Designation: F3070 – 14

Standard Guide for Evaluating Area Search Dog Crews or Teams[1]

This standard is issued under the fixed designation F3070; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon (ε) indicates an editorial change since the last revision or reapproval.

1. Scope

1.1 This guide defines the knowledge, skills, and abilities required for a dog crew or team to perform an area search.

1.2 Area search dog crews or teams perform searches on the surface of the land, including open urban or wilderness areas, as well as mountainous terrain, and alpine environments.

1.2.1 Additional training shall be required for area search dog crews or teams that search in mountainous terrain, alpine environments, or underground.

1.3 This guide does not include the knowledge, skills, and abilities required to search in partially or fully collapsed structures, confined spaces, or on bodies of water, inland or oceanic.

1.4 Area search dog crews or teams trained to meet the requirements of this guide may operate in urban and disaster areas that may be isolated, or have lost their infrastructure.

1.5 Area search dog crews or teams must work under qualified supervision deemed appropriate by the AHJ.

1.6 This guide does not provide a theoretical basis for how an area search dog crew or team functions.

1.7 Search dog crews or teams are eligible to be members of Type I and II SAR crews or teams of the following Kinds, as defined in Classification F1993:

1.7.1 Kind A (Wilderness),
1.7.2 Kind B (Urban),
1.7.3 Kind C (Mountainous),
1.7.4 Kind G (Cave),
1.7.5 Kind H (Mine),
1.7.6 Kind I (Avalanche),
1.7.7 Kind K (Aircraft), and
1.7.8 Kind L (Unclassified).

1.8 Further training may be required before an area search dog crew or team can fully participate on a particular Type and Kind of team or crew, based on specific local need, regulations, or policies.

1.9 *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 limitations prior to use.*

2. Referenced Documents

2.1 *ASTM Standards:*[2]

F1633 Guide for Techniques in Land Search
F1847 Guide for Minimum Training of Search Dog Crews or Teams
F1848 Classification System for Canine Search Resources
F1879 Guide for Demonstrating Obedience and Agility in Search and Rescue Dogs (Withdrawn 2014)[3]
F1993 Classification System of Human Search and Rescue Resources (Withdrawn 2014)[3]
F2209 Guide for Training of Land Search Team Member
F2685 Guide for Training of a Land Search Team Leader (STL)
F3068 Guide for Contents and Use of a Position Task Book (PTB)
F3072 Guide for Intermediate Wilderness GPS/GNSS Use (GPS/GNSS-IIW) Endorsement

2.2 *Other References:*

SWGDOG approved guideline SC1 – TERMINOLOGY (abcdefghijk)
Work Capacity Testing for Wildland Firefighters, The United States Department of Agriculture (March 2002)

3. Terminology

3.1 *Definitions:*

3.1.1 *air scent dog, n*—a search dog trained to detect human scent by air scenting.

3.1.2 *air scenting, v*—a search dog action whereby a dog attempts to detect the presence of human scent in air currents and, if found, follow that airborne scent to its source.

[1] This guide is under the jurisdiction of ASTM Committee F32 on Search and Rescue and is the direct responsibility of Subcommittee F32.02 on Management and Operations.

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[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.

3.1.3 *area search, v*—the act of using a dog to search a designated area for a target odor.

3.1.4 *decoy, n*—a person in the search area who does not match the target odor.

3.1.5 *scent, v*—the act of providing the odor or smell of the search subject to a scent-discriminating search dog.

3.1.6 *search dog team (search dog crew), n*—a single dog and handler (and support personnel if used) that operate in the field as a single resource.

3.1.7 *trail, n*—a manmade footpath used for hiking, walking, biking, etc. that traverses a non-urban area of land.

3.1.8 *training log, n*—a search dog handler's written record which documents all personal and canine training, including exercises and missions.

3.2 Terminology not defined in this classification, but included in this guide, may be found in Guide F1847 and Reference SWGDOG SC1.

4. Significance and Use

4.1 An area search dog crew or team is required to have, at a minimum, the knowledge, skills, and abilities outlined within this document.

