot will fall into the pit and continue to heat up. While the fire is burning, prepare the food and wrap it up in bundles with cloth or large green leaves. When the fire has died down, remove the ashes and place the food on top of the hot stones, meat to the centre and vegetables around the edge. The pit is now covered with layers of green saplings, leaves and earth, which is piled up to seal the hole as shown in Figure 5. The oven will cook the food similar to a pressure cooker for about two hours. Open the oven carefully so as not to drop dirt on the food and remember that once opened, the food will stop cooking and cool quickly.

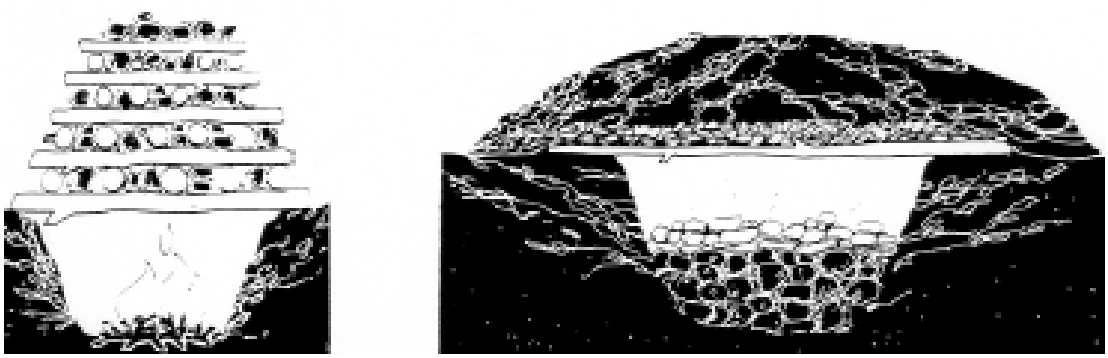


Figure 5 A Ground Oven or Hangi

Reflector Fire

5011. This is used mainly for warmth as it will direct the heat in one direction and has another advantage in that the reflector draws the smoke towards it. The methods of using a reflector fire are shown at Figure 6.

Figure 6 Reflector Fires

Methods of Lighting Fires

5012. Often in a survival situation, you will be without matches to light your fires. Alternative must be found and whilst some pieces of your equipment can be utilised, this may not always be the case. Friction causes heat and over the centuries, many ways have been found to create fire using this principle. A few alternatives are described here and illustrated at Annex A. No doubt you will discover more, as during your training, you should practice to see which method suits you best.

a. Fire bow and drill; is probably the easiest method to make fire using friction.

   The string of the bow is wound around a drill made of soft wood, which is held onto a flat piece of the same timber. When the bow is drawn quickly back and forth, the drill

spins and cerates heat at the block. Tinder is placed at this point and will soon start to smoulder, then by gently blowing on the tinder, flame will be produced.

b. The fire plough; is an alternative to the drill if you don't have the means to make an effective bow. The materials used are the same but as will be seen by the diagram, the 'plough' in this case, is drawn back and forth in a groove in the block.

c. Flint and steel; is the most reliable way of making a fire without matches.

   Place the tinder so that it is protected from the wind, hold the flint in your hand and strike it with a knife blade or similar, with a downward action. Sparks will fall onto the tinder causing it to smoulder, it can then be fanned gently into a flame.

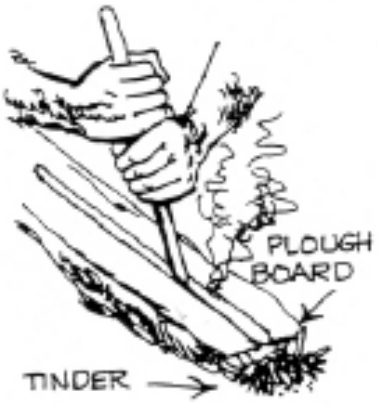
d. Electric sparks; can be used to start a fire if you have a vehicle battery. Simply use the bare ends of the terminals by making them arc onto a pile of tinder.

e. Glass; such as a lens from a camera or binoculars or from a broken bottle can be used to focus the rays from the sun onto very dry tinder. Some compasses incorporate a small magnifying glass which is ideal for fire lighting and this should probably be one of your considerations when deciding which compass to buy.

