

IF LOST RELAX

CONSERVE strength, fluids, heat, by moving little as possible. PREPARE emergency signals, make shelter, inventory supplies, ration all food. GUARD against infections, intestinal disorders. DONT TRAVEL in adverse weather, if injured or confused. Eventually someone will find you. Stay with downed aircraft, easily spotted. Determine your location, scout immediate area. DECIDE if best to travel or stay. Dont separate parties; mark your path, leave messages behind, keep a log. DOWNHILL travel along watersheds may triple distance, lead to marshes, thickets, etc. STRAIGHT LINE travel may be best. KEEP knife, spare food, first aid, signal equip. on person at all times. TEST for exhaustion -look up at sky, if it appears to be receding get some sleep.

ALL HEALTHY MAMMALS, BIRDS, INSECTS ARE EDIBLE

SHELTER

Avoid wind, hi water lines, poor drainage. Vent carbon monoxide. NATURAL -caves; overhangs; between rocks; snow banks; under trees with tops tied together; sand burrow; hollow tree; hole-in-snow around tree. LEAN-TO -tarp, bark, layered grass, branches.



DESERT SHADE



TROPICAL HAMMOCK



SNOW CAVE



TRENCH



IGLOO

Spiral: fit as you go.

THATCH -tie overlapping leaves, branches, to stick frame.

WATER

SURVIVE 10 days on no water at 50°F. NEED 3-4 pints/day, most can come from food. Look uphill for pollutants. Taste test water, boil to be safe. ANIMAL trails usually intersect at angle toward water, follow downhill. Birds fly to water in early morn & eve, nervousness indicates water nearby. VINES, tree roots, thin branches, hi water content; stand sections on end to drain in a trough. Avoid milky saps. URINE salts, like seawater. Okay distilled, better to freeze -first crystals to form are pure water. SNOW/ICE -50% less fuel needed to melt ice. Melt snow in hand or packed in can over fire. Eating raw snow causes dehydration. Ice is best. OCEAN ICE -year or more old loses salt, is fresh (bluish). Find on hi places where has summer thawed. Icebergs salt free. OCEAN BEACHES -dig hole below hi tide line or behind dunes, use first water seeping in -deeper water is salty. AT SEA -use solar still. Okay to add little salt water to distilled or rain water to add minerals. Salt water kills 1-2 days faster than no water at all. All edible salt & fresh water fish have safe water in meat, chew or wring out in cloth. RAINWATER -collect all. DEW -wring out of blankets, etc, laid in open. Mop from grass, rocks, cacti, other surfaces. SWAMP/TROPICS -standing water usually unfit, streams muddy. Dig hole 1-6 ft from shore, let filter in, strain, purify. Halazone, chlorine unreliable. ARID LANDS -avoid water holes where green veg. doesnt thrive (poison). Look for water around veg, especially willows, cottonwood; low places in outside bend of dry creeks (dig hole, wait 2 hrs); base of cliffs, hills, mtns; canyon heads; mineral stained rock; rainwater 'potholes' in rocky places; low places between dunes. Muddy water ok -let silt settle. CACTI -mash core, extract liquid, taste varies. Small barrel (fishhook) cactus & yucca best. All cacti in world is safe. PURIFY ALL ARID LAND WATER. Alkali, mineral flavors nearly always present -ok in small quantities; leech thru bag of sand; add charcoal, or boil.

SOLAR STILL -in open, damp place.

6X6 clear plastic sheet over hole, sealed edges, rock center weight, bucket collects water evaporated from ground. Add veg. pieces, urine. Collects about 1 qt. in 2 hrs.



PURIFICATION -

Boil -20 min, stand 30 min, strain. Boil with charcoal removes bad taste.

Tincture Iodine -5 drops to 1 qt. Shake.

Iodine Tabs -follow directions.

Bleach -2 drops to 1 qt, stir, stand 30 min.

Chlorine - 1 tsp to 8 qts, stand 30 min.

(Increase formulae if water is dirty)

DAYS EXPECTED SURVIVAL IN DESERT: No Walking / Walking at Night Only

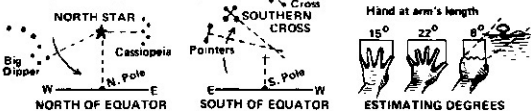
Shade / Max.	Quarts: 0	1	2	4	10
120°F	2/1	2/2	2/2	2.5/2.5	3/3
90°F	7/5	8/5.5	9/5.5	10/6.5	15/8
60°F	10/8	11/8.5	12/9	14/11	21/14

12 in = 1 foot = 30.48 centim's 1 qt = .95 liters = 2 lbs water 0°F = -18°C
 100 cm = 1 metre = .001 kilom's 16 oz = 1 pound = .45 kilograms 32°F = 0°C
 1 rod = 16 1/2 ft = 25 links (1/4 chain) 1 fathom = 6 ft = 2 yards 70°F = 21°C
 5280 ft = 1 mile = 1.61 kilom's 1 league = 3 miles = 4.86 kilom 212°F = 100°C



ORIENTING

BY WATCH - hold watch level, point hour hand at sun. South is midway between hour hand and number twelve in the smallest angle. South of Equator: read with face down, midline points north. **BY SHADOW** - put long stick in ground, mark tip of shadow; hour later mark tip again. Line from first to second mark points East. N-S line is at right angle. **BY STARS** - stars rise in east, fall in west. Plot movement of an overhead star by sighting across two fixed sticks (ex: if star on your right is rising (east) you are facing north). North Star and Southern Cross remain relatively stationary above each pole.



