



OUTDOOR SURVIVAL

**a game
about
wilderness
skills**

OUTDOOR SURVIVAL

Get playing QUICKLY - read this card FIRST

PREPARE FOR PLAY: Punch out Person Counter "A," only, from the die-cut set of Counters and distribute one to each player. Disregard remaining Person Counters for the Basic Game. Place these components in view: LOST Scenario Card No. 1, the inner box lid showing the Mapboard Movement Chart, the die, and the mapboard itself. For the Basic Game, disregard Life Level Cards, and remaining Scenario Cards.

HOW TO WIN: Be the first player to move his Person Counter off any edge of the mapboard.

HOW TO START: Place each player's Person Counter "A" in the middle of the mapboard on the hexagon (hex) marked "BASE NO. 5." Determine sequence of player turns simply by roll of the die. (*High roll goes first, second high roll goes second, etc.*)

HOW TO PLAY: As this is a Basic Game, you need be concerned with only two things: 1) Direction of movement, and 2) How far you may move. (*Ignore "Necessities" and "Wilderness Encounters" shown on the Scenario Card.*)

- 1) **DIRECTION:** If you were actually lost in the wilderness somewhere, chances are you would have very little idea of direction. This is reflected in the game. So, at the beginning of each player's turn, he refers to the Direction Ability chart printed on Scenario Card No. 1 and rolls the die. He must then move his Person Counter in the direction stated.
- 2) **HOW FAR YOU MAY MOVE:** The number "6" printed on Person Counter "A" states how many movement points it can spend to travel cross-country in each turn. In real life, people can travel farther in a given time limit across clear terrain than across mountains, rough terrain, swamps, etc. This is reflected in the game. The Mapboard Movement Chart printed on the inner box-lid states how many movement points it costs to enter each mapboard hex. For example, since it only costs one movement point to enter a Clear terrain hex, you could move your Person Counter 6 hexes in one turn as long as all 6 hexes were Clear terrain hexes. On the other hand, since it costs 2 movement points to enter a Woods/Rough hex, you could only move a total of 3 hexes per turn through Woods/Rough terrain.

You may move through any combination of varying terrain in one turn providing you have the proper number of movement points to spend. For example, you could spend your 6 movement points by entering a Clear terrain hex, (1), then a River hex (3), then another Clear terrain hex (1), and then a Ford hex (1). Suppose, however, that the final move would take you into a Woods/Rough hex instead of a Ford hex; you would not be allowed to enter the Woods/Rough hex because it requires 2 movement points which you did not have left to spend. Thus you would only be able to spend 5 movement points in this particular turn. Unused movement points cannot be accumulated and used on later turns.

You **MUST** move as far as your movement points will take you, even if you don't really want to go that far.

If you begin your turn or happen to land on a **TRAIL** hex somewhere in the middle of your turn, you have the option to follow that Trail regardless of how it bends and winds and still be considered moving "in straight line only." Thus if you are required to move in "straight line only," you are allowed to follow a Trail as far as your movement points will take you. If you emerge from a Trail with movement points left over, you have the option of continuing in any direction even if you are restricted to "straight line only" movement for that turn. You may, of course, ignore a Trail and continue across it in a true "straight line only" movement.

It costs you 3 movement points to enter a **RIVER** hex, regardless of whether you are crossing the river or traveling along the river. You may, however, negate this cost by crossing a river at a **FORD** in which event it only costs you 1 movement point. Note, however, that moving into a Ford hex at other than its entrance hex, such as another River hex, costs you 3 movement points instead of 1 movement point.

STRATEGY: In the Basic Game, speed is the most essential element. Since your Person Counter will be limited in the direction it can travel by the Direction Ability Table, you must plan ahead, making sure that you are always moving in the general direction of open, clear terrain. Use trails whenever possible as these are tremendously faster than cross-country travel. Wherever possible, avoid moving towards the mountain or desert areas: these can slow you up to the point where you may only travel two or three hexes per turn. Plan ahead! Know where your Person Counter is going to be at least one turn ahead. Good Luck!

(When you have become familiar with this Basic Game, go on to the regular game contained in the Rules of Play folder. Included therein are rules that provide for even MORE realism and excitement. Once you have mastered the Basic Game, you will have no difficulty with the regular game.)

Rules of Play

OUTDOOR SURVIVAL

INTRODUCTION

OUTDOOR SURVIVAL is a simulation of the essential conditions for staying alive when unprotected man is beset by his environment. It recreates real world conditions of the wilderness, and places trained and untrained people in emergency situations. The players have varying abilities to make the necessary decisions for survival. This is done through a number of scenario situations of increasing complexity, which state the abilities of the Player(s) to survive, and their objectives.

Each scenario contains a "To Win" section explaining the goal of that particular game. These may be solo (for one person) or competitive (for more than one player). Each turn in the game represents one day; each hexagon on the mapboard represents a width of five kilometers (three miles).

OUTDOOR SURVIVAL is actually five different games. LOST is the "basic" game in which you must get out of the wilderness before lack of food and water ends your survival ability. In SURVIVAL you must get across a large wilderness area before your opponent. In SEARCH you must find someone who's lost before the other search

parties do. In RESCUE you must not only find the lost party, but by using your survival skills, get them out of the wilderness. In PURSUE you must, as the escapee, get out of the wilderness into a neutral country or, as the pursuer capture the escapee. Or, in an adaptation of this scenario, one or more players can take the part of hunters while one player assumes the role of their quarry.

GAME COMPONENTS:

1. Rules of Play Folder_
2. Primer on survival tips
3. 22" x 24" Mapboard of "the Wilderness"
4. One set of die cut playing pieces representing persons.
5. Mapboard Movement Chart — printed on Lid of Inside game box.
6. Five scenario cards
7. Four Identical Life Level Index chart cards
8. One die
9. Basic Game Rules Card: Newcomers to simulation gaming should play the Basic Game first. Once mastered, move onto the regular game described in this Rules of Play Folder.

Parts & Brief Description

THE PRIMER

Survival tips; but not used in the play of the game. For reading before and after playing.

THE MAPBOARD

The mapboard is a representation of approximately 13,200 square miles of wilderness—a tract that includes all of the deterrents inherent within, such as woods, rough terrain, desert, swamp, river, and mountains. A hexagonal grid is superimposed to determine location and movement much in the manner of squares on a chess board. We will refer to these "squares" hereafter as "hexes."

DIE CUT PLAYING PIECES

Each set of colored pieces represents one person, hereafter called "Person counters." The letters A through O reflect the physical condition of that person. We will hereafter refer to physical condition as "Life Level." Life Level "A" is the peak condition which can deteriorate if that person's daily requirements of food and water are not satisfied. The number printed on each Person Counter is its "Movement Allowance" and it tells how many clear terrain mapboard hexes a person can move through when he is in that life level. For example, a person starting out in Life Level "A" can move through 6 clear hexes per turn. However, if the physical condition has been weakened to, say Life Level "D," he could move only 4 clear terrain hexes per turn. Each player also has a "Food Index" counter and a "Water Index" Counter which are used on the Life Level Index Chart cards. Counters labeled "Life Level Index" are used only when employing optional rules. Set them aside for now.

LIFE LEVEL INDEX CHART

Each player takes one chart, all charts being identical. Before starting the first turn, each player places all of his Person counters on the row of boxes labeled "LIFE LEVEL INDEX." He also places a Water Index Counter on the "Start Here" box of the Water Index row, doing likewise with his Food Index counter.

MAPBOARD MOVEMENT CHART

This chart is printed on the lid cover of the inside game box and should be kept in view at all times, or until such time as it has become memorized by each player. It determines exactly how many hexes a person may travel through, depending upon the "difficulty" of specific terrain.

BASES AND OUTPOSTS

The "houses" on the mapboard are bases. These serve simply as markers to set up Person counters at the beginning of a scenario. Outposts are bases of unlimited supply. Players use blank counters to indicate these outposts. They are immobile, and may be placed anywhere on the board at the beginning of the situation as called for by the respective scenario.

SCENARIO CARDS

There are actually five different games in OUTDOOR SURVIVAL, graduating in expertise from No. 1 to No. 5. Instructions for play relevant to an individual scenario are printed on each card itself. When selecting a specific scenario, it must be kept out on the table in easy view of each player.

1. LOST — This recreates the situation of someone who, while camping or hiking has lost his way and run out of supplies. This situation could also apply to someone stranded in a desolate area through an accident.
2. SURVIVAL - This situation is actually something of a variation on the LOST situation. In this case the lost people must traverse a wide tract of wilderness in order to get home. This situation could also represent a "race" between people who like to live dangerously.
3. SEARCH — This is one of the most common real life situations. Someone is lost and you have to go looking for him. This situation assumes that once the lost party is found, transportation can be provided to lift rescued and rescuer to civilization.
4. RESCUE - A variation of SEARCH in which the rescuer, having found the lost party, guides them to safety through the wilderness. For the search phase of this game it is assumed that the searchers have the appropriate equipment and supplies.
5. PURSUE — Offers two adaptations on which players can add their own variations. For the war game buff, this game provides the ingredients for an escaped-prisoner-of-war-chased-by-guards situation. For the outdoorsman, the adaptation applies to hunters pursuing a beast.

It is suggested that the WILDERNESS ENCOUNTER situations on the reverse side of each scenario card be used only after becoming familiar with the play of several scenarios. Then consult the OPTIONAL RULES section of this folder.

How to Play

SEQUENCE OF PLAY

- Step 1: Select one of the five scenarios. It should be kept in full view, or passed around to each player when it becomes that player's turn to play. Place Person counters on the mapboard where so stated by the scenario card. Place correctly all Life Level counters.
- Step 2: Determine (by roll of a die) the order in which each player takes his turn. The player rolling the higher number moves first. Game length is determined in the "TO WIN" section of the scenario card.
- Step 3: Refer to the DIRECTION ABILITY chart of the scenario card and roll the die. This tells you in which direction you must move. How far you can move is determined by your counter's movement allowance (the printed number).
- Step 4: Refer to the NECESSITIES chart of the scenario card. Then determine whether or not the current day's needs for food and water have been satisfied as a result of your move. Adjust your Food Index and Water Index counters accordingly on the Life Level Index card.
- Step 5: If movement of your Food Index and Water Index counters have triggered a change in your Person counter Life Level, make the proper exchange between the Person counter that is in play on the mapboard and one that is on the Life Level Index row of your Life Level Index card.
- Optional: (Steps 6 and 7 are for use with the optional rule only.)
- Step 6: Having completed your normal movement turn, roll the die once. If you roll a 1, 2, 3, or 4 your turn has ended and your opponent may now return to step 3 and proceed normally. However, if you roll a 5 or 6 you must play the WILDERNESS ENCOUNTER chart. You then announce which of the three columns you'll play (NATURAL HAZARDS, ANIMAL/INSECT, or PERSONAL) and then roll the die. Adjust your Food Index and Water Index counters accordingly.
- Step 7: Repeat Step 5.
- Step 8: Repeat steps 3 to 7 until game is concluded.

- (F) If forced to go off the board by the dictates of the Random Direction chart when not desirous of doing so, you may opt to remain stationary instead.
- (G) Person counters may never make a 180° turn, that is, re-enter a hex just left. Counters must move straight in the new direction after turning. They may turn at any point after the first hex is entered, but it is never required for them to turn.

TRAIL MOVEMENT

Whenever a unit moves into a hex containing a trail, the player has the option of ignoring the dictates of the Direction Ability chart and continuing his movement along that trail.

Cases:

- (A) Turns in movement incurred by bends or twists in a trail do *not* count against movement limitations as called for by the Direction Ability chart. In other words, movement along a trail is considered a straight line. When you land on a trail hex you may follow that trail regardless of turns.
- (B) When leaving a trail you must move straight ahead in the direction that the trail points to, unless you have a "turning" ability in that turn due to your roll on the Direction Ability chart.
- (C) When traveling on a trail you may ignore the results of the Random Direction chart. However, you still roll for the Direction Ability chart to see what your "turning" capabilities are should you wish to leave the trail that turn or should the trail end.
- (D) If you leave a trail hex after having entered that hex at the trail movement rate of 1 point per hex, in a direction other than that which the trail points to, you do so at the movement cost of the other terrain in that trail hex. Exception: If the movement cost of the terrain moved into is greater than that of the terrain in the exited trail hex, you always use the greater cost of the two.
- (E) You may change direction when leaving a trail only if the Direction Ability chart gives you a "turning" capability for that turn.

HOW TO MOVE PERSON COUNTERS

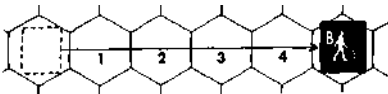
Person Counters must be moved as far as possible in accordance with its direction instructions, and in accordance with the limitations of its movement allowance and the Mapboard Movement Chart. Procedure: Move each unit individually, tracing the path of movement through the hexes.

CASES:

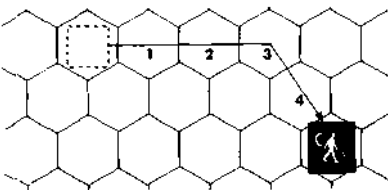
- (A) Movement is calculated in terms of hexes. Basically each unit expends one movement point of its total movement (point) allowance for each hex entered. To enter some types of hexes requires more than one movement point; see the Mapboard Movement Chart printed on the Box Lid.
- (B) In any turn, the Player may decline to move his Person counter at all, and remain stationary in a hex. This must be decided *before* he rolls for his direction instructions, unless stated otherwise on the Direction Ability chart.
- (C) Person counters *must* be moved in accordance with their direction instructions, as given to them by the DIRECTION ABILITY chart and a die roll.
- (D) Person counters may move over different types of terrain as long as they have sufficient movement points to *enter* that particular type of terrain. Thus, a Person counter with a movement factor of 2 could not move at all if surrounded by mountain or swamp hexes.

Person counters must be moved in the direction instructed. Movement may be in two ways: straight, with no turns; or straight with turns. Examples of these are:

straight, no turns:



straight, with turn:



- (FT) Any disagreement over the location of exit hexes or other such ambiguities may be resolved by a friendly roll of the die.
- (G) You may enter a trail hex at the movement cost of one only if you enter that trail hex through a hex side which is clear terrain or pierced by a trail.

FORDS

Fords do not have the same qualities as trails. They merely negate the river in that particular hex for purposes of movement across the river. In other words, you may not change direction on a ford hex unless the Direction Ability chart gives you a "turning" capability for that turn.

RIVERS

The cost of entering a river hex is always 3 movement points regardless of whether or not the river is actually crossed. Exception: Swamp hexes which include rivers are traversed at a cost of 4 movement points, not 3.

HOW TO USE THE LIFE LEVEL INDEX CHART

Each player has his own card and places his own Person counters, Food Index, and Water Index counters where indicated.