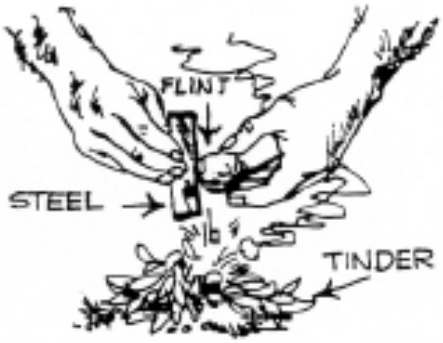
ANNEX A TO
SVP 5

METHODS OF LIGHTING FIRES

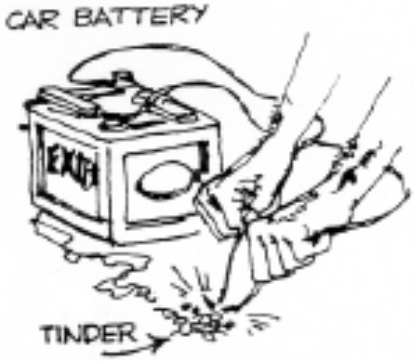
FIRE BOW & DRILL



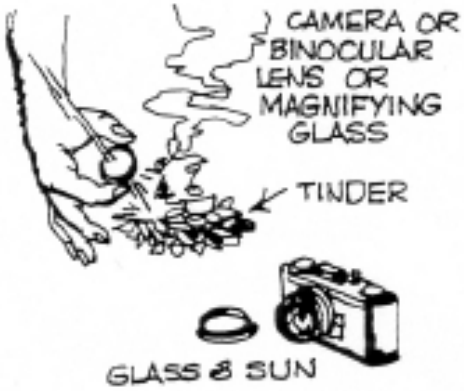
FIRE PLOUGH



FLINT & STEEL



ELECTRIC SPARK



GLASS & SUN

SURVIVAL PROFICIENCY (SVP)
SVP 6 - KNOTS AND LASHINGS
1 PERIOD

Introduction

6001. In bush craft, knots and lashings often take the place of nails in the construction of shelters and other devices which are useful when living in the natural environment. In survival, the ability to be able to join various types of natural materials together could mean the difference between the ability to feed and clothe yourself or not.

Knots, Bends and Hitches

6002. There is a knot, bend or hitch for every task in bush craft, the skill is in knowing which is best for the purpose and then how to tie and use it to its best advantage. Rope work should be practised so that it can be carried out under all conditions, in the dark, poring with rain, blowing a gale or whatever. Pick the worst scenario you can think of and train yourself to tie and untie, all of the knots with skill and confidence.

Reef knot

6003. Sometimes called the square knot, this is one of the most common and easiest to tie. It is used to join two ropes together when their diameters are the same. Never use it with ropes of unequal thickness or with synthetic rope as it will slip and come untied. Figure 1 shows the sequence.

a. Pass the *right* end over the *left* and tuck it under.

b. Now pass the *left* over the *right* and tuck it under.

c. Tighten the knot by pulling both parts of the rope on each side.

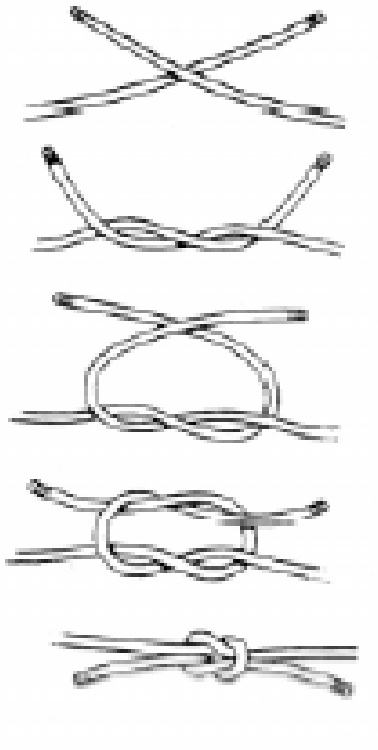


Figure 1 Reef Knot

Sheet Bend

6004. This is normally used to join two lines of different diameters. It can however, be used in place of a reef knot, especially if the ropes are wet or slippery. The sheet bend is shown at Figure 2. The double sheet bend, shown at Figure 3, is also useful for slippery lines, if the diameter between the two is very different or if the strain on the knot is not constant and a sheet bend might slip.

a. Make a loop in the thicker rope and bend the running end of the lighter one around behind the loop to the front, take it over itself and then back down through the loop. Dress the knot down as it tightens.