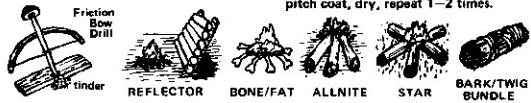
TRUE NORTH - geographic north pole, 'up' on most maps. **MAGNETIC NORTH** - mag. pole that compass points to worldwide (approx 1000 miles south of North Pole, no. of Hudson Bay). **MAGNETIC DECLINATION** - the difference between True and Magnetic Norths, in degrees east or west of True North.

SOME MAGNETIC DECLINATION READINGS (Approx.)

U.S. - CANADA: 10°E Adak, AK; 21°E Anchorage; 30°E Ft Yukon, AK; Whitehorse, NWT; 10°E The Pas, MB; 22°E Banff, N. Cascades; 20°E Glacier, MT; Bend, OR; 13°E Yosemite, Yellow-stone; 15°E Los Angeles, Grand Canyon; 14°E Cortez, CO; 13°E Tucson, AZ; Black Hills, SD; 10°E Big Bend, TX; Liberal, KS; 5°E Ozarks; 3°E Ely, MN; 0° Churchill, MB; Indianapolis, Ev-erglades; 1°W Smokies; 6°W Shenandoah; 10°W Hearst, Ont; 14°W Adirondacks; 21°W upper Maine; 30°W St Johns, Newf, Schefferville, Lab; MEXICO: 6°E Yucatan; 8°E Mexico City; 9°E Monterey; 10°E Mazatlan; 11°E Canyon del Cobre. WORLD: 10°W London, Gibraltar; 5°W Zurich; 5°W Chad; 3°W Mt Kilimanjaro; 2°E Istanbul; 2°E Kabul, Afg; 1°W Mt Everest; 1°W Hong Kong; 7°W Tokyo; 1°E Jakarta; 0° Guam; 11°E Hawaii; 10°E Sydney, Aust; 15°E Easter Is; Cape Horn; 13°W Brasilia; 7°W Manaus, Braz; 0° LaPaz, Bol; 10°W Trinidad; 4°E Panama.

FIRE

Build away from grass, trees, overhead snow. Clear duff to mineral soil. **FLINT/STEEL** - quartz, jasper, agate, any glassy stone. **AMMUNITION** - remove pro-jectile, pour 1/2 powder onto tinder, reload shell with rag wad, fire in air, put blazing rag on tinder. **GAS/OIL** - with sand in can, or in hole. **BATTERY** - spark from wire to each terminal. **BURNING GLASS** - any convex lens; binoculars, glasses, bottle bottom, bottle filled with water, maybe carved ice piece: in bright sun, beam onto tinder. **AN-IMAL** - bones burn, fat makes good lamp, warming fire. **TINDER** - shaved twigs, dry leaves & needles, heart of wet wood, plastic, dung, dry roots, pitch knots in old logs. **OVERNIGHT** - cover coals with ashes, dry earth, will smolder until morning. **TORCH** - wrap bark cylinder, or burn pine knots. 24 hr torch: fray end of 1" diam stick, pitch coat, dry, repeat 1-2 times.



KEEPING WARM AND DRY

BUILD SMALL fire, sit closer, keep warmer. Sit between fire & reflecting surface. Sleep with feet toward fire. Fire not essential in sub-zero temps if properly insulated. **CLOTHES/BOOTS** - keep loose for better insulation, ventilation, circulation. Prespira-tion damp clothes frost; poof out air at collar & cuffs. Beat frost out of clothes with a stick. Mittens are warmest. Melted fat helps waterproof boots. Bark pieces good in-nersoles. Persistently damp shoes, socks can cause 'trench-foot' - infection, gangrene. Insulate clothes with grass, moss, leaves, feathers, etc. **FALL THRU ICE** - can kill in seconds; quickly roll in snow to blot up moisture & for warmth, remove clothes, let freeze, beat ice out, then build drying fire. **SLEEPING** in clothes holds moisture, chills body. You will not freeze to death in your sleep - cold awakens you. **SNOW TRAVEL** burns 5-10 times more energy than staying put.

FAST FOOD

ALL HEALTHY MAMMALS, BIRDS, INSECTS, ARE EDIBLE

BEST survival weapon is fat, unbled, lean meat, providing all basic essentials. **FORAGING** can burn more energy than gained, upset digestion. **INNER BARK** of birch, aspen, poplar, most pines, slippery elm, cottonwood, willow, red maple, good raw, cooked, tea. Store dried strips. **SAP** very nourishing, cherry, maple, aspen, birch, hickory, can live on this alone for many weeks. Drink raw: tap from hole into inner bark, 2 gal in 24 hrs. Ingest via straw into mouth while sleeping. Plug tap after use. **PINE**- all seeds in cones rich in fat, protein. **ACORNS, NUTS, PECANS** all good raw, roasted, meal. If bitter leach (grind, soak) out tannic acid. Avoid buckeye. **EVERGREEN NEEDLES** raw, tea, hi vit. C. **EGGS**- bird; turtle (whites wont hardboil), all good. **JACKING**- use light to hypnotize frogs, game on trail, waterhole, den. **BURROWS**- fan smoke or pour water in, wait with club or noose. **SLOW ANIMALS** easy to club: opossum, porcupine, armadillo, marmot, groundhog, roosting birds, moulting ducks, lizards, others. **FEEDING ANIMALS**, drive away, steal their meal. **FUNGI**- avoid all mushrooms, puffballs, etc. **AVOID** snails (parasites), toads (toxic skin), worms (grit, no food value). **INSECTS**- moths, mayflies, cicadas, crickets, dragonflies, termites, very good. **GRUBS**- wood-beetle larvae in logs. **GRASSHOPPERS**- remove legs, wings. **LIZARD, FROGS, Salamanders, Snakes**- good, remove head, viscera, skin; roast, fry. **FISH**- club, or drive to shallows, barricade. **CRAYFISH**- boil tails. **TURTLES**- decapitate, bleed well, boil to pull off skin; split undershell in + pattern, declaw, disembowel. Wash all meat in & outside, season, boil 25 min more. When flesh pulls off easy cut up and add to stew. **LEATHER**-untanned: good protein -chew, swallow.