4.1.1 An area search dog crew or team which meets the requirements in this guide is a Canine Search Resource of the category Area Search Dog as defined in F1848 Standard Classification System for Canine Search Resources.

4.1.2 Additional differentiation of the specific Canine Search Resource is defined in F1848 Standard Classification System for Canine Search Resources.

4.2 This guide only establishes the minimum knowledge, skills, and abilities required for an area search dog crew or team to perform area searches. No other skills are included or implied.

4.3 This guide is an outline of the topics required for training or evaluating an area search dog team or crew, and may be used to assist in the development of a training document or program.

4.4 This guide can be used to evaluate a document to determine if its content includes the topics necessary for training area search dog crews or teams. Likewise, this guide can be used to evaluate an existing training program to see if it meets the requirements in this guide.

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

4.6 Though this guide establishes minimum training requirements, it does not imply that an area search dog team or crew is a "trainee," "probationary," or other similarly termed part of an organization.

4.6.1 The AHJ is responsible for determining the requirements and qualifications for its member ratings.

4.7 An area search dog crew or team shall document training by completion of a position task book, compliant with ASTM F3068, or by field demonstration under qualified supervision. Where proficiency in a skill or ability must be demonstrated, unless stated otherwise it shall be demonstrated for initial qualification, and then as often as required by the AHJ.

5. General Knowledge

5.1 The handler and the canine members of a search dog crew or team shall meet the requirements of ASTM F1847 Standard Guide for Minimum Training of Search Dog Crews or Teams.

5.2 The canine member of a search dog crew or team shall meet the requirements of ASTM F1879 Standard Guide for Basic Obedience and Agility Skills for A Search Dog.

5.3 The canine handler shall have an ASTM F3072 Standard Guide for Intermediate Wilderness GPS/GNSS Use (GPS/GNSS-IIW) Endorsement.

6. Handler Specific Area Search Skills and Abilities

6.1 The handler shall be competent in the application of common effectors of air scent dynamics to area search, including but not limited to:

6.1.1 Weather,

6.1.2 Topography,

6.1.3 Time of day,

6.1.4 Season, and

6.1.5 Scent Source Duration, i.e., the amount of time the subject has been in place.

6.2 The handler shall be competent in the recognition and prediction of air scent movement through topography and the local flora for the operational area that the dog team typically works.

6.3 The handler shall be able to develop an effective strategy to search the area based on topography, environment, and the overall mission goals.

6.4 The AHJ shall determine the physical performance requirements for dog teams' members and develop appropriate performance measurements.

6.4.1 The recommended minimum physical performance requirements for canine handlers fielding as a member of an Area Search Dog Crew or Team is the "Moderate" level as defined in "Work Capacity Testing for Wildland Firefighters" (Appendix X2), or meet the fitness requirements specified by the AHJ.

6.5 The handler shall be competent in debriefing relative to the Area Search Dog Crew's or Team's performance during their operational period.

7. Specific Skills and Abilities for Area Search Dog Crews or Teams

7.1 Area search dog crew or team shall demonstrate the ability to operate safely, effectively, and efficiently for the minimum operational period based on the Type of the dog crew or team as set forth in ASTM F1848 Standard Classification for Search and Rescue Dog Teams.

7.2 Area search dog crews or teams shall demonstrate competency at a frequency identified by the AHJ.

7.3 Area search dog crews or teams shall be able to operate in all seasons in the normal area of operations.

7.4 Area search dog crews or teams shall demonstrate the ability to quickly and efficiently locate one or more subjects using air scenting during area search during the day.

7.4.1 Scent-specific Area Search Dog Teams or Crews shall demonstrate the ability to locate a single target subject with a minimum of two (2) decoy subjects in the search area and where the dog does not alert on the decoys.

7.4.2 Non Area Search Dog Teams or Crews shall demonstrate the ability to locate at minimum two subjects in the search area.

7.4.3 The search area shall be approximately 160 acres (~65 hectares), adjusted in accordance with the National Search Dog Alliance (NSDA) Daytime Acreage Adjustment Chart, December 19, 2008, (Annex A1) to account for variations in temperature, vegetation, terrain, wind, cloud cover, time of day, and number of people in the area.