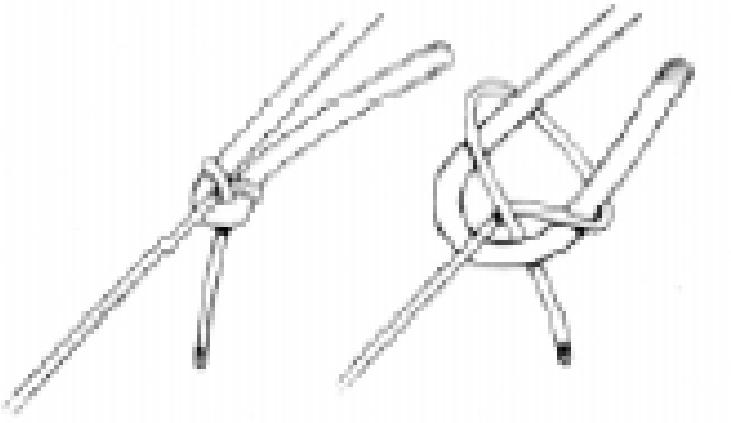


Figure 2 Sheet Bend

b. For a double sheet bend, take the running end of the light rope around the loop one more time and dress the knot as for a sheet bend.

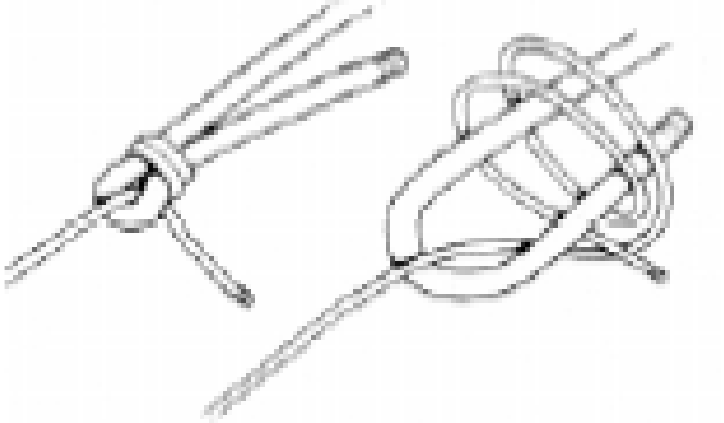


Figure 3 Double Sheet Bend

Bowline

6005. The bowline is used to make a temporary eye or loop in the end of a rope, see Figure 4.

a. Make a small loop in the standing part of the rope.

b. Pass the running end up through the loop, around behind the standing part and then back down through the loop and tighten.

Figure 4 Bowline

Figure - of - Eight Knot

6006. This knot is used to either stop the end of a rope from fraying (until it can be spliced or whipped) or to stop the rope from passing through a block or hole. It can also be tied as a double figure - of - eight, simply by doubling the line before making the knot, to make a secure loop in the end of a rope. Both are shown at Figure 5.

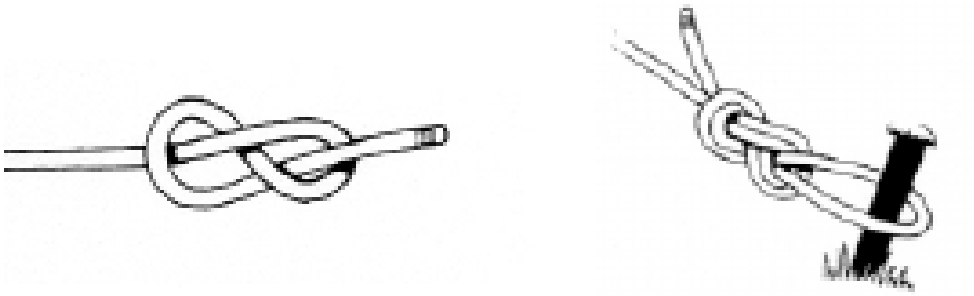


Figure 5 Figure - of - Eight (left) and Double Figure - of - Eight Knots

Clove Hitch

6007. The clove hitch is useful to attach a rope to a spar or pole, when the direction of pull is at ninety degrees to the pole. It is easy to untie even when wet. The sequence of tying this hitch is shown at Figure 6.