MARINE -all seaweed (not threadlike) below water is edible, cooked; eat slowly. Avoid if wilted, slimy, odorous. **ALSO EDIBLE**- sea cucumbers, urchins, abalone, scallops, octopi, squid, limpets, chiton, periwinkles, mussels, shrimp, oysters, eels (no scales), crabs, non-arctic shark, white meat of salt water clams. **DONT EAT** black mussels, sea snakes (scales), rays, jellyfish, man-of-war, fish without scales, with irregular scales, tiny mouths, sunken eyes, slimy gills, flabby flesh, bad odor, box shape, bright colors, or that puff up with air. **SAFEST FISH** lie in deep water beyond reefs. **PLANKTON**- green slime under boats, logs, rocks, edible raw, dried. Party lived on this alone for 115 days. **DONT EAT** plants stranded or growing on beaches.

ARCTIC -nearly all veg. edible. **DONT EAT** fungi, baneberry, buttercup, death camus, false hellebore, larkspur, monkshood, lupine, vetch (locoweed), waterhemlock. If eaten induce vomiting. **ROCK TRIPE** lichen good raw, soup, tea. Leathery dark lettuce leaf up to 3 in. wide, around rock. Grows into south US. **REINDEER MOSS** lichen, also into US. Low greengray plant, eat raw, boiled. **SHARK**- meat poison, in arctic only. **ALL LICHEN** in far north edible, soak or boil for safety. **SWEET VETCH** or licorice root, commonest root; in clumps on sandy soil, shores. Cooked, better than carrot. **ALL BERRIES** in arctic are edible, except bane berry.

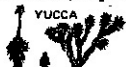
DESERT -Apache warriors lived just on salamanders, mesquite beans, cactus water. **ALL CACTI** fruits & fleshy parts good raw, fried, etc, remove spines, skin. **SEEDS** -pinyon pine, desert serviceberry, gamble oak, ironwood, jojoba, desert gourd seeds, flowers. **MESQUITE**- large shrub, small tree. Straight spines & bean pods, fernlike leaves, yellow flowers. Seed & pods raw, cooked. **MANZANITA**- large shrub, crooked branches. Brownish-pink berries raw, cooked, ground; acorn like. **TUMBLEWEED** or Russian Thistle, young plant boiled. **JOSHUA TREE**- flower buds roasted. **YUCCAS**- flowers raw, fruit raw or roasted. **AGAVES** (mescal) stalk heart like asparagus, roasted. **FAN PALM** ripe berries roasted, hang in huge clumps off ends of branches.



Rock Tripe



Reindeer Moss



YUCCA



Manzanita



Mesquite



Agave

PLANT EDIBILITY TEST: limit diet to plants positively identifiable, or seen eaten by rabbits, rodents, beavers, squirrels, raccoons, monkeys, and bears. Birds arent reliable. Place very small amount inside lower lip, taste for soapy, bitter, acid, burning taste for 5 min. Increase dose every 6-10 hrs. If no ill effects in 24 hrs it is probably safe, but continue caution. **AVOID** those with milky saps (toxic), black spurs on grains (diseased), or that look sickly. Cook if in doubt.

SOME EDIBLE PLANTS

AMONG THE MORE NUTRITIOUS & COMMON, IN TEMPERATE ZONES

Most plants have edible parts taste test succulent parts of appealing plants.

Caution: water plants absorb pollutants. Starchy parts more nutritious boiled.

ABBREVIATIONS: underline water habitat, * very nutritious, y young, PL entire plant, SE seeds, G grains, B buds, FL flowers, FR fruit, L leaves, SH shoots, ST stems, STA stalks, R roots, T tubers, r raw, c cooked, b boiled, p peeled, d dried, g ground (dried, meal), t tea.

GRASSES: blades with common base or stalk; be careful, hi cellulose content leaves are stomach abrasive; no known grass is poisonous: eg. wheat, barley, rice, reeds, rushes, reedtop, millet, oats, sedges, foxtail, crabgr, nutgr, johnsongr, buffalogr, canarygr, others: all SEg, PLrc.

LEGUMES: wild beans, peas, Gd. Taste test to be sure.

BERRIES: fruit & tea leaves—blackb, raspb, salmonb, dewb, cloudb, strawb, thimbleb, wintergreen. Fruit—mulb, goosab, elderb, blueb, bunchb, whortleb, huckleb, hackb, currants, others.

