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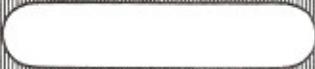
LAND AND SEA EMERGENCIES

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PREFACE

This publication is issued to provide Canadian Forces aircrew personnel and aircraft passengers with methods of survival on land or at sea in the event of an emergency landing or bail out.

The information contained herein is designed primarily to recall survival techniques to those who have been survival trained, but is complete enough to direct those, who have not had survival training, in the correct procedures to follow.

The techniques and procedures outlined are the result of years of experience and trial and are designed to enable the survivor to take care of himself and others for an indefinite period with a minimum expenditure of energy.

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INTRODUCTION

Survival for an indefinite period is a real possibility in any survival situation regardless of climatic conditions or geographic location. With a little know how, the proper care and use of your survival equipment, and a determined will to live, your chances of surviving until rescue arrives are excellent.

This publication outlines in point form the basic principles and techniques of survival. You should read the chapter pertaining to the survival situation you are faced with and apply the principles as contained in that chapter as well as Chapters 1 Psychology and 2 Medical Care.

CHAPTER 1
PSYCHOLOGY

1. Fear of Unknown. This normal reaction must and can be controlled:

- have confidence that SAR will find you
- have confidence in your equipment and yourself
- concentrate on job to be done
- don't panic.

2. Enemies of Survival and How to Control Them:

a. Pain

- keep mind occupied with survival plans
- remain optimistic;

b. Cold

- take all precautions to prevent freezing
- do not let it dampen your will to survive;

c. Thirst

- dehydration can be very serious
- drink ample water; do not ration water; drink as necessary
- avoid alcoholic drinks;

d. Hunger

- natural reaction when food is scarce
- lack of food is not as serious as imagined
- remember the body will function for an indefinite period with no food;

e. Fatigue

- can cause carelessness

- do not overexert yourself
- control tendency to give up;

f. Boredom and Loneliness

- can be caused by disappointments
- remain active to keep these out your mind
- remain optimistic.

NOTE — Most of these enemies can be controlled by keeping your mind on the job at hand — that of following the survival procedures.

3. Group Behaviour

- appoint a leader
- plan and work together as a team
- know what your job is
- each member should be assigned a task he is best suited to do
- all suggestions and criticism should be considered
- decisions must be made and stuck to
- all equipment should be checked
- survey the situation.

4. Personality Requirement

- make up your mind
- improvise
- get along with others
- keep cool, calm, and collected
- be patient
- be optimistic
- be prepared for uncomfortable situations
- analyse problems and deal with them.

5. Survival Hints

- generally survival priorities are: (1) First Aid, (2) Fire, (3) Shelter, (4) Signals and (5) Food and Water
- accomplish physically demanding tasks as soon as possible, before the lack of energy, hunger, thirst, etc, affect you
- then, conserve your energy and strength by:
 - resting
 - keeping warm
 - employing passive hunting and fishing methods, ie, — nets, snares
- maintain clothing and equipment in best possible condition

- food preparation best done by boiling; then drink water for warmth and additional nutrition

- IMPROVISE
 - use your mind and imagination
 - don't be discouraged by minor set-backs
 - don't discard ideas too soon
 - your downed aircraft is a tremendous source of wealth to a survivor; there are POLs, tires, etc, for fires and signals and material for improvising utensils, shelters, weapons, clothing, etc.

CHAPTER 2

MEDICAL CARE

1. General Priorities for Treatment

- start patient breathing
- stop bleeding
- protect wounds
- immobilize fractures
- treat for shock.

NOTE — Although injuries must be protected and/or immobilized, attempt to allow patient mobility (example: — do not splint a fractured leg to the uninjured leg; if this is avoided and a crutch is improvised, the patient will retain some ability to move about).

2. Starting Breathing

- the best method is mouth-to-mouth resuscitation
 - check mouth for airway blockages
 - place hand under patient's neck and lift

- with heel of other hand on forehead, tilt head back to open airway, and pinch nostrils
 - tight seal over patient's mouth with your mouth
 - exhale into patient's mouth; remove mouth and observe for chest expansion and contraction
 - if no expansion, clear airway by rolling patient on his side and striking between shoulder blades
 - continue "Mouth-to-mouth" (15 to 20 times per minute for adults) until patient breathes on his own
-
- use mouth-to-nose method for patients with mouth injuries or swollen tongues — method the same except patient's mouth must be sealed and air exhaled into nose.

3. Stopping Bleeding

- best method is to apply pressure to the wound, elevate the injured part above the level of the heart, and allow the patient to rest
- avoid contacting wound with your hand; use sterile or clean dressing
- tourniquets are not recommended.

4. Protecting Injury

- injuries must be protected from contamination and further aggravation
- if applicable, clean wounds by flushing with clean water
- dressings should be dry and sterile or clean
- for wounds, dressings must be applied in a manner to maintain pressure and prevent bleeding; for embedded or protruding objects use a ring/doughnut dressing which will maintain pressure on wound site but not on object.

5. Immobilizing Fractures

- treat where patient lies unless location is hazardous
- assemble all necessary material before starting
- splint the fracture
 - improvise as necessary
 - use padding around splint
 - tie at least above and below fracture
- if fracture must be set, apply traction (slow, steady pull) and rotate to a natural position; maintain traction until splinting

is complete — DO NOT attempt to set dislocations or fractures at joints; simply splint these injuries.

6. Treating Shock

- signs of shock are:
 - skin pale, cold, and clammy
 - pulse fast and weak
 - breathing fast and shallow
- treat the injury that precipitated the shock
- reassure patient — work in calm, efficient manner
- keep patient warm
- give hot liquids unless patient is unconscious or semi-conscious or if he has abdominal injuries
- let patient rest, usually with head lower than body.

7. Burns

- promptly remove anything of a constrictive nature (belts, bracelets, rings, boots, etc)
- in early stages, reduction of heat is essential — immerse in cold water or apply clean cold compresses until pain subsides

- cover burns with dry sterile dressing
- DO NOT remove clothing which sticks to burned area
- DO NOT apply ointments (except for sunburns)
- DO NOT prick blisters nor breathe over, nor touch burned area
- fluids may be given
- give 222's for pain
- treat for shock

8. Heat Illnesses (Heat Stroke, Cramps, Exhaustion)

- symptoms may vary:
 - mild — painful muscle spasms of arms, legs, and abdomen
 - worse — cramps
 - headaches and dizziness; even fainting
 - restlessness
 - weak pulse
 - cold, clammy skin
 - severe — skin hot and dry
 - pulse strong and pounding
 - headaches, dizziness, even unconsciousness and convulsions

- victim must be cooled quickly
 - remove to cool, shaded area
 - fan patient
 - for more severe cases, immerse in cool water or pour cool water over him
- when temperature returns to normal, move to cool shelter and cover with a light, dry covering
- give plenty of water; add salt if available (1/2 teaspoon per pint).

9. Hypothermia

- condition of dangerously low body temperature due to cold and wet condition
- early indications are uncontrollable shivering, stiffness of movement, confusion, low body temperature
- treatment
 - handle gently
 - prevent further heat loss
 - give warm fluids
 - apply warm compresses to abdomen or immerse in hot bath (excluding arms and legs).

10. Frostbite

- recognized by
 - numbness
 - skin may be dull, white, or waxy in appearance
 - tissue may be solid in more severe cases
- DO NOT rub; DO NOT apply snow or ice
- for frostbite, thaw with body heat
- deep freezing should not be thawed; if thawed, apply a sterile dressing, immobilize, and prevent contamination (high risk of gangrene occurring)
- if frozen limb/part thawed, do not use, ie; — one can walk on a frozen foot; but once thawed, it must not bear weight until medically treated

11. Insect Bites

- paste of clay and water will reduce sting
- prevention is best treatment; cover all exposed surfaces and use repellents.

CHAPTER 3

TEMPERATURE ZONE (BUSH) SURVIVAL

1. Immediate Actions

- stay clear of a/c until risk of fire subides
- apply first aid
- make a fire
- build a shelter
- prepare signals
- supplement food and water
- if winter drain oil from engines.

2. Medical Care — In accordance with Chap 2.

3. Shelters

a. Location

- you should locate your shelter near the crash scene considering the following factors:
 - area protected from wind
 - safe from overhead threats

- high ground
 - no danger of flooding
 - away from insects (summer)
 - near clearing for easy access to signalling area
 - availability of building material, fire wood, and water
 - near water and wood supply;
- b. Types — erect the type that best suits the season and survival situation —
- (1) lean-to
- best all round emergency shelter when heat is required
 - select level ground
 - pole framework between two trees or one tree and tripod
 - cross pole 4 feet high and as long as required for number of survivors
 - depth
 - 3 to 4 feet for single man
 - 8 feet for more than one

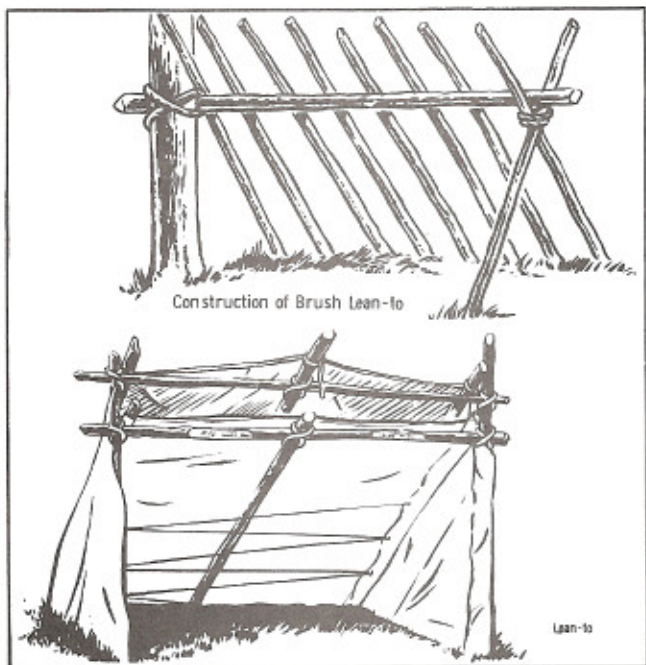


Figure 3-1

- covering
 - boughs (butt end up) in a thatching fashion
 - parachute material or other cloth stretched tight, two separated layers preferable
 - both boughs and parachute material
- improvised bed is important
 - bough bed is best
 - dry moss can be used
 - inverted life raft is acceptable
- lay a log across front of shelter to retain equipment and bed inside shelter,