WATER INDEX: At the end of each turn in which the current day's needs for water are *not* met, (Note: swamp squares may not be used to satisfy water needs) that player must move his Water Index counter one block downward (*to the right*). Blocks are separated by "trigger points" (*where it might say "1 Life Level"*). Whenever the downward movement of a Water Index counter crosses such trigger points, that player's Person counter loses the stated life level. That means he must replace his Person counter now on the mapboard with that of the next letter shown on the Life Level Index row. For example, if at the end of the first turn (*each turn represents one day*) Player No. 1 did not satisfy that first day's needs for water, he must move his Water Index counter into the next block down from the "Start Here" block. That move does not trigger a life level change. However, if he does not satisfy his current day's needs for water in his second turn, then he must move his Water Index counter down to the third block. That move *does* trigger a life level change. Thus he also has to exchange Person counter (A) with Person counter (B) on the mapboard. You will note that Person counter (B)'s movement allowance reduces that player to a

movement allowance of 5 hexes per turn instead of the previous 6.

It is possible that a person could trigger a change in life level on both the Food and Water Indexes on the same turn. In such cases, the effects are added together and the resulting sum is subtracted from the Life Level Index. In cases where a player is able to satisfy more than just the current day's needs, he may recover life levels by passing trigger points in the opposite manner (*upward, or to the left*). When that player is instructed to recover steps on the Water Index, he moves his Water Index counter to the left one block for each step he is to recover. He then substitutes for his Person counter accordingly if a trigger point has been crossed. For example, if a player's Water Index counter is on the fifth block, and he is instructed to "recover 2 steps," that counter is moved back to the 3rd block. And if his mapboard counter is at Life Level "D," it is replaced with Life Level "C."

FOOD LEVEL: Treat the same as for Water Index. You will note, however, that one's physical condition deteriorates at a much faster rate from lack of water than from lack of food. Again, as with water, it is possible to recover lost life levels. However, in no case may food or water indexes "regain" food or water further to the left than the "start here" boxes.

LIFE LEVEL INDEX: Counters A through 0 reflect that player's physical condition. No more than one of the 15 may be on the mapboard at any one time. If a player has counter 0 on the mapboard, and he is required to lose one or more life levels, he has not "survived" and is automatically out of the game.

You are NOW ready to play OUTDOOR SURVIVAL. "Examples of Play" (below) are for ready reference. "Optional Rules" (at right) may be adopted to add realism to the play of the basic game.

For current replacement parts list send a stamped, self-addressed envelope marked "parts list" to: The Avalon Hill Game Company, 4517 Harford Road, Balto., Md. 21214.

Optional Rules

WILDERNESS ENCOUNTER CHART

The Wilderness Encounter aspect is adopted at step 6. At the end of your normal move in each turn, roll the die once to determine if you must play the Wilderness Encounter chart. If you roll a 1, 2, 3, or 4 your turn has ended and your opponent should proceed immediately to step 3. If you roll a 5 or 6 you must play the Wilderness Encounter chart. Call out — verbally — one of the three encounters you wish to take a chance on. Then roll the die once, and cross index the die roll with the proper encounter column. Adjust the Food and Water Indexes and the Life Level counters accordingly. Your turn ends and play continues in like manner to the next player. You may never ignore the gains or losses called for by the Wilderness Encounter chart, even if you currently occupy a food or water hex.

When the Wilderness Encounter chart calls for the loss of a "life level," the Food and Water Indexes are not affected. Simply replace the person counter with a lower Life Level counter making no additional changes in the Food or Water Indexes. This simulates a weakening of condition resulting from causes other than lack of food or water.

You will note that we give you a choice in the selection of the encounter for the sake of adding strategy to the play of the game. But in real life, travelers would not have this control over Wilderness Encounters. If you wish to simulate this aspect, substitute another die roll for the choice: a roll of 1 = Natural Hazards; 2 & 3 = Animal-Insect encounters; 4, 5 & 6 = Personal elements.

You will note that the three encounter options provide for a variety of decision making ranging from the conservative to the panic stage. They are, of course, slanted according to the level of players' expertise in wilderness skills.

Encounters reflected under Natural Hazards include forest fires, flash floods, and inclement weather. Negative elements under Animal/Insect Encounters involve poisonous snake and insect bites, wrecked shelters and supplies ruined by marauding animals, with positive elements reflecting a person's ability

to successfully obtain animals and insects for food. Under Personal Encounter, the negative elements reflect bodily injury, and consumption of polluted water and poisonous food, with positive elements showing a person's ability to accumulate food and water surplus, provide shelters, build fires, and apply proper medical treatment to one's self.

LIFE LEVEL INDEX COUNTER:

Whenever the Wilderness Encounter chart calls for the loss of a life level, it may be assumed that this is the result of an injury which can not be "healed" during the course of the game. When using this optional rule the Life Level Index counter is placed on box "A" on the Life Level Index to start the game. For each loss of life level called for explicitly by the Wilderness Encounter chart, the Life Level Index counter is moved one "box" further to the right. The Life Level Index counter simply represents the highest or "peak" stage that a player's Player counter may be at during the game. If the Life Level Index counter is on "box B" on the Life Level Index, then you may never "regain" life levels past the "B" stage. Food and Water Indexes may continue to be moved upward regardless of the Life Level Index counter but "trigger points" are ignored if the resulting gain in life levels would call for the use of a Person counter greater than that allowed by the Life Level Index counter.

BASES: If you find that survival in any of the scenarios is too difficult to achieve, you may wish to consider each "base" hex to have the same advantages as a combination food and water hex. Furthermore, by remaining on that particular hex for two additional turns, you may regain one food and one water step. This optional rule would be most useful in the SURVIVAL scenario.

Scenario 6: One of the most interesting aspects of OUTDOOR SURVIVAL is the opportunity it provides for devising your own scenarios. Once you have mastered the mechanics of play, many additional ideas, providing more testing of outdoor knowledge and skills, will come to you. Integrating these situations with the standard games will add pleasure and skill-sharpening to the playing.

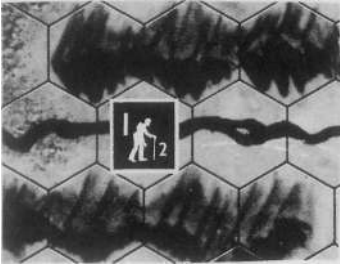
To illustrate this possibility we will briefly outline the rules for a "man vs. beast" pursuit scenario below.

For the purposes of this illustration we will assume the "beast" to be a whitetail buck and the pursuer a deer hunter. To reflect the greater speed and agility of the deer, double the movement factors of the animal's "person counter" for all levels. The animal satisfies its current day's food needs every time it ends movement on a plain or forest square. Water needs are satisfied by passing through or ending movement on a catch-basin, stream hex, or swamp square. The deer, not having the reasoning powers of a man, must roll the direction ability chart used in the Lost Scenario on every turn. The deer may not leave the board — the game continues until either the prey is caught or the pursuer is reduced to life level G — at which point he admits defeat and gives up the hunt. The hunter, for his part, uses the direction ability and necessities chart found in the Search scenario. To successfully conclude the scenario, the hunter must occupy a clear terrain hex adjacent to the deer (at which point it is assumed his rifle will bring the hunt to a successful conclusion) or else actually occupy the same non-clear terrain hex as the deer (i.e., swamp, mountains, forest). In addition, to simulate the difficulty of a rifle shot in heavily wooded terrain, force the hunter to roll a 1, 2, or 3 to make a successful shot whenever the hunter is in a woods hex.

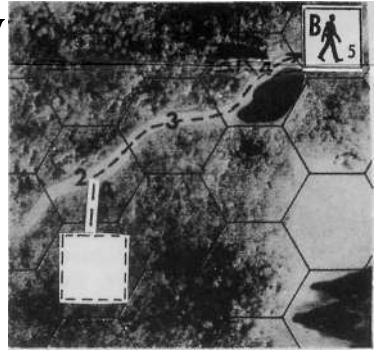
It must be emphasized that the above "scenario" should, by no means, be considered a hard and fast rule. It was included only to show you the possibilities for innovation that exist in the creation of new scenarios. Indeed, the creation of "variant" scenarios is one of the reasons why OUTDOOR SURVIVAL is such an excellent game for solitaire play. It's open-endedness should make it a favorite for those who lack opponents.

HINT: Another variant on the same theme could be easily constructed by changing the scale of the mapboard to 1 hex equals 100 yards, thus paving the way for chance tables which could reflect the accuracies of rifle fire at ranges of 100 through 500 yards. As you can see, the possibilities are endless, and the situations limited only by the powers of one's imagination.

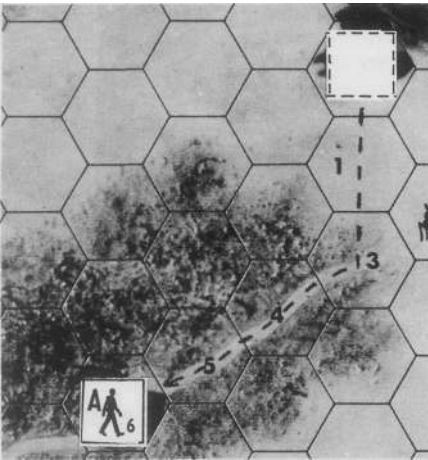
Examples of Play



No. 1 — I2 may not move because it is surrounded by terrain requiring a movement expenditure of "3" to enter.



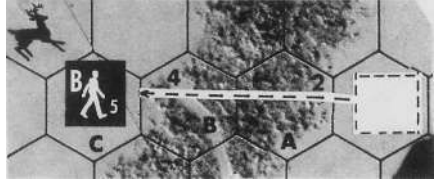
No. 2 — B5 is not allowed to make any turns. He proceeds straight north until reaching the trail on square A. He then abandons his northerly direction to follow the trail. He may do this because "Movement along a trail is considered a straight line."



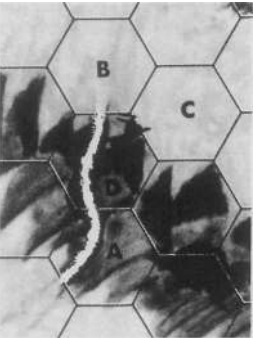
No. 5 — A6 has no turning capability. However, he elects to follow the trail as "movement along a trail is considered a straight line." Note that although he ends his turn going in a direction other than that which he started, he has not violated his turning capabilities.



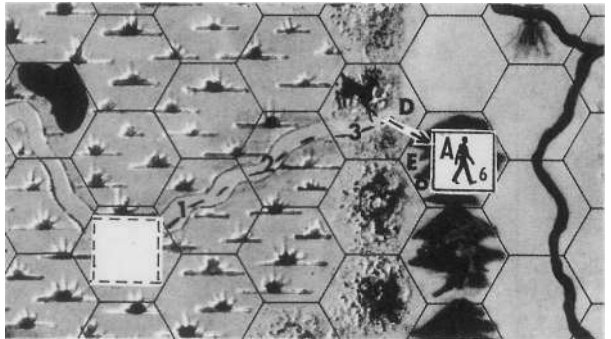
No. 4 - H2 may cross the river to "A" due to the effects of the ford at "B."



No. 6 — B5 may move from square B to square C with an expenditure of only one MP because it used the full woods expenditure (2) to reach square B and hence is not subject to the rules of movement governing trails in this instance.



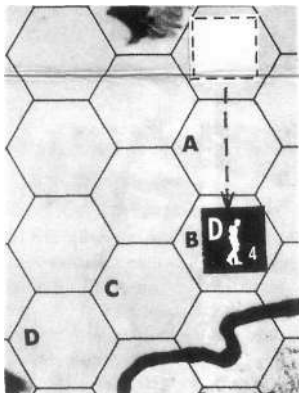
No. 8 — To move from A to B would cost two movement points. To move from A to C would cost 4; one to enter square D on the trail, and 3 to leave the trail for square C because the trail does not lead to square C and the counter moved onto square D at the special trail rate of one MP.



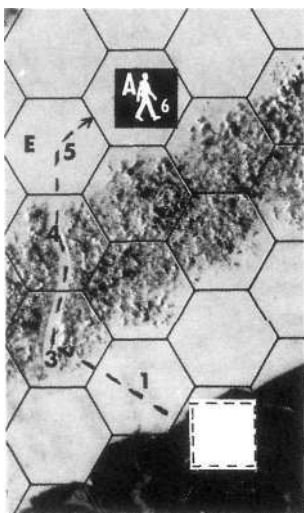
No. 9 - A6 exits from square D at a cost of 3 movement points rather than the "2" cost of the forest terrain in square D due to the rules governing exit from a trail hex (case D).

Outdoor Survival Primer

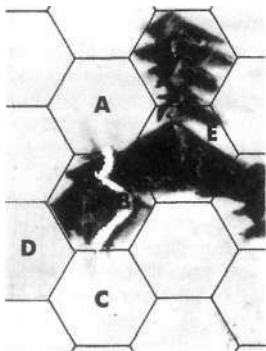
This 24-page booklet, based on the best and latest of what the experts know, fully illustrates in text and pictures the techniques of: direction finding, signaling, making shelter, building fires, dealing with natural hazards, first aid, living off the land . . . and lists basic supplies needed for a planned wilderness adventure. Also included is a bibliography of the very popular Stackpole Books used as a basis for translating wilderness expertise into the design elements of this game.



No. 3 - D4 must stop on "B" because it costs 3 movement points to enter a river square and he has only 2 remaining. Note that if he had a turning capability he could proceed to "D."



No. 7 — A6 is able to make one direction change. He executes this change at square E.



Movement Cost: from A to B is one
 from A to B to C is two
 from A to B to D is four
 from E to B to D is four
 from E to B is three

OUTDOOR SURVIVAL

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 Cameron & Kelker Streets, Harrisburg, PA.

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By sending in the Registration Card assembled with this game you will qualify for our FREE answering service. Questions on play will be answered by our R&D staff at no charge. Please be sure to enclose a stamped, self-addressed envelope.

THE AVALON HILL GAME COMPANY

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a primer about
WILDERNESS SKILLS
for players of the game—

OUTDOOR SURVIVAL

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Where to find Skill Information ..

Direction Finding Page 3

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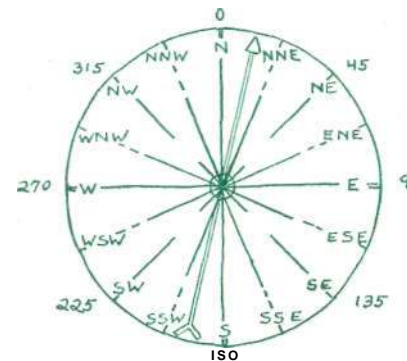
Equipment and Supplies Page 22

- canteen • food • guns and ammunition • fishing gear • tents and plastic shelters • sleeping bag • matches • flashlight • jackknife • compass

Direction Finding

In the wilderness, as in civilization, the basic necessities are water, food, and shelter. A person who is lost or stranded must decide whether his chances of obtaining these necessities will be better if he attempts to find his way back to civilization or if he stays where he is and summons help. If he decides to get out by himself, the aid of a compass will be invaluable.

USING A COMPASS



The compass dial is divided into 360 degrees, which may be most easily visualized as 360 possible routes fanning out like wheel spokes from its user's location. Compass degrees are customarily numbered in a clockwise direction starting at north. East is one-fourth of the way around the dial. East in terms of degrees is, then, one-fourth of 360, or 90. The distance between each of the four cardinal points - north, east, south, and west - is the same 90. South is therefore designated as 180° and west as 270°.