TREES: Red Cedar (juniper) FRrc, Lt; Spruce* SHr, Lt; Red Sumac, red FRrt; Hawthorn FRrc, Lt; Sassafras SHr, Lt; Slippery Elm Lr; Birch Lrt, SHrb; Beech yLr; Red Maple Br; Sugar Maple* yLr, ySEr.





HUNTING

3

Look for dens, runways, feeding and watering places. Best in early morn & eve hours. Stalk silently, slowly, against or across wind, or lay in waiting. AIM: deer, elk, moose —back of head, lower neck, behind front shoulder; seal —behind eye; musk-ox —neck or shoulder; bear —behind ear, upper neck, behind front shoulder; small game —head. **SNARES** —place snares/traps among natural obstacles; minimize human scent.

(arrow means tie to twitch-up sapling, limb)



RABBIT SNARE



SQUIRREL SNARE



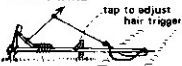
BIRD SNARE



APACHE BIG GAME



DRAG SNARE



NADING SNARE



BOW-ARROW



PITFALL



CONE



FIGURE 4



Held together by tension
Use collapsible Fig. 4 for log and rock deadfalls.



SHORELINE



Nooses, gorges, hooks in grass, tied to rock, drowns animal, stick float marks spot.

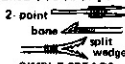
MANY small nooses —tie to limbs near nests, roosts. **DRAWSTRING BAG** —squirrel bait inside; pull cord. **POLE** with noose on end, for nesting birds, fish. **BOLA** —stones on end of strings, spin overhead and thrown at flocks of birds, small animals.



Throwing Stick



Baited Gorge

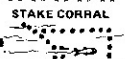


SIMPLE SPEARS

FISHING —hooks —pins, nails, bone, etc. **FLIES** —shoestring, milkweed, hair, feathers. **BAIT** —worms, grubs, shellfish, insects, meat. **NITELINE** —string of baited hooks across stream. **DRUGS** —crushed leaves & stalk of mullein, root of soapplant, green buckeye seeds, thrown into water will daze fish, float to surface; can eat at once. Burn coral or sea shells to make lime.



FUNNEL TRAP



STAKE CORRAL

face into current or toward hi tide line.

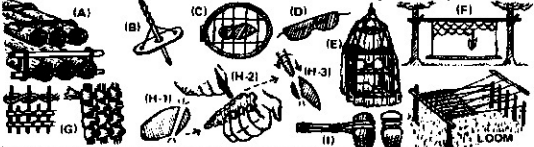
DRESSING GAME —Always cook well for safety. Protect meat from egg-laying flies (maggots). Save all fat to cook with meat. **BIRDS** —bleed, pluck at once, singe & remove pin feathers. Boil carrion-eating birds 20 min. to kill parasites. **SMALL GAME** —cut skin around mid body, peel off to head and tail, remove feet, head. Open belly from anus to chin. Cut thru pelvic, break open. Cut open rib cage; remove anus, genitals, guts in one piece. Wash well. **BIG GAME** —cut jugular, bleed (hunting people do not bleed meat; much vit. C, prevents scurvy). Remove leg scent glands on deer. Skin —midline cut from anus to jaw, from midline out to hocks (rear) & ankles (front), cut around each leg & head behind ears. Remove organs soon; don't rupture intestines, gall and urine bladders. Hang carcass to cool before butchering. Halve between 2 & 3 ribs from rear. Remove from place of killing. **ALL PARTS** large, small animals edible (avoid polar bear & seal liver, too hi vit. A) **RABBIT** —ONLY —DIET —no fat, induces diarrhea, starvation. Don't handle uncooked animal in bare hands, danger of tularemia (rabbit fever). Discard all rodent skins. **BONE MARROW**, **BLOOD** —nourishing in healthy animals. Calcium —chew bone ends. **WOOD KNIFE** —elm, hickory bark. Shape. Soak overnight, fast dry over fire. Sharpen on rock. Repeat many times. Gets hard as soft steel. Good for skinning; light chores.

EQUIPMENT

SKINS -scrape off all fat, flesh. Smoke dry over tripod over to fire 1-2 days. Good bedding, etc. fur side out. Save bird pelts. **RAWHIDE** -presoak if skin is dry! stake out, scrape skin side perfectly clean. Wash (water or urine), clean, leave staked in sun to dry 1-2 days. Turn over, restake, scrape off fur (easier if soaked overnight). In wood-ash solution! On soft backing, pound dry hide with blunt hammer to break grain, til white & soft. **TANNING** -same soaking, scraping as rawhide (deer, elk dont require pounding). When dry rub with warmed brains, finally mashed, until saturated. Roll up overnight. Next day restake & scrape off all brain tissue. Work back and forth thru a rope loop; friction dries & completes tanning. If used for clothing, smoke over smudge fire until light brown (will dry soft if it gets wet).

DRYING MEAT any lean meat; remove all visible fat -will go rancid quickly. Dry in sun or four feet over hot coals (green hardwood non-resinous). **DO NOT COOK**. Keep from moisture at all times. Brush with salt before drying aids preservation; pepper keeps flies away. Properly dried keeps months. Hang h from animals, covered from egg-laying flies. Wash mold spots (harmless) before cooking to eat. **JERKY** -preferably beef or deer flank. Cut 1" X 1" in. strips, any length. Dry same process until shoe-leather brittle (12 hrs to 2 days). Will keep year or more in cool dry place. **PEMMICAN** -powdered jerky, mixed 50/50 with paste of dried berry (any) or fruit pulp and melted suet rolled into balls; store in watertight material, or dip in more suet for extra coating. Will keep years; highly nutritious classic survival food. **FISH** -split down back, or fillet; sun dry on rocks. Grind bones, meat, add to stew, patties, etc. Dont eat raw (parasites). **SMALL GAME, BIRDS** -dry whole, on rocks in sun; prop ribs open with stick. When dry crush bones, dry extra day dries marrow.