(2) suspension tepee

- best in insect-infested area in summer
- simple, quick to erect
- erect in area sheltered from wind
- tripod of 15-foot poles, branch of trees, or crossbar tied between two trees
- tie apex of parachute to tripod, etc
- stretch parachute right and peg out to form size of shelter desired

- double layer of parachute best
- enlarge apex for better craft to avoid smoke when fire burning in shelter
- build a small fire in centre of tepee for warmth and insect suppression,

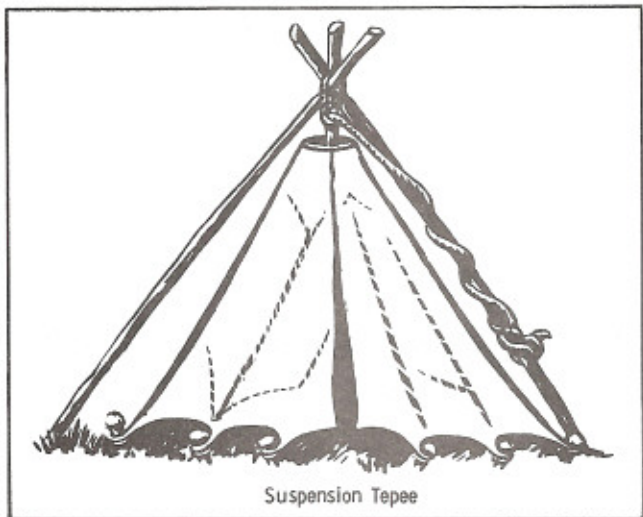


Figure 3-2

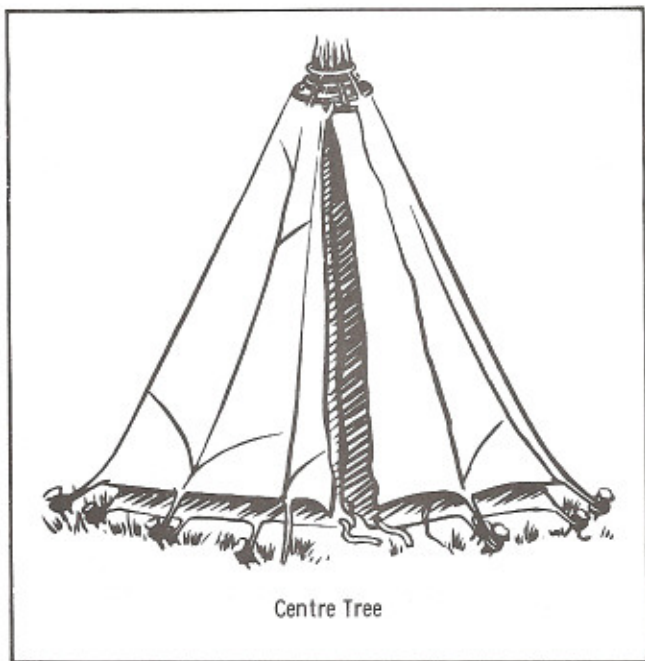


Figure 3-3

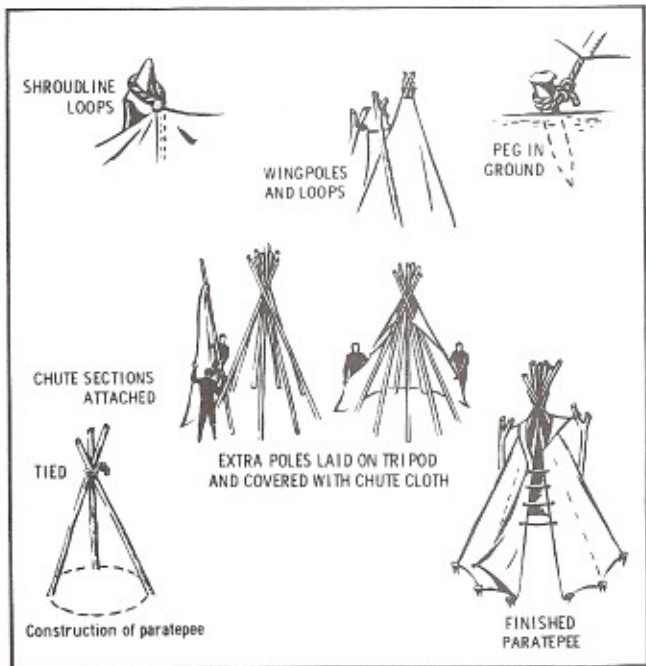


Figure 3-4

(3) para tepee

- will withstand more wind than suspension tepee
- same insect proof characteristics
- size limited to accommodate two to three persons
- will leak rain more readily than suspension tepee
- 6 to 8 poles 12 feet in length in tripod fashion
- wrap parachute material tightly around with apex at top,

(4) natural shelters

- caves
- base of safe, overhanging rock
- large fallen tree
 - ensure safe
 - clear out branches underneath
 - cover with more boughs or parachute
- base of large tree with large overhanging branches,

(5) aircraft

- inside fuselage if intact and on even keel

- not recommended in winter, nor in summer if in direct sunlight
- ensure no fire hazard
- under wing or tail section
- difficult to heat,

(6) emergency tents

- if available
- can be improvised by using a parachute or other material to improvise double layer, dead-air space effect.

4. Signals

- should be readied for immediate use as soon as practicable:

a. Radio Signals

- try a/c radios
- use emergency radios as directed
- conserve batteries
- keep batteries warm
- transmit from high grounds, clear of obstructions
- keep radio upright
- put a reflecting surface under radio;

b. Pyrotechnics

- use only when search a/c sighted
- fire according to instructions
- use safety precautions to avoid an accident
- aim in front of search a/c
- keep handy for immediate use
- if away from camp carry pyros with you;

c. Fire and Smoke

- prepare signal fires early
- smoke by day and fire by night
- white smoke for summer — use evergreen boughs, green grass, etc
- black smoke for winter — use oil, rubber, etc
- locate in conspicuous place, ie, open area, floating on a lake
- three in line or in triangle — use camp fire for one

- protect from rain or snow
- take precautions to prevent fires getting out of hand;

d. Light Signals

- heliograph mirror — use in accordance with instructions
- campfire at night
- candle inside a parachute shelter
- a/c landing lights
- strobe lights
- flashlight — shone on a reflecting surface at night
- shiny parts of a/c by day
- torch tree
 - isolated evergreen
 - birds nest of tinder in lower branches
 - use a/c fuel if available
- flash fire
 - use a/c fuel on ground or saturate pieces of fabric
 - ignite when a/c seen
 - take fire precautions;

e. Shadow and Colour (Contrast)

- in winter
 - tramp out signal in snow on lake or in clearing
 - lay evergreen boughs on snow
 - colour snow with sea marker dye
- in summer
 - torn sod blocks over in clearing
 - fresh peeled logs in clearing or floating on lake
 - white rocks on dark background
 - strips of parachute material pegged to ground
- colour panels from safety equipment kit pegged to ground winter or summer;

f. Sound signals

- to regroup after bail out or attract ground party
- firearms — fire three shots
- whistle
 - in kit
 - improvise

— shout;

g. Informative

- if you walk out — leave note giving all facts
- blaze trail
- leave note at each camp
- lay out ground to air signals using material in 4e.

5. Fire Methods

a. Requirements —

(1) spark

- matches
- cigarette lighter
- flint and steel — bounce spark into dry tinder
- battery — short battery with wire
- pyrotechnics and ammunition
- magnifying glass — focus sun's rays on dry tinder,

GROUND — AIR EMERGENCY CODE

REQUIRE ASSISTANCE	ICAO SYMBOLS	V
REQUIRE MEDICAL ASSISTANCE		X
NO OR NEGATIVE		N
YES OR AFFIRMATIVE		Y
AM PROCEEDING IN THIS DIRECTION	ADDITIONAL CANADA ONLY	
ALL IS WELL		LL *
REQUIRE FOOD AND WATER		F
REQUIRE FUEL AND OIL		L
REQUIRE REPAIRS		W

GROUND TO AIR SIGNALS

Use strips of fabric, parachutes, peeled logs, sods, stones, or branches in snow. Try to provide maximum contrast. All figures should be at least 40 feet in length. Symbols may be used in combination.

*A space of 10 feet between symbols if possible.

(2) tinder

- cotton fuzz, paper fuzz, absorbent cotton, gasoline impregnated rags, dead grass, or moss
- must be DRY,

(3) fuel

- progress from fine kindling to heavier fuel as fire gains intensity
- dry dead twigs
- birch bark
- feather sticks — shave dry sticks with knife in fan shape
- gasoline or oil impregnated wood
- have a good supply before starting fire
- fine dry wood burns fast; green or wet wood burns slower and longer
- do not smother fire

Ventilation

- fire needs oxygen
- blow or fan a smoldering fire;

b. Fire Layout

- light fire on gravel or bare mineral earth
- in snow, light fire on green log base
- do not build under a tree
- build a log fire across mouth of lean-to for warmth and insect suppression;

c. General

- keep matches dry
 - if wet, dry in sun
 - rub through hair
- don't waste matches — use sticks from fire for lighting smokes
- keep a good supply of tinder and fuel on hand
- during wet weather, dead standing wood is driest
- locate your fire away from strong winds
- don't use rocks around fire — they may explode

- guard against flying embers
- bank fire at night
 - use green logs or stumps
 - will not have to relight in morning
 - don't chop wood into small pieces unless necessary; long poles/logs can be "fed" lengthwise into the fire.