7.4.4 The subject(s) must be located in 3 hours or less.

7.4.5 The terrain in the test area shall be representative of that in the area search dog crew or team's normal area of operation.

7.5 Area search dog crews or teams shall demonstrate the ability to quickly and efficiently locate one or more subjects using air scenting during area search at night.

7.5.1 Scent-specific Area Dog Teams shall demonstrate the ability to locate a single target subject in the search area.

7.5.2 Non Scent-specific Area Dog Teams shall demonstrate the ability to locate a single subject in the search area.

7.5.3 The search area shall be approximately 40 acres (~16 hectares), adjusted in accordance with the NSDA Nighttime Acreage Adjustment Chart, December 19, 2008, (Annex A2) to account for variations in temperature, vegetation, terrain, and wind.

7.5.4 The subject must be located in 2 hours or less.

7.5.5 The terrain in the test area shall be representative of that in the area search dog crew's or team's normal area of operations.

7.5.6 When testing scent-specific dog teams or crews, there shall be at least one decoy in the test area and the dog shall not alert on the decoy(s).

7.6 Area search dog crews or teams shall demonstrate the ability to quickly and efficiently locate a subject near an established trail using air scenting.

7.6.1 The subject must be located in 2 hours or less.

7.6.2 The test area shall be a trail approximately 1 mile (~1.6 kilometers) long in moderate terrain representative of that in the area search dog crew's or team's normal area of operations, where the air flow is limited by vegetation.

7.6.3 The search subject shall be hidden within 30–50 feet (9–15 m) of the trail.

7.6.4 The dog team shall be limited to one pass down the trail and back , i.e., from start point to end point, and back to the start point.

7.6.5 The handler shall remain within approximately 100 feet (30 m) of the established trail.

7.6.6 The subject must be located in 1 hours or less.

7.7 Area search dog crews or teams shall demonstrate the following in the field:

7.7.1 The handler and canine operate effectively as a team.

7.7.1.1 The canine consistently reacts to target scent during the search.

7.7.1.2 The handler observes and correctly interprets the canine's signals and behavior.

7.7.1.3 The canine and handler remain on task over prolonged periods in a search area that contains few or no positive scent sources.

7.7.2 The handler recognizes areas where the target scent is not present.

8. Record Keeping

8.1 The handler shall maintain complete and accurate training and deployment logs for each canine team.

8.2 These logs must be made available for inspection and review upon the request of the AHJ.

8.3 The AHJ shall determine the requirements for the team's training and mission logs. It is recommended that each training and mission log contain, at minimum, the following information:

8.3.1 Date, time, and duration of all training exercises,

8.3.2 General weather conditions,

8.3.3 General environmental conditions,

8.3.4 General location,

8.3.5 General training scenario and results, and

8.3.6 Issues identified and planned corrective actions.

9. Keywords

9.1 air scent; area search; canine; dog; training log

ANNEXES

(Mandatory Information)

A1. NSDA DAYTIME ACREAGE ADJUSTMENT CHART

A1.1 See Table A1.1 for the NSDA Daytime Acreage Adjustment Chart.

A1.2 No tests should be given when conditions reach the Danger, Extreme Danger or Frostbite zones (see Fig. A1.1). At the discretion of the Evaluator, tests may also be cancelled in other extreme wind or weather conditions.

TABLE A1.1 National Search Dog Alliance: Daytime Acreage Adjustment Chart

Check *ONE* box in each row using your best estimate for the average conditions that will exist during the test.

