

## Fire Equipment Development Needs Ratings for Local Respondents - Presented in Questionnaire Order

**Total Local Responses = 24**

N = Number of Persons Responding to Each Question

	N	Overall Average	Males	Females
1 What government agency do you work with:				
2 Which agency do you work with:				
3 What state is your office in:				
4 What wildland fire organization are you attached to:				
5 What is your job title:				
6 Top 3 red card qualifications you fill during fire season:				
7 Years of experience in wildland fire protection:	24	15.6		
8 Gender:	24		24	0
9 Weight in pounds:	24	197.9		
10 Height in inches:	24	71.0		

See PowerPoint pie charts for statistical details on these first 10 variables.

N = Number of Persons Responding to Each Question

Rating Categories	N	Total Number Each Category			Valid % Each Category			Overall Average
		No Need	Low Priority	High Priority	No Need	Low Priority	High Priority	

Please rate the degree of need for development of new products or technology:

AERIAL OPERATIONS									
11a	Greater Consistency of drop height for airtankers.	18	3	13	2	16.7%	72.2%	11.1%	2.17
11b	Produce more consistent, accurate drop patterns.	19	2	11	6	10.5%	57.9%	31.6%	2.74
11c	Produce more consistent fixed wing drop patterns.	18	2	10	6	11.1%	55.6%	33.3%	2.83
11d	Deliver/retrieve fire supplies without landing.	19	3	12	4	15.8%	63.2%	21.1%	2.05
11e	Increase capacity Type 1 helicopter water drops.	18	3	10	5	16.7%	55.6%	27.8%	2.39
11f	Increase capacity Type 1 helicopter bucket drops.	17	3	8	6	17.6%	47.1%	35.3%	2.59
11g	Improve Type 1 helicopter/helibucket performance.	18	2	10	6	11.1%	55.6%	33.3%	2.67
11h	Increase accuracy Type 2 & 3 helicopter drops.	19	2	15	2	10.5%	78.9%	10.5%	2.37
11i	Increase capacity Type 2 & 3 helicopter bucket drops.	19	3	13	3	15.8%	68.4%	15.8%	2.37
11j	More accurate Type 2 & 3 helicopter bucket drops.	19	2	13	4	10.5%	68.4%	21.1%	2.53
11k	Increase capacity Type 2 & 3 helicopter bucket drops.	19	3	13	3	15.8%	68.4%	15.8%	2.32
11l	Improve reliability/quality of helicopter water bucket.	18	2	12	4	11.1%	66.7%	22.2%	2.50
11m	Improve quality flight helmet microphones/pigtails.	18	3	11	4	16.7%	61.1%	22.2%	2.28
11n	Develop cold weather flame-resistant flight suits.	17	5	10	2	29.4%	58.8%	11.8%	1.71
11o	Develop cold weather personal protective accessories.	18	3	10	5	16.7%	55.6%	27.8%	2.28
11p	More comfortable flame-resistant flight flight suits.	17	3	13	1	17.6%	76.5%	5.9%	2.12
11q	Develop contaminant-free helicopter fuel storage.	17	3	12	2	17.6%	70.6%	11.8%	2.00
11r	Improved helicopter seats to reduce spine injuries.	17	2	8	7	11.8%	47.1%	41.2%	2.76

11s	Develop multipurpose collapsible litter f/helicopters.	18	1	12	5	5.6%	66.7%	27.8%	2.89
11t	Improve mixing, handling, transport of retardants.	17	3	13	1	17.6%	76.5%	5.9%	2.06
11u	Improve quality of the flight helmet.	17	3	12	2	17.6%	70.6%	11.8%	2.06
11v	Improve environmental management of chemicals.	17	3	13	1	17.6%	76.5%	5.9%	1.82
11w	Improve snorkel systems for helitankers.	17	3	11	3	17.6%	64.7%	17.6%	2.12
11x	Improve aerial ignition systems for prescribed burns.	16	3	13	0	18.8%	81.3%	0.0%	2.00
11y	Improve rappel hardware for available helicopters.	17	2	10	5	11.8%	58.8%	29.4%	2.65
11z	Develop equipment for helibase management facilities.	17	2	13	2	11.8%	76.5%	11.8%	2.41

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ENGINES AND WATER TENDERS		N	Total Number Each Category			Valid % Each Category			Overall Average
			No Need	Low Priority	High Priority	No Need	Low Priority	High Priority	
13a	Improve compressed air foam systems.	23	0	12	11	0.0%	52.2%	47.8%	3.39
13b	Reduce noise levels for apparatus operations.	23	2	9	12	8.7%	39.1%	52.2%	3.17
13c	Improve engine mobility in rough and steep terrain.	23	2	11	10	8.7%	47.8%	43.5%	3.09
13d	Develop standardized engines across agencies.	23	1	9	13	4.3%	39.1%	56.5%	3.43
13e	Improve engines to meet HAZMAT exposure.	22	1	13	8	4.5%	59.1%	36.4%	3.14
13f	Improve storage capacity for equipment on engines.	23	1	8	14	4.3%	34.8%	60.9%	3.61
13g	Improve long-term chemical suppressants/equipment.	23	2	10	11	8.7%	43.5%	47.8%	3.13
13h	Improve electronic identifiers/locators for engines.	23	0	10	13	0.0%	43.5%	56.5%	3.57
13i	Develop a standardized family of engines.	23	0	7	16	0.0%	30.4%	69.6%	3.78
13j	Improve aspirated air proportioner foam system.	23	1	12	10	4.3%	52.2%	43.5%	2.96
13k	More clearly define role of water tenders in engines.	23	1	8	14	4.3%	34.8%	60.9%	3.52
13l	Include more safety features in engine design.	23	1	9	13	4.3%	39.1%	56.5%	3.22
13m	Improve foam application equipment for engines.	23	1	9	13	4.3%	39.1%	56.5%	3.39