6. Water

- a must to prevent dehydration
- drink as much as thirst dictates

a. Sources (Summer)

- springs or running water best
- standing water in lakes or sloughs
- rain water
- dig a hole in a depression, gully, or dry creek bed
- sap layer of trees, ie, birch, maple, etc, in spring

(Winter)

- open water on river or lake best
- ice next best
- snow when melted keep tamped down in pot until some water has formed
- do not eat snow — tends to dehydrate body;

b. Purification

- no known poisonous water
- not necessary to purify spring water
- other water
 - boil 3 to 5 minutes
 - halazone tablets as directed
 - nine drops iodine per quart
- filter or let settle to remove sediment
- if unpalatable, add charcoal and let it stand.

7. Food

- not an immediate requisite for survival
- emergency rations will sustain you for an indefinite period of inactive survival
- if strenuous exertion or in cold, you must supplement rations
- eat perishable foods first
- digestion process requires water; if no water available, don't eat
- protein requires more water than carbohydrates for digestion;

a. Emergency Rations

- eat as directed;

b. Inflight Rations

- eat first if perishable;

c. Natural Foods

(1) plant life

- generally anything eaten by birds and animals is safe

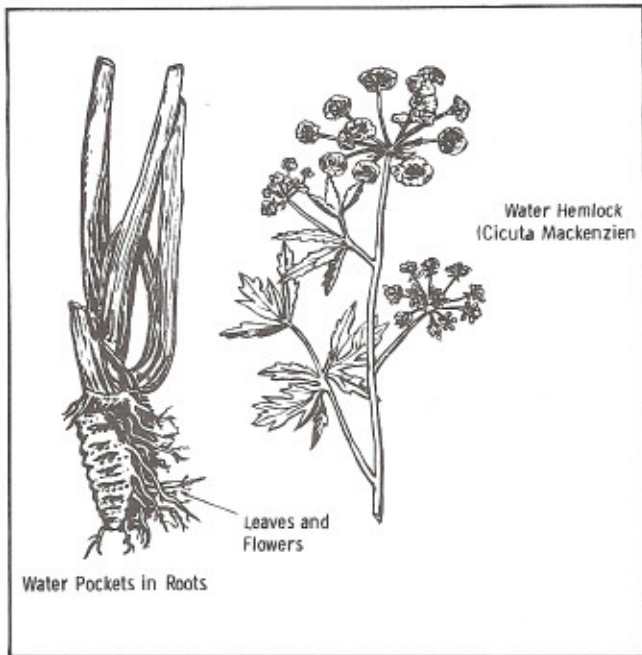


Figure 3-6

— if doubtful, eat small amounts and await any reaction,

(2) poisonous plants —

(a) Water Hemlock

- found in boggy clearings
- two to four feet high
- three part purple-streaked leaves
- disagreeable odour when crushed
- water pockets in hollow tuber like roots
- DO NOT EAT,

(b) Death Cup Mushroom

- found in wooded areas
- when mature, white cup-like formation at base and broad collar-like ring part way up stem
- DO NOT EAT
- if in doubt, avoid all mushrooms,

(c) **Bane Berry**

- bushy perennial 1 to 3 feet tall
- small white flowers in a short terminal cluster
- red or white berries in clusters
- DO NOT EAT;

(3) **edible plants**

- do not eat plants that exude white, milky fluid when cut
- flowers — eat either raw or boiled
- greens — eat raw or boiled; provides roughage and vitamins
- roots — eat either raw or boiled — some may have to be boiled in more than one change of water to remove acrid flavour — provides starch and protein
- berries — avoid white berries — avoid other berries growing in clusters unless known as edible — eat raw or stewed
- lichens — dry scale-like plants — boil and dry then powder and use as soup or gravy thickener

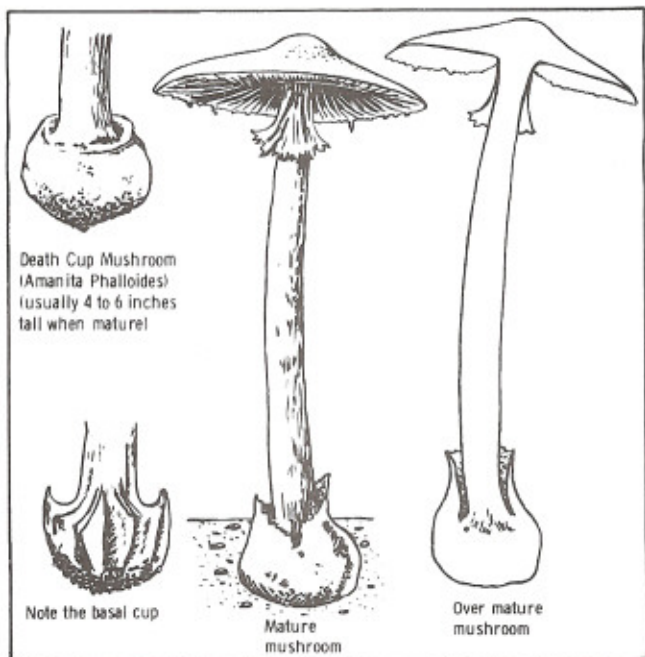


Figure 3-7

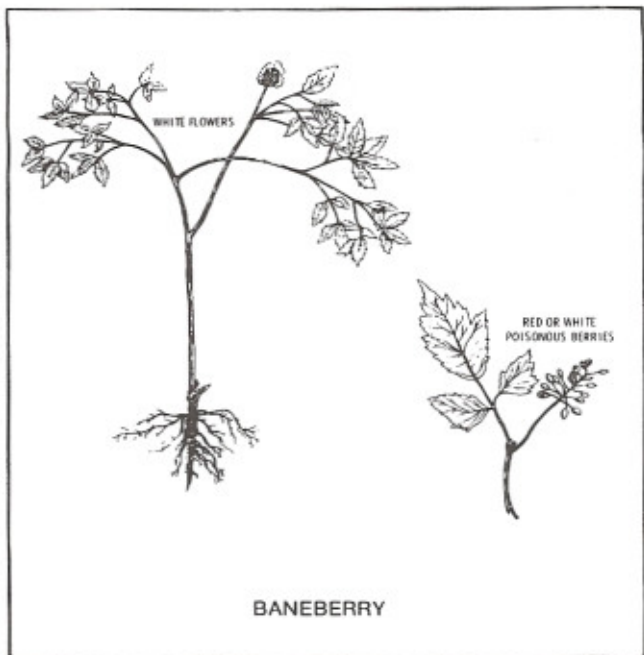


Figure 3-8

- mushrooms — unless positively identified, avoid eating them
- leaves — Labrador tea, shrub-like growth found in muskeg areas — boat-shaped leaves with brown velvety underside — steep to make aromatic stimulating beverage-high in vitamin "C"
- sap from maple, basswood, birch, and new forming bark contain carbohydrates and vitamin "C",

(4) red meat

- all parts of birds and animals are edible
- if fish-eating birds, skin them
- dress out game immediately —

(a) cooking

- all meats should be cooked
- boiling is best
- frying — requires grease — not recommended
- barbecueing — over a smokeless fire — improvises a spit — wastes juices

- roasting — planking — stake to split green non-resinous log and roast next to smokeless fire
- baking — shallow pit lined with rocks — heat with good bed of coals — place meat wrapped in sticky mud or clay — more coals — cover with few inches of earth
- steaming — same as baking but wrap food in tin foil or grass and add water to form steam,

(b) preserving

- if more meat is available than can be eaten, must be preserved
- in winter, freeze it
- in summer — keep it cool in metal container in ground-ventilated container
- cure by drying in sun and near fire — or smoking but avoid resinous smoke and do not over smoke,

(c) caching

- hang away from trees or uprights to prevent animals from disturbing
- cover to keep birds and small animals off
- high enough to be away from flies,

(5) insects

- grasshoppers and locusts — toast the body
- grubs or wood burrowing beetles — toast or boil
- ants — remove head, thorax, and legs
- earthworms are also edible,

(6) reptiles

- lizards, frogs, snakes, and turtles are all edible
- boil or fry,

8. Hunting

- small game and birds will be most likely game
- snares and traps best

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— firearms if available:

a. Rabbits

- usually frequent thickets
- look for runs (paths)
- easy to snare;

b. Squirrels

- store food in tree cavities or hole in ground
- look for pile of cone chips near base of tree
- set leaning pole snare near site of chips;

c. Porcupine

- found in most forested areas
- look for bark stripped off trees fairly high above ground
- if seen in tree, chop tree down
- kill with blow from stick on nose
- handle carefully — front foot or belly