Halfway between north and east is called northeast, which in terms of degrees is half of 90, or 45. The other corresponding points are similarly named: southeast, southwest, and northwest.

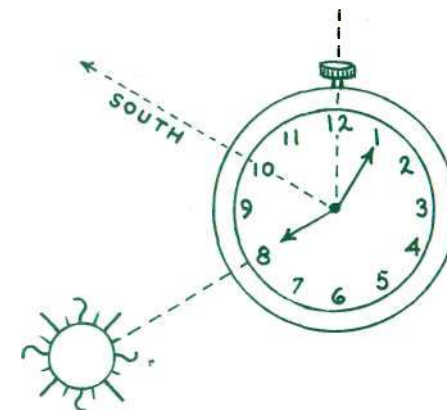
Halfway between north and northeast is north-northeast, or 22.5. Halfway between northeast and east? East-northeast. Each of the four cardinal points always comes first.

Compasses are even more helpful when used together with maps. To orient a map with the aid of a compass, however, allowance must be made for compass declination, which is the difference between true north and magnetic north. This variance, caused by the fact that compass needles point toward the magnetic pole rather than the North Pole, is indicated on most local maps.

Suppose that where you are the compass declination is 14° east of north. An arrow marked N verifies that north is at the top of your chart, which unless otherwise indicated is the case with most maps. Move the map until the arrow, or until one side of the upright rectangular sheet if there is no such mark, points 14° west of compass north. For all practical purposes, you can now read the map in terms of the surrounding countryside.

If you do not know the local compass declination and it is not marked on the map, find the North Star by one of the methods described below under Direction Finding by Sun and Stars. This star lies almost exactly over the North Pole. Then either note immediately the variation between almost exact north and where the compass needle is pointing, or scratch a line pointing to the North Star or indicate such a line by two stakes so that you can compare your compass north to the thus established north-south mark by daylight.

In the United States and Canada a watch can be used as a makeshift compass accurate within 8°, provided that: (1) the sun is shining brightly enough to throw a shadow, (2) the watch is accurately set, and (3) the watch shows the local standard Greenwich time. Lay the watch face up with the hour hand pointing directly toward the sun. To check this, hold a twig or pine needle upright at the edge of the dial. It should cast a shadow directly along the shorter hand. South will lie midway along the smaller arc between the hour hand and twelve o'clock. At eight o'clock in the morning a line drawn from the center of the watch through the numeral ten will point south.



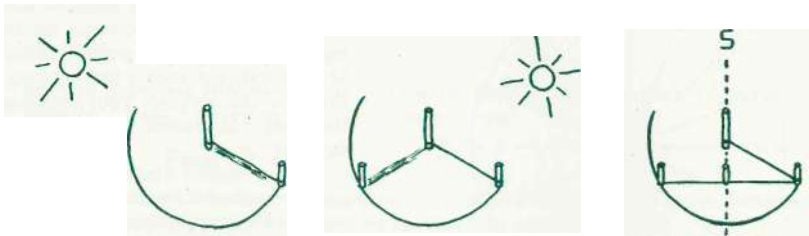
Telling Direction by Watch and Sun

Suppose you do not have a compass? Then improvise one. Stroke an ordinary needle in one direction with a piece of silk. Rub the

needle with oil collected by passing thumb and forefinger over the nose and forehead. Suspend the needle by two thin bits of grass or other fiber formed into loops and lower it carefully into any body of still water. Cautiously remove the support. The needle, floated by surface tension, will turn until it is aligned with the north and south magnetic poles unless some metal is near enough to distract it. If you have stroked the needle from head to tip, the head will point north.

DIRECTION FINDING BY SUN AND STARS

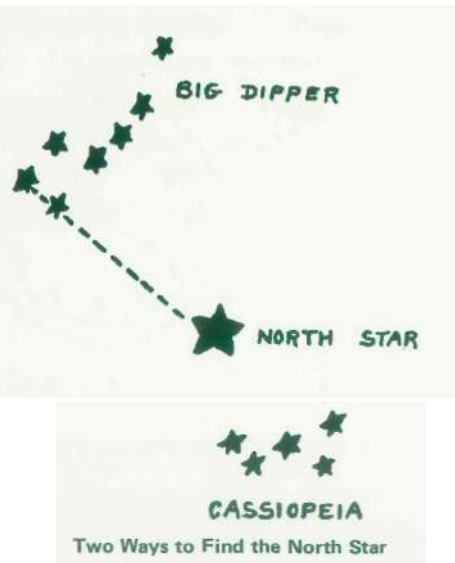
Here is a way to find where south is without a



Telling Direction by Sun, Pole, and Stakes

There is a less accurate but far swifter method of telling direction any time the sun (or moon) is bright enough to cast a shadow. Mark the tip of a pole's shadow. Wait five minutes. Then a straight line drawn from the shadow's new tip through the first mark will run roughly west.

One of the most accurate direction-finding methods employs the North Star, which is



compass, if it is morning and the sun is shining. Drive a short pole into the ground. Observe how long a shadow the pole casts. Loop a string, lace, piece of straw, etc. around the pole. Keep this taut and, holding it at the desired length to a sharp stick, draw an arc that exactly touches the end of the shadow. Mark this point with a stake.

The shadow of the pole will keep shortening until noon, at which time it will begin to lengthen. Watch until it once more meets the arc. Mark that spot with a second stake. A line connecting the pole with a point halfway between the first and second stakes will point due south.

located almost directly above the North Pole. To find this bright star, follow an imaginary line through the two stars that form the outer edge of the Big Dipper. When the Big Dipper is not visible, use the constellation Cassiopeia to find the North Star. It will be helpful to memorize the relationship between the North Star and Cassiopeia, which is always on the opposite side of the North Star from the Big Dipper and about the same distance away.

When the North Star is not visible, use any star to get a general idea of direction. Select two fixed points over which to watch. These may be two stakes driven into the ground with their tops aligned carefully. If you so observe a star for several minutes, it will seem to rise, to move to one side or the other, or to sink. If the star seems to be rising, it lies generally to the east. If the star loops flatly to the right, it lies roughly south. A star swinging flatly to the left is in the north. A falling star is situated in the west.

DIRECTION FINDING BY LANDSCAPE FEATURES

In cloudy weather, landscape features can be used to determine direction. The growth rings exposed in standing stumps tend to be widest on the sunniest side, which under ideal conditions will be on the south. Downfall is another valuable sign. Trees generally fall in the direction of the prevailing wind. The tops

of such trees as hemlocks and pines naturally point toward the rising sun, that is, toward the east, unless the wind turns them in

another direction. Plant growth is larger and more open on a north slope, and smaller and denser along a southern exposure.

Water Purification

A lost or stranded person who has been without water for some time and suddenly comes upon a source is naturally tempted to drink his fill. This is most unwise for, short of laboratory tests, there is no way to determine whether water is pure. Contaminated water can incapacitate anyone for travel whether it is used for drinking, rinsing a toothbrush, washing food utensils, or cooking. As far as purity is concerned, ice and the water obtained from melting ice differ in no respect from the water originally frozen. Although heat kills germs, cold does not. Neither, by the way, does liquor.

To rid water of germs, boil it for five minutes at sea level and an additional minute for each additional thousand feet of elevation. If you have no utensils for boiling water, improvise them. A large shell can be used as a container. If there is a small stone with a hollow in it, build a fire around it. Water can be boiled in a container made from birchbark if flames are kept from touching it above the water level. To make such a container, fold a large rectangle of moist birchbark inward at each of its four corners and hold the resulting receptacle in shape with wooden skewers. If you have a long wide strip of bark, fold it in at the two ends to make a container shaped like a split log.

No purification of water by chemical means is as dependable as boiling, but two halazone tablets will ordinarily make a quart of water safe for human consumption in half an hour. If the water is muddy or particularly questionable, double the amount of halazone and the time. Most sporting goods and drug stores sell two-ounce bottles containing 100 halazone tablets. A drop of tincture of iodine will also usually purify a quart of water in 30 minutes.

In tropical or subtropical areas, water should either be boiled or treated with iodine water purification tablets. Use one of these tablets to purify a quart of clear water; two tablets, if the water is not clear.

When using any chemical purifier, be sure to disinfect all points of human contact with the water container. To do this, replace the cap loosely after adding the chemical and wait five minutes; then shake well, allowing a little water to leak out and disinfect the screw threads before tightening the cap.

No method of water purification will eliminate poisons in the water. Some water holes, as in the southwestern deserts of the United States, contain poisons such as arsenic. It is easy to recognize such water holes by the absence of green vegetation. Animal bones may also be scattered about them.

Obtaining Water

Finding water in the wilderness is less a problem than purifying it. Everyone knows that water flows downhill and that it encourages vegetation, especially such brush and shrubs as alder and willow; so look for water near the base of hills, where it can many times be distinguished in distant ravines and canyons by the intensity of plant cover. Following game trails in whatever direction they become wider and deeper is also a good way to find water.

Not only does vegetation indicate the nearness of water; it sometimes is a direct source. Rain water may accumulate in the large leaves of plants and trees. Look also for

water in natural basins such as are frequent in rocky terrain.

In the desert, cacti furnish a watery fluid. To get this juice, cut off sections of cactus and mash them in a container. Then either drink any resulting fluid on the spot or pour it into a second container and repeat the process as often as necessary. If you have no utensils, mash the cactus segments one by one and suck the pulp. Barrel cactus provides its own utensils. Just slice off the top, crush the interior to a pulp, and either scoop out the watery sap with a cupped hand or imbibe from a hole tapped in the side.

When everything else fails in desert

country, you can distill your own water. Scoop out a bowl-shaped hole some twenty inches deep and forty inches across. Place a cup, upturned hat, or other receptacle in the center of the cavity. Then anchor a sheet of plastic six feet square, such as is often carried in a shirt pocket for use as a shelter, all the way around the top of the hole with stones or dirt, and set something such as a rock in the center of the sheet so that the plastic will sag in a point directly over the container. Heat from the sun will cause moisture in the ground to condense on the bottom of the plastic and drip into the receptacle. Such a solar still can extract up to three pints of water a day. To get even more fluid, cut cacti and other water-holding plants into pieces and drop them under the plastic. Incidentally,

contaminated water can be purified by pouring it into the hole and allowing it to vaporize and drip in the heat.

If you are stranded in a cold climate, clean snow can quench your thirst. Its only drawback is that a considerable amount is required to equal a glass of water. One soon learns to break off sections of crust when this is available. Heavy granular snow from former storms is usually better yet. Most concentrated, of course, is ice itself.

Even sea ice can furnish drinking water. Ocean ice loses its salt so rapidly that ice one year old is nearly fresh, and ice formed two or more years before cannot be distinguished in taste from river ice. Melted hollows in sea ice usually contain ample fresh water.

wooden wedge. Open a second blade at an opposite angle to form a barb. Then hide the knife in a gob of bait.

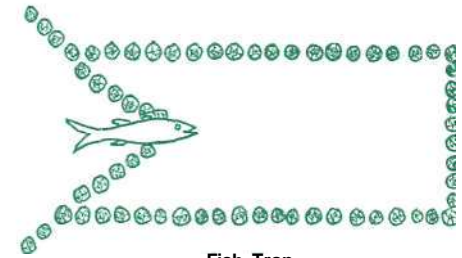
You can also cut hooks from hard, tough wood. Whittle out the shank first. Lash one or more sharp slivers so that they slant upward from the lower end. To add a barb, lash another sliver more acutely downward from the top. If you have no knife, use thorns or fish bones for points and barbs.

You can catch fish by spearing them as well as by using hook and line. To make a spear, sharpen a long dry stick and harden its point over the embers of a fire. It's easy to add a barb by whittling the point at the joint of an inverted crotch and slivering an inch or two of the angle into a sharply restraining projection. Barbs and tips of bone, metal, or stone can also be lashed into place.

When hunting fish with a spear, thrust the weapon very slowly through the water toward the target, often to within inches of the fish before making the final jab. At night, with the help of a light, it is often possible to spot a fish lying almost motionless in shallow water. Advancing the spear cautiously and aiming low enough to counteract deceptive refraction make it easier to pin the fish against the bottom.

Fish can also be caught in improvised traps. To make one such trap, drive sticks and branches into the bottom so that their tops protrude above water. Arrange the sticks to form a narrow-mouthed enclosure into which the fish are led by a wide funnel-like V. Attracted by some such bait as spoiled fish or

meat, fish guided into the pen through the slit at the apex often cannot find their way out. Similar traps can be made from wire or vines.



Fish Trap

Simpler means will often suffice to catch fish. It is sometimes possible to splash up a shallow brook, driving any fish ahead of you. When these are cornered in a pool, block their retreat if necessary with piled stones and go in and kill them with a club. Or try stranding fish in pools by diverting a small stream.

Another way to strand a catch is to pry an opening in a beaver dam. Sometimes you can wade in, kick up the muck that amasses behind such a dam, and catch the mud-blinded fish with bare hands. Fish can also be caught with bare hands by feeling carefully among the cavities in streambanks. Try cupping your hands and holding them motionless against a bank. Fish will often investigate, and you can catch them by closing your hands quickly but not too hurriedly.

Catching Fish

Naturally, a person who is stranded or lost in the backcountry may not have his fishing gear with him, but he can still catch fish. Fishing line can be improvised by unraveling a bit of sweater. A small strip of bright cloth such as the corner of a handkerchief tied on the line will do for bait. In virgin fishing territory a fish that bites the cloth can often be flipped out on the bank.

Stronger fishing line can be made from unraveled fabric by knotting lengths of four or so threads together at frequent intervals. Another way to make fishline is to cut around and around a section of leather, forming a continuous lace

Natural bait can often be found. Look in water first, for it is the source of most fish food. Minnows, fish eggs, worms, wood grubs,

insects, and crayfish are all good baits. Crayfish, often found by turning over the rocks in streams, make an excellent meal in themselves, provided there are enough of them. You can cook them by dropping them into boiling water. It is then easy to suck the lower portions free of the shells. Grasshoppers, also edible once hard portions such as wings and legs have been removed, are fine fish bait and can easily be gathered at night with the aid of a light, perhaps a torch of flaming birchbark or a burning pine knot.

It is possible to devise many different types of hooks. A bent pin really works, though care must be taken that the fish doesn't slip off. Open safety pins and bent nails can also be used with considerable success. For a really rugged hook, lash the blade of a pocket knife partly open against a



Improvised Fishhooks and Spear

Killing Game

Practices contrary both to game regulations and sportsmanship are justified by the law of survival. One of these generally forbidden practices is jacking, in part the act of attracting and holding an animal's eyes at night by the beam of a light. Deer can often be spotted and held in this fashion long enough to be shot. Likely places for jacking are the downwind sides of well-used game trails and water holes.