ROASTING TUBERS -fish, etc. Pack in mud, clay; put in coals. Scales peel off with mud. **SOUP HOLE/BATH WATER** -dig hole, line with waterproof material. Put in layer of rocks, then red-hot rocks. (Water inside river rock will explode if heated.) **STEAM PIT** -dig hole, put in red-hot rocks, 2 in. layer of grass (green), then food, more grass; fill up with damp soil / sand. Poke hole to bottom of pit, to add steaming water. Many hours to cook.



(A) **RAFTS** -3 long logs, standing dead wood (test float) (bundled plants, limbs ok). Notch to fit, or lash. Square raft will spin. Listen ahead for rapids. Auto-pilot: rock or pail trailing on short rope from front center keeps raft in main channel. (B) **PUMP DRILL** -for stone, wood, bone. Hard stone bit, jasper, agate. Use fine quartz sand for abrasive. Or make simple drill by spinning stick between hands. (C) **SNOW SHOES** -lift-line tied to front center of each shoe aids walking. OR -strap on evergreen boughs. (D) **SNOW GOGGLES** -bark, cloth, etc. wrap around. Smear soot around eyes. (E) **COOLING FOOD** -Evaporator: works best in sun, wind. Pot holds water, cloth stays wet, open weave shelves circulate air. OR -dig hole, line with rocks, cover slab rock and sand. (F) **NET** -gill net, hammock. Unravel socks, sweater, tie 2 in. loops; join many nets. (G) **WEAVING** -Dry grasses & reeds; presoak, keep moist. Willow: cut green, strip, dry; soak before use. Colling: bundle grass or bark fibers; two foundation rods of willow core wood; joined by splints of willow sapwood or bark. Pitch coated holds water. Twining: warp strands of inner bark of cedar, sagebrush, fluffed & twisted. Good burden sacks, clothing, pit liners. (H) **PRESSURE FLAKING** -strike blade piece off large stone (H-1), hold padded blade (H-2), use blunt object to flake chips off with (H-3) twisting pressure into edge of blade. (I) **AXE** -heat slender willow. Tie with shoots.

ROUND BOAT -stretch waterproof material over domed frame of willow sticks. **POTTERY** -fine-particled river bank clay; coil or slab wall, even thickness. Hardwood fire in 2 ft. deep pit, built on & around pottery. Remove when orange-red (4-6 hrs); slow cool. **CORDAGE** -Nettle: dry stalk fibers; pound stalk, clean fibers by hand. Good yarn, string, snares, nets, ropes, bowstrings, woven fabrics. Milkweed: silky fibers in dry stalk. Dogbane (best in West): silky stalk fibers. Hawthorn, willow, elm, spruce roots, rose: inner white bark good cordage, strongest when wet. **SINEW** -long leg or back tendons. Scrape, sun dry til hard; pound til soft & fluffy, will split apart.



FIRST AID

MOUTH-TO-MOUTH RESUSCITATION —lay victim on back, loosen clothes, turn head to side, clear foreign objects from mouth, including false teeth. Tilt head back, just chin up to straighten windpipe & open airway around tongue (pad under neck). Open mouth, pinch nose closed, blow four quick breaths into victim. If no sign of respiration within 5 sec. continue blowing 12 times a minute (every 5 sec), forcefully into adults, lightly into children, enough to cause chest to rise. Wait for complete exhalation before blowing again. Continue indefinitely. (If air gets into stomach and bulges up, press down to cause belching, and clear vomit from mouth.) Can use nose, also.

BLEEDING — stop by (1) direct pressure with compress on wound, (2) elevation of wounded part above heart, (3) digital pressure on artery, (4) tourniquet —certain loss of limb. **ARTERIAL PRESSURE POINTS:** use only until blood has clotted under compress. For bleeding in scalp: light press. in front of middle ear; outside or inside of head: mod. press. on neck 3" below ear, 3" above collarbone, push against spine; cheek: light press. in notch on under edge of jaw 2/3 back from chin; lower arm: strong press. on inside of arm 1/2 between shoulder & elbow; arm: firm press. behind middle of collarbone, push artery against first rib; above knee: strong press. in groin with heel of hand, push artery against pelvic; lower leg: press. behind flexed knee. **TOURNIQUET** —encourages gangrene; don't use unless loss of limb is certain. Apply 2-3" above wound. Make very tight, release just enough to find bleeding point, then tighten back. Never remove. Get to help.

