



Standard Guide for Training of Land Search Team Member¹

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1. Scope

1.1 This guide establishes the minimum training requirements for land search personnel as it relates to their general, field, and search specific knowledge and skills.

1.2 A Land Search Team Member searches on the surface of the land only, including urban or disaster areas that may be isolated or have lost supporting infrastructure.

1.3 This guide does not provide the minimum training requirements for searching in partially or fully collapsed structures, in or on water, in confined spaces, or underground (such as caves, mines, and tunnels.)

1.4 Personnel trained to this guide are not qualified to perform rescue. No knots, rope, high angle or low angle litter, or other rescue skills are required of a Land Search Team Member.

1.4.1 Basic rescue skills and knowledge are found in Guide F2751.

1.5 Personnel trained to this guide are not qualified to operate in leadership positions.

1.6 Land Search Team Members are eligible to be members of Type II search teams or crews as defined in Classification F1993.

1.6.1 Type II teams which may utilize personnel trained to this guide are:

- 1.6.1.1 Kind A (wilderness);
- 1.6.1.2 Kind B (urban);
- 1.6.1.3 Kind J (evidence/cadaver);
- 1.6.1.4 Kind K (missing aircraft).

1.6.2 Land Search Team Members are eligible to be members of Kind C (mountainous) teams provided that they are supervised by a Mountain or Alpine endorsed team member.

1.7 Further training may be required before a Land Search Team Member can participate on a particular Kind of search team, depending on local needs, regulations, or policies of the authority having jurisdiction.

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1.8 *This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety and health practices and determine the applicability of regulatory requirements prior to use.*

2. Referenced Documents

2.1 ASTM Standards:²

- F1633 Guide for Techniques in Land Search
 - F1767 Guide for Forms Used for Search and Rescue
 - F1773 Terminology Relating to Climbing, Mountaineering, Search and Rescue Equipment and Practices
 - F2047 Practice for Workers' Compensation Coverage of Emergency Services Volunteers
 - F1993 Classification System of Human Search and Rescue Resources (Withdrawn 2014)³
 - F2047 Practice for Workers' Compensation Coverage of Emergency Services Volunteers
 - F2751 Guide for Training of Support Level Land Rescue Team Member (LRT-Support) Member
 - F2890 Guide for Hazard Awareness for Search and Rescue Personnel
 - F2890 Guide for Hazard Awareness for Search and Rescue Personnel
 - F3068 Guide for Contents and Use of a Position Task Book (PTB)
 - F3071 Guide for Basic Wilderness GPS/GNSS Use (GPS/GNSS-IW) Endorsement
- ### 2.2 Other Documents:
- NWCG PMS 307 Work Capacity Testing for Wildland Firefighters⁴

3. Terminology

3.1 Definitions of Terms Specific to This Standard:

- 3.1.1 *authority having jurisdiction (AHJ)*, *n*—(1) the team, organization, agency, or other entity which is using this guide; (2) the team, organization, agency, or other entity to which a

² For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at service@astm.org. For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

³ The last approved version of this historical standard is referenced on www.astm.org.

⁴ http://www.nwcg.gov/pms/pubs/newshelt/workcaptest_lo.pdf

person being trained, tested, or evaluated belongs, if the instructor, evaluator, or tester is not a member of the same organization.

3.1.2 *field, n*—the location, away from the base or command post, in which a land search team member is searching or performing other tasks.

3.1.3 *field operations, n*—searches and other tasks being performed away from the base or command post.

3.1.4 *initial planning point (IPP), n*—the point that is initially used to plan the search incident. The IPP may be the original point last seen or the last known position. The IPP may also be a point entirely separate based on the best available investigative information. IPP does not move after planning begins.

3.1.5 *land search team, n*—a group of individuals searching on the surface of the earth.

3.1.6 *land search team member Level I, n*—a person who, at a minimum, meets the requirements of this guide.

3.1.7 *normal area of operation, n*—(1) the area(s) where an AHJ performs its search operations on a regular basis; (2) the area(s) where the AHJ is frequently called to assist with search operations managed by others.

3.2 For definitions of terms used in this guide, see Guide [F1633](#), Terminology [F1773](#), Classification [F1993](#), Practice [F2047](#), and other references within this guide.

4. Significance and Use

4.1 This guide establishes the minimum knowledge, skills, and abilities that a person must have to perform as a Land Search Team Member. No other skills are included or implied.