It is sometimes possible to drive a small animal from its burrow by smoking it out or pouring water into the hole. The animal may come within reach of a club, or the opening may be such that the creature can be impaled on a barbed pole or secured by twisting a forked stick into its hair and skin. If this doesn't work, try digging. Or, spread a noose

in front of the hole, hide nearby, and jerk the loop tight when the quarry ventures out.

The sluggish porcupine is the one animal that even the greenest and weakest tenderfoot can kill with only a stick. To do so, just reach over the animal, which usually presents the raised quills of back and tail, and strike it on the head. The best way to skin a porcupine is first to turn it over and make the initial incision along the smooth underside.

Rabbits are also easy to kill. In the spring the young lie so fearlessly that all a person has to do is reach down and pick the youngster up. Adult rabbits depend so much on camouflage that if you pretend not to see one and continue strolling as if going past, it is frequently possible to come close enough to hit it with a stone.

To skin a rabbit, begin by pinching up enough of the loose back skin to slit by shoving a knife through. Insert your fingers and tear the fragile skin apart completely around the rabbit. Now peel back the lower half like a glove, disjuncting the tail and finally cutting off each hind foot. Do the same thing with the top section of skin, loosening it finally by severing the head and two forefeet. Finish by pulling the animal open just below the ribs, flipping out the entrails, and retrieving heart and liver.

Turtles are an especially valuable food source. Sometimes it is possible to backtrack a female to a nest of eggs, generally buried in sand or mud not far from water. Turtle blood and juices are often used to quench thirst.

You can kill a turtle by concussion or by beheading, but be careful even after it is dead to avoid both jaws and claws. If possible, drop the turtle in boiling water and scald it for several minutes. It is then easy to quarter the under shell, remove the entrails, and simmer the meat free of the upper shell.

Snares are effective for catching game, both large and small. With a strong enough thong or rope, you can snare deer and larger animals. Rabbits and squirrels can be caught with nothing huskier than horsehair or light fishline.



Snare Made with Bent Sapling

A snare is a slip noose placed with the object of tightening about and holding an animal that inadvertently runs into it. The size of the snare depends on the size of the animal sought. For example, on a rabbit trail the loop should be about 4 inches in diameter and hang 1/2-3 inches above the ground.

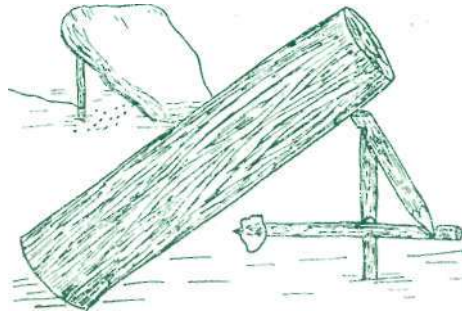
Suppose you want to snare a rabbit. Hang the noose on a rabbit path so that the animal will run headfirst into it and quickly choke himself. To help things along, narrow the trail at that particular spot by (1) dropping a branch or small tree as naturally as possible across the track and making a narrow slit in it

in which to suspend the noose, (2) shoving a few sticks into the ground to serve as a funnel, or (3) blocking the bottom, top, and sides of the runway with brush except for a small opening where the loop awaits.

A quick way to collect squirrels is to lean a pole against a conifer and at six or so points on the pole attach small nooses. A squirrel scampering up the incline runs his head into the loop and falls free.

One of the best ways to make a snare is to bend a sapling and arrange a trigger so that the animal will be lifted off its feet, and, if not choked as humanely as possible, at least rendered unable to exert direct pressure.

You can also kill game with deadfalls. One way of preparing a deadfall is to prop up an end of a heavy object such as a log with a stick, doing so with such studied insecurity that any animal which moves the support will knock it loose.



Two Ideas for Making Deadfalls

All birds and their eggs are good to eat. When they are molting and unable to fly, it is not hard to corner them on foot. Roosting or nesting birds can be secured by a noose fastened to the end of a pole. Birds can also be caught in fine snares and deadfalls.

Ptarmigan and grouse promise feasts for anybody lost in the wilderness, especially as a few stones or sticks are often the only weapons needed. If one misses the first time, such fowl usually will afford a second and even a third try. When they do fly, they generally go only short distances and may be successfully followed, particularly if the pursuer does so casually and at such an angle that it would seem he were going to stroll on past.

A bola is a handy weapon for bagging birds. To make one, simply attach several stones to the ends of thongs. When using the bola, grasp it at the center from which all cords radiate and twirl it above your head. Hurling at flying birds, the spinning strings often twist around one or more and bring them to the ground.

Tracking Game

Of course, if you are to kill enough game to stay alive, you must know where to look. Tracks are among the best clues to animal whereabouts. Illustrated here are the tracks of some common North American game animals. These tracks appear on the page as they would in soft snow, damp sand, or mud, though clear prints are rare on the leaf-strewn forest floor or on hard, dry ground. Tracks are often distorted, and you may see only disturbed leaves, clots of thrown-up earth, bent grass, broken twigs, and other clues running in a line. It's impossible to tell what animal made them without following them for a while. The animal will probably cross a

soft spot, and then you may find just one clear print of one foot.

If tracks suddenly come to a dead end, the animal may have backtracked in its own prints in order to get to cover where it can jump aside. It is therefore unwise when following the trail of an animal to step right on the tracks. This makes it harder to backtrack and find the jumping-off place. The animal may also have jumped to a leaning tree, log, or other object well off the ground. Look around for such a means of escape.

If tracks fade, try moving from side to side to get the right light. From one angle, tracks may be almost invisible. From another, the line of slight depressions may be clear because of the shadows that they cast.



1. Whitetail deer. 2. Cottontail rabbit. 3. Gray squirrel. 4. Porcupine. 5. Woodchuck. 6. Beaver. 7. Raccoon 8. Opossum.

Butchering Game

In butchering, a thin-edged rock or the jagged end of a dead limb can be used as substitute for a knife. Birds can be dressed in a few minutes with bare hands. To minimize damage to the succulent skin, pull out the feathers while the fowl is still warm. Pull out the small pouch near where the neck disappears into the body, for it is the crop. Then, grasping the bird above and below the ribs, pull it open. Take out the viscera, but save the heart and liver.

Animals are usually most easily skinned when hung by the separated hind legs. Cut around each ankle. Slit up the inside of the leg to join a long cut made from the vent up the abdomen to the throat. Do the same with each foreleg. Then, using the cutting edge whenever it becomes necessary to free the hide from the body, pull down the skin. Remove all the vitals with as little cutting and puncturing as possible. Save the liver, heart, and kidneys.

Building a Fire

The question of warmth is often the deciding factor in determining whether you should stay put and await rescue or try to get out of the wilderness by yourself. During extremely cold spells it is usually wise to find the best shelter available and lay up beside a fire until the frost moderates.

The best kindling is birchbark. Enough small shreds of this can be pulled off by hand so that there is seldom any need to disfigure a tree.

In evergreen country it's easy to start a blaze in any kind of weather. A fairly tight handful of the dead resinous twigs that abound in the lower parts of all conifers will readily burst into flame at the touch of a match. In wet, cold weather when the trees are covered with ice, you have only to expose the dry oily interiors of the dead branches. Shavings from pitch pine light very easily. So do shavings from any dead wood adhering to standing evergreens. If no softwood is about, look for dead wood on other trees. When fallen litter must be used for kindling, be sure to choose only wood that is firm and dry.

Fuzzsticks also start a fire quickly. They are made by shaving a piece of wood repeatedly, not detaching the accumulating curls.

One way to start a fire is to bunch a few wisps of birchbark on the bare ground. Pile a handful of evergreen twigs above this. Over this nucleus, lean a few larger seasoned conifer stubs. Also in wigwam fashion, lay up some dead hardwood. Then ignite the birchbark so the flames will eat into the heart of the pile.

There is no time in any wooded area when a fire cannot be built from materials at hand. A sheltered nook can always be found or made. Even during a freezing rain, a knife will provide shavings and kindling. If you have no

knife, you can still break and splinter enough dead wood to kindle a blaze.

There are many ingenious ways to make little sticks out of big limbs without the use of either knife or ax. For instance, you can burn firewood in two. Another dodge is to lay the ends of long sticks in the fire, continuing to advance them until they are consumed.

Try to accomplish the lighting with a single match. Hold the match so that any draft reaching it will feed the fire down to the stem where it will keep burning. Use whichever method seems best, such as the following: (1) facing the wind with both hands cupped in front of the flaming match, (2) stretching out between the breeze and the carefully heaped flammables so your body acts as a shield, (3) protecting the first feeble flames with a large sheet of bark, jacket, or other handy article.

In cold weather have everything ready for the fire before uncovering your hands. The fingers will probably be stiff. If the flames do not commence licking upward almost immediately once the hands are bared, shove them against your skin to warm before making another attempt.

Fires can be lit without matches by using the direct spark technique. This requires a generous wad of tinder. The bark of birches and some cedars makes good tinder when detached in very thin layers and shredded. Among other suitable materials are the dry fuzz from pussy willows; a handful of very dry pine needles; dry vegetable fibers; the droppings of bats; down from birds, nests, milkweed, and fireweed; the fluff of cotton grass and cattails; the downy heads of such flowers as mature goldenrod; the desiccated pith from the inside of elderberry shoots, and such pulverized materials as moss, lichens,

grass, dead evergreen needles, dry-rotted wood, and dehydrated mushrooms and other fungi.

A suitable spark can be made by striking the back of a knife or an iron object against a piece of flint or other hard stone such as quartz, jasper, iron pyrite (fool's gold), agate, or native jade. If none of these items are available, try to find two rocks that, when struck together with a brisk, stroking motion, will give off sparks.

Focusing the sun's rays on tinder with the aid of a small magnifying glass or lens from a

pocket telescope or pair of binoculars will also start a fire. Sometimes a piece of ordinary glass will do as well. A satisfactory lens can be made by shaving a piece of clear ice and then smoothing it with the warm hand. Or use the magnifying properties of water to make a fire by (1) holding the curved crystals of two watches or pocket compasses of about the same size back to back, (2) filling the space between with water, and (3) directing this makeshift enlarging lens so as to converge the rays of the sun in a point sharp enough to start tinder glowing.

Obtaining Shelter

Nature sometimes offers readymade shelter. A fallen tree is often at hand under whose roots a browse bed can be laid so as to benefit from the luxury of a crackling night blaze, nor is it unusual to come upon a dry indentation in a streambank that can be quickly roofed with brush and cheered by a campfire in front. Don't overlook caves, either. A cave to be used as shelter should be dry, protected from wind, and small enough to be easily heated.

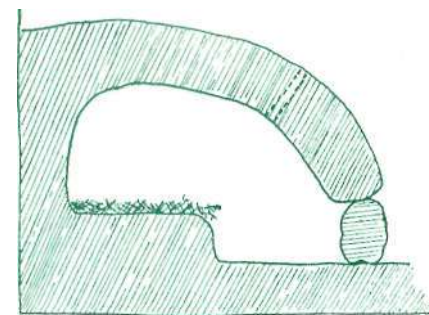
Trenches make good shelter in the desert and in snow. If on flat, shelterless desert, scoop out a narrow pit in which to lie while the sun is blazing down. The utmost shade will be secured if this trench extends east and west. Two or three feet of depth can result in a difference of as much as 100 in temperature between its shadowy bottom and ground level. It's a good idea to leave some sign of your presence before taking to such a refuge, perhaps by weighting a shirt over one of the excavated piles.

When snow lies deep, a trench can often be made by stamping. It may be in the shape of a rough triangle with the wider end, roofed and floored with evergreen, large enough to sit or curl up in, with the narrower part reflecting a small fire.

Many other kinds of shelter can be made with snow. If you're traveling along a river, there may be boulders along the shore between which snow walls can be heaped and over them several young evergreens spread. If snow is deep enough, tunnel into it, taking care to do this at right angles to the wind so there will be less chance of the opening's being choked by drift.

To make a snow house, heap snow in a mound slightly larger than the shelter desired. Pack down the final surface. If the weather is well below freezing and water is at hand, throw it over the pile to form a glaze of ice.

Otherwise, let the mound harden as well as it will in the air for a half-hour or so. Then burrow into the pile at right angles to the wind until as thin a shell as seems practical remains. Build a small blaze within. Any water will be blotted up by the remaining snow. Finally, drag out embers and ashes, poke a ventilation hole through the dome, and allow the shelter to ice. A very small fire within such a snow house will keep the temperature surprisingly comfortable.

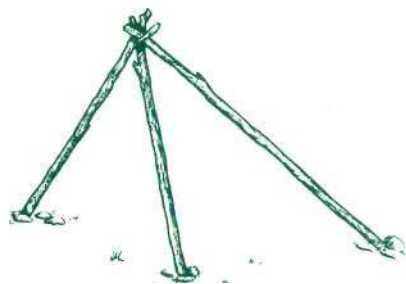


Snow House

Naturally, do not make a snow shelter where there is danger from drifts, overhang, or slides. In open country, beware of making a snow shelter on the side of a slope that is protected from the wind. In open terrain such lees gather drifts that can bury one. Also, keep yourself dry by keeping mitts, boughs, bark, or a sheet of plastic between you and the snow.

Lean-tos are another wilderness standby. To make a simple lean-to, drive two forked sticks into the ground about seven feet apart and lay a pole between the two crotches. Then make a tentlike enclosure by angling

long evergreen boughs from ridgepole to ground along each side. Finish by closing at least one end, perhaps by laying several small firs against it.

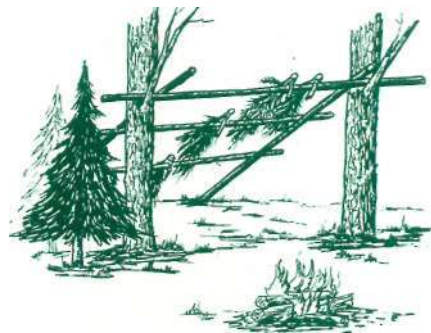


Simple Lean-to Frame

More complicated frames can easily be assembled, especially when the joints are fastened by lashing them with fine but tough spruce roots or with wiry birch or willow withes. Natural forks can be used instead, of course. The accompanying drawings illustrate some of the more common types of lean-tos.



Elaborate Lean-to Frame



Overnight Shelter in Evergreen Country

Distress Signals

Very often the best procedure to adopt when lost, stranded, or in trouble is to stay where you are, conserve energy by moving about as little as possible, improvise the easiest shelter, and set about to attract aid.

A fire makes one of the better distress signals. One way to send up smoke that is conspicuous by daylight is to throw evergreen or any green boughs into a hot fire. Burning rubber articles will send up black billows. A long-lasting smudge can be made by covering hot coals with humid green foliage, wet dead leaves, slowly burning green wood, moist decayed wood, damp animal droppings, etc. If fuel is scarce, the best course may be to keep only a small fire going, if that is necessary for warmth, and to concentrate on heaping up signal pyres to be lit at a moment's notice.

The distress signal most commonly used is made with three fires or three smokes, preferably built in a straight line. You can also send smoke signals from a single blaze by momentarily cutting off the smoke with something such as a wet blanket and releasing series of three puffs.