All ratings to be made at the start of the test based on average predicted conditions: *do not alter acreage if conditions change during the course of the test.*

CONDITIONS	A EXCELLENT	B GOOD	C FAIR	D POOR
Heat Stress/Wind Chill Indexes	☐ 10 to 70°F	☐ 71 to 82°F	☐ 83 to 89°F ☐ 0 to 10°F	☐ over 90°F[A] ☐ below 0°F[A]
Ground Cover	☐ 81% or more open (i.e., almost all of the area is open fields or woodland. Grid searches are readily possible given the type and density of ground cover.)	☐ 65–80% open (i.e., a significant portion of the area is easily passable but there are areas of dense cover. Most portions of the area can be gridded.)	☐ 25–64% easily passable (i.e., a significant portion of the area is covered in dense brush, heavy snow or other obstructions but there are open portions. Many sections cannot be gridded.)	☐ Less than 25% open (i.e., nearly all of the area is covered in dense brush, heavy snow, or other obstructions. Most areas cannot be gridded.)
Elevation Change (high point versus low point or cumulative per 160-Acres)	☐ Level (less than 100 feet change)	☐ Mild climbs (100–299 feet)	☐ Moderate climbs (300–500 feet)	☐ Significant climbs (over 500 feet)
Passersby (number of hikers, joggers, etc. in area)	☐ None	☐ 1/day to 3/hour	☐ More than 4/hour	
Wind	☐ Strong breeze (7 or more mph, but not a gale[A])	☐ Moderate breeze (6–7 mph)	☐ Light breeze (4–5 mph)	☐ No or little wind (0–3 mph)
Cloud Cover	☐ More than 70% low clouds	☐ 70–50% clouds	☐ 49–30% clouds	☐ Less than 30% clouds
6' Shadow (daytime only)	☐ More than 8 feet	☐ 6–8 feet	☐ 3–5 feet	☐ Less than 3 feet
TOTALS: add columns and multiply	A ____ × 0 acres =	B ____ × 4 acres =	C ____ × 8 acres =	D ____ × 18 acres =

Maximum Acreage under excellent conditions	= 160 acres
Total Acreage adjustment: Sum of A + B + C + D	= ____
Subtract adjusted acreage from 160 – (A + B + C + D)	= ____ Total adjusted acres (minimum of 40)

The Evaluator may make acreage adjustments for poor conditions not specified on the adjustment chart (snow, high winds, intense cold, steep drainages, slippery footing, etc.) but only as necessary and never below the 40-acre minimum. The amount and rationale for any adjustment not listed on the chart must be specified on the test form.

[A] No tests should be given when the combination of air temperature and relative humidity is at or above the danger zone or the combination of temperature and wind speed (wind chill) is in the frostbite zone. At the discretion of the Evaluator, tests may be cancelled in extreme wind or other unsafe conditions.

Temperature (°F)

Relative Humidity (%)	80	82	84	86	88	90	92	94	96	98	100	102	104	106	108	110
40	80	81	83	85	88	91	94	97	101	105	109	114	119	124	130	136
45	80	82	84	87	89	93	96	100	104	109	114	119	124	130	137	
50	81	83	85	88	91	95	99	103	108	113	118	124	131	137		
55	81	84	86	89	93	97	101	106	112	117	124	130	137			
60	82	84	88	91	95	100	105	110	116	123	129	137				
65	82	85	89	93	98	103	108	114	121	128	136					
70	83	86	90	95	100	105	112	119	126	134						
75	84	88	92	97	103	109	116	124	132							
80	84	89	94	100	106	113	121	129								
85	85	90	96	102	110	117	126	135								
90	86	91	98	105	113	122	131									
95	86	93	100	108	117	127										
100	87	95	103	112	121	132										

Likelihood of Heat Disorders with Prolonged Exposure or Strenuous Activity

Caution Extreme Caution Danger Extreme Danger

Source: http://www.weather.gov/om/heat/index.shtml)

New Wind Chill Chart

Wind (mph)