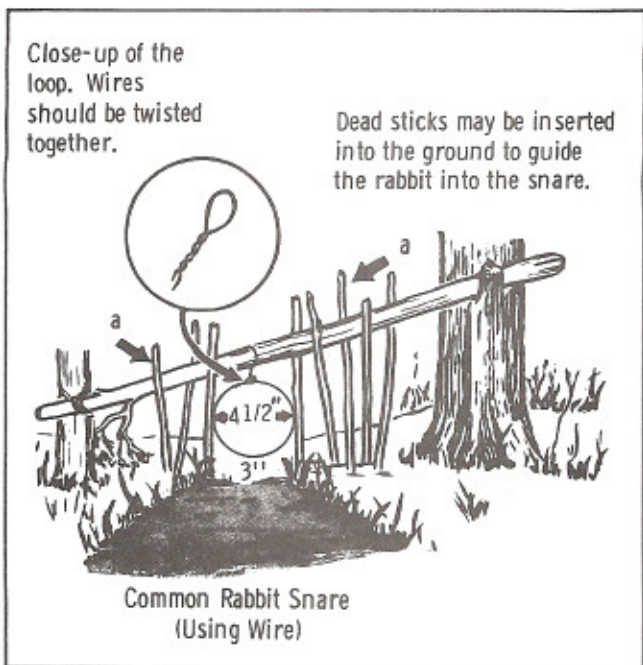


Figure 3-9

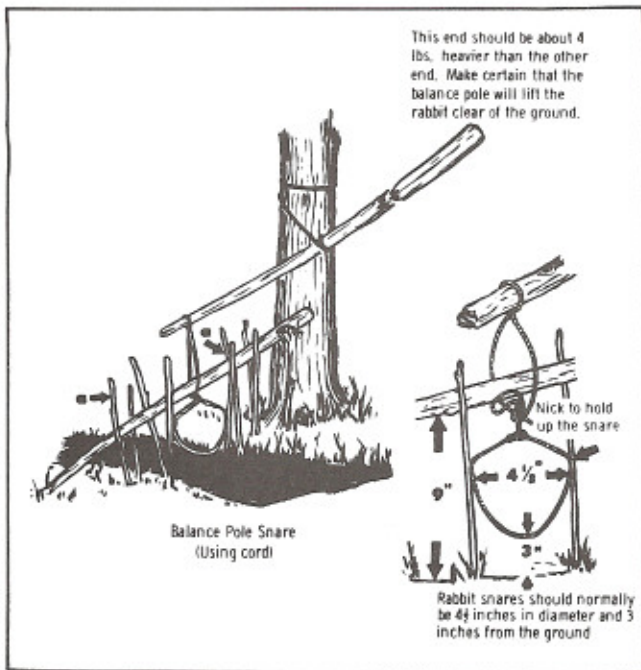


Figure 3-10

— skin by slitting belly and roll skin back over quills;

d. Carnivorous Fur Bearers

- mink, marten, etc
- may be shot or snared;

e. Beaver and Muskrat

- may be found in lakes, ponds, sloughs or marshy areas
- travel in paths or runways proceeding from water
- snare or shoot;

f. Fox, Wolf, Coyote, and Lynx

- will not likely be seen
- use bait snare;

g. Upland Birds

- not easily frightened
- can be shot, or killed with a sling shot or thrown rocks

- can be snared around the neck with wire snare or a long pole
- look for nests and eggs;

h. Waterfowl

- not easily approached
- shoot on water
- look for nest and eggs
- pull a fish net over them when bird is on nest;

j. Other Birds

- gulls will take a baited hook
- Canada Jay can be taken on Ojibwa Bird Snare;

k. Big Game

- deer and moose most likely to be seen
- difficult to hunt by novice
- snare on game trails
- can be dangerous in a snare — will have to shoot it

- hole 6 inches deep in game trail
- cover with cardboard or heavy paper with x cut in it
- place large loop of snare on cardboard and anchor to log
- camouflage.

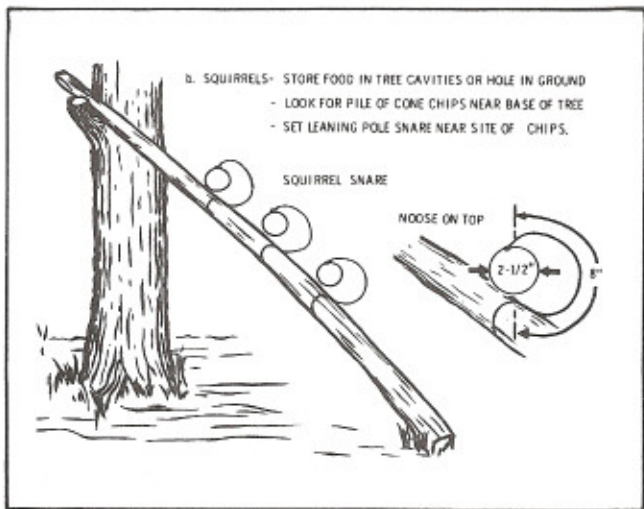


Figure 3-11

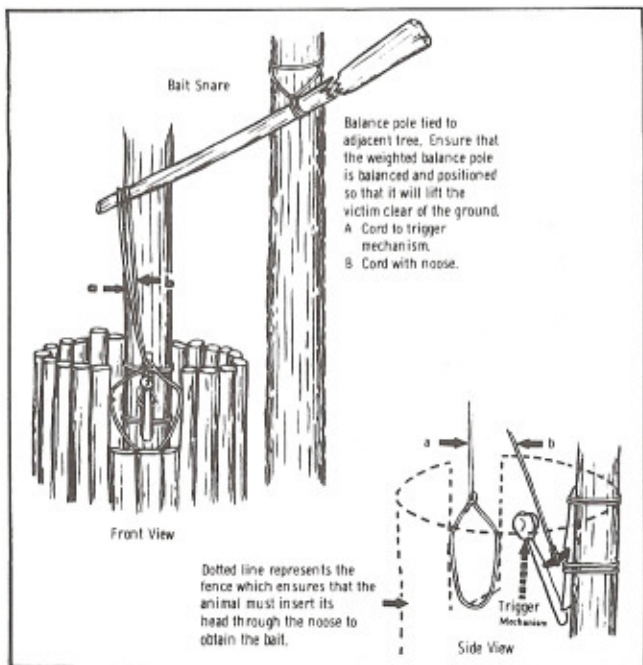


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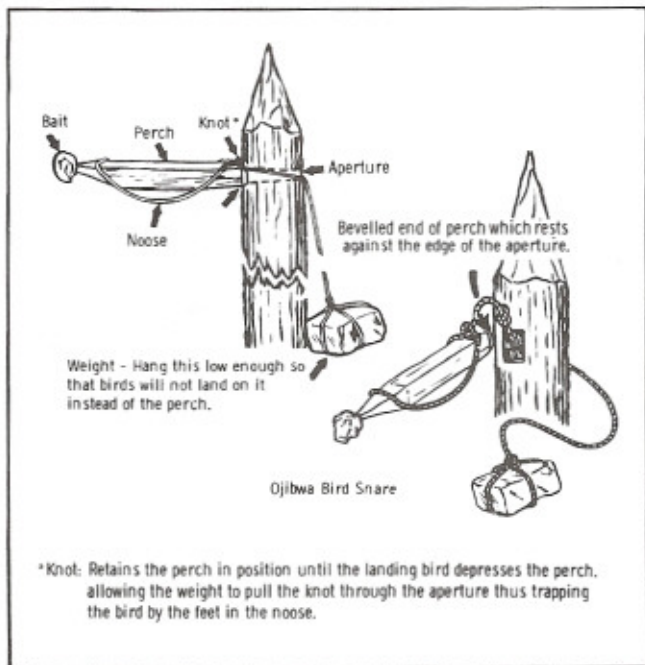


Figure 3-13

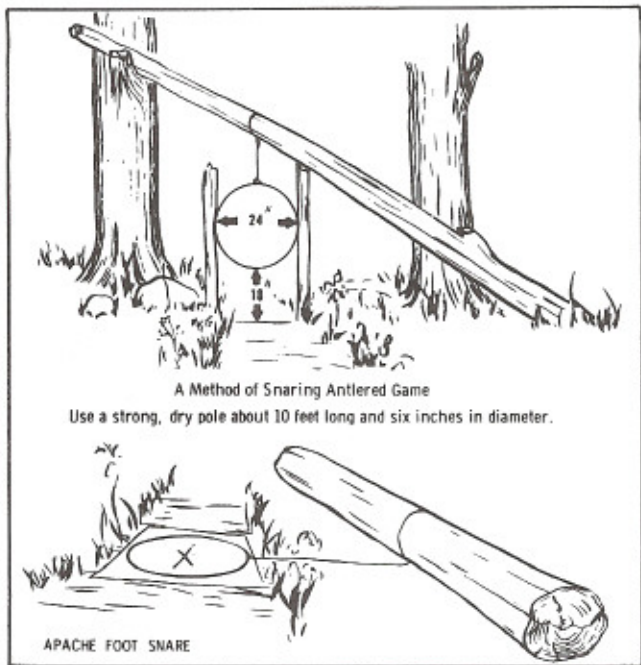


Figure 3-14

9. Fishing

- most lakes, rivers, and streams contain fish, clams, and crayfish:

a. Netting

- most productive
- manufacture your own net from inner lines of parachute shroud
- 2-1/2-inch mesh best
- floats on top, weights on bottom
- set
 - off lake shore with long pole
 - block off stream
 - under ice in winter;

b. Other Methods

- spear in clear water
- snare with wire loop on long pole
- hook and line
 - night lines
 - casting

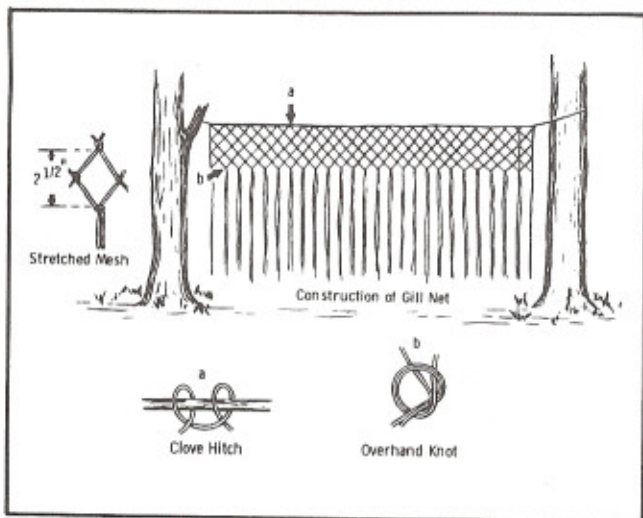


Figure 3-15

- float with baited hook
- jigging — keep bait moving.