The most universally recognized distress signals are based on the number three: three flashes, three shots, etc., even to the three

dots, three dashes, three dots of the familiar SOS. Knowledge of a dot-and-dash code is invaluable in an emergency. It permits the sending and receiving of messages with flag, flashlight, mirror, whistle, smoke, and such primitive devices as thumping on a hollow log. The International Morse Code, which is the most widely understood, follows:

Letters	Morse Code	Letters	Morse Code
A	· -	N	- · -
B	- · · ·	O	- - -
C	- · - ·	P	- · - · -
D	- · -	Q	- · - · -
E	·	R	· - · -
F	· · - ·	S	- · -
G	· - -	T	- - ·
H	· · · ·	U	· - ·
I	· ·	V	· - · -
J	- · - · -	W	- · - ·
K	- · -	X	- · - · -
L	· - · -	Y	- · - · -
M	- -	Z	- · - · -

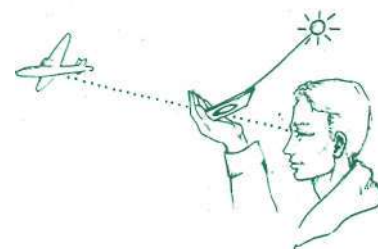
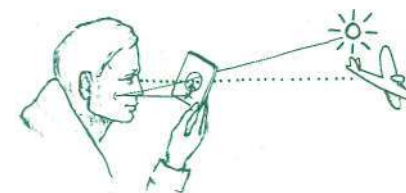
Such signals transmitted by flag can be seen for miles under favorable conditions. The flag may be something such as a large handkerchief or shirt, knotted to the end of a light pole some six feet long.

Hold the base of the staff at waist level in the palm of one hand and grip the stick a dozen inches or so higher by the master hand. All letters start with the staff held straight upward. The dot is made by swinging the flag down to the right and then back again. The dash is made by swinging the flag in a similar arc to the left and back.

To keep the flag flat for maximum visibility, move it in tight loops. Hold the flag upright a moment to end a letter. Lower and raise it in front of you to finish a word. Swinging right-left-right-left-right signifies the conclusion of a message.

A mirror can also transmit messages in Morse Code or attract rescuers simply by reflecting sunlight. Anyone traveling in the bush will do well to carry the Emergency Signaling Mirror, available at some surplus stores, in a pocket. If help is needed, it is a good idea to sweep the horizon with an aimed beam of reflected sunlight even if no rescuer is visible. If an airplane is in sight, signal it as follows. When the angle between the sun and

the plane is not greater than 90°, hold the mirror three to six inches from your face and sight at the plane through the small hole in the center. The light from the sun shining through the hole will form a spot of light on your face, reflected in the rear surface of the mirror. Still sighting on the plane through the hole, adjust the angle of the mirror until the reflection of the light spot on the rear of the mirror coincides with the hole and disappears.



Signaling Plane with Mirror

Top: When angle between plane and sun is 90° or less. Bottom: When angle between plane and sun is more than 90°.

If the angle between the sun and the plane is more than 90°, sight the target through the hole; then adjust the angle of the mirror until the reflection of the light spot on your hand coincides with the hole in the mirror. This method works even when the plane is almost on one horizon and the sun almost 180° away on the opposite horizon.

First Aid

MEDICAL KIT

Anyone traveling in the backcountry or undertaking a rescue mission should have with him a lightweight medical kit. The items discussed below comprise a kit that can be used to treat everything from dysentery to a laceration. It weighs less than four ounces, excluding the snakebite suction cups and anti-venom, and is adequate for one person to take on a one-week trip. Amounts of drugs would vary, of course, on a longer trip.

A.P.C. (Same as Empirin) or Aspirin. Twelve 5-grain tablets. For headaches. Dose: two each four hours.

Aspirin with Codeine. Six half-grain codeine capsules. For severe pain and controlling cough. Dose: one each three to four hours.

Compazine. Four to six 5-mg. tablets. For nausea or vomiting. Dose: one each four hours.

Probanthine. Six to eight tablets. For stomach spasms or diarrhea cramps. Dose: One each four hours.

Lomotil. Twelve tablets. For diarrhea. Dose: one or two tablets each three to four hours until diarrhea is under control, then one each four hours.

Pyribenzamine. Six 50-mg. tablets. For drying up a cold and relieving itching eyes, hives, and other allergic reactions. Dose: one each four hours.

Sulfasuxidine. Sixteen 5-gm. tablets. For dysentery, if there is fever and it does not respond to simple measures. Dose: two or three each four hours.

Erythromycin. Twelve 250-mg. tablets. For respiratory and other infections. Dose: one each four hours at meals and bedtime for three to four days. Use longer for tonsillitis and pneumonia.

Dexedrine. Two or three 5-mg. tablets. For energy in emergency only. Dose: one every four to six hours.

Butyn, or Metycaine and Merthiolate. Ointments for anesthetizing the eye in cases of snow blindness or when removing a foreign body.

Spectrocin Eye Ointment. For eye infection or external otitis in ear. Apply each four hours.

Ophthalmic Pontocaine, %. Liquid eye anesthetic. Apply each four hours.

Surgical Supplies. (1) Roller gauze, 1- or 2-inch. (2) Telfa, a nonsticking gauze. (3) Small assorted adhesive bandages. (4) 3 x 3 or 4 x 4 flats. (5) Scalpel blades, 11 Bard-Parker and curved blade. (6) Suture material, three-0 and five-0 nylon with needle attached in sterile packet. (7) Mosquito clamp. (8) Manicure scissors. (9) Package of Butterfly plastic tapes for holding wounds together without suturing. (10) Packet of three-0 plain catgut for ties on bleeding arteries. (11) Oil of cloves for treating toothache.

Suction Cups and Antivenom Kit. For treating snakebite.

MEDICAL TREATMENTS

Insect Bites. Limbs sometimes become badly swollen from multiple fly and mosquito bites. The swelling can be reduced with cool starch baths, aspirin by mouth, and one 50-mg. tablet of Pyribenzamine each four hours. To make a starch bath, add a cup of starch, flour, or oatmeal to a quart of boiling water. Stir this into a container of lukewarm water in which the patient soaks for fifteen to twenty minutes. A paste of starch and water — or, better yet starch boiled with a little water to make a thick, gravylike concoction — can be applied locally to allay itching.

People who are sensitive to insect bites may suffer shortness of breath, then shock and loss of consciousness. In such a case, treat for shock (see below). Fortunately, sensitive people can get a special kit from their doctor before taking off for the wilderness.

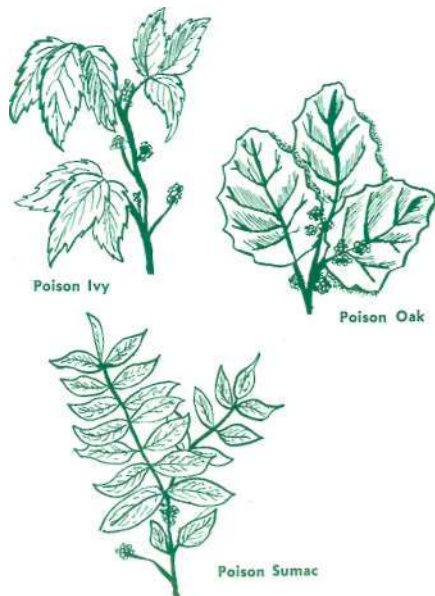
Ticks attach themselves to the body and become engorged with blood before dropping off. They pass on a group of diseases, mostly in the Rocky Mountains. Everyone going into this area should be immunized against Rocky Mountain spotted fever beforehand.

It is a good idea to inspect the body at least three times daily for ticks in tick country. The best way to remove a tick is to dig the head out by lifting the tick upwards to arch its back and work around the head from the back forward with an 11 Bard-Parker scalpel blade.

The bite of the black widow spider — a glossy, moderately large black spider with a reddish hourglass marking on its underside — can cause severe muscular cramps and pain in

some. Use aspirin for the pain and cramps. Cold compresses applied to the site of the bite help reduce swelling and delay absorption of the venom. Recovery is the rule.

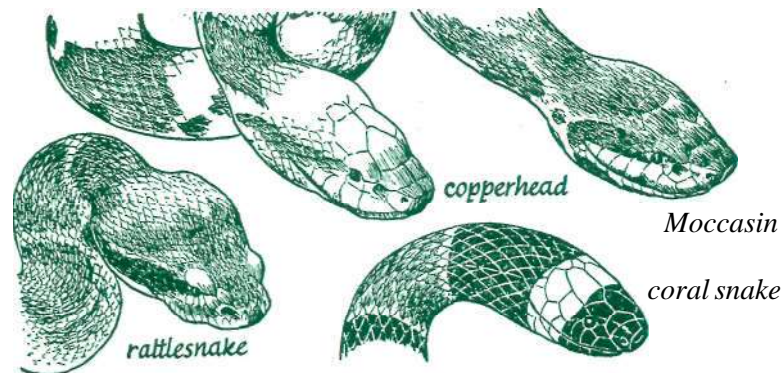
Poison Ivy, Oak, and Sumac. Contact with these plants, pictured here, causes a skin irritation. Avoid them. Treatment with a starch bath or paste, described under Insect Bites, helps to allay the itching. Try at all costs to avoid scratching the affected areas.



Common Poisonous Plants

Snakebite. Anyone venturing into the wilderness should be able to identify the four poisonous snakes of North America — rattlesnake, copperhead, coral snake, and water moccasin — illustrated here. If in doubt as to whether someone has been bitten by a poisonous snake, examine the marks left by the bite. A double row of tooth marks and no fang marks are signs of a bite by a nonpoisonous snake. Treat as with any puncture wound. One or two small puncture wounds indicate a bite by a poisonous snake. Symptoms are a feeling of stinging pain, swelling, and discoloration in the part struck. Nausea, weakness, a weak and rapid pulse, and a profuse flow of saliva ensue.

If ice is available, treat a poisonous snakebite as follows. Put a tourniquet several inches above the bite on the side of the heart. Release briefly every five minutes until the extremity can be put into a fifty-fifty mixture of ice and water. Immerse well above the bite. Remove the tourniquet permanently within



Poisonous Snakes of North America

three to five minutes after immersion. While you are soaking the bitten part, test the patient for allergy to antivenom according to the directions which come with the antivenom kit. If the test is negative, inject half an ampule of antivenom at the site of the bite and the other half at a higher level in the same extremity. After the affected part has been immersed for three or four hours, pack the extremity with improvised ice bags. After twenty-four to thirty-six hours, allow the extremity to warm slowly.

Snakebite kits, which take up little more room in the pocket than a 12-gauge shotgun shell, are widely available. Their function is based on suction cups. Complete instructions come with the kits.

Heat Exhaustion. This occurs among those who exert themselves in an excessively warm climate, such as in the desert. There may be weakness and dizziness or headache for several days. Often there is fainting. Sweating may be profuse at first. Before collapsing, the patient becomes weak, pale, and clammy. The body temperature is normal or subnormal. If the latter, use hot packs. Rest in a cooler location is the treatment. Recovery is the rule.

Heat Stroke. Heat stroke is entirely different from heat exhaustion and often fatal. In this condition, the body temperature rises, often as high as 112°. The skin is hot and dry. The body temperature must be lowered. Treatment consists of removal to a cool spot and cool baths or rubdowns. Try not to use ice, as this may force the blood into the body away from the skin, thereby further increasing the body temperature. If ice is used, massage the extremities of the body vigorously to keep the circulation going. Medical help must be sought.

Frostbite. Frostbite is indicated by a sudden blanching of the skin on the nose, ear,

cheek, etc., accompanied by a tingling sensation. The skin is yellow-white. Feeling in the affected part decreases. Frostbitten skin feels cold, frosty, and crisp or resilient to the touch.

The best treatment is quick thawing in a water bath of 102°. The water should be warm, but not hot, to the touch. In the field, a bared hand can be held over the face until the latter hurts, a foot thawed on a friend's stomach, or a hand put in your warm armpit.

Sprains. Sprains in the wrist and ankle are hard to tell from fractures. Either a fracture or sprain can cause swelling and pain with motion. If an ankle or wrist is badly swollen, apply an elastic Ace bandage, leave it in place for a month, and use the part gingerly. This assumes that there is no evident gross deformity of the bone that would make you suspect a fracture.



Treatment for Back Sprain



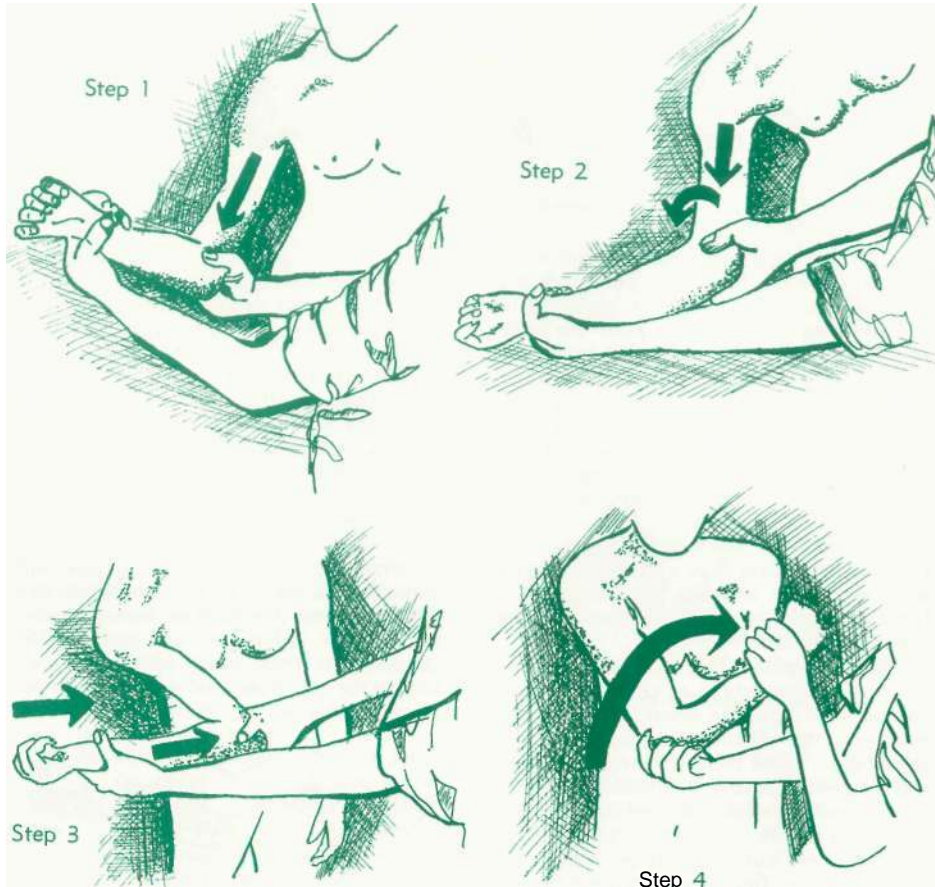
Use of Sling for Shoulder Sprain

Any back injury not resulting from a blow can be assumed to be a sprain. Rest for two to seven days in flexion (pillow under knees and back, as shown in drawing) will heal the back ligaments. In minor cases, rest and aspirin suffice.