Temperature (°F)	Calm	5	10	15	20	25	30	35	40	45	50	55	60
40	36	34	32	30	29	28	28	27	26	26	25	25	
35	31	27	25	24	23	22	21	20	19	19	18	17	
30	25	21	19	17	16	15	14	13	12	12	11	10	
25	19	15	13	11	9	8	7	6	5	4	4	3	
20	13	9	6	4	3	1	0	−1	−2	−3	−3	−4	
15	7	3	0	−2	−4	−5	−7	−8	−9	−10	−11	−11	
10	1	−4	−7	−9	−11	−12	−14	−15	−16	−17	−18	−19	
5	−5	−10	−13	−15	−17	−19	−21	−22	−23	−24	−25	−26	
0	−11	−16	−19	−22	−24	−26	−27	−29	−30	−31	−32	−33	
−5	−16	−22	−26	−29	−31	−33	−34	−36	−37	−38	−39	−40	
−10	−22	−28	−32	−35	−37	−39	−41	−43	−44	−45	−46	−48	
−15	−28	−35	−39	−42	−44	−46	−48	−50	−51	−52	−54	−55	
−20	−34	−41	−45	−48	−51	−53	−55	−57	−58	−60	−61	−62	
−25	−40	−47	−51	−55	−58	−60	−62	−64	−65	−67	−68	−69	
−30	−46	−53	−58	−61	−64	−67	−69	−71	−72	−74	−75	−76	
−35	−52	−59	−64	−68	−71	−73	−76	−78	−79	−81	−82	−84	
−40	−57	−66	−71	−74	−78	−80	−82	−84	−86	−88	−89	−91	
−45	−63	−72	−77	−81	−84	−87	−89	−91	−93	−95	−97	−98	

Frostbite occurs in 15 minutes or less

$$\text{Wind Chill (°F)} = 35.74 + 0.6215T - 35.75(V^{0.16}) + 0.4275T(V^{0.16})$$

Where, T = Air Temperature (°F)
V = Wind Speed (mph)

Source: http://www.erh.noaa.gov/er/iln/tables.htm#wind%20chill

No tests should be given when conditions reach the Danger, Extreme Danger or Frostbite zones. At the discretion of the Evaluator tests may also be cancelled in other extreme wind or weather conditions.

FIG. A1.1 Heat and Wind Chill Chart

A2. NSDA NIGHTTIME ACREAGE ADJUSTMENT CHART

A2.1 See Table A2.1 for the NSDA Nighttime Acreage Adjustment Chart.

A2.2 No tests should be given when conditions reach the Danger, Extreme Danger or Frostbite zones (see Fig. A2.1). At the discretion of the Evaluator, tests may also be cancelled in other extreme wind or weather conditions.

TABLE A2.1 National Search Dog Alliance: Nighttime Acreage Adjustment Chart

Check *ONE* box in each row using your best estimate for the average conditions that will exist during the test.

All ratings to be made at the start of the test based on average predicted conditions: *do not alter acreage if conditions change during the course of the test.*

CONDITIONS	A EXCELLENT	B GOOD	C FAIR	D POOR
Heat Stress/Wind Chill Indexes	☐ 10 to 70°F	☐ 71 to 82°F	☐ 83 to 89°F ☐ 0 to 10°F	☐ over 90°F[A] ☐ below 0°F[A]
Ground Cover	☐ 81% or more open (i.e., almost all of the area is open fields or woodland. Grid searches are readily possible given the type and density of ground cover.)	☐ 65–80% open (i.e., a significant portion of the area is easily passable but there are areas of dense cover. Most portions of the area can be gridded.)	☐ 25–64% easily passable (i.e., a significant portion of the area is covered in dense brush, heavy snow or other obstructions but there are open portions. Many sections cannot be gridded.)	☐ Less than 25% open (i.e., nearly all of the area is covered in dense brush, heavy snow, or other obstructions. Most areas cannot be gridded.)
Elevation Change (high point versus low point or cumulative per 40-Acres)	☐ Level (less than 100 feet change)	☐ Mild climbs (100–200 feet)	☐ Moderate climbs (200–300 feet)	☐ Significant climbs (over 300 feet)
Wind	☐ Strong breeze (7 or more mph, but not a gale[A])	☐ Moderate breeze (6–7 mph)	☐ Light breeze (4–5 mph)	☐ No or little wind (0–3 mph)
TOTALS: add columns and multiply	A ____ × 0 acres =	B ____ × 2 acres =	C ____ × 3 acres =	D ____ × 5 acres =

Maximum Night Acreage under excellent conditions	= 40 acres
Total Acreage adjustment: Sum of A + B + C + D	= ____
Subtract adjusted acreage from 40 – (A + B + C + D)	= ____ Total adjusted acres (minimum of 20)

The Evaluator may make acreage adjustments for poor conditions not specified on the adjustment chart (snow, high winds, intense cold, steep drainages, slippery footing, etc.) but only as necessary and never below the 20-acre minimum. The amount and rationale for any adjustment not listed on the chart must be specified on the test form.