Figure 6 Clove Hitch

Rolling Hitch

6008. This hitch has similar uses as the clove hitch, but is used where the direction of pull is other than ninety degrees. In the illustration at Figure 7, the hitch is shown being used to secure a tent peg.

Round Turn and Two Half Hitches

6009. This is a very versatile hitch and is useful when attaching a line to a ring, eyelet or post. It can also be used as a tightening hitch to secure a load or tarpaulin. See Figure 8.

a. Take the running end of the line twice around the post.

b. Tie a half hitch onto the standing part of the line and tighten it. Repeat the half hitch a second time.

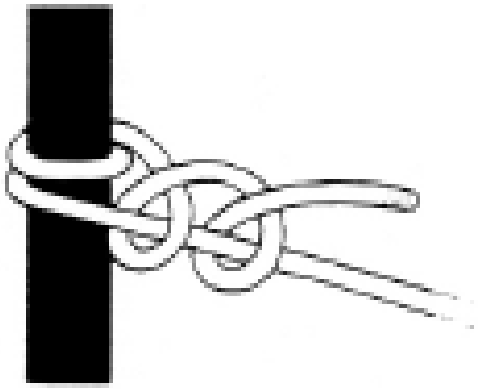


Figure 8 Round Turn and Two Half Hitches

Lashings

6010. Lashings are used in field construction to tie spars and poles together. When lashing timbers together it is important to use ropes which are suitable to the task. For poles up to 30 mm diameter, a line similar to sash cord is sufficient. For spars up to 80 mm diameter, the rope needs to be 10 mm circumference and for spars over 80 mm, use 30 mm circumference rope. To gauge the length of rope required, allow 1 metre for each 25 mm of the combined diameter of the spars.

Square Lashing

6011. This is used to lash two spars at right angles to each other. It is started with a clove hitch around the upright spar directly below the cross piece. Twist the loose end of the clove hitch around the main part of the rope and commence the wrapping turns as shown in Figure 9. The lashing consists of three wrapping turns around the spars and then two frapping turns which are strained tight between the timbers. Finish off with another clove hitch, beside the lashing on the cross piece.

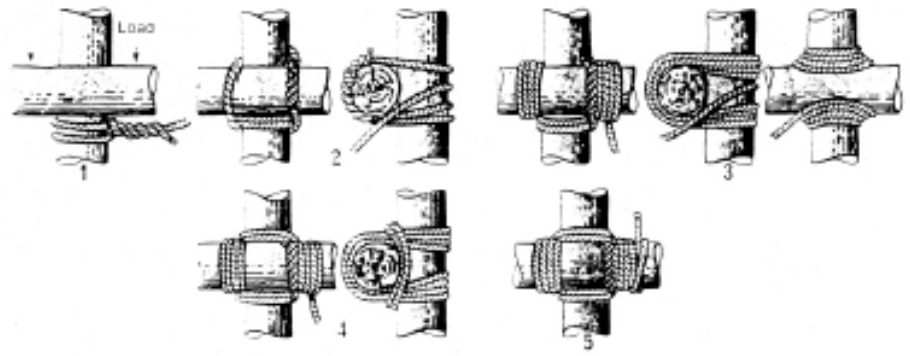


Figure 9 Square Lashing

Diagonal Lashing

6012. The diagonal lashing can be used to either lash two spars which are not at right angles to each other, or to spring two spars together, where they cross in the construction. The lashing is started with a timber hitch, which is tightened so as to bring both spars together. Three wrapping turns and two frapping turns are applied as shown in Figure 10. Finish the lashing off with a clove hitch on the most convenient spar.