10. Care and Use of Equipment

- your survival equipment is designed to do a job for you; to do this job well it requires your care, maintenance, and proper usage:
 - a. Axe
 - head must be tight on handle
 - if loose
 - drive wedge in further
 - make a new wedge
 - soak head in water (not in winter)
 - tighten by striking the end of the handle with a rock
 - ensure it is sharp
 - ensure handle is not cracked — if cracked or broken, make a new handle — hardwood preferable
 - keep axe in sheath
 - carry axe with edge held away from body
 - when felling a tree
 - check “Lean” of the tree for best direction of fall

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- check for overhead hazards such as broken limbs
- clear underbrush which could interfere with axe swing
- take a firm stance standing or kneeling
- make first cut on side of intended fall, low and about 1/2 way through
- make a back-cut on other side, higher than first
- when tree falls, stand back in case butt jumps
- when splitting wood — place piece to be split across a log
- when not in use, use sheath or stick in dry stump or log;

b. Knife

- keep sharp
- carry in sheath situated on back of hip
- tie to person;

c. Firearms

- store in sheltered cold spot (winter)

- do not lubricate (winter)
- keep barrel clean
- store ammo and gun in safe place;

d. Clothing

- keep clean and repaired
- dry as necessary
- shed layers of clothing if becoming warm due to exertion
- dry clothing in front of fire — no nearer than hand can stand
- never leave clothing by unattended fire
- when drying leather, turn in and “Work” leather periodically to ensure it remains pliable;

e. Miscellaneous Equipment

- small pieces of equipment should receive the following care:
 - have a designated place for each piece of equipment
 - never lay down where they may not be found

- locate items for easy access, ie, signal flares, etc
- tie small items to person to avoid loss
- do not cut rope unless absolutely necessary
- air out sleeping bag daily
- tie knots that are easily undone
- save everything for possible later use
- keep clothing and cooking utensils clean;

f. Improvising

- you are limited only by your ingenuity in production of improvised equipment. You should consider:
 - needles from bone or metal
 - fish lures from wood, metal, and bright-coloured cloth
 - water containers from bark, internal organs and skins of animals, and aircraft metals

- whisk broom from bird wings
- eating utensils from wood, bone, and metal
- eye shields from wood or cloth
- use parachute to make shelters, signal strips, clothing, sleeping robe, sails, wrappers for game, bandages, etc
- use shroud lines for snares, fish lines, fish net, ropes, lines, sewing, lashings, snowshoe webbing, etc
- use parachute pack for knapsack, footwear, mittens, headgear, axe and knife sheaths, etc.

11. Travel

- normal survival situations dictate that you should not leave the scene of the crash. The only time you should consider leaving is if you are in a location where survival might prove difficult or dangerous. Under these conditions, travel only as far as is necessary to find a good safe place for your camp

— the decision is yours if you decide to walk out to habitation; the following five requirements must be fulfilled:

1. Know where you are and where you are heading
2. Have a means of setting and maintaining a course
3. Be sure you have the necessary physical stamina
4. Have necessary clothing to complete journey
5. Be sure you have food, fuel, shelter, and signals available or the means of obtaining same on your journey:

a. Travel Hints

(1) summer

— walking is easier along ridges and on game trails

- following streams and rivers downstream usually leads to habitation
- in wading streams, remove socks and replace boots and use pole to help maintain footing
- move slowly and steadily
- be prepared to signal passing planes
- avoid deadfall — can be dangerous
- blaze a trail and leave notes,

(2) winter

- avoid deep snow — keep to ridges
- if walking on rivers, avoid rocks and pushed up ice, keep to ice clear of snow, carry a pole, avoid over-flow areas, be prepared to get rid of pack in case you break through, and have water proof matches available
- blaze a trail and leave notes;

b. Direction Finding

- use compass

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- north star
- sun and watch — set watch at standard time — point hour hand at sun — 1/2-way between hour hand and 12 will give N/S line
- stick and shadow — shortest shadow will give N/S line
- the ends of any two shadows of the same object when jointed will give E/W line.

CHAPTER 4

ARCTIC SURVIVAL

1. Immediate Actions

- clear aircraft until risk of fire eliminated
- apply first aid
- put on warm clothing
- make a fire
- make a temporary shelter
- keep signalling devices handy and improvise additional signals
- consider further action.

NOTE — Summer and winter conditions are drastically different. Above “Immediate Actions” are a guide only. In winter, warmth and shelter are dire necessities.

2. Medical Care — In accordance with Chap 2.

3. Fires

a. Survival Stoves

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- assemble stove in accordance with instructions
- ensure no parts are lost or misplaced during assembly
- most survival stoves will burn a variety of fuels — some require special fuels for preheating
- fill the stove with fuel outside the shelter
- light according to instructions;

b. Fuels for Improvised Stoves

- oil (engine — drain before it congeals — prime with a few drops of de-icer fluid, gasoline, etc
- gasoline or kerosene — caution — very combustible — mix with oil to last longer
- de-icer fluid — highly combustible
- candles — in emergency kit
- seal oil-blubber — slow burning
- insect repellent — slow burning
- petrolatum gauze dressing — open at centre, pull up small piece for wick;

A simple stove can be made as in the following diagram. A wick may be improvised with cotton material, surgical gauze, or clothing. Fuels to burn in this type stove are oil, seal oil-blubber, insect repellent, paraffin.

Ensure there is ventilation whenever you have an open flame in a shelter.

c. Open Fires

- a possibility during summer
- natural fuels include tundra (peat-like), grasses, shrubs
- will help suppress insects.

4. Shelters

- a requirement in summer or winter for protection from insects or cold respectively
- in summer, build shelter on a hillock
 - drier
 - less insects
- in winter, choose a sheltered area

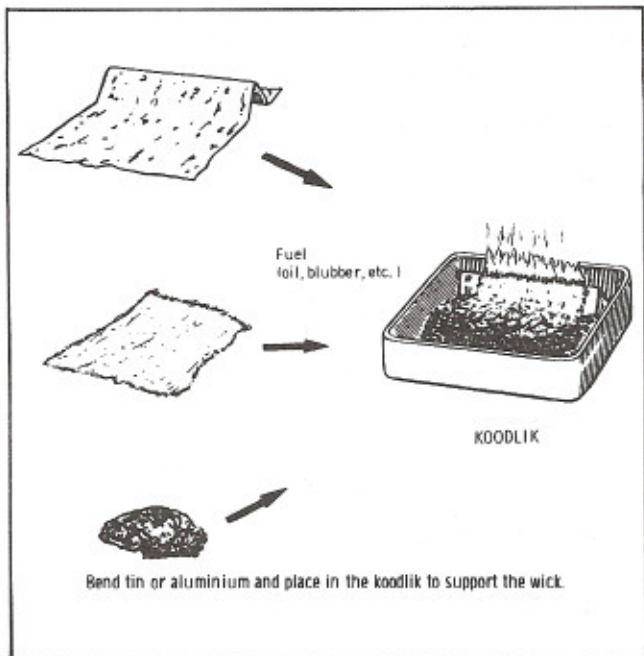


Figure 4-1

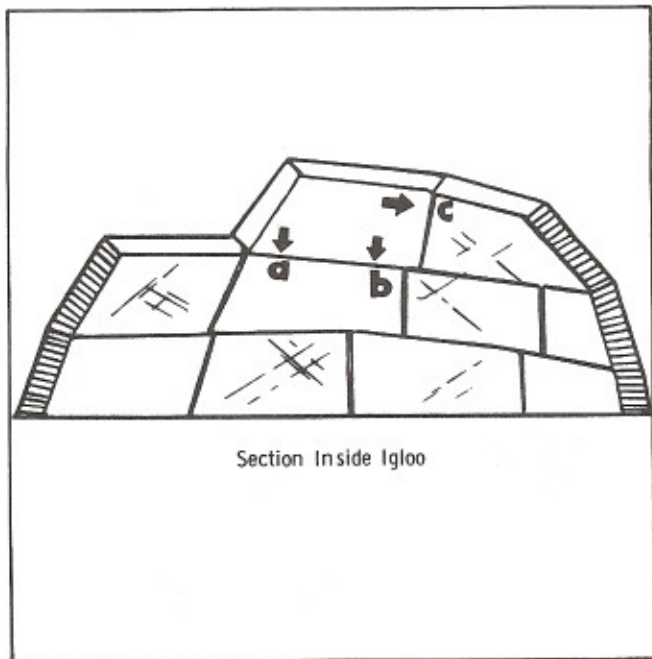


Figure 4-2

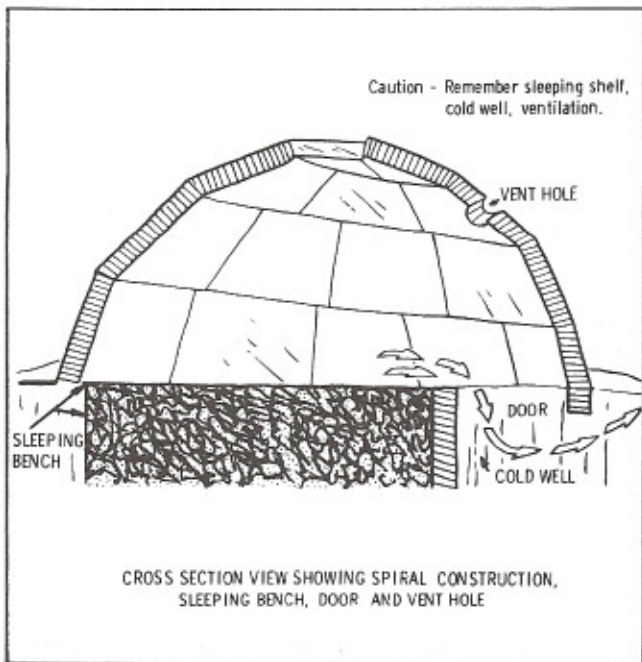


Figure 4-3

a. Igloo

- the ideal winter shelter in the Arctic
- use the snow knife or snow saw to cut snow blocks. Ideal blocks are 42 inches x 20 inches x 6 inches. Probe the snow with snow knife or quarter-inch rod to find where the resistance to the probe indicates a firm consistency. Remember ABC principle-spiral construction;

b. Fighter Trench

- a temporary shelter to the survivor to get in out of the wind and weather. To be used while igloo is being built;

c. Snow Cave

- to be dug into the side of a drift
- requires a lot of work
- danger of becoming wet while building;