MANUAL HEART COMPRESSION — simultaneous with mouth-to-mouth resusc., in case of heart stoppage. Get to victim instantly; lay on back, clear airway; look, listen for breathing. Give four quick breaths (nose pinched). Check jugular pulse in neck (if normal, stop here). Holding fist 8-10" above victim, give one sharp blow to a point exactly 3 FINGER WIDTHS ABOVE bottom of breastbone, to shock heart into action; do not repeat. If still no pulse in neck, administer heart compression strokes to same point on breastbone: with heel of hand, covered by other hand, elbows locked, shoulders vertical above hands — compress 1 1/2 to 2 in. toward spine, once every 3/4 seconds. After 15 strokes give two quick breaths (nose pinched), 15 more strokes, 2 breaths. After 4 cycles check neck pulse. If no pulse or breathing, continue 15/2 cycles indefinitely. (If two people present, one person delivers one strong breath between every 5th & 6th strokes, on the 5th upstroke. Blow with such force "as to blow the person's hands into the air". Do not break the rhythm.)

SHOCK —pale, dazed, cold sweat, weak pulse. Stop bleeding, relieve pain, lay with head low or legs raised a few inches. Keep moderately warm. Give Encouragement. Ingestion of stimulants, fluids, food, varies with type and extent of injuries.

AMPUTATION —when massive damage to limb poses threat of overwhelming infection or shock. Decision should not be made lightly, you are trading a limb for a life. **OPEN CIRCULAR TYPE:** all dead tissue must be removed to the lowest possible level of live tissue, and stump left open. Make incision thru skin & underlying tissue connecting skin & muscle at the lowest apparently living level, & allow skin to retract. Then sever muscles at the new skin line. The muscle will promptly retract, leaving bone exposed. Then cut the bone. A tourniquet is normally required to control bleeding as the amp. is done thru living tissue. As blood vessels are exposed, grasp & tie them, preferably before cutting them. Leave the stump open to allow drainage. Apply light bandage to protect from infection without stopping drainage. Apply protective splint, well below stump end.

BLACK WIDOW SPIDER BITE —rarely fatal to the healthy. Only female poisonous (1/2" long, red-dish hour glass underneath large silky abdomen). Local swelling, redness. Maybe muscle pain, cramps, nausea, shock. Take aspirin. Suck out venom, apply cold compress. **BROWN RECLUSE SPIDER** —common west & southwest U.S., (1/2" oval body, dark violin spot on head). Severe pain throughout body. Painful bite area becomes gangrenous, sloughs away in a few days. Keep covered with sterile ointment. May be more dangerous than black widow.

BURNS —extreme pain, shock can kill. Cut away clothing from area, leaving parts that stick. Cover with vaseline compresses (non-sticking). Not absorbent cotton. Don't remove wax or metal pieces, or open blisters. Give much water, lightly salted.

CHOKING —clear mouth, tongue forward. Bear-hug victim from behind, with his head slumped over. Hold one wrist with other hand, give sharp jerk against diaphragm, midway between naval & breastbone — forcing air in lungs to dislodge object in throat. After 2 jerks you are out of air.

CRUSHING WOUNDS —treat for shock, immobilize limbs that could aggravate wound. **OPEN CHEST** —air leakage: close with compress at maximum exhalation. **PUNCTURED LUNG** —broken ribs, bloody froth at mouth —little you can do except lightly bandage chest to ease pain.

ABDOMINAL —high mortality rate: bandage wound to prevent gut from coming out. If area extruded do not replace it — cover with bandage, keep damp with sterile, mild salt water.

DISLOCATIONS —SHOULDER, lay victim on back with elbow close to body, toward back. Holding elbow, turn elbow out at right angle to body. Holding forearm in this position, gently lift elbow up to about 60° angle. Bring forearm quickly across front of body, holding elbow in raised position. If first attempt fails, don't repeat. Strap arm (wrist) to opposite shoulder, watch swelling. **HIP**, by direct traction from ankle. Splint 10 days. **JAW**, place padded thumbs over lower molar teeth, with fingers under the chin. Press down strongly. As back of jaw moves down & back, lift chin up. It should "pop" into place. Be careful to not let thumbs be pinched by closing jaw.

FOOD POISONING —induce vomiting; rest. Purge: 1 tsp salt to 1 qt warm water on empty stomach. Weak tea, toast, salted water diet for 1–3 days.

FRACTURES —treat for shock. Apply padded splints, immobilize joints on both ends. Aspirin for pain. **COMPOUND** —apply compress to wound, do not set bone. **SKULL** —swelling of brain tissue. Raise head, rest. Headache 1–2 days not serious if wits normal. Severe if headaches continue, vomiting, fuzzy wits, impaired limbs — seek help. NO stimulants. Coma: throaty breathing

FROSTBITE/FREEZING —skin dead white, no feeling. DO NOT rub, or hold in snow. Fast thaw against body, or in 100° water. Don't thaw if chance of re-freezing. Treat as burn — sterile dressing. Give aspirin, hot fluids, NO alcohol. Don't exercise wounded area.

GUNSHOT —stop bleeding, don't remove projectile. Don't suture. Use compresses.

HEAT EXHAUSTION —minor sunstroke —due to salt & water loss. Faint fluttery pulse, nausea, pale face. Give high energy snacks, cool liquids, rest, salted water. (Take 1 salt tab to 1 cup water 1–10 times daily, to avoid salt depletion)

HEAT STROKE —sunstroke —extreme overheating, body failure to cool itself. Hot dry skin, delirium, fast pulse, hi temp. Cold water bath, rub limbs. Lay on back, head raised, clothes off. Fan, give cold drinks, no stimulants.

HYPOTHERMIA —cooling of body core, due to wind, cold, wetness. Shivering, clumsiness, confusion, coma, in few hours death. Rewarm body, rub limbs toward heart. Exercises. Stimulants.