4.2 Every person who is identified as a Land Search Team Member shall have met the requirements of this guide.

4.3 This guide is to be used by individuals and agencies having jurisdiction that wish to identify the minimum training required for a Land Search Team Member.

4.3.1 The AHJ shall determine the depth or detail of training required to meet these needs.

4.4 Though this guide establishes the minimum standard of training, it does not imply that a Land Search Team Member is a “trainee,” “probationary,” or other similar term member of a team, organization, or agency.

4.4.1 Determining the requirements and qualifications for land search team members is the responsibility of the AHJ.

4.4.2 Nothing in this guide precludes an AHJ from adding additional requirements for its own members.

4.5 This guide can be used to evaluate a document or training program to determine if its content includes the topics necessary for training individuals to operate as a Land Search Team Member.

4.6 This guide does not stand alone and must be used with the referenced documents to provide the specific information needed by a Land Search Team Member or AHJ.

4.7 This guide by itself is not a training document. It is an outline of the topics required for training or evaluating a Land Search Team Member.

4.8 This guide can be used to evaluate a book or other document to determine if its content includes the information required for training a Land Search Team Member. Likewise, the guide can be used to evaluate an existing training program to see if it meets the requirements of this guide.

4.9 The knowledge, skills and abilities defined in this guide are not presented in any particular order and do not represent a training sequence.

4.10 A Land Search Team Member shall document his or her training by completion of a position task book, compliant with Guide [F3068](#), or by field demonstration under qualified supervision.

4.11 Unless stated otherwise, an ability or proficiency in a skill shall be demonstrated for initial qualification and then as often as required by the AHJ.

4.12 Except where a physical skill or ability must be demonstrated, the AHJ shall determine the best way to evaluate a person’s knowledge. This may be by written exam, oral exam, demonstration, or by some combination of the three.

5. Personal Fitness

5.1 Land Search Team Members shall demonstrate annually that they meet the requirements of a medical fitness standard determined by the AHJ.

5.2 Land Search Team Members shall demonstrate annually that they meet the requirements of a physical performance standard determined by the AHJ.

5.2.1 The recommended minimum physical performance requirement for Land Search Team Members is the “Moderate” level as defined in NWCG PMS 307 (see [Appendix X2](#)).

6. General Knowledge and Skills

6.1 Land Search Team Members shall complete National Incident Management System (NIMS) ICS-100, “Introduction to Incident Command System.”

6.2 A Land Search Team Member shall complete the Department of Interior, Office of Aviation Management (DOI OAM), Course A100 – Basic Aviation Safety, or equivalent training.

6.3 A Land Search Team Member shall maintain certification in professional rescuer/health care provider CPR.

6.4 A Land Search Team Member shall maintain certification in basic first aid, or a more advanced level of emergency care. At a minimum the medical or first aid training for certification shall include the following:

6.4.1 Basic treatment for common injuries experienced in the field.

6.4.2 Basic treatment for the conditions listed in [7.11](#).

6.5 Land Search Team Members shall know the regulations, policies, procedures, and guidelines of the AHJ with regard to the following:

6.5.1 Land Search Team callout or dispatch to an incident,

6.5.2 Incident check in,

6.5.3 Land search team mission briefing,

6.5.4 Land search team mission debriefing,

- 6.5.5 Demobilization and departing from an incident,
- 6.5.6 Land search team member communications with the media,
- 6.5.7 Working with other agencies or organizations,
- 6.5.8 Insurance coverage, and
- 6.5.9 Safe driving procedures and safety.

6.6 Land search team members shall demonstrate an understanding of the legal aspects of SAR with respect to the AHJ for the following:

- 6.6.1 Entering private property,
 - 6.6.2 Emergency response,
 - 6.6.3 Finding deceased individuals,
 - 6.6.4 Crime scenes,
 - 6.6.5 Subject, victim, witness, or patient confidentiality requirements, including, but not limited to, the Health Insurance Portability and Accountability Act (HIPAA),
 - 6.6.6 Negligence and abandonment, and
 - 6.6.7 Confidentiality of mission information.
- 6.7 Land Search Team Members shall be trained to operate within the Incident Command System (ICS).