Shoulder and elbow sprains may require

that the affected part be put at rest in a sling (see illustration). Knee sprains can be rested in an elastic bandage.

Do not use heat for neck sprains, although heat helps other sprains. Take two aspirins each four hours. Neck sprains are slow to mend. If full motion is possible, even though



Reduction of Shoulder Dislocation

painful, it is unlikely that a fracture or dislocation is present.

To reduce the swelling associated with sprains, apply cold compresses for the first 12-18 hours. After that, use heat.

Shoulder Dislocation. The head of the arm bone is obviously out of place and can be displaced forward or backward. Reduce dislocation as shown. Hold arm in place with a Desault's bandage (see illustration). Keep immobilized for three weeks.

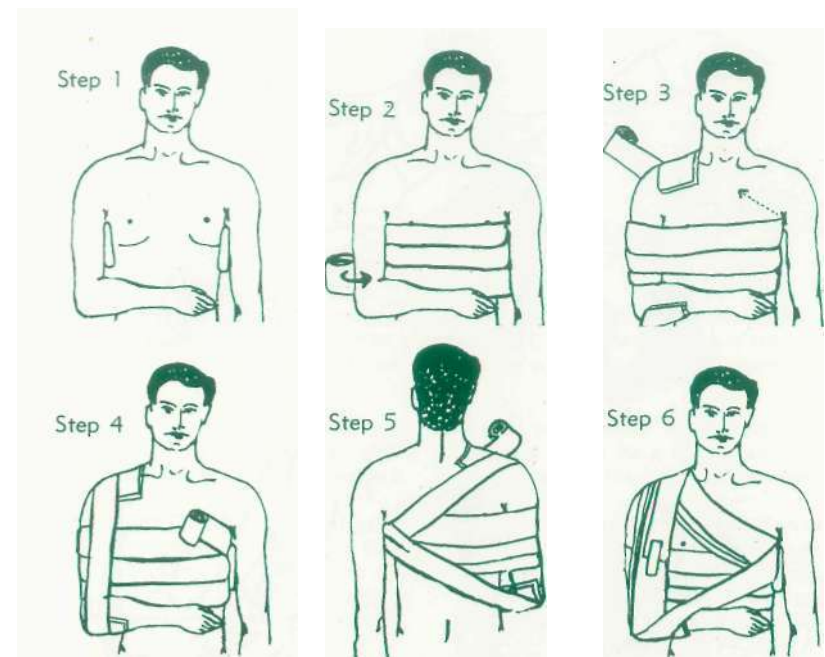
Dislocated Jaw. The jaw is held open, and a prominence can be felt on the side where the jaw is dislocated. The dislocation may occur on both sides.

Reduce by wrapping the thumbs well in a towel or other padding and inserting them in the mouth. Exert downward pressure on the lower rear teeth while the fingers lift the chin. The jaw will go back into place with a pop.

Hip Dislocation. Reduce by the four maneuvers shown in the drawing. Then splint the leg for ten days.

Arm Fractures. For fractures of the upper arm, use a hanging arm cast, as shown. Healing usually takes 6-8 weeks.

In forearm fractures, two bones are involved. If one bone breaks, it is likely that the other has broken too. If the forearm bones are obviously misaligned, reduce by holding



Desault's Bandage for Holding Arm in Place

Step 1. Put a pad in each armpit. Step 2. Hold the pads in place with several turns of bandage about the chest. Step 3. Pass bandage around back and up toward injured side. Note pad on collarbone. Step 4. Pass bandage over injured shoulder, down and over elbow, and across back to good armpit. Step 5. View of same from back. Step 6. Pass bandage up to injured shoulder, over it, down back of injured arm, around to front of injured arm, and obliquely across chest to complete figure-8 type loop.

Hanging Arm Cast

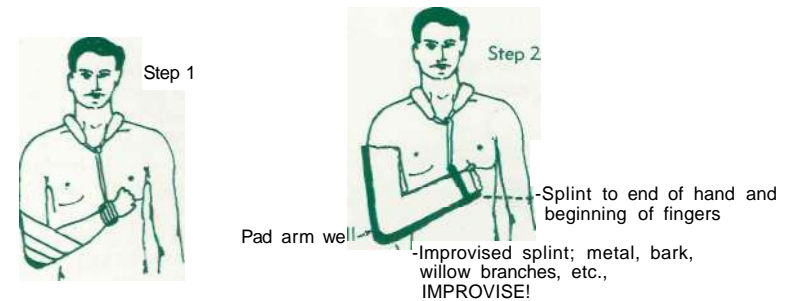
Tape enough weight along bottom of cast to make 6-8 pounds.

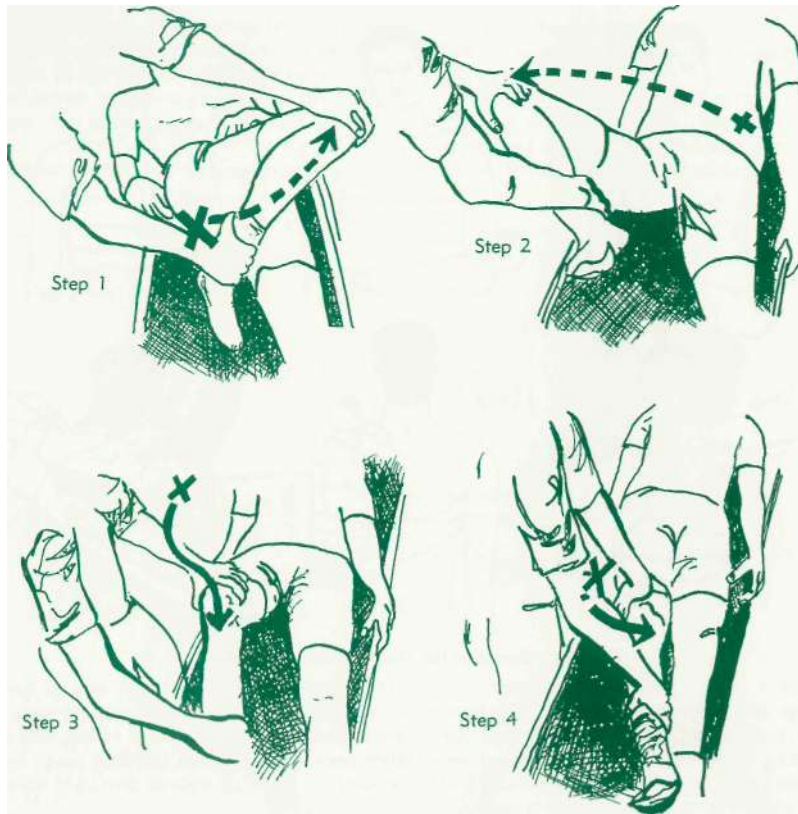
Loop sling over wrist taped to splint

Right-angle splint improvised from bark, metal, etc., placed over well-padded arm



How to Hold Forearm Without Plaster





Reduction of Hip Dislocation

Step 1. Swing heel and raise up. Step 2. Keep bent knee and ankle in same relative position. Swing knee out. Step 3. Steady leg with left hand. Pull ankle down with leg turned out somewhat than drawing shows. Step 4. Complete straightening leg and, with foot in neutral position, force knee into knock-kneed position. Do in one smooth motion.

the elbow at right angles, placing a stockinged foot in the bend of the elbow, and pulling with one hand while the other tries to mold the ends back into position. Use a long, slow pull. Then immobilize the arm so the wrist and elbow do not move for eight weeks. The drawing shows how to do this without a plaster cast.

Thigh Bone Fracture. Splint as shown and seek professional help.

Other Fractures. Compound fractures, in which the bone tears through the flesh and skin, and fractures of the hip, kneecap, and



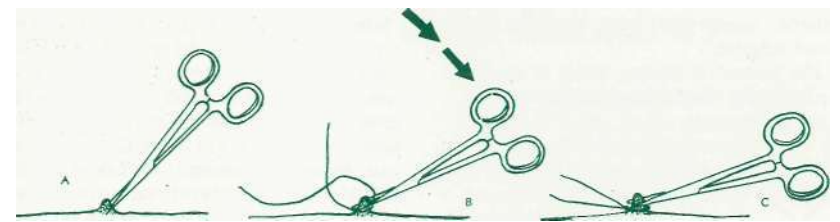
Pad in armpit

Splinting of Thigh Bone Fracture

lower leg need professional medical treatment.

Cuts. In treating cuts, you must stop the bleeding, bring the skin together to promote healing with a minimum of scarring, and prevent infection. To stop bleeding, exert steady, firm pressure over the cut with a folded gauze, handkerchief, or whatever is available. Hold the compress at least five minutes. If there is still bleeding, repeat the process.

Employ a tourniquet only if the bleeding is uncontrollable. Tourniquets are used only to control bleeding from the arteries of the arms and legs (blood from arteries spurts; blood from veins seeps). Bleeding from the arteries of face and body can be stopped by pressure alone. To improvise a tourniquet, roll up a handkerchief. Tie it loosely between the wound and the heart and as close to the wound as possible; then tighten it with a



Use of Mosquito Clamp

A. Take small bite of bleeding artery in clamp. B. Swing clamp down. This allows ligature to be looped around clamp and pass under tip of clamp. C. Complete overhand knot. Remove clamp and lay down second knot; do this without tugging or entire ligature will come off.

twisted stick. The tourniquet should be just tight enough to control the bleeding while other preparations are carried but. Loosen it each 8-10 minutes.

If the bleeding is still not controlled, grasp the end of the bleeding artery with a Mosquito clamp and clamp it. This crushes the end of the artery and, if left on five minutes, often stops the bleeding. If the artery starts to

bleed again when the clamp is released, reclamp it and tie a ligature of three-0 plain catgut around the base of the bleeding artery, as illustrated.

Clean the wound next. Use drinking water for a clean wound. If the wound is dirty, pick out the foreign matter with the tips of the clamp. Then irrigate the wound gently but firmly with soapy water. Bits of frayed and

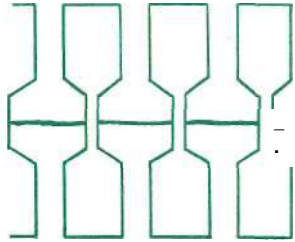


Arm-Lift Method of Artificial Respiration

1. Kneel at patient's head. Place hands on back just below shoulders. 2. Press down slowly on patient's back to force air from lungs. 3. Rock back. As you do so, grasp patient's arms just above elbows. 4. Lift patient's arms to pull air into lungs. Let arms fall and press down on back again. Repeat cycle 12 times per minute.

devitalized tissue are best trimmed with manicure scissors.

If the wound is gaping, bring it together with a Butterfly plastic tape, as shown.



Laceration held together by butterfly tape

How to Use Butterfly Tape

Shock. Shock often follows a severe injury, blow, or fracture. It may be induced by rough handling, cold, severe pain, or excessive

bleeding. The skin is cold and clammy, and the patient feels light-headed and faint. The pulse is rapid and weak. To treat, lower the head below the level of the heart and raise the feet. Keep the patient warm and control pain with codeine. Avoid moving the patient.

Breath Stoppage. Immediate action is needed whenever breathing stops as a result of drowning, smoke inhalation, or electric shock as from lightning. If the arm-lift method of artificial respiration does not produce results, use mouth-to-mouth resuscitation.

Food Poisoning. Some symptoms are nausea, sharp stomach pains or cramps, faintness, vomiting, and weakness. To treat, induce vomiting by giving the patient several glasses of water, preferably warm, and sticking a finger down his throat. Do this several times. Keep the patient warm and quiet.



Mouth-to-Mouth Resuscitation

1. Wipe away foreign matter.
2. Pull lower jaw outward.
3. Blow air into victim's lungs.
4. Allow victim to exhale.

Dealing with Natural Hazards

Storms. Bad weather can be a catastrophe in the wilderness, and weather considerations will naturally play a crucial part when anyone lost or stranded is deciding whether to stay where he is or try to get out of the backcountry by himself. An ability to predict the weather comes in handy in such a case.

Clouds provide the most accurate signposts for wilderness weather forecasting. It is necessary to keep watching them, however. Even more important than momentarily predominant cloud formations is the way they change. Nimbostratus, cirrostratus, altostratus, and cumulonimbus clouds, pictured here, are harbingers of rain or snow.

The higher the clouds, the better the weather. Prospects are even finer when scattered clouds, decreasing in number, are separated by brilliant clear blue. The combining of clouds, especially in a milky sky, does not augur so well. When thin but tight cloud cover slowly blankets the moon, wet weather is not far away.

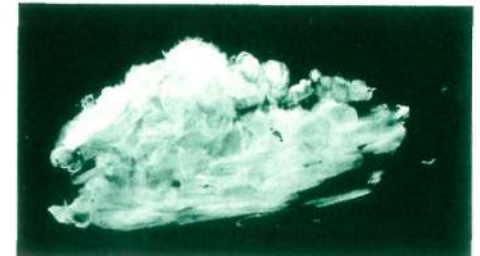
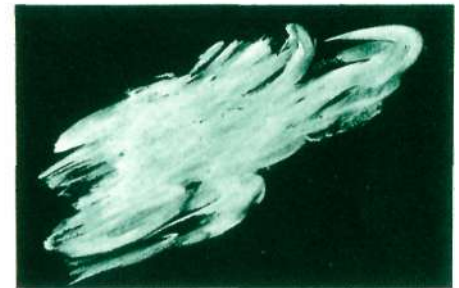
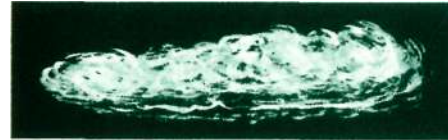
When the sky is cloudy, watch the corona, the circle that appears around the sun or

moon. When the corona grows larger, the drops of water in the atmosphere are evaporating and the weather probably will be clear. When the corona shrinks, water drops in the clouds are becoming so large that rain is almost sure to fall.

Watch the color of the sky, too. A red sky in the morning and a gray sky in the evening indicate approaching rain. A gray sky in the morning and a red sky in the evening forecast fair weather.

When neither dew nor frost forms during the night, precipitation is ahead. When smoke from a fire beats downward after rising a short distance, you can likewise expect wet weather.

Forest Fires. In the woods fire danger can be detected by the following signs: (1) the air is dry and hot, often with a strong odor of pine pitch; (2) grass and dead leaves underfoot crackle as you walk; (3) the bark peels off some trees in dry, brittle sheets; (4) the sky is a hot brassy blue; (5) the voices of animals and birds are muted or silent; (6) the soil is dry and often hard. Anyone who finds



Storm Clouds

Top left: nimbostratus. Top right: cirrostratus. Bottom left: cumulonimbus. Bottom right: altostratus.

himself in such a place should get out of it as fast as possible. When there is smoke in the air and animals are running and birds flying all in one direction, he should dash for a river, lake, or wide-open space of considerable extent.