[A] No tests should be given when the combination of air temperature and relative humidity (heat stress) is at or above the danger zone or the combination of temperature and wind speed (wind chill) is in the frostbite zone. At the discretion of the Evaluator, tests may be cancelled in extreme wind, hazards that are not visible at night or other unsafe conditions.

Temperature (°F)

Relative Humidity (%)	80	82	84	86	88	90	92	94	96	98	100	102	104	106	108	110
40	80	81	83	85	88	91	94	97	101	105	109	114	119	124	130	136
45	80	82	84	87	89	93	96	100	104	109	114	119	124	130	137	
50	81	83	85	88	91	95	99	103	108	113	118	124	131	137		
55	81	84	86	89	93	97	101	106	112	117	124	130	137			
60	82	84	88	91	95	100	105	110	116	123	129	137				
65	82	85	89	93	98	103	108	114	121	128	136					
70	83	86	90	95	100	105	112	119	126	134						
75	84	88	92	97	103	109	116	124	132							
80	84	89	94	100	106	113	121	129								
85	85	90	96	102	110	117	126	135								
90	86	91	98	105	113	122	131									
95	86	93	100	108	117	127										
100	87	95	103	112	121	132										

Likelihood of Heat Disorders with Prolonged Exposure or Strenuous Activity

Caution Extreme Caution Danger Extreme Danger

Source: http://www.weather.gov/om/heat/index.shtml)

New Wind Chill Chart

Wind (mph)

Temperature (°F)	Calm	5	10	15	20	25	30	35	40	45	50	55	60
	40	36	34	32	30	29	28	28	27	26	26	25	25
	35	31	27	25	24	23	22	21	20	19	19	18	17
	30	25	21	19	17	16	15	14	13	12	12	11	10
	25	19	15	13	11	9	8	7	6	5	4	4	3
	20	13	9	6	4	3	1	0	−1	−2	−3	−3	−4
	15	7	3	0	−2	−4	−5	−7	−8	−9	−10	−11	−11
	10	1	−4	−7	−9	−11	−12	−14	−15	−16	−17	−18	−19
	5	−5	−10	−13	−15	−17	−19	−21	−22	−23	−24	−25	−26
	0	−11	−16	−19	−22	−24	−26	−27	−29	−30	−31	−32	−33
	−5	−16	−22	−26	−29	−31	−33	−34	−36	−37	−38	−39	−40
	−10	−22	−28	−32	−35	−37	−39	−41	−43	−44	−45	−46	−48
	−15	−28	−35	−39	−42	−44	−46	−48	−50	−51	−52	−54	−55
	−20	−34	−41	−45	−48	−51	−53	−55	−57	−58	−60	−61	−62
	−25	−40	−47	−51	−55	−58	−60	−62	−64	−65	−67	−68	−69
	−30	−46	−53	−58	−61	−64	−67	−69	−71	−72	−74	−75	−76
	−35	−52	−59	−64	−68	−71	−73	−76	−78	−79	−81	−82	−84
	−40	−57	−66	−71	−74	−78	−80	−82	−84	−86	−88	−89	−91
	−45	−63	−72	−77	−81	−84	−87	−89	−91	−93	−95	−97	−98

Frostbite occurs in 15 minutes or less

$$\text{Wind Chill (°F)} = 35.74 + 0.6215T - 35.75(V^{0.16}) + 0.4275T(V^{0.16})$$

Where, T = Air Temperature (°F)
V = Wind Speed (mph)

Source: http://www.erh.noaa.gov/er/iln/tables.htm#wind%20chill

No tests should be given when conditions reach the Danger, Extreme Danger or Frostbite zones. At the discretion of the Evaluator, tests may also be cancelled in other extreme wind or weather conditions.