7. Personal Health, Safety, and Survival

7.1 Land Search Team Members shall know how to protect themselves from the effects of the environment in the field, including the following:

- 7.1.1 The five ways in which the body loses heat, the positive and negative effects of this heat loss, and the ways to assist or prevent them.
- 7.1.2 The reasons for wearing layered clothing, the function of each layer, and the advantages and disadvantages of materials used in each layer.
- 7.1.3 The factors to be considered when choosing socks and footwear.

7.2 Land Search Team Members shall know a minimum of three methods for avoiding getting lost.

7.3 Land Search Team Members shall have training in how to survive if lost in the field, including the following:

- 7.3.1 The survival situation plan: STOP - Stay, Think, Observe, and Plan.
- 7.3.2 Maintaining a positive mental attitude.
- 7.3.3 The basic needs for survival, and their order of priority.
- 7.3.4 Differentiating between the requirements for short term survival versus long term survival.

- 7.3.5 Two methods of water purification for use in the field.
- 7.3.6 The functional requirements of an emergency shelter.

7.4 Land Search Team Members shall demonstrate the ability to build an emergency shelter using only personal field equipment and materials found in the field.

7.5 Land Search Team Members shall demonstrate the ability to build a sustainable fire using only personal field equipment and materials found in the field.

7.6 Land Search Team Members shall know the types and quantity of food to be carried in the field during a search mission.

7.7 Land Search Team Members shall know the personal hygiene and sanitation requirements and techniques used in the field.

7.8 Land Search Team Members shall know at least two types of emergency signaling devices, their advantages and disadvantages, and how to use each device.

7.9 Land Search Team Members shall meet the requirements of Guide **F2890** for hazardous materials training.

7.10 Land Search Team Members shall know the safety precautions and procedures to be employed when working around still and swift water in the normal area of operations.

7.10.1 Land Search Team Members are not qualified to participate in swift water operations.

7.11 Land Search Team Members shall know the signs, symptoms, and preventive measures for the following:

- 7.11.1 Cold related problems.
- 7.11.2 Heat related problems.
- 7.11.3 Dehydration.
- 7.11.4 Fatigue and exhaustion.
- 7.11.5 Blisters.
- 7.11.6 Sunburn.

7.12 Land Search Team Members shall know the hazards in the normal area of operations, including, but not limited to, the following:

- 7.12.1 Plants.
- 7.12.2 Wild and domestic animals.
- 7.12.3 Terrain.
- 7.12.4 Weather patterns and conditions.
- 7.12.5 Lightning.
- 7.12.6 Other (for example, snow blindness, altitude related problems, etc.).

7.12.7 Land Search Team Members shall know the procedures to be followed when searching in hazardous areas and conditions.

7.13 Land Search Team Members shall know the dangers of airborne and blood-borne pathogens and how to mitigate the risks, including:

- 7.13.1 Types of pathogens.
- 7.13.2 Methods of transmission.
- 7.13.3 Body substance isolation methods.
- 7.13.4 Personal protective equipment (PPE) for airborne and blood-borne pathogens and its use.

8. Land Navigation

8.1 Land Search Team Members shall know the difference between topographic maps and road maps, and the advantages and disadvantages of each.

8.2 On topographic maps, Land Search Team Members shall demonstrate the ability to:

- 8.2.1 Identify and explain the meaning of common symbols.
- 8.2.2 Describe legend information and its use.
- 8.2.3 Identify, and know the significance of, contour lines and spacing.
- 8.2.4 Identify, and know the significance of, true North, magnetic North, grid North, and declination.
- 8.2.5 Orient a map using terrain.

8.2.6 Orient a map using a compass.

8.2.7 Determine the distance between two points on a map.

8.2.8 Determine the heading, bearing, or azimuth between two points on a map.

8.3 Land Search Team Members shall know how man-made and naturally occurring phenomenon affect the accuracy of a compass.