Flash Floods. When camping in the desert, do not make the mistake of pitching a tent on the luringly level bottom of a dry gulch or riverbed. A faraway storm can send a flash flood roaring down such a declivity with hardly a moment's warning. Just keep to high ground and you'll be safe.

Mire. Quagmires where mud, decaying vegetation, and water are mixed in proportions not solid enough to support a person's weight present a hazard. If you should feel such an instability, try to reach solid land by running. If this is impossible, crawl out on your knees or stomach. There may be a nearby branch or bush to grab. Or a pack or coat may support your weight.

Quicksand. Quicksand, sand suspended in water, is similar to mire but offers less time to escape. You may be able to throw yourself full length immediately and either crawl or swim free. Try ducking under water to loosen your feet, digging around with the hands and quickly jettisoning footwear. Avoid sudden and abrupt motions. Rest but don't give up, for quicksand often occupies a hole no larger around than a sofa.

Snowslide. The best way to survive a snowslide is to keep on top of the avalanche. This can be done with a swimming motion, especially the backstroke.

Hazards of Ice Travel. In the winter, wilderness travel is often easiest by walking on the surface of frozen streams. To minimize the risk, carry a long light pole horizontally. Then, if you plunge unexpectedly through the ice, the pole can serve as a bridge, both

checking the descent and affording support. The pole can also be used to jab at suspicious portions ahead, such as those hidden beneath snow.

Beware of candle ice, ice several feet thick which has decomposed into long vertical needles, among which a testing pole can be driven all the way through in a single jab. Candle ice is best shunned entirely.

Suppose you do break through. If you have a sheath knife, drive its point into solid ice and use it to roll yourself out and away. It may be necessary to break away thin ice by hand to reach a surface strong enough to hold your full weight. Then get as much of your arms as possible over the edge, bring your body as nearly horizontal as you can, perhaps with the help of a swimming motion made with the feet, throw a leg over, and roll to safety.

If only your feet have gotten wet, change your stockings or squeeze them as dry as possible, pour and wipe away any water inside the boots, warm the feet against some other portion of the body, dress, and continue as usual. If you are thoroughly drenched, roll quickly in the most absorbent snow at hand and build a fire.

Animal Encounters. Beware of approaching the young of any animal. The mother, whether a deer or a bear, will chase any intruder away. Suppose you come face to face with a larger animal that shows no disposition to retreat. The best thing to do is stand perfectly still and talk in as calm a manner as possible. The animal will probably move away but if it doesn't, you may have to retreat in a casual manner, avoiding sudden movements and still talking quietly. Running from an animal will often induce it to give chase.

Canteen. Lighter plastic containers are now replacing the customary metal canteens. Some are collapsible and others have waterproof caps.

Food. In calculating how much food to take along on a wilderness expedition, a good yardstick is to allow at least 25 ounces of reasonably water-free foods per adult per day. Figuring in terms of calories, allow at least 3,000 per person per day. Include fats, proteins, and carbohydrates in proportions which will furnish this amount remembering that every ounce of fat food has about 200

calories while protein and carbohydrates yield about 100 calories per ounce. Freeze-dried and dehydrated foods are the only kind to take along on a trip into the wilderness.

Guns and Ammunition. On any trip into the wilderness where it is necessary to provide for emergencies, the best survival weapon is a flat and hard-shooting rifle. It should be rugged, accurate, and durable. A shotgun is no fit substitute, for although it has about the same displacement and heft as a rifle, it shoots bulkier ammunition at much smaller prey. A telescopic sight will add vital minutes to the most productive hunting periods of every day. Include a light sling, too.

Every member of a party should have a rifle apiece so they can spread out and hunt separately. The rifles should be identical so that the parts of one or two can be used to repair the third.

As for ammunition, the best cartridge is the high-velocity, hollow-point type.

Fishing Gear. This need not weigh more than 10 pounds, including spinning rod, reel, and tackle. For tackle, take hooks, sinkers, flies in a 35-mm can, lures, leader, and bobber. For emergencies, carry nylon line wrapped around a stick. This can be used with a field-cut switch.

Shelters. Tents carried on treks into the backcountry should be light, waterproof, durable, and insect-proof. Good lightweight tents are usually made of high-count cotton fabric or nylon. Treated cotton fabric weighing at least six ounces per yard provides water-repellent shelter that is rot- and mildew-resistant while still being able to breathe.

Look for tents featuring lap seams sewn double, catenary cut to eliminate sag, coated waterproof sides and floors of one piece, reinforcing at strain points, grommets or braided nylon tape loops, sleeves for poles, and adequate screen doors and vents that can be opened from inside or outside. Poles are aluminum and sectional for easy packing. Shock-cord sectioned poles that are self-erecting are practical.

Plastic sheets, obtainable in any size desired from sporting goods stores, can easily be set up as shelters with the aid of nylon cord and plastic stick-on grommets. Such sheets should be at least .004 inch thick. In country where high winds are prevalent, a heavy thickness of .006 inch is best. Such plastic sheets also make good groundsheets. Plastic tubes provide roof and groundsheet in one. Only a length of nylon cord is needed to rig a ridge support between two trees. Gear will spread the tube out on the ground.

Sleeping Bag. When selecting a sleeping bag, first consider the insulation it provides. The following table shows the amount of

insulation sleepers need at various temperatures when the wind is still.

Temperature (in degrees Fahrenheit)	Insulation (in inches)
40	Wi
20	2
0	2%
-20	3

Down provides maximum insulation at minimum weight. In buying a down bag, check its loft, that is, its thickness as it lies zipped up. The loft of a bag indicates its insulating capacity. The table below shows the loft needed at various temperatures when the wind is not blowing.

Temperature (in degrees Fahrenheit)	Loft (in inches)
40	4
25	5%
15	6
5	6/2
-20	8

Matches. Carry a waterproof container filled with wooden matches. It should be unbreakable so that, even if you slip into a stream, the matches will remain intact. It should also include some device for attaching it to the clothing. In sheer wilds, it is good insurance to carry a second filled container.

If you are caught in the bush with only paper matches, protect them from dampness, both perspiration and outer wetness, as much as possible. Wrapping the folder in foil or plastic will protect heads and stems as well as the striking surface.

Flashlight. Make it a rule never to be without a flashlight and know where it is in your pack. The best buys in flashlights are the palm-sized models weighing 2-3 ounces, including a pair of alkaline batteries. Alkaline batteries give seven times longer service than standard batteries. Carry an extra set of batteries and an extra bulb. Keep the bulb with personal items where it is not likely to be crushed.

Jackknife. This is the only cutting tool needed. It can be used in butchering, making fuzsticks for a fire, cutting laces from leather, improvising a fish hook, removing splinters, and a myriad other ways. Get a sturdy knife with at least two blades, can opener and punch.

Compass. Any compass carried for wilderness use should have a luminous dial. It should be rugged and have some provision so that it can be attached securely to the person. Carry a spare for insurance.

Equipment and Supplies

Whether you are on a wilderness or a rescue mission, it pays to start out with the best equipment and to have as many of the important items on your person as possible, either in or on your clothing or in your pack. Chief among these important items are a water-filled canteen, water purification tablets, food, guns and ammunition, fishing gear, tent or plastic shelter, sleeping bag, matches, flashlight, jackknife, compass, and medical kit, already discussed.

For more about Wilderness Skills ...

The information in this booklet, and the illustrations, have been drawn from these books about the outdoors published by Stackpole Books:

LIVING OFF THE COUNTRY

in which veteran outdoorsman Bradford Angier shows how to stay alive in the woods. \$5.00

POCKET GUIDE TO ANIMAL TRACKS

pictures, describes paw and hoof prints and characteristics of 44 North American small and big game. \$2.95

INTRODUCTION TO BACKPACKING

offers step-by-step ways to wander in comfort with good living and good eating always along. By Robert Colwell. \$5.95

SKILLS FOR TAMING THE WILDS

is a handbook of woodcraft wisdom on fires, cooking, shelters, survival, making-do. By Bradford Angier. \$6.95

READING THE WOODS

unfolds the stories told by rocks, soil, forests, plants when one sees more in nature's familiar faces. By Vinson Brown. \$5.95

BEING YOUR OWN WILDERNESS DOCTOR

in which Dr. E. R. Kodet, with Angier's help, tells what to do and how to do it if you must. \$3.95

These and many other Stackpole Books about the outdoors are available through bookstores and in school and public libraries.

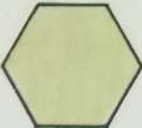

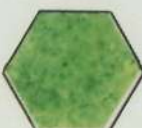
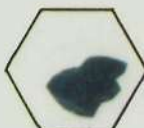












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MAPBOARD MOVEMENT CHART

Column (A) shows the terrain; column (B) shows how many Movement Points it costs to enter:

COLUMN A	COLUMN B	COLUMN A	COLUMN B
Clear Terrain 	1	Fords 	1
Woods/Rough 	2	Catch-Basin 	Same as dominant terrain feature
Desert 	2	Base 	Same as dominant terrain feature
Mountains  	3	Food Source 	Same as dominant terrain feature
Rivers  	3	Trails:   	1
Swamp  	4		

EXAMPLES: Players may elect to, and in many cases be required to, move across several combinations of varying terrain. The distance in hexes is dictated by the Movement Allowance number printed on that player's Person Counter.

Example 1: Person at Life Level A has a Movement Allowance of 6. Since it only costs him 1 Movement Point to enter each Clear Terrain hex, he could move 6 Clear Terrain hexes in one turn. Of course if he were at Life Level D he could only move 4 Clear Terrain hexes in one turn.

Example 2: Showing Point costs in parens, here is how a Person at Life Level A would move over varying terrain — onto Rough Terrain (2), then onto Clear Terrain (1), and finally onto a Mountain hex (3) where he must end his turn — $2 + 1 + 3 = 6$.

Example 3: Suppose in Example No. 2 the third hex is a Swamp instead of a Mountain hex. To move onto the Swamp would cost 4, 1 more point than he has remaining. Thus, such movement would not be allowed and he would be required to end his turn on the second hex entered which was the Clear Terrain hex. Unused movement points, as in this example, are not transferable or accumulated from turn to turn.

Example 4: In the event a player's only movement would take him into a hex that would cost more Movement points than he has available for that turn, he is required to remain stationary until an alternate route becomes available or he recovers sufficient Life Levels. This could happen to a Person at, say H, who only has 2 Movement Points to spend but must enter a Mountain hex, which costs 3, if he is to move at all.

Lost

SCENARIO 1

OBJECTIVE: Get out of the wilderness (off the board) before thirst and starvation render you *not survived*.

START all Person Counters at Base No. 5.

TO WIN: First player to move off any side of the mapboard wins. Players rendered *not survived* before moving off the mapboard must drop out of the game. (Alternative: require players to move off East side only.)

DIRECTION ABILITY

Die Roll	Consult Random Direction Chart printed on board, then roll the die again; you then must move in the direction indicated by the arrow on the Random Direction Chart. Move in straight line only – no turns permitted – as far as possible subject to current movement allowance and terrain restrictions.
1	
2, 3	Consult Random Direction Chart printed on board, then roll the die again; you then must start in the direction indicated by the arrow on the Random Direction Chart. After moving one or more hexes you may make one direction change if desirable. Move as far as possible (subject to current movement allowance and terrain restrictions).
4, 5, 6	Start in any direction but you must move in straight line only – no direction change permitted – as far as possible (subject to current movement allowance and terrain restrictions).

NECESSITIES

FOOD: You satisfy current day's needs only if you eat movement on a Food hex (moving through a Food hex does not satisfy your needs).

WATER: You satisfy current day's needs only if you eat movement on a Catch-basin or Stream hex (moving through such hexes does not satisfy your needs).

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WILDERNESS ENCOUNTER

Die Roll	Natural Hazards	Animal/Insect	Personal
1	X	X	GAIN 1 ease Food Index
2	X	X	GAIN 1 speed Water Index
3	REMAIN STATIONARY 2 turns	REMAIN STATIONARY 1 turn	REMAIN STATIONARY 1 turn
4	X	LOSE 1 speed Food Index	LOSE 2 speed Food Index
5	REMAIN STATIONARY 3 turns	X	LOSE 1 speed Water Index
6	X	LOSE 1 Life Level	LOSE 2 Life Levels

X = No Diecounter (no change in LIFE LEVEL status)

LOSE 1 W = Lose 1 W Adjust Person Counters on Mapboard and Life Level Index Card.

GAIN (1) = GAIN 1 Speed on Food or Water Index = Adjust Food and Water Level Counters on Life Level Index card, adjusting Person Counters if necessary. Such gains in losses are in addition to the turn's normal expenditures.

0 = MAIN STAY CHANCE = True this number of turns specified. If a person retires (cannot determine whether in a non-fused hex, he loses 1 turn on the Food Index, for each turn he remains stationary. Similarly he loses 1 step on the Water Index for each turn he remains stationary in a non-water hex. He must still roll for the Wilderness Encounter every turn.

Survival

SCENARIO 2

OBJECTIVE: Get across large wilderness area as quickly as possible.

START all Person Counters at Base No. 9.

TO WIN: First player to move off West side of the mapboard wins. Failing this, the player who gets closest to the West edge before expiring may be considered the relative winner.

DIRECTION ABILITY

Die Roll	
1	Consult Random Direction Chart printed on board, then roll the die again; you then must start in the direction indicated by the arrow on the Random Direction Chart. After moving one or more hexes you may make one direction change if desirable. Move as far as possible (subject to current movement allowance and terrain restrictions).
2, 3, 4	Start in any direction but you must move in straight line only – no direction change permitted – as far as possible (subject to current movement allowance and terrain restrictions).
5, 6	Start in any direction. After moving one or more hexes you may make one direction change if desirable. Move as far as possible (subject to movement allowance and terrain restrictions).

NECESSITIES

FOOD: You satisfy current day's needs if you pass through or end movement on a Food hex. You may also recover 3 steps on the Food Index by remaining stationary for the following three turns on a Food hex.

WATER: You satisfy current day's needs if you pass through or end movement on a Catch-basin or Stream hex. You may also recover 1 step on the Water Index by remaining stationary for the following three turns on a water hex.

WILDERNESS ENCOUNTER

Die Roll	Natural Hazards	Animal/Insect	Personal
1	X	X	GAIN 2 steps Food Index
2	X	X	GAIN 1 step Water Index
3	REMAIN STATIONARY 2 turns	REMAIN STATIONARY 1 turn	REMAIN STATIONARY 1 turn
4	X	LOSE 1 step Food Index	LOSE 2 steps Food Index
5	REMAIN STATIONARY 2 turns	X	LOSE 1 step Water Index
6	X	LOSE 2 steps Water Index	LOSE 1 Life Level

X = No Encounter (no change in LIFE LEVEL status)

LOSE Life Levels = Adjust Person Counters on Mapboard and Life Level Index Card.

GAIN OR LOSE Steps or Food or Water Index = Adjust Food and Water Level Counters on Life Level Index card, adjusting Person Counters if necessary. Such gains or losses are in addition to the turn's normal expenditures.