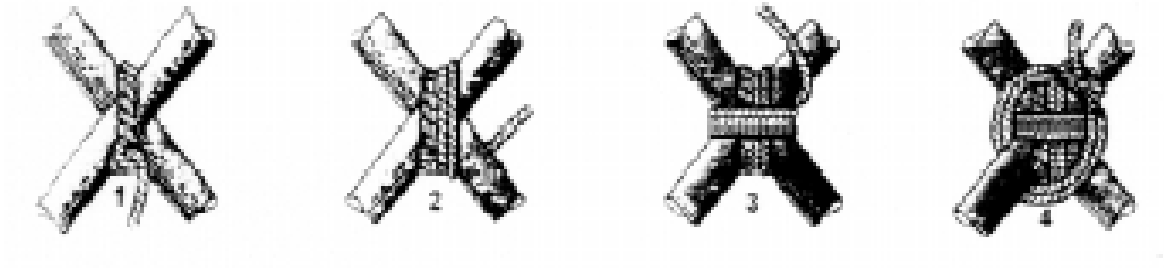


Figure 10 Diagonal Lashing

Shear Lashing

6013. Shear legs are used in the construction of bridges and so on, or to form the arm of a crane or derrick. The shear lashing is the means by which the two spars of the shear legs are lashed together. To start, place the two timbers side by side and tie a clove hitch on one, about a metre from the top. Bind the spars together with 6 - 8 wrapping turns, tighten with two frapping turns and then finish with another clove hitch on the opposite spar to the one you started on. See Figure 11.

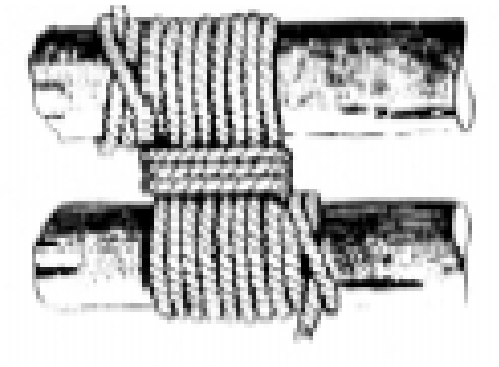


Figure 11 Shear Lashing

Figure - of - Eight Lashing

6014. This is used to lash three spars together to form a tripod. Place the spars beside each other and bind them together using 7 - 8 loose figure - of -eight wrapping turns, starting with a clove hitch on the middle spar. Finish off with two frapping turns between each leg and a clove hitch on one of the outside spars as shown at Figure 12.

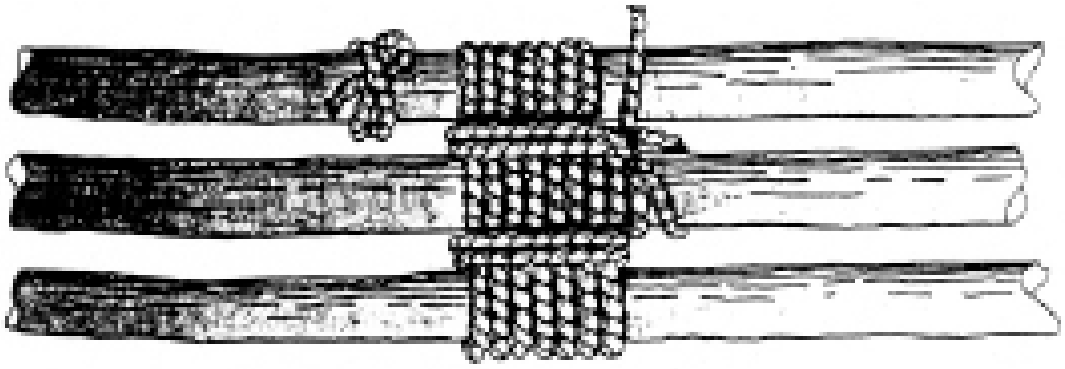


Figure 12 Figure - of - Eight Lashing

SURVIVAL PROFICIENCY (SVP)
AVP 7 - SIGNALLING
1 PERIOD

Introduction

7001. The possibility of early rescue in a survival situation is greatly increased if you can attract attention to yourself. How you do this will depend on what means are available to you and the terrain you are in. Some of the options open to you are described here, but also, use your initiative and be inventive. standard Survivors should be aware that international distress signals do exist and where possible, these should be used.

Signal Fires

7002. Fire and smoke are both excellent ways to attract attention and the construction of signal fires should be placed fairly high on the list of priority tasks. The international distress signal is three fires, which ideally, should be placed in a triangle. The points of the triangle (where the fires are) should be equal distances from each other, but not too far apart so that all three can be fed from the same pile of fuel in the centre. One fire will do, if you don't have either the material or the energy to make three and even your campfire can be built up to make a beacon when the time comes. The signal fire needs to be up off the damp ground and one method for the construction of a platform is shown at Figure 1, but often a small isolated tree or bush will do just as well. Set the fire on the platform or in the tree's branches, remembering to poke in plenty of dry grass or leaves for tinder. Keep the fire dry by covering it with any material you have salvaged or if you don't have that, with plenty of green branches. These can then be thrown onto the signal fire at the appropriate time to create smoke. Check your beacons every morning and again just before dusk, to ensure that everything is dry and ready to be lit at a moment's notice. The best position for a signal fire is in an open area of ground, on a ridge or high point or even on a raft in a river or lake. Don't risk starting a bush fire as this could cause you even greater survival problems.