8.4 Land Search Team Members shall demonstrate the ability to do the following in the field:

8.4.1 Follow a compass heading, azimuth, or bearing.

8.4.2 Estimate distance traveled in the field.

8.4.3 Using a compass, determine a heading, azimuth, or bearing in the field and plot it on a map.

8.5 Land Search Team Members shall know the advantages and disadvantages of the following when used to determine a position:

8.5.1 Latitude/Longitude.

8.5.2 Universal Transverse Mercator (UTM) Grid system.

8.5.3 US National Grid system (USNG).

8.5.4 References to features on a map.

8.5.5 Any AHJ specified methods.

8.6 Land Search Team Members shall demonstrate the ability to determine, and communicate to another person, the coordinates of a point on a map in each of the following systems:

8.6.1 Latitude and Longitude.

8.6.2 Universal Transverse Mercator (UTM).

8.6.3 US National Grid (USNG).

8.6.4 References to features on the map.

8.6.5 Any AHJ specified methods.

8.7 Land Search Team Members shall demonstrate the ability to plot on a map a location defined by coordinates in each of the following systems:

8.7.1 Latitude and Longitude.

8.7.2 Universal Transverse Mercator (UTM).

8.7.3 US National Grid (USNG).

8.7.4 References to features on the map.

8.7.5 Any AHJ specified methods.

8.8 Land Search Team Members shall have a wilderness GPS use endorsement as defined in Guide [F3071](#).

9. Personal Protective Equipment

9.1 Land Search Team Members shall have, and know how to use, the Personal Protective Equipment (PPE) necessary to safely participate in field search operations, as determined by the AHJ, including:

9.1.1 Appropriate clothing, outerwear, footwear, and personal field equipment.

9.1.2 Survival equipment.

9.1.3 A durable, hands-free method of carrying personal and team equipment into the field.

9.2 To assist the AHJ or the Land Search Team Member with personal equipment decisions, [Appendix X1](#) contains the following equipment lists:

9.2.1 Table X1.1 is a list of items to be considered for personal equipment.

9.2.2 Table X1.2 is a list of suggested items for a personal first aid kit.

9.2.3 Table X1.3 is a list of suggested items for a personal base camp kit.

9.3 Land Search Team Members shall know the reasons for carrying, and explain or demonstrate the use of, all field equipment required by the AHJ.

9.4 Land Search Team Members shall demonstrate an understanding of mission-specific packing for the normal area of operations.

10. Communications

10.1 Land Search Team Members shall demonstrate the ability to verbally communicate information clearly, effectively, and accurately.

10.2 Land Search Team Members shall know the radio communications procedures and protocols used in search missions in the field, as determined by the AHJ.

10.3 Land Search Team Members shall demonstrate the ability to operate the radio equipment used for search missions in the field, as determined by the AHJ.

10.4 Land Search Team Members shall demonstrate the ability to correctly send and receive position coordinates by radio.

11. Basic Search and Rescue Knowledge

11.1 Land Search Team Members shall know the meaning of the following terms, as used in search and rescue operations:

11.1.1 *Search*.

11.1.2 *Rescue*.

11.1.3 *Recovery*.

11.1.4 *LAST (Locate, Access, Stabilize, Transport)*.

11.2 Land Search Team Members shall know the six phases of search operations:

11.2.1 Preplanning.

11.2.2 Notification.

11.2.3 Planning and Strategy.

11.2.4 Tactics and Techniques.

11.2.5 Suspension.

11.2.6 After action review or critique.

11.3 To the extent determined by the AHJ, Land Search Team Members shall know the roles of other agencies or organizations, at the following levels, that coordinate, provide resources, provide services, or perform other functions in search and rescue for the AHJ.

11.3.1 National.

11.3.2 State or Provincial.

11.3.3 Tribal.

11.3.4 Local.

12. Search Specific Knowledge and Skills

12.1 Land Search Team Members shall demonstrate an understanding of the basic principles affecting search operations, including:

12.1.1 Search is an emergency.

12.1.1.1 Search urgency depends on a variety of factors (examples of search urgency rating forms are found in ASTM F1633 and ASTM F1767, as well as other references).

12.1.2 Searching for clues, not just subjects.

12.1.3 Clue consciousness or awareness.

12.1.4 Hasty searches usually precede grid searches.

12.1.5 Lost person behavior, including:

12.1.5.1 General classifications of lost persons.

12.1.5.2 Factors that affect lost person behavior.

12.1.5.3 Application of statistical studies of lost person behavior.

12.2 Land Search Team Members shall know the function and importance of lost or missing person questionnaires (examples of questionnaires are provided in Guide F1767).