INFECTION —elevate wounded part, rest. Apply hot compress wrung out of boiled salt water. Drink much water. Don't open until very localized; use sterile needle. Applying mouth of heated bottle will draw infection as it cools. Poultice of clean clay, shredded bark & grass seed, works ok.

PUNCTURES —remove object, bleed to cleanse wound. Saw or break off large objects.

RABIES —no first aid. Observe animal habits & health for later prognosis; or kill animal and save its head (brain) on ice, or cage it alive.

SCORPION BITES —burning, swelling, maybe nausea. Suck out venom, apply cold packs. Small 1% in. scorpion most potent. Painful bite, rarely fatal. **CENTIPEDE, TARANTULA** —not poisonous but some centipedes toxic. All can cause serious infection.

SCURVY —prolonged vit. C deficiency —symptoms develop over 1–3 month period: pessimism, irritability, dizziness, joint pains, bleeding gums, loose teeth. Appetite & digestion not affected. Prevention & cure by diet of fresh, not overcooked foods, even in all-meat diet. Don't bleed meat.

SNAKE BITE —most danger to very young & old. Look for fang marks in addition to regular tooth marks. Fast pain & swelling, puncture area purplish. Usually delayed weakness, faint, nausea, salivation. (Kill snake for positive ID for anti-venom) Treat before returning to camp. Keep warm & still, excess movement spreads poison. With wounded part down, apply loose band 1½" above bite, ONLY to restrict lymph vessels in skin layers. Loosen every 15 min. for a few seconds, reapply above swelling. Make 1/2 in. cuts thru fang marks parallel to limb; avoid veins, nerves, tendons. Apply suction (mouth ok if no open sores) at least one hour. Cold compress slows spreading poison. (Another theory is to make one cut between the fang marks, applying successive bands in advance of the swelling without removing any of them.) Apply sterile dressing; splint. Give much water, tea, NO alcohol. (Don't make cuts in tropical areas—apply mouth suction, deep massage with teeth.)

SNOW BLINDNESS —wear lightproof bandage, apply cold compress (tea bag). NO eyewashes.

SPRAINS —strained or torn ligament. Cold compress 12–18 hrs to reduce swelling. Warm compress thereafter. Take pain killer, put in sling, rest.

SUTURING —(curved needle, nylon filament) Minimal pain. Wash out cut, dry. Space sutures well apart for drainage. Stitch below skin, 1/8 — 1/4 in., but not into fat or muscle. Tie each knot to one side, leaving 1/4 in. ends. Remove in 7 days. Don't suture inside mouth, or tongue. Remove facial sutures in 4 days. For cut tendon apply splint only. For cuts over 14 hrs old or very dirty or irregular or ripped, apply butterfly bandages only. Don't suture deep wounds into chest or abdominal cavity; seek help. Don't suture gunshot wounds.

TICKS —inspect daily. Retract head if touched with heat, petrol products. Sterilize, bandage.

TYPHOID —severe headache, fever, vague feeling of uneasiness. No first aid.

GENERAL DESERT

Day-night temp. extremes. Usually adequate veg. Great visual range - flash signal mirror even if no target; large fire at night. Keep fully covered from ultra-violet rays, dehydration. Slow and easy does it. TRAVEL by night. SHADE by day. Brief storms flash - flood dry creeks, canyons. Anticipate dead-end canyons, drop-offs. WATER - base of hills, mtns; solar still; cacti; dig hole. To prevent sunstroke take 1-10 salt tabs daily with water. FOOD - mesquite beans, palm, cacti, nuts, seeds, herbs, salamanders, insects, small game, deer, antelope. SNAKES, scorpions, spiders in shaded places, crevices. All active at night, but avoid man. Check shoes, clothes, bedding.

GENERAL TUNDRA

Arctic plain, beyond forest line. Moss & lichen. June and Aug driest months. Short 50° summer. MARSHY - water can't penetrate permafrost, streams flood rapidly. Brownish surface water drinkable. Abundant lakes, ponds; meandering streams, rivers. THIN ICE everywhere. Game, veg., shelter, fuel, at dangerous minimum. Severe blizzards, wind chill factor. SWARMS of blackflies, mosquitoes, deerflies, midges, in summer, but carry no diseases. QUICKSAND at stream junctures. FOOT TRAVEL risky, exhausting, useless; travel by RAFT no matter how long it takes to build. Mirages, no prominent landmarks. Most towns are on rivers.

GENERAL TROPICS (worldwide)