d. Arctic Tent

- found in transport aircraft
- suitable summer shelter
- in winter, can use tent as a permanent shelter or temporary shelter while building an igloo
- can be improved by adding a wall of blocks (snow or tundra) around perimeter and by improvising a second canopy (and dead-air-space);

e. Parachute Shelter

- structure improvising using snow or tundra blocks
- parachute draped over structure
 - preferably two layers with dead-air-space separating
 - use additional blocks to separate and hold down material;

f. General

- snow shelters must be well caulked

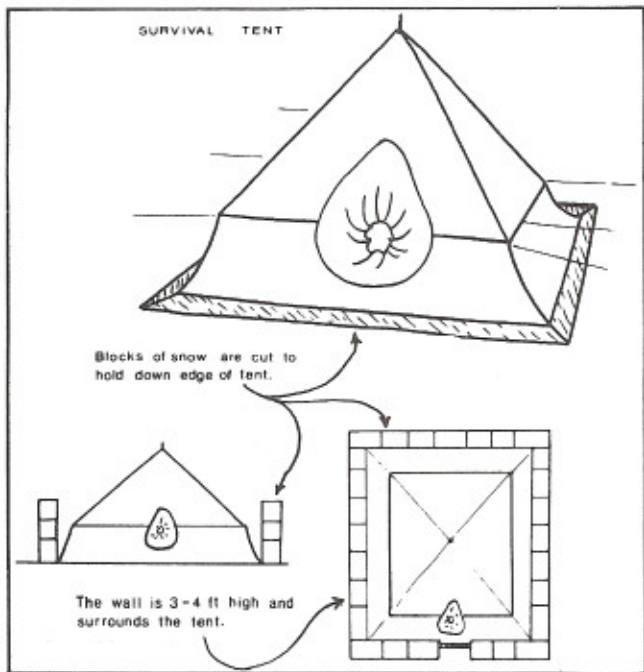


Figure 4-4

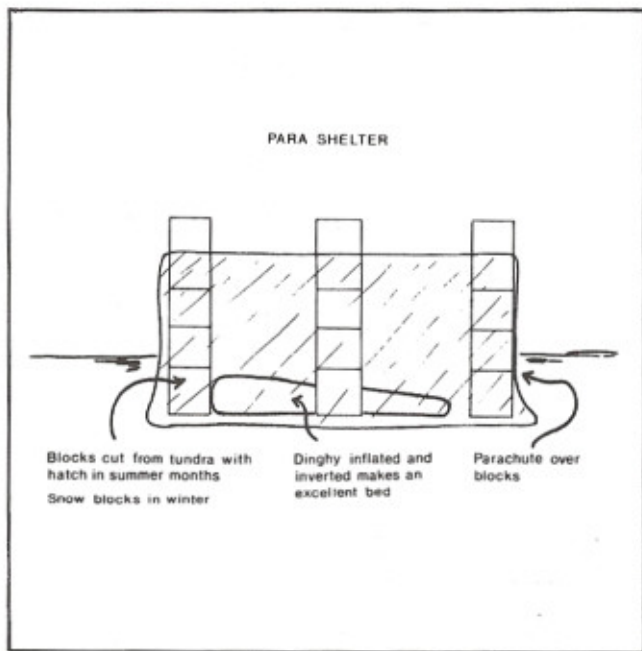


Figure 4-5

- snow shelters should be glazed inside by initially raising temperature quite high causing some melting; then allow to freeze; improves heat retention (air tight)
- ventilation important in all shelters
 - in snow shelters 2-inch vents required in door block and in ceiling.

5. Signals — See Chap 3 on signals.

Signals pertaining to Arctic

- make a large “X” with snow blocks
 - two blocks high
 - approximately 30-foot arms running NW/SE and SW/NE for optimum shadow effect
- secure signal panel over igloo
- keep signals cleared of blowing snow.

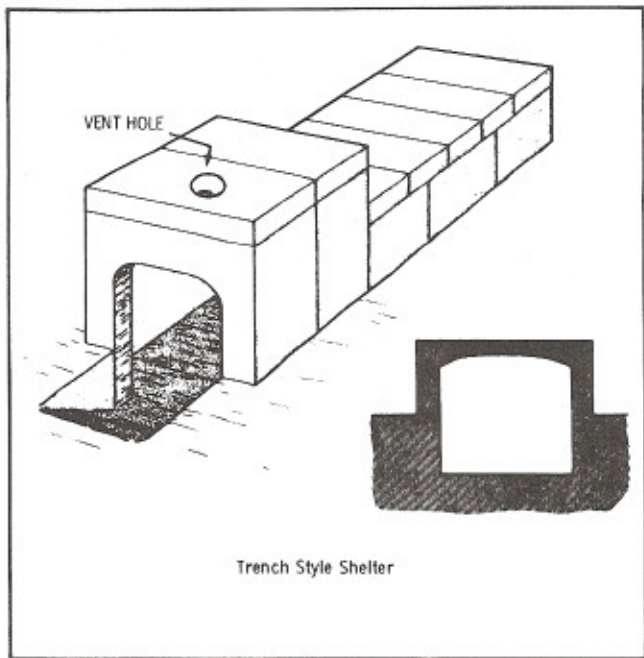


Figure 4-6

6. Water



Do not eat snow or suck ice.

- all water is fit to drink in the Arctic
- ice is better than snow to melt
- when melting snow, tamp often
- drink lots of water
- on sea ice, ensure snow is salt free
- old bluish-coloured sea ice is salt free
- if purification is necessary, use one halazone tablet for each pint of water OR boil water for at least 3 minutes.

7. Food

- all food should be thawed before consumption

a. Take Stock

- emergency food packs
- uneaten flying rations
- chocolate, gum, etc, in pockets;

b. Appoint Storekeeper

- ration food daily to each member.

8. Hunting

a. General

- when hunting or fishing, leave a lookout at camp
- leave a well-defined trail back to camp
- do not wander too far from camp, ie, blizzards, fatigue
- live off the land, retain emergency rations;

b. Winter

If firearms are available:

- muskox

- polar bear
- seal
- walrus
- fox
- rabbit (arctic hare)
- birds (very few)

If firearms are not available — small game, ie:

- rabbit
- ptarmigan
- owl
- raven
- make snares
- set traps
- use the net

CAUTION

Never eat bearded seal livers or polar bear livers.

c. Summer

If firearms are available:

- muskox
- polar bear
- seal
- walrus
- fox
- rabbit
- birds (very few)

If firearms are not available — small game, ie,

lemming	geese
rabbits	owls
fox	birds
ducks	

- ducks, geese, swans have a flightless period for 2 — 3 weeks in midsummer when moulting
- ptarmigan are tame and can be killed with a stick or stone
- gulls can be caught with a baited hook and line.

9. Fishing

a. Winter

- set net under ice
- jig through hole in ice
- ICE WILL EXCEED 3 FEET AFTER 1 JANUARY;

b. Summer

- fish the deeper streams, rivers, lakes, and tidal pools
- arctic shore line — clams, mussels, snails, limpets, chitons, sea urchins, and sea cucumbers
- do not eat dead shell fish
- live shell fish move when touched or cling tightly to rocks;

c. Fishing Equipment

- survival kit
- spear (improvised)
- sticks or stones (shallow water)

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- with your hands (shallow water)
- net (works 24 hours a day).

10. Travel

- compasses unreliable in Arctic
- landmarks poor
- use cairns and other markers to blaze trails.

CHAPTER 5
SEA SURVIVAL

I. Immediate Actions

- call roll
- cut adrift
- rendezvous with other life rafts
- stream drogue
- retrieve stores
- shelter from weather
- administer first aid
- stow or dispose of all sharp objects
- check life raft for damage
- bale out water
- prepare signalling equipment for use
- activate desalter kits
- plan of action, allocate duties.

2. Medical Care — In accordance with Chap 2

a. Windburn and Sunburn

Prevention

- do not expose skin needlessly
- apply sunburn preventive cream to exposed skin

Treatment

- apply antiseptic emulsion
- keep covered;

b. Sore Eyes

Prevention

- wear sunglasses, eye shields or helmet with visor down

Treatment

- apply antiseptic cream on eyelids
- cover lightly with bandage;

c. Seasickness

Treatment

- keep busy
- do not eat or drink
- anti-seasick tablets;

d. Immersion Foot

Prevention

- keep feet warm and dry
- keep life raft floor dry

Treatment

- remove footwear
- wrap feet loosely with dry cloth
- keep feet dry
- exercise toes and feet;

e. Salt Water Sores

Prevention

- keep body dry

Treatment

- apply antiseptic cream
- apply dressing;

f. Parched Lips and Cracked Skin

Prevention and Treatment

- do not lick lips
- apply antiseptic cream;

g. Constipation or Difficult Urination

Do not be alarmed, they are to be expected with a shortage of food and fresh water.

DO NOT DRINK SALT WATER.

3. Signals

- all signalling gear available should be checked and prepared for instant use, according to the instructions supplied with each item

a. Emergency Radios

— use as directed — will only operate while there is life in the batteries — conserve the batteries;

b. Pyrotechnics

— do not ignite until aircraft or ship is seen;



When igniting keep away from your body and life raft.

c. Heliograph Mirror

— operate in accordance with instructions, on a bright day, mirror can be seen for many miles
— frequently flash across the horizon;

d. Sea Marker Dye

— use as directed;

e. Signal Light

- the signal light should be used at night only. Disconnect during the day or when you do not think it is required;

f. Emergency Radios

- included in all seat-packs and most survival kits
- use according to directions
- keep elevated and upright
- protect battery from cold and salt water;

g. Whistle

- when separated from other crew members, the whistle can help to guide you to each other
- it can also assist in the event of a ship rescue.