12.3 Land Search Team Members shall know the following terms and understand their significance in search operations:

12.3.1 Point Last Seen (PLS).

12.3.2 Last Known Point (LKP).

12.3.3 Initial Planning Point (IPP).

12.3.4 Search segment or area.

12.3.5 Probability of Area (POA).

12.3.5.1 Probability of Detection (POD).

12.3.5.2 Probability of Success (POS).

12.3.5.3 Coverage.

12.4 Land Search Team Members shall know the factors that affect POD, including:

12.4.1 Searcher speed.

12.4.2 Searcher spacing.

12.4.3 Terrain.

12.4.4 Vegetation and ground cover.

12.4.5 Weather.

12.4.6 Time of day.

12.4.7 Searcher condition.

12.4.8 Search subject condition.

12.5 Land Search Team Members shall know the functions of the following land search team positions:

12.5.1 Search team leader.

12.5.2 Radio operator.

12.5.3 Navigator.

12.5.4 Search team member.

12.6 Land Search Team Members shall know the actions to be taken upon finding the following:

12.6.1 Clues or evidence.

12.6.2 The search subject(s) or objective(s):

12.6.2.1 Alive.

12.6.2.2 Deceased.

12.6.3 Possible crime scene.

12.7 Land Search Team Members shall know the differences between active (or direct) and passive (or indirect) search tactics, their advantages and disadvantages, and the reasons for their use.

12.8 Land Search Team Members shall know how the following passive or indirect search techniques are performed:

12.8.1 Investigation.

12.8.2 Attraction.

12.8.3 Containment.

12.9 Land Search Team Members shall know how to perform the following active or direct search tactics:

12.9.1 *Type I*—Hasty search.

12.9.2 *Type II*—Loose, area, sweep, or efficient search.

12.9.3 *Type III*—Tight, grid, evidence, or thorough search.

12.10 Land Search Team Members shall know how tracking or sign-cutting may be used in search operations.

12.11 Land Search Team Members shall know the following in regard to tracking or sign-cutting:

12.11.1 The difference between sign and tracks.

12.11.2 The difference between sign-cutting and tracking.

12.11.3 The procedures used to preserve tracks or sign and to preserve an area for a tracking team.

12.12 Land Search Team Members shall know the procedures for preserving an area for a search dog team.

12.13 Land Search Team Members shall know the proper procedures for handling scent articles to be used by search dog teams.

12.14 Land Search Team Members shall know the techniques and procedures used for any other search methods used by the AHJ.

12.15 Land Search Team Members shall know the advantages and disadvantages of night search.

12.16 A Land Search Team Member shall demonstrate the ability to perform as a member of a land search team in the normal area of operations. The AHJ shall determine how to evaluate the individual's performance. Written tests, oral tests, or both types may be used in addition to a physical demonstration. Factors to consider include, but are not limited to, the following:

12.16.1 Day versus night.

12.16.2 Terrain.

12.16.3 Season.

12.16.4 Hazardous areas.

13. Keywords

13.1 equipment; land; personnel; rescue; SAR; search; team; training

APPENDIXES**(Nonmandatory Information)****X1. BACKGROUND INFORMATION**

X1.1 The tables in this appendix were compiled from the equipment lists of 20 local and national search and rescue organizations from across the United States.

X1.2 The information in these tables is for reference only and the tables are provided to assist an AHJ or Level I land search team member in making equipment decisions. These are not lists of required equipment. See Section 9 for equipment requirements.

X1.3 The lists are general in nature and should be supplemented by AHJ for specific conditions, for example, winter.

X1.4 Only those lists identified as minimum, basic, 24 hour, hasty, or similar were included in **Table X1.1**. Equipment lists identified as technical, cold weather, rescue, and so forth were excluded.

X1.5 There were a total of 100 different personal equipment items contained on the 20 lists. No list had all 100 items and only six items were listed on all 20 lists.

X1.6 The items in **Table X1.1** were scored in four ways:

X1.6.1 One point for each list on which an item appeared. The maximum possible score for an item was 20.

X1.6.2 Two points for being a required item, one point for being optional or recommended. The maximum possible score for an item was 40.

X1.6.3 2.5 points were given to required items on the basic/24 hour list; 2 points if required on the extended/base list; 1.5 points if optional or recommended on the basic/24 hour list; 1 point for optional or recommended items on the extended/base list. The maximum possible score for an item was 50.

X1.6.4 The sum of the other three methods. The maximum possible score for an item was 110.

X1.7 The first 16 items in **Table X1.1** were in the same order by all four scoring methods. It is recommended that a Level I land search team member have these items available to carry into the field on any search. The next 9 items in **Table X1.1** were the same in each of the four scoring methods, but not in the same order. The last 20 items in **Table X1.1** were in the same order when scored by all four methods.