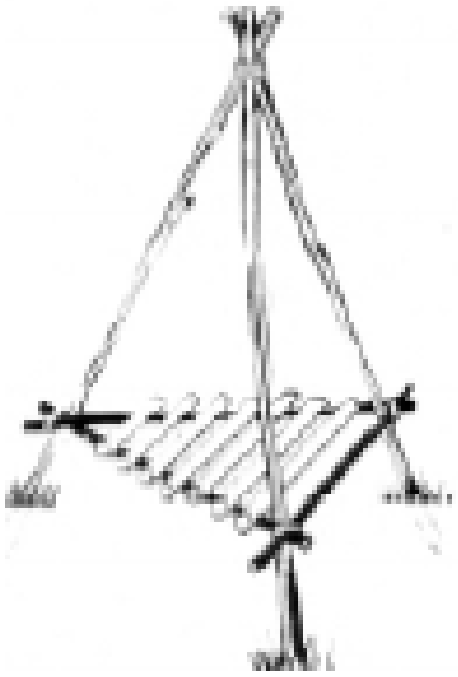


Figure 1 Platform for a Signal Fire

Heliograph

7002. Any shiny object , like a mirror, a piece of glass or a polished tin lid, may be used as a heliograph, to reflect the sun's rays and create a flash of light which can be seen from a great distance.

The simplest, effective method of using this type of heliograph is to hold your thumb up, at the full extent of your arm, using it as a sight on the object you wish to signal. Hold the heliograph in your other hand up to your face and reflect the sun's rays onto your extended thumb. By simply moving the reflection on and off your thumb you can send a message which will be seen as a series of light flashes by your target object.

7003. If you have a commercially produced heliograph, it will have a polished surface on each side and a hole in the centre, similar to the one shown in Figure 2. To use this type, hold the heliograph up in front of your face so that you can see your own reflection in the mirror. Next, sight the object (in this case an aircraft) through the hole along the line shown as

(a) in the general direction of the sun

(b) so that a spot of light

(c) appears on your face (you will see it in the mirror).

Still keeping site on the aircraft, move the heliograph so that the spot disappears back through the hole, this is what causes the flash.

A knowledge of the Morse Code is useful although not essential, but some standard signals (like SOS) should be memorised. A copy of the Morse Code and its use in emergency is at Annex A.

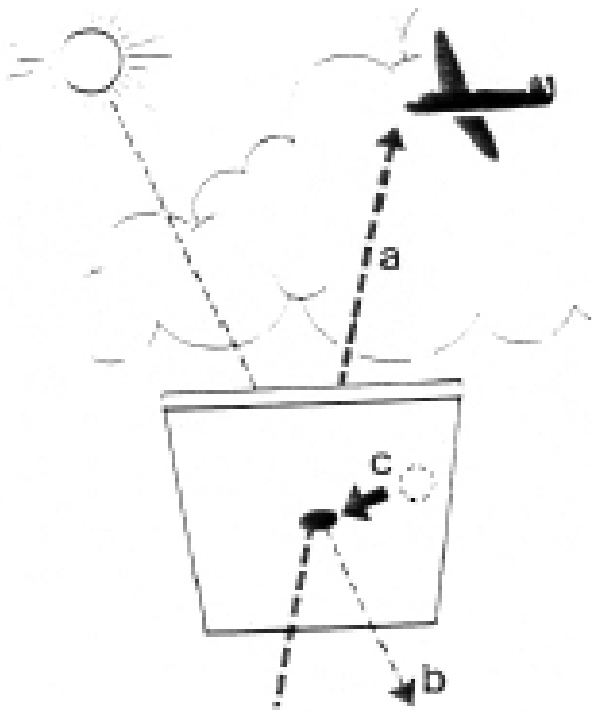


Figure 2 Sighting a Heliograph

Ground to Air Codes

7004. These consist of a series of panels laid out on open ground to pass a message to an aircraft. If you don't have panels, anything that can be seen clearly will suffice, even having people lying on the ground to form the characters of the message, has been proved to be quite effective. The code, which is also at Annex A, is quite self explanatory, but if you don't have a copy with you , it can still be of use, so parts of it should be memorised as part of survival training. What will usually happen after an aircraft has been contacted (perhaps by another visual means), is that it will drop a message to you. This can then be acknowledged by the survivors using the ground to air code symbol for either yes, or no.