4. Water

a. Precautions

- do not drink any fresh water substitute (salt water, urine, etc);

b. Sources

- de-salting apparatus
- solar still
- bluish-coloured ice in ice flows is salt free
- rain water can be collected on life raft roof; discard initial quantities as they may be contaminated by salt water spray;

c. Rationing

- do not attempt to ration — but use wisely;

d. Preserve Fluids in Body

- prevent sweating
- take advantage of a breeze
- dip clothing in sea and wring out;



After clothing has dried on your body, a film of dry salt will cling to your body. Remove this with your hands or a dry cloth.

e. Smoking

- smoking increases thirst. It is advisable to cut down or quit;

f. To Allay Thirst

- suck on a piece of cloth or button. This will increase the saliva in your mouth and cut down the desire for drinking;

g. Eating

- refrain from eating if you have no fresh water as digestion uses up body fluids.

5. Food:

a. Survival Ration (Carbohydrate)

- requires little body fluid to digest
- eat as directed;

b. Protein Food

- requires large amount of body fluid to digest, ie, meat, fish, eggs, seaweed;

c. Birds

- all sea birds are edible and nourishing either raw or cooked if unlimited water available;

d. Seaweed

- is tough and salty, absorbs body fluids, and is difficult to digest
- eat only when you have plenty of fresh water
- likely to contain parasites; must be washed
- rich in iodine, iron, and vitamins;

e. Food and Water Rules

- the quantity of food and water rations must be varied in direct proportion to each other. With plenty of

fresh water, food ration may be increased. If water ration decreases, food ration must decrease

- live off natural foods if your ration of fresh water will permit. Save emergency rations for when water supply is low.

6. Fishing

a. Useful Hints

- do not handle the fishing line with bare hands or fasten it to the life raft
- if using a spoon or spinner, keep it moving
- when you catch a fish, use any part of it for bait
- a light at night attracts fish and therefore is an aid to fishing
- surplus fish can be cut into strips and dried for future use — food or bait
- improvise a small net as small fish are attracted to the life raft
- a piece of cloth or wool, preferably red colour, can be substituted for bait;

b. Poisonous Fish

- general rule — do not eat a brightly-coloured fish
- do not eat a fish covered with bristles or spurs
- do not eat any fish that puffs up
- do not eat fish with parrot-like mouth or humanoid teeth
- do not eat eggs found in clusters or clumps;

NOTE — All other fish are edible.

c. Dangerous Fish

- keep clothing on and keep a good look-out
- do not fish if sharks, barracuda, or swordfish are in the vicinity
- do not trail hands or feet over the side
- do not throw out waste food, body waste, or scraps of any kind during the day
- if dangerous fish are about, remain quiet and the likelihood of attack will be negligible

- survivors in water, who are approached by dangerous fish should form a circle facing outwards and beat the water with strong regular strokes.

7. How to Keep Warm

- your clothing and life raft should be kept as dry as possible at all times; keep head and neck dry and covered
- wet clothing should be removed and dried
- the parachute should be dried and wrapped around the body
- if more than one person, you should be together on bottom of life raft to transmit body heat
- warm hands by placing under armpit or between the thighs
- mild exercise should be taken to prevent stiffness of muscles and joints
- the vaseline bandage in the first aid kit can be used as a source of heat, by cutting the aluminum cover with an X (about 1-inch slits) pull the vaseline gauze out to form a wick and light. One bandage will last many hours.

8. How to Keep Cool

- remove clothing except for thin layer of cloth to keep the sun's rays away from the body including the head and neck

- if you dip clothing in the salt water to take advantage of cooling by evaporation remember:
 - have all clothing dry by evening
 - ensure all dry salt accumulated on body has been wiped off
 - salt water sores can result from continuous use of salt water on your skin.

9. General

- wear sunglasses, eye shields, or helmet and visor during day
- apply sunburn preventive cream to exposed skin.

CHAPTER 6

DESERT SURVIVAL

1. Immediate Actions

- stay well away from aircraft until all danger of fire is passed
- ensure you have retrieved all water and emergency equipment from the aircraft
- get into shade as soon as possible
- evaluate the situation calmly, take stock of your equipment, decide on a course of action
- don't rush, take it easy
- two things require immediate action
 - medical care of injured
 - shelter.

NOTE — Desert terrains vary from sandy wastelands; to barren, rocky, rugged terrains; to desert islands. All are barren and arid and offer extreme temperature variations — scorching hot during the day and possibly freezing at night. Desert survival poses very special survival problems.

2. Medical Care — As discussed in Chap 2

a. Heat Illnesses

- a very real threat
- prevention is best; avoid perspiring
 - stay in shade during day
 - dress to protect self from direct sunlight; keep whole body covered
 - accomplish most work at dusk and dawn
- casualties of heat illnesses must be cooled; since sufficient water not usually available, provide an awning (allows shade and ventilation)
- also, excavating a trench in the ground or improvising a platform approximately 1-1/2 feet above the ground provides some relief from the heat;

b. Malaria

- a possibility around settlements and oases where mosquitoes occur
- wear protective clothing, headnet, etc;

c. Cold Injuries

- protect against frostbite
- don't discard clothing.

3. Shelters

- double duty — must provide shade and allow air circulation during the day; must be warm for night
- normally stay with aircraft, but DO NOT stay in aircraft (becomes an oven during the day); however, aircraft is a good shelter during rain and sand storms
- otherwise, utilize aircraft and material as structure with which to improvise
- natural shelters may be found, usually caves
 - check all natural shelters for snakes
- a covered trench may be only possible shelter.

4. Fire

- required for signals, water purification, food preparation, and warmth at night
- fuels are extremely rare; aircraft fuel and oil will be most useful

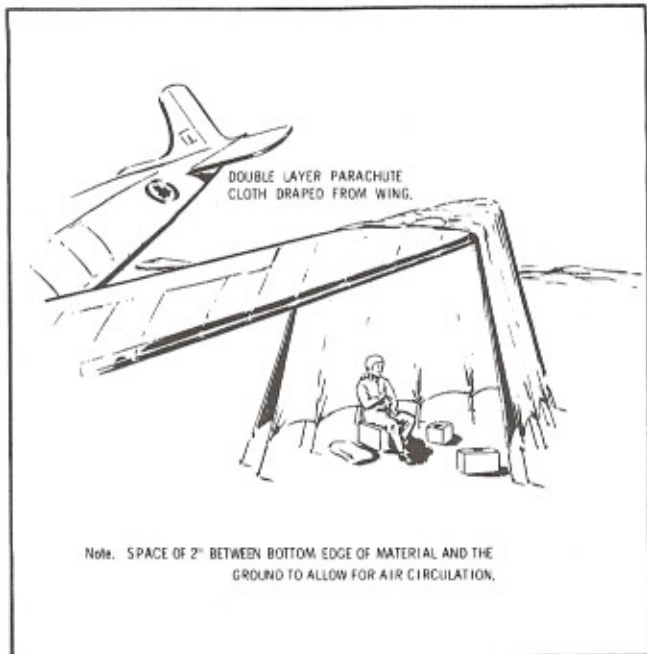


Figure 6-1

- all twigs, leaves, stems, and underground roots may be burnt if available. Dried animal dung may also be used as fuel
- stoves may be improvised from metal containers; fill with sand and saturate with oil
- never add petroleum to a fire.

5. Signals

- smoke signals during the day, fire signals at night are effective in the desert.

For signals see Chap 3.

6. Water

- water is the key to desert survival
- conserve your water by conserving perspiration
- drink water as you need it
- when drinking, the lips, mouth, and throat should be moistened before swallowing
- conserve your water supply by keeping it in the shade to avoid evaporation
- don't smoke during the day
- main water source in desert is an oasis, which is characterized by vegetation

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- if inland, look for dry river beds, which may produce water by digging below the concave bank on the outside of a curve or bend. Allow the water to collect by scooping small holes
- dew may be collected early in the morning from rocks or metals
- sop up the dew with a piece of cloth then wring it into a container
- the water still as shown, is another source
- during the rainy season, rain traps may be erected to catch as much water as possible; an inflated life raft may be used or any piece of tarpaulin can be suspended between four stakes, allowing the water to drain down and accumulate in the centre
- don't drink unpurified water, it will only lead to dysentery
- cactus plants contain water; cut slices and suck water or mash and wring water out

Daily Water Requirements to
Maintain Water Balance

<u>Mean Temp</u>		<u>Pints per</u>	<u>Litres per</u>
<u>Deg C</u>	<u>Deg F</u>	<u>24 hrs</u>	<u>24 hrs</u>
35	95	9	5.
32	90	6-1/2	3.70
29	85	4-1/2	2.60
27	80	2-1/2	1.50
24	75	2	1.14

At a mean temperature of (18°C — 65°F) or below (Temperature or Winter Desert Conditions) water loss is at the basal amount of 1-3/4 pints per 24 hours. The water still utilizes a plastic sheet and sunlight to distill drinkable water from soil and fleshy plants such as cacti. The still consists of a bowl-shaped hole in the soil about 20 inches deep which is covered

with a plastic film formed and held in the shape of a cone by a rock placed in the centre. Sunlight passes through the plastic and is absorbed by the soil and plant material, resulting in evaporation of water, followed by condensation on the cooler plastic. The water drops form on the under side of the plastic, run to the point of the cone, and drop into a container placed directly under the rock. Without plant material, you get 1 pint.

7. Food

- if water is in short supply, reduce food intake
- perishable foods should be eaten first
- birds and animals are scarce, however, they may sometimes be found
- most common animals are small rodents
- small burrowing animals come out at dawn or dusk, and can be caught in snares
- edible plant food is rare in the desert
- grasses are edible and wild tulips and onions may be found in some areas
- avoid plants with milky or coloured saps as they are likely poisonous
- snakes, lizards, etc. are edible and frequent brush and rock areas.