X1.8 The items in **Table X1.1** are sorted first by total score, then by the number of lists on which the item appeared, then alphabetically.

X1.9 The contents of the personal first aid kit (**Table X1.2**) should be based on the medical or first aid training that the Level I land search team member has received. See Section 7 for first aid and medical requirements.

TABLE X1.1 Compilation of Personal Equipment from Minimum Equipment Lists of 20 Search and Rescue Teams

Item	Maximum Possible			Item	Maximum Possible		
	20 Lists	110 Total	100 % of max		20 Lists	110 Total	100 % of max
1 compass	20	110	100	51 webbing, 1 in. x varying lengths	5	25.5	23
2 flashlight or headlamp	20	110	100	52 scissors	5	25	23
3 water, 2 quarts or litres minimum ^A	20	110	100	53 water purification filter	6	24.5	22
4 knife, multipurpose (or equivalent)	20	108	98	54 handkerchief or bandana	5	23.5	21
5 rainwear or poncho	20	108	98	55 gaiters ^B	6	23	21
6 first aid kit, personal ^C	20	106	96	56 entrenching tool ^B	5	22	20
7 matches ^D	19	104	94	57 ground sheet	5	22	20
8 food, 1 day's worth ^E	19	100	91	58 sewing kit ^F	5	22	20
9 whistle ^G	18	97	88	59 razor blade, single edge	4	22	20
10 spare batteries for light ^H	16	88	80	60 can opener ^B	5	21.5	20
11 notepad with pencil or pen	16	86	78	61 quarters, 2 minimum	4	20.5	19
12 cup, drinking ^I	16	77	70	62 gloves, wool or insulated	3	16.5	15
13 gloves, leather ^J	15	76	69	63 jacket, insulated	3	16.5	15
14 mirror, signal	15	76	69	64 measuring device, 18 in. minimum	3	16.5	15
15 sunglasses	14	73	66	65 tape, duct, 5 to 10 ft	3	16.5	15
16 shelter material	14	72.5	66	66 towelette, moist	3	16.5	15
17 spare bulb for light ^H	13	71.5	65	67 wire, 5 to 10 ft, 14 Ga.	3	16.5	15
18 nylon cord, at least 25 ft	14	67.5	61	68 saw, folding ^B	4	16	15
19 trash bag, large (min. qty. varied)	14	66.5	60	69 water container, extra ^B	5	15.5	14
20 helmet	13	65.5	60	70 slings, nylon (min. qty. varied)	3	15	14
21 fire starter ^D	12	63.5	58	71 aluminum foil	3	14.5	13
22 toilet paper	13	61.5	56	72 bivy sack	3	14.5	13
23 sleeping bag	13	58	53	73 ear plugs	3	14.5	13
24 candle	11	54.5	50	74 map	3	14.5	13
25 goggles	11	53.5	49	75 tracking stick	3	14.5	13
26 socks, spare	11	53	48	76 spare boot laces	3	14	13
27 insect repellent	12	52.5	48	77 space blanket	3	12	11
28 sleeping pad ^F	11	52	47	78 chem-light	2	11	10
29 water purification tablets	11	51.5	47	79 binoculars	3	10.5	10
30 flagging material ^K	10	51	46	80 pack cover ^B	3	10	9
31 cook kit ^F	10	45.5	41	81 ascender ^L	2	9	8
32 carabiner (min. qty varied) ^L	9	45.5	41	82 flares, aerial	2	9	8
33 headgear (ball, fleece, or wool cap)	9	45.5	41	83 smoke, signal	2	7	6
34 watch	9	45.5	41	84 strobe light	2	7	6
35 stove ^B	11	45	41	85 altimeter	2	6.5	6
36 cook kit utensils or spoon ^F	9	44	40	86 \$5 bill	1	5.5	5
37 food, extra ^F	9	43	39	87 condom, non lubricated	1	5.5	5
38 sunscreen	9	43	39	88 gloves, exam (not in first aid kit)	1	5.5	5
39 lip balm	9	42.5	39	89 hand warmer	1	5.5	5
40 harness (seat or climbing) ^L	8	42	38	90 repair kit (unspecified)	1	5.5	5
41 nylon rope, 50 ft, 9 mm ^L	8	40	36	91 sitting pad	1	5.5	5
42 flashlight or headlamp, backup ^{H,B}	9	39	35	92 wire ties, plastic, 8 locking	1	5.5	5
43 orange vest	7	38.5	35	93 camera and film	1	3.5	3
44 Prusiks (min. qty. varied) ^L	7	34.5	31	94 mosquito netting	1	3.5	3
45 tent ^F	8	34	31	95 signal panel	1	3.5	3
46 descender ^L	6	29	26	96 \$10	1	3	3
47 lighter ^D	6	28.5	26	97 GPS	1	3	3
48 identification card	5	27.5	25	98 scent bag	1	3	3
49 resealable plastic bag, qt. (min. qty varied)	5	27.5	25	99 spare glasses or contacts	1	3	3
50 safety pins, large, 2	5	25.5	23	100 straps, extra gear tie down	1	3	3