FIG. A2.1 Heat and Wind Chill Chart

APPENDIXES

(Nonmandatory Information)

X1. GOALS AND PHILOSOPHY OF COMPETENCY TESTING

X1.1 The competencies identified in this standard are from the Search Management perspective and have been identified as being important for operational performance. The very nature of defining fixed tests while testing biological systems has distinct caveats that need to be appreciated and understood. These issues only serve to bring focus to the concept that this Guide's attempts to capture, Competency, while testing and observing handlers and their dog in real time.

X1.2 Essentially, the testing and qualification of a dog team attempts to quantitatively measure a set of parameters in a system that is inherently qualitative. A dog, a biological detector, is tasked with detecting a signal, scent, which is being dynamically impacted by a multitude of factors real time. The reading and interpretation of the biological is then occurring by a secondary biological detector, the handler, who is being dynamically impacted by a separate set of factors real time. Further complicating the scenario is the fact that the primary biological detector, the dog, is detecting a signal that is essentially undetectable by the handler (or evaluators). Therefore, it is unreasonable to focus on a simple quantitative solution (test) for the qualification of dogs. Instead the concept of competency moves to the forefront of a qualification system.

X1.3 Fixed tests can be used to provide a quantitative measure of the dog (or dog team) but it is ill advised. Instead, tests should be used to develop a reasonable testing paradigm where a handler's and dog's competency is judged. Consider the following scenario, a handler and dog being testing under the quantitative parameters for a 40 acre area search test on flat open terrain only covers 0.5 acres of the total area in 59 minutes and locates the subject who is not placed in any unusual fashion. Although the handler and dog in question passed according to the quantitative parameters, a strong argument can be put forth that the handler failed to display the competency required to operate as the typical SAR resource would be expected to operate.

X1.4 Every effort has been made to reflect this philosophy of competency based testing in this guide. Whenever possible specific quantitative stipulations have been avoided, instead general parameters are provided so that AHJs and certifying organizations can develop the specific criteria for their local or specific conditions. AHJs and certifying organizations are encouraged to utilize this Guide to help identify and define critical competencies for certification or credentialing. The challenge for AHJs and organizations is, while using this Guide, to develop the fair but subjective measures that are required to determine competency while ensuring professionalism and interagency operability.

X1.5 In developing this Guide, the task group reviewed standards from dog organizations from around the United States and the world. During that review process, various competencies were identified and adopted into this Guide. Simultaneously, every effort has been made to ensure that this Guide provides a reasonable pathway ensuring operational competency while not being overly complicated or difficult for AHJs and organizations to utilize.

X2. WORK CAPACITY TESTS

X2.1 The United States Forest Service (USFS) defines 3 work capacity tests for wildland firefighters. The information presented in this appendix has been obtained from the USFS website (http://www.fs.fed.us/fire/safety/wct/wct_index.html).

X2.2 The three levels are defined as following:

X2.2.1 *Arduous work* involves above average endurance (aerobic fitness), lifting more than 50 pounds (22.7 kg) (muscular fitness), and occasional demands for extraordinarily strenuous activities. All wildland firefighters perform arduous duty.

X2.2.2 *Moderate work* involves lifting 25–50 pounds (11.3–22.7 kg), and occasional demand for moderately strenuous activity. Safety officers and fire behavior officers perform moderate duty.

X2.2.3 *Light work* involves mainly office-type work with occasional field activity.

X2.3 The work capacity tests for each level are defined in the following table:

Fitness Requirement	Test	Description
Arduous	Pack Test	3-mile (4.8 km) hike with 45-pound (20.4 kg) pack in 45 min
Moderate	Field Test	2-mile (3.2 km) hike with 25-pound (11.3 kg) pack in 30 min
Light	Walk Test	1-mile (1.6 km) hike in 16 min no pack

X2.4 All tests are to be conducted on level ground and the USFS defines time adjustments for altitude.