Flares

7005. If you have flares available, it is most likely that they will be of the hand - held variety, which either burn in the hand, or fire a rocket which then explodes in the air to produce a star effect, or a parachute flare. Either way, the instructions on how to use the flare (written on the body) must be followed to the letter, as serious injuries have been caused by incorrect use of flares, an extra problem you can do without in a survival situation. Flares must also be kept dry and away from any naked flame or source of heat.

7006. Hand - held flares vary in size and method of operation but basically, all consist of a tube with a removable cap over one end and a striker or firing device at the other. Some flares are double ended, which means that they have a smoke generator at one end for day use and a flame at the other for night time. The protective caps on flares are marked with symbols (crosses, knurled edges etc.) so that they can be identified in the dark. Survivors must memorise what the symbols indicate (all flares are not the same) so that mistakes can be avoided. Never discharge a flare of any type near engine fuel, as burning residue from the flare is likely to have disastrous results. Smoke and flame flares should also be held out and down from your body, so that the residue falls either on the ground or in the water and not all over your hand.

Radio

7007. If your party has been issued with Service radio equipment, then Standard Operating Procedures (SOP) will also have been issued with it. These instructions will detail any emergency frequencies and procedures suited to the situation and therefore, need no elaboration here. In the AAFC however, it is more likely that you will be operating with Citizen's Band (CB) radio or some other short range Very High Frequency (VHF) commercial system.

Citizens Band Radio

7008. CB radio is now widely used as an emergency communication system and several organisations in Australia monitor the emergency frequencies on a 24 hour basis. The variety of set types is far too wide to be covered here, but they fall into two basic categories, Amplitude Modulation (AM) and Single Side Band (SSB), which multiplies the capability of the AM unit by about four.

7009. If you need to use a CB radio in an emergency, use the following procedure;

a. Switch on the set and adjust the volume.

b. If it is an SSB unit, select the Upper Side Band (the lower is AM).

c. Select the emergency frequency, 27.065 MHz (Channel 5 on the dial).

d. Press the talk switch on the hand set and say *" Calling any station - calling any station, I have an emergency message, can you hear me - over "* and then release the switch and wait for an answer.

7010. If you don't get an answer, try another channel and / or move to a different location and continue the procedure. When you get a response, don't be concerned if you aren't familiar with CB jargon. Simply explain that you are using the CB in an emergency, for the first time and speak clearly and slowly, using very plain language.

VHF Radio

7011. Portable VHF radios are to be considered as 'line of sight' operation. That means that their range over the ground is not great (up to 20 km), but it can be increased by climbing onto high ground or using a relay system. Ground to air VHF communications will of course extend the range considerably.

7012. If you are not familiar with radio procedures, or don't have a copy of these instructions then in an emergency, follow the actions described as for CB operation. A set procedure is however, laid down for sending a distress call over VHF and this is as follows.

a. Turn on the set and select the emergency frequency, 156.80 MHz (Channel 16).

b. Press the talk switch on the hand set and send the call like this; *"MAYDAY - MAYDAY - MAYDAY"* Now send your callsign or name three times and continue with, *"MAYDAY - THIS IS* (your callsign or name). Follow this with your location and a brief description of the emergency *"OVER"*

c. If you don't get any response, follow the same procedure as described in paragraph 7010 above.

d. After sending a distress call the emergency no longer exits, you must call up and broadcast a cancellation, making sure that you identify yourself clearly.

Emergency and Safety Signals

7013. There are three code words which have an international meaning to indicate that an important message is about to follow. They should be recognised instantly by radio users and all other transmissions should stop until the message has been passed. The code words, which are always said three times at the beginning of a message and their meanings are as follows.

a. MAYDAY ; (from the French *m'aidez - help me*) is used for distress signals only.

b. PAN - PAN ; means that a station has a very urgent message concerning the safety of a vessel, aircraft, group or person.

a. SECURITE ; (pronounced SAYCURITAY) precedes a general broadcast concerning a navigation warning , meteorological report or other safety warning.

ANNEX A TO
SVP 7

MORSE CODE & GROUND - AIR CODES