RAIN FOREST dense aerial canopy, signaling useless; little sunlight, sound deadened, radio waves blocked. TRAVEL in day only. Follow streams, adjacent ridgeline trails. TINDER inside large termite nests, dead twigs in trees. DANGERS - Piranha freshwater fish (20") in calm waters, devour everything. Build shelter above ground. Much poison oak, ivy - don't touch anything. Large cats, pois, snakes, uncommon. (see Marine fish warnings) WATER - boil all - streams, springs, pools. Common liana vines full of water, cut sections, drink as is. Grapevine, bamboo similar water. Avoid if milky. Water in tree crotches: 'cups' in large aerial leaves, strain. Unripe coconut milk good. Hollowed out banana stumps fill with good water. FOOD varies with season, locale. Best along streams, shores, swamps, clearings, thickets. Sparse food in dense rain forest, cloud forests. All birds, animals, lizards, crocodiles, alligators, snakes, freshwater clams, shrimp, turtle, fish, are edible. Avoid frogs. COOK all flesh (parasites). Search clearings for pig, deer, squirrel, coati, monkey. Iguana lizard (1-5 ft) good as chicken, in cent. & south Amer. Bait for land crabs with open coconut. PLANT FOOD - be cautious of plants with red in any part. Abandoned native gardens in clearings. Berries resembling strawb, raspb, blackb, are good, as are wild figs of any color. AVOID MILKY SAPS except in figs, mangoes, papaya, breadfruit. Spit out seeds of all fruit, may be poisonous. DONT EAT corral bean, physic nut, dumb cane, manchineel. ALL PALMS - succulent parts edible. Peanuts below ground good raw, cooked. BANANAS raw, cooked, also shoots & buds. Plantains like raw bananas, roasted or boiled. Sugar Cane - chew inner stalk. All wild sweet potatoes, yams, wild tomatoes, good. Cooked leaves of purslane, pokeweed. Cassava (sweet type) root raw, boiled. ANY VINE like morning glory has edible roots, shoots, leaves, if cooked. ALL FERNS, young curled shoots good. BAMBOO common, young shoots best, like asparagus. BREADFRUIT TREE, 30-40 ft, large leathery leaves; cook fruit - 6" thick, rough, yellow-green, hung at end of branches. Remove seeds, mash pulp. Staple for natives. ARROWROOT, 2-3 ft tall, large coarse herb; 1-3 ft leaves; green & purple flowers, white in trop. Am.; 2 lb tubers good cooked. BREADFRUIT



BREADFRUIT



ARROWROOT

SAVANNAS tropical grasslands. Nearly impenetrable thickets. Large cats, snakes uncommon. Insects bad - wasps, spiders, centipedes, scorpions most poisonous but rarely fatal, except black widows. FOOD - little variety in plant life. Streams much fish. Turtle, bird eggs, fledglings, fast food. All grasses, seeds, nuts, fruits, edible. Roots, tubers tend to be poison, when raw. Squeeze out juice, cook pulp. TRAVEL by raft.

CLIMBING

-doubled rope can be retrieved; hang from sling around tree or rock.

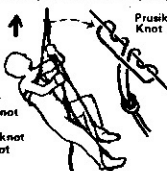


FOOT LOCK



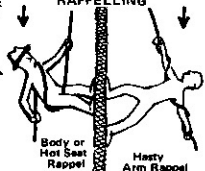
- raise chest knot
- raise left foot knot to chest knot
- raise right foot knot to left foot knot
- raise chest knot

BASIC 3-KNOT PRUSIK TECHNIQUE



Prusik Knot

RAPPELLING



Body or Hot Seat Rappel

Hasty Arm Rappel

METRIC 1 2 3 4 5

INTERNATIONAL EMERGENCY SIGNALS

THREE (3) signals of any kind means SOS (distress). TWO means all well.

WHISTLE -keep around neck at all times. Carries far, saves voice.

SIGNAL FIRES (3 in a line) keep dry, ready to light at all times.

DAY Smoky Fires: white -use green, damp veg; black -use oil.

NIGHT Fires: make large and bright.

HELIOGRAPH MIRROR: metal sun reflector polished both sides, with sighting hole.

Very best signal devise. Can use alum. foil, tin can, etc. Flash periodically in all directions, even if there's no target - someone might see you.

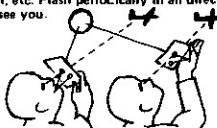


IF SUN / TARGET ANGLE EXCEEDS 90°

Hold in hand so sun spot shines into palm, sight target thru hole, adjust angle til sun spot reflected on back of mirror disappears into hole. Keep target sighted in hole.

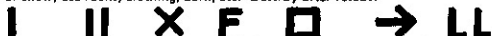
IF SUN / TARGET ANGLE 90° OR LESS

Hold 3-6 in. from face, sight target in hole, sun spot on face reflects on back of mirror, adjust angle til spot disappears into hole, keeping target in hole.



AIRCRAFT REPLIES: flashes from green signal lamp or rocking wings means message understood. Red flashes or full circle to right means not understood.

GROUND-AIR SYMBOLS: based on shadow & contrast. Draw as big as possible in sand or snow, use rocks, clothing, bark, etc. Destroy after rescue.



Serious injury need doctor need medical supplies unable to proceed need food and water need compass and map am proceeding this direction all well



NO YES not understood probably safe to land here indicate direction and proceed need fuel and oil need guns and ammo. will attempt take off

MORSE CODE: radio, flashlight, mirror, whistle, etc.

A . - -	F . . . -	K . - . -	P . - . -	U . - -	Z . - . .	5
B . . . -	G . . . -	L	Q . - . -	V . . . -	1	6
C . - . -	H . . . -	M	R . . . -	W . - . -	2	7
D . . . -	I . . . -	N . . . -	S . . . -	X . . . -	3	8
E . . . -	J . . . -	O . . . -	T . . . -	Y . . . -	4	9
						0

SOS (distress), DE (from), K (go ahead), R (affirmative), BT (message break), EEEEEEE... (erase message) (stop, repeat), INT (?), IMI (repeat), AA (all after), AB (all before), AR (end message)

Example: VVV DE SCOUT PARTY BT LOST POLOMAR MT BT INJURIES BT K

GROUND-AIR BODY SIGNALS



IDENTIFICATION: Name, Address, Telephone, Blood Type