^AGeneral recommendation. Local conditions may warrant carrying more or less water.

^B Appeared as optional equipment more often than as required equipment.

^C See Table X1.2 for suggested contents.

^D The basic requirement is some method of starting a fire.

^E Ready-to-eat, for "survival" purposes. Search assignment may require additional food (Item 37).

^F Appeared on more extended mission or base kit lists than basic or 24 h lists.

^G Non-metallic or metallic with non-metallic lip piece recommended in cold weather.

^H The basic requirement is to have a new light source in case the first fails. A second light source (Item 42) can be carried instead of spare batteries and a bulb.

^I A metal cup can be used for heating water and carried instead of a cook kit (Item 31).

^J For hand protection, not warmth (Item 62) or body substance isolation (Items 6 and 88).

^K Plastic "surveyor" tape or flagging, or crepe paper.

^L Technical or rescue equipment which a Land Search Team Member is not required to know how to use. These items shall only be used by Land Search Team Members trained to use them.

TABLE X1.2 Suggested Items for a Personal First Aid Kit

Alcohol swabs
Antacid tablets, otc ^A
Antihistamine, otc ^A
Anti-itch or itch relief ointment
Antiseptic ointment or pads
Bloodborne pathogen protection (body substance isolation) kit
Butterfly closures
Compresses or sanitary napkins
Cotton swabs
CPR mask or shield
Decongestant, otc ^A
Disinfectant
Elastic bandage
Eyeglasses or contacts, spare
Eye wash
Foot blister padding
Gauze pads
Gloves, exam (separate from BSI/BBP kit)
Sewing needle or straight pin
Pain relief, otc ^A
Personal medications
Roller bandage
Self-adhesive bandages
Tape, first aid
Triangular bandage
Tweezers

^A otc = over-the-counter (non-prescription).

TABLE X1.3 Suggested Items for a Personal Base Camp Kit

Clothes bag
Clothes, spare
Comb or brush
Footwear (other than field boots)
Nail clippers
Personal hygiene items
Shaving kit
Soap
Toothbrush and toothpaste
Towel
Washcloth

X2. WORK CAPACITY TESTS⁵

X2.1 The United States Forest Service (USFS) has defined the following work levels for wildland firefighters:

X2.1.1 *Arduous Work*—Involves above average endurance (aerobic fitness), lifting more than 50 lb (muscular fitness), and occasional demands for extraordinarily strenuous activities. All wildland firefighters perform arduous duty.

X2.1.2 *Moderate Work*—Involves lifting 25 - 50 lb and occasional demand for moderately strenuous activity. Safety officers and fire behavior officers perform moderate duty.

X2.1.3 *Light Work*—Involves mainly office-type work with occasional field activity.

X2.2 The work capacity test for each level is defined in the following table:

Work Level	Test	Description
Arduous	Pack Test	3-mile hike with 45-pound pack in 45 min
Moderate	Field Test	2-mile hike with 25-pound pack in 30 min
Light	Walk Test	1-mile hike with no pack in 16 min

X2.3 All tests are to be conducted on level ground.

X2.4 Test times shall be adjusted for altitude, as shown in the following table:

Altitude, ft	Pack Test, s	Field Test, s	Walk Test, s
4,000 to 5,000	30	20	10
5,000 to 6,000	45	30	15
6,000 to 7,000	60	40	20
7,000 to 8,000	75	50	25
8,000 to 9,000	90	60	30

⁵ http://www.fs.fed.us/fire/safety/wct/wct_index.html

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