REMAIN STATIONARY = Lose that number of turns specified. If a person must remain stationary while in a non-food hex, he loses 1 step on the Food Index for each turn he remains stationary. Similarly he loses 1 step on the Water Index for each turn he remains stationary in a non-water hex. He must still roll for the Wilderness Encounter every turn.

Search

SCENARIO 3

OBJECTIVE: Locate a lost person.

START all Person Counters at either Base No. 7 or No. 9 at the individual player's choice. Take one MISSING Counter (of any color) plus 6 blank Counters and place them upside down in separate locations randomly on the middle board.

TO WIN: First player to move into or through the hex containing the MISSING Counter wins.

DIRECTION ABILITY

Die Roll	
1, 2	Start in any direction but you must move in straight line only — no direction change permitted — as far as possible (subject to movement allowance and terrain restrictions).
3, 4, 5	Start in any direction. After moving one or more hexes you may make one direction change if desirable. Move as far as possible (subject to movement allowance and terrain restrictions).
6	Start in any direction. After moving one or more hexes you may make as many direction changes as desirable. You are not required to move at all, and may move less than your current movement allowance.

NECESSITIES

FOOD: You satisfy current day's needs if you pass through or end movement on a Food hex. You may also recover 3 steps on the Food Index by remaining stationary for the following two turns on a Food hex.

WATER: You satisfy current day's needs if you pass through or end movement on a Catch-basin or Stream hex. You can also satisfy current day's needs simply by rolling a 1 or 2 on the die after ending movement on a non-water hex. And you may recover 1 step on the Water Index by choosing to remain stationary for the following two turns on a water hex (including a non-water hex after rolling a 1 or 2).

WILDERNESS ENCOUNTER

Die Roll	Natural Hazards	Animal/Insect	Personal
1	X	GAIN 1 step Food Index	GAIN 1 step Food Index
2	X	GAIN 1 step Water Index	GAIN 1 step Water Index
3	REMAIN STATIONARY 1 turn	X	X
4	X	LOSE 1 step Food Index	LOSE 1 step Food Index
5	REMAIN STATIONARY 2 turns	X	LOSE 1 step Water Index
6	X	LOSE 2 steps Water Index	LOSE 1 Life Level

X = No Encounter (no change in LIFE LEVEL status)

LOSE Life Levels = Adjust Person Counters on Mapboard and Life Level Index Card.

GAIN OR LOSE Steps on Food or Water Index = Adjust Food and Water Level Counters on Life Level Index card, adjusting Person Counters if necessary. Such gains or losses are in addition to the turn's normal expenditures.

REMAIN STATIONARY = Lose that number of turns specified. If a person must remain stationary while in a non-flood hex, he loses 1 step on the Food Index for each turn he remains stationary. Similarly he loses 1 step on the Water Index for each turn he remains stationary in a non-water hex. He must still roll for the Wilderness Encounter every turn.

Rescue

SCENARIO 4

OBJECTIVE: Locate lost persons *and* bring them out of the wilderness.

START all Person Counters at either Base No. 7 or No. 9 at player's choice. Place as many MISSING Counters as there are players plus 6 blank Counters upside down randomly anywhere on the middle board. Procedure is identical to that of SEARCH scenario. Each player may only rescue one MISSING person. Once joined, rescuer and rescued cannot separate and both move at rescuer's movement

ability. It is assumed that current day's supplies are satisfied for both persons.

TO WIN: First player to move off any edge of the mapboard with the rescued person wins. (Alternative: require players to move off the same side they started from.)

DIRECTION ABILITY

Die Roll 1, 2, 3	Start in any direction. After moving one or more hexes you may make one direction change if desirable. Move as far as possible (subject to current movement allowance and terrain restrictions).
4, 5, 6	Start in any direction. After moving one or more hexes you may make as many direction changes as desirable. You are not required to move at all, and may move less than your current movement allowance.

NECESSITIES

FOOD: You satisfy current day's needs if you pass through or end movement on a Food hex. You can also satisfy current day's needs simply by rolling a 1 or 2 on the die after ending movement on a non-food hex. And you may recover 1 step on the Food Index by choosing to remain stationary in the following turn on a Food hex (including a non-food hex after rolling a 1 or 2).

WATER: Current day's needs are automatically satisfied — except where indicated otherwise on the Wilderness Encounter Chart.

WILDERNESS ENCOUNTER

Die Roll	Natural Hazards	Animal/Insect	Personal
1	X	X	GAIN 2 steps Food Index
2	X	X	GAIN 1 step Water Index
3	REMAIN STATIONARY 2 turns	REMAIN STATIONARY 1 turn	REMAIN STATIONARY 1 turn
4	X	LOSE 1 step Food Index	LOSE 2 steps Food Index
5	REMAIN STATIONARY 2 turns	X	LOSE 1 step Water Index
6	X	LOSE 2 steps Water Index	LOSE 1 Life Level

X = No Encounter (no change in LIFE LEVEL status)

LOSE Life Levels = Adjust Person Counters on Mapboard and Life Level Index Card.

GAIN OR LOSE Steps on Food or Water Index = Adjust Food and Water Level Counters on Life Level Index card, adjusting Person Counters if necessary. Such gains or losses are in addition to the turn's normal expenditures.

REMAIN STATIONARY = Lose that number of turns specified. If a person must remain stationary while in a non-food hex, he loses 1 step on the Food Index for each turn he remains stationary. Similarly he loses 1 step on the Water Index for each turn he remains stationary in a non-water hex. He must still roll for the Wilderness Encounter every turn.

Pursue

SCENARIO 5

the Guard's option. Guards automatically satisfy current day's needs each turn in which they pass through or land on Outposts. Escapee always moves first.

TO WIN: First Escapee to get off any side of mapboard wins at which point game ends. Guards win if they capture one Escapee (by moving into a hex containing an Escapee) before any get off the board.

OBJECTIVE: As an escaped prisoner, get out of the wilderness to safety; as the pursuer, recapture the escapee before he gets off the board.

START one player as the Escapee at Base No. 5, a second player as pursuer (Guard) at either Base No. 1, 2, 3 or 4. (If three players, employ as another Guard; and a 4th player as another Escapee.) In addition, for each Guard player add three blank Counters to be used as Outposts. Place Outposts randomly anywhere on board at

DIRECTION ABILITY

Pursuer	Pursued	
1	1, 2	Consult Random Direction Chart printed on board, then roll the die again: you then must start in the direction indicated by the arrow on the Random Direction Chart. After moving one or more hexes you may make one direction change if desirable. Move as far as possible (subject to current movement restrictions).
2, 3	3,4,5	Start in any direction but you must move in straight line only — no direction change permitted — as far as possible (subject to movement allowance and terrain restrictions).
4,5,6	6	Start in any direction. After moving one or more hexes you may make one direction change if desirable. You are not required to move at all, and may move less than your current movement allowance.

NECESSITIES

FOOD: You satisfy current day's needs if you pass through or end movement on a Food hex. You may also recover 3 steps on the Food Index by choosing to remain stationary for the following three turns on a Food hex.

WATER: You satisfy current day's needs if you pass through or end movement on a Catch-basin or Stream hex. You may also recover 1 step on the Water Index by choosing to remain stationary for the following three turns on a water hex.

WILDERNESS ENCOUNTER

Die Roll	Natural Hazards	Animal/Insect	Personal
1	X	X	GAIN 2 steps Food Index
2	X	X	GAIN 1 step Water Index
3	REMAIN STATIONARY 2 turns	REMAIN STATIONARY 1 turn	REMAIN STATIONARY 1 turn
4	X	LOSE 1 step Food Index	LOSE 2 steps Food Index
5	REMAIN STATIONARY 2 turns	X	LOSE 1 step Water Index
6	X	LOSE 2 steps Water Index	LOSE 1 Life Level

X = No Encounter (no change in LIFE LEVEL status)

LOSE Life Levels = Adjust Person Counters on Mapboard and Life Level Index Card.

GAIN OR LOSE Steps on Food or Water Index = Adjust Food and Water Level Counters on Life Level Index card, adjusting Person Counters if necessary. Such gains or losses are in addition to the turn's normal expenditures.

REMAIN STATIONARY = Lose that number of turns specified. If a person must remain stationary while in a non-food hex, he loses 1 step on the Food Index for each turn he remains stationary. Similarly he loses 1 step on the Water Index for each turn he remains stationary in a non-water hex. He must still roll for the Wilderness Encounter every turn.

Life Level Index Chart

WATER INDEX



FOOD INDEX



LIFE LEVEL INDEX



AT START: Place WATER INDEX AND FOOD INDEX Counters at respective "Start Here" spaces. Place ALL Person Counters on respective lettered spaces.

DURING PLAY: Move WATER and FOOD INDEX Counters downward (to the right) only at the end of turns in which a person's current day's needs are not satisfied. When passing downwards through trigger points, lose that number of Life Levels; when recovering upwards, gain that number. Substitute Person Counters as called for when passing through trigger points.

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Life Level Index Chart

WATER INDEX



FOOD INDEX



LIFE LEVEL INDEX



















AT START: Place WATER INDEX AND FOOD INDEX Counters at respective "Start Here" spaces. Place ALL Person Counters on respective lettered spaces.

DURING PLAY: Move WATER and FOOD INDEX Counters downward (to the right) only at the end of turns in which a person's current day's needs are not satisfied. When passing downwards through trigger points, lose that number of Life Levels; when recovering upwards, gain that number. Substitute Person Counters as called for when passing through trigger points.

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Person Counters











					
WATER INDEX	FOOD INDEX	LIFE LEVEL INDEX			







					
					

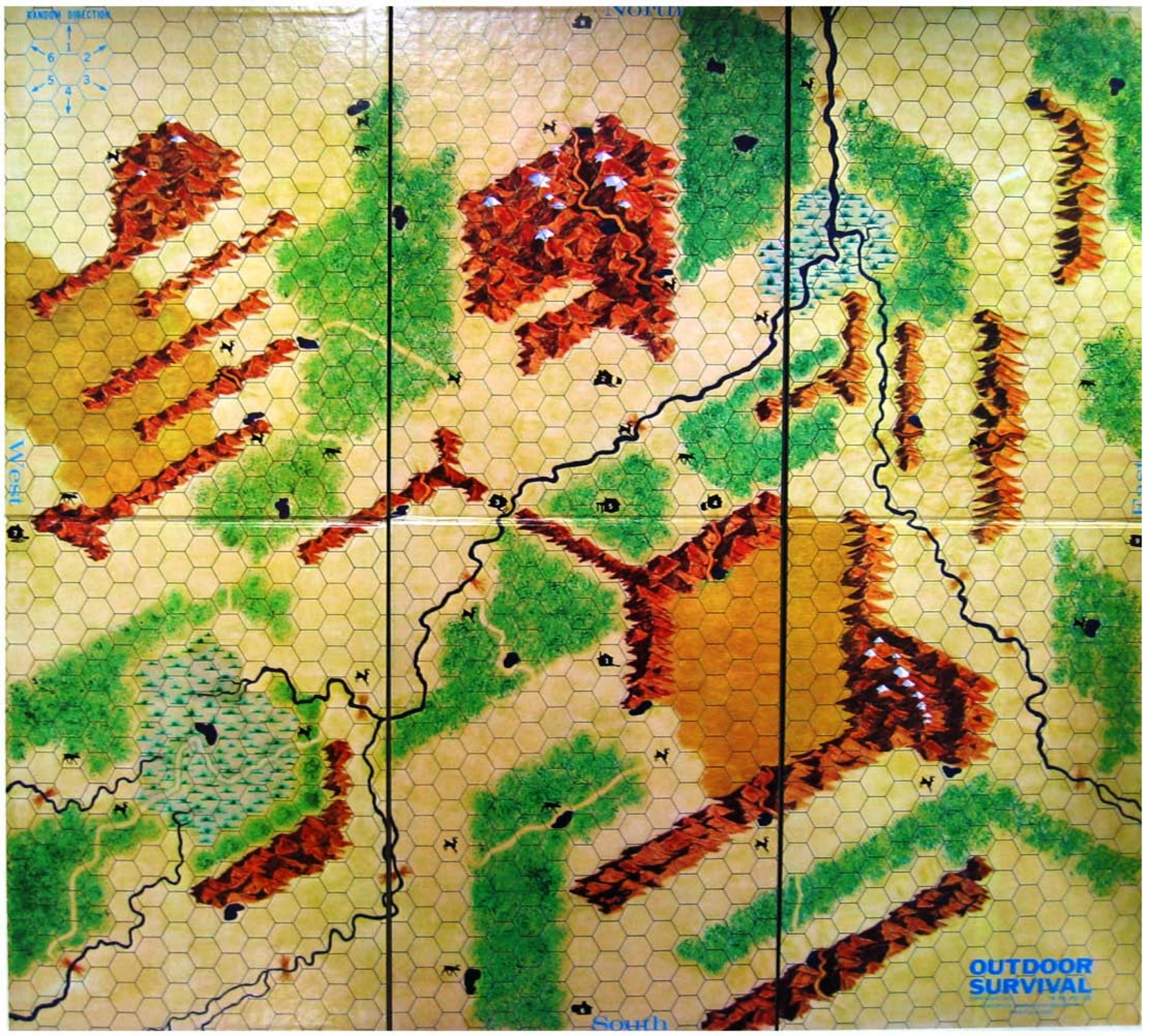
					
WATER INDEX	FOOD INDEX	LIFE LEVEL INDEX			

					
WATER INDEX	FOOD INDEX	LIFE LEVEL INDEX			

					
WATER INDEX	FOOD INDEX	LIFE LEVEL INDEX			



RANDOM DIRECTION



West

South

OUTDOOR SURVIVAL

OUTDOOR SURVIVAL

a game
about
wilderness
skills

A BRAND NEW WAY TO KEEP UP WITH THE
OUTDOORS WHEN YOU HAVE TO BE INDOORS

...and have FUN too!

For two, three, or four players or teams (and any number of Kibitzers) OUTDOOR SURVIVAL is more than just a game. Indoors, at home or in camp, it teaches what there is to know about getting along away from civilization—or sharpens whatever knowledge and skills players may have, for when they might be needed in real life.

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LOST . . . in which all players take the part of a most inexperienced woodsman.

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RESCUE . . . searchers must not only find a lost party but return all to safety in good shape.

PURSUE . . . the hunted and the hunters, escape, people after people, or man chasing beast.

For easier playing—quick reference during a game or leisurely browsing to pick up new tricks for the next one—check the how-to Outdoor Survival primer. This 24-page booklet—based on the best and latest of what the experts know—fully illustrates, in text and pictures, the techniques of direction finding, signaling, making shelter, building fires, dealing with natural hazards, first aid, living off the land, and lists basic supplies for a planned wilderness adventure.

THE EASY-TO-LEARN OUTDOOR SURVIVAL GAME HAS

- 22" x 24" mapboard of typical wilderness terrain
- Rules of Play folder
- 4-player set of die-cut Person Counters
- 24-page primer of outdoor survival techniques
- Life Level Index cards for each player
- 1 die
- Scenario cards for—LOST, SURVIVAL, SEARCH, RESCUE, PURSUE