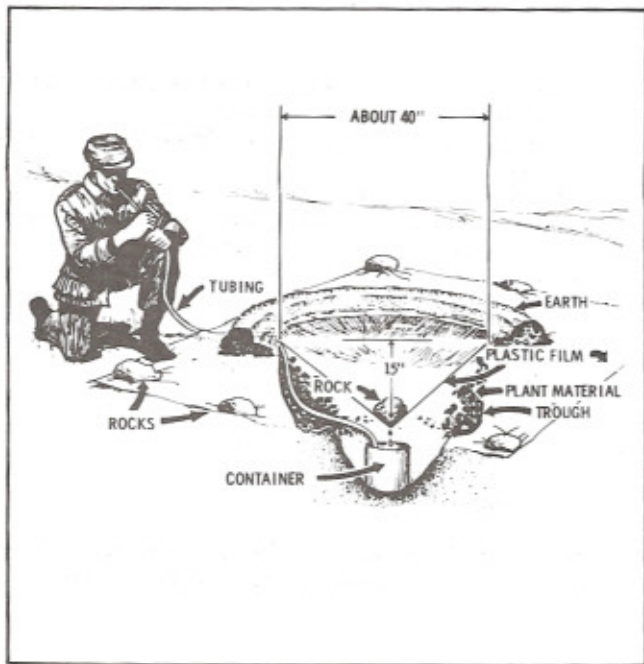


Figure 6-2

8. Travel

- do not travel unless you are certain that the objective can be reached on the water supply available
- you need a minimum of a gallon (4.56 litres) of water a day if travelling
- travel in the cool of the night
- do not underestimate the difficulties that will be encountered or overestimate your physical condition
- do not overload, 35 pounds should be maximum
- carry only essential items, water, shelter material, navigation aids, signal devices, and first aid kit
- don't hurry
- rest during the day
- try to avoid soft sand and rough terrain areas.

For further travel information, see Chap 3.

9. Clothing and Equipment

- don't discard any of your clothing, you require it for protection against sunburn, heat, sand, and insects

- keep your head, neck, and body covered during the day, you'll last longer on less water
- wear loose light-coloured clothing if possible
- your T-shirt makes a good neck drape
- if you have no hat, try to improvise one from any available material
- eyes must be protected from both direct and reflected glare
- sun glasses must be worn throughout the day
- rest your feet often, remove shoes, dry out socks, turn them inside out
- try to keep the inside of shoes free from sand
- if shoes are lost or worn out, try to improvise a sandal from aircraft rubber flooring, parachute material, or any other available material.

10. General

- if caught in a dust storm, lie down back to wind, cover mouth and nose
 - ensure clothing is buttoned up tightly
 - avoid sand drifting around you by rolling about from time to time
- owing to the extreme temperature changes, the need for additional clothing will be felt at night.

CHAPTER 7

TROPICAL SURVIVAL

1. Immediate Actions

- stay clear of the a/c until the engines have cooled and spilled fuel has evaporated
- check injuries and apply first aid
- take shelter from rain, sun, and insects
- build a smudge fire if feasible; this helps keep insects away
- relax and formulate a plan of action. Decide where to build a shelter, signal area, whether you'll stay at the crash site or travel
- build shelter
- prepare signals
- do not leave landing site without blazing or marking your route if in dense jungle.

2. Medical Aid

- administer immediate medical treatment to the slightest scratch; the risk of poisoning from an open wound is very great

- protection from the sun is most important. It causes sunstroke, or heatstroke, sunburn, and heat exhaustion
- insects carrying diseases and parasites are the most serious danger in the tropics
- Malaria — caused by the bite of an infected mosquito and the fever occurs at regular intervals after the first attack
 - it is normally some time before you get sick if bitten by infected mosquitoes
 - the best treatment is to avoid being bitten by wearing clothing and covering your entire body
- sandflies, body lice, ticks, and leeches are all tropical hazards and cause fever and sickness. Again the best treatment is the wearing of clothing to protect all body areas from these insects. Secure clothing tightly around ankles and cuffs
- Snake Bite — if bitten, immediately apply a tourniquet between the bite and the heart
 - make a cross-shaped cut about one-quarter-inch deep through the fang marks and apply suction over the bite. If sucking by mouth, ensure there are no open sores in the mouth, and spit out poison immediately

- release tourniquet every 20 minutes for periods of 30 seconds. After 3 or 4 hours, release the tourniquet when swelling or discoloration of bitten area has disappeared
- for other medical treatment, see Chap 2.

3. Shelter

- if you have landed in dense jungle where your aircraft and signals can't be spotted from the air, it may be advisable to move to a more suitable area for shelter
- try to locate a camp site on a knoll or higher ground away from swamps
- don't build shelter under large trees or trees with dead limbs. They may fall and injure you or wreck your camp site
- if in wet jungle forest, you may have to use the a/c as shelter. If so, try to make it insect proof by covering all openings with any material available. Parachute, aircraft insulation, etc
- before building any shelter, set fire to the undergrowth to lessen insect and reptile problems

- one type of improvised shelter is made by draping a parachute or tarpaulin over a rope or vine stretched between two trees or by propping it up on poles
- a good rain shelter can be constructed by covering an "A" type framework with a good thickness of palm or other broad leaves, pieces of bark, or mats of grass
- don't sleep on the ground; improvise a hammock on sleeping platform
- another type of bed can be constructed by building a frame of four poles and covering the top with long spineless palm leaves to a depth of four to five layers. Cut the corner poles long enough to support a mosquito net.

4. Fire Methods

- fire required for signalling, insect suppression, warmth, keeping dry, purifying water, and food preparation
- small fires are normally more suitable than large ones
- in palm country, good tinder may be located by using the fibers at the base of the palm leaves
- the insides of dry termite nests make good tinder
- wood is generally plentiful even if it is wet outside; the heart of dead wood will be dry enough to burn

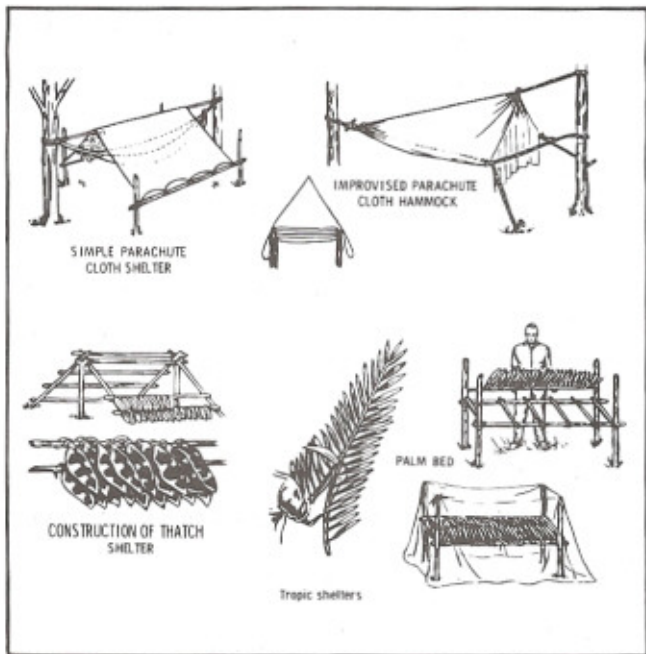


Figure 7-1

- wet bamboo is not recommended as fuel as it may explode and throw out dangerous splinters
- general fire skills and precautions as outlined by Chap 3 apply.

5. Clothing

- keep body covered as much as possible
- bind cuffs
- wear headnet
- attempt to dry clothing before nightfall to avoid discomfort from cold
- always hang clothes and boots to alleviate occupation by crawling, stinging insects such as ants, spiders, and centipedes
- always check and shake out clothes before dressing.

6. Signals

- set up signals in natural clearings and along edges of streams
- parachute or contrasting colour objects such as life rafts stretched across streams or bays or placed in ponds may attract attention
- keep pyros handy and dry
- make use of every signal device that is available

- signals under dense jungle growth can't be seen
- for other signals information, see Chap 3.

7. Water

- water is available from the numerous streams, springs, lakes, pools, and swamps, but is not safe to drink until it has been purified
- some water may be discoloured or turbid and may be partially cleared by filtering through an improvised filter such as parachute cloth, sand, or charcoal
- animal trails often lead to water; follow them but don't get lost
- water may also be obtained from some plants; coconuts contain refreshing water. The green, unripe coconuts are best
- bamboo stems sometimes have water in the hollow joints. Shake the stems of old, yellowish bamboo and if you hear a gurgling sound, cut a notch at the base of each joint to catch the water
- vines are often good water sources
- never drink from a vine that has a milky sap
- water may also be collected during a rain by digging a hole and lining it with any available material such as canvas or life raft, etc

- bamboo sections make good improvised canteens for storing and carrying water
- beware of snakes, crocodiles, and alligators around water sources.

8. Food

a. Animals

- animals travel through the tropical forest along paths or trails
- look on the ground for hedgehogs, porcupines, wild pigs, and deer
- in the trees you may find squirrels, bats, and monkeys;

b. Sea Food

- there are edible fish in most of the jungle streams
- coral rocks, along beaches or extending out into deeper water as reefs, normally provide survival food. Shellfish cling to these reefs
- be sure that all shellfish you take are healthy. Do not collect them from colonies where some are dead or dying

- fish, crabs, lobsters, crayfish, sea urchins, and small octopi can be poked out of holes, crevices, or rock pools;

c. Plant Foods

- the tropics normally offer the survivor a large assortment of food, however, most people are quite unfamiliar with most kinds of tropical plants
- cook all plant food when in doubt about edibility
- a few of the common and most widely known foods are:
 - coconut and palm cabbage
 - banana
 - pineapple
 - papaya
 - bamboo shoots
 - nuts — walnut, chestnut, oak acorns, almonds, hazelnuts, and beechnuts
 - berries
 - ferns make good greens when young
 - any food a monkey eats can be safely eaten by man.

For information on snares, nets, etc, see Chap 3.

9. Travel

- read Chap 3 as the requirements for travel in tropical areas are much the same as in temperate zones
- travel in the tropics can be most difficult because of heavy undergrowth, swamps, lack of land marks, heat, and humidity
- a most useful aid to travel in the tropics is a machete, to help cut a route, find food, and make a raft and temporary shelter
- other important items to have are a compass, first aid kit, signal equipment, good foot gear, and hammock or material to make one
- travel only when it is light.