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FOAM APPLICATION EQUIPMENT		N	Total Number Each Category			Valid % Each Category			Overall Average
			No Need	Low Priority	High Priority	No Need	Low Priority	High Priority	
15a	Improve application rate info for foam applicators.	23	1	16	6	4.3%	69.6%	26.1%	2.83
15b	Develop a towable foam application unit.	23	5	13	5	21.7%	56.5%	21.7%	1.83
15c	Improve specs and selection guide for foam systems.	23	1	15	7	4.3%	65.2%	30.4%	2.91
15d	Improve chemical suppressants f/engines & equipment.	23	1	13	9	4.3%	56.5%	39.1%	3.13

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WATER HANDLING EQUIPMENT		N	Total Number Each Category			Valid % Each Category			Overall Average
			No Need	Low Priority	High Priority	No Need	Low Priority	High Priority	
17a	Modify an All Terrain Vehicle to carry water.	23	3	11	9	13.0%	47.8%	39.1%	3.00
17b	Develop high-capacity hose maintenance equipment.	23	3	15	5	13.0%	65.2%	21.7%	2.52
17c	Develop identification system for marking fire hose.	22	1	12	9	4.5%	54.5%	40.9%	2.91
17d	Modify sprinkler technology to contain a fire.	23	1	13	9	4.3%	56.5%	39.1%	3.26

17e	Improve chemical suppressants used w/water equip.	23	1	11	11	4.3%	47.8%	47.8%	3.30
17f	Develop delivery systems f/ground chemical suppressants	23	1	12	10	4.3%	52.2%	43.5%	3.26
17g	Improve information on ground application rates.	23	1	16	6	4.3%	69.6%	26.1%	2.70
17h	Expand line of water handling accessories.	23	1	13	9	4.3%	56.5%	39.1%	3.04
17i	Improve lightweight hose with rugged characteristics.	23	0	8	15	0.0%	34.8%	65.2%	3.96
17j	Improve quick coupling fittings.	23	6	11	6	26.1%	47.8%	26.1%	2.09

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DOZER AND TRACTOR PLOWS		N	Total Number Each Category			Valid % Each Category			Overall Average
			No Need	Low Priority	High Priority	No Need	Low Priority	High Priority	
19a	Systems to correct environmental damage by dozers.	16	1	13	2	6.3%	81.3%	12.5%	2.38
19b	Improve communications with the dozer operator.	18	0	6	12	0.0%	33.3%	66.7%	3.83
19c	Protection of dozer operator from smoke and dust.	16	0	7	9	0.0%	43.8%	56.3%	3.50
19d	Improve towable cargo and water hauling capacity.	17	1	15	1	5.9%	88.2%	5.9%	2.53
19e	Develop a dozer blade to cut a narrower fireline.	16	2	12	2	12.5%	75.0%	12.5%	2.06
19f	Develop alternative construction techniques f/dozers.	16	2	9	5	12.5%	56.3%	31.3%	2.69
19g	Develop foam capacity for dozers.	17	3	10	4	17.6%	58.8%	23.5%	2.18
19h	Develop dozer brush rakes to construct control lines.	16	1	12	3	6.3%	75.0%	18.8%	2.56
19i	Improve dozer safety equipment.	16	1	6	9	6.3%	37.5%	56.3%	3.50
19j	Improve dozer identifier and locators.	17	0	7	10	0.0%	41.2%	58.8%	3.47
19k	Develop a fireline burnout system for dozer plows.	16	1	9	6	6.3%	56.3%	37.5%	2.94

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LINE CONSTRUCTION AND MOP-UP		N	Total Number Each Category			Valid % Each Category			Overall Average
			No Need	Low Priority	High Priority	No Need	Low Priority	High Priority	
21a	System to mark fireline on ridges & canyons from the air.	23	0	13	10	0.0%	56.5%	43.5%	3.22
21b	Develop standardized color-coded flagging for trees.	23	0	6	17	0.0%	26.1%	73.9%	4.17
21c	Develop means of cutting through heavy down fuels.	23	1	7	15	4.3%	30.4%	65.2%	3.70
21d	Transportable lightweight mechanical line digger.	23	2	9	12	8.7%	39.1%	52.2%	3.30
21e	Hand tools that are more effective and less fatiguing.	23	1	10	12	4.3%	43.5%	52.2%	3.65
21f	Power tools that are more effective and less fatiguing.	23	1	11	11	4.3%	47.8%	47.8%	3.52
21g	Develop lighter, more powerful chain saws.	23	1	10	12	4.3%	43.5%	52.2%	3.61
21h	Improve safety design of tools.	23	2	11	10	8.7%	47.8%	43.5%	3.09
21i	Improve equipment to build fireline w/minimal damage.	23	1	18	4	4.3%	78.3%	17.4%	2.43
21j	Improve the variety of fireline explosives.	22	1	14	7	4.5%	63.6%	31.8%	2.73
21k	Improve selection and capacity of firing devices.	23	0	13	10	1.0%	56.5%	43.5%	3.17
21l	Develop a mechanical line digger.	23	1	13	9	4.3%	56.5%	39.1%	2.96
21m	Develop portable lightweight sprinkler mopup system.	23	0	12	11	0.0%	52.2%	47.8%	3.48
21n	Improve foam technology for mopup.	23	0	12	11	0.0%	52.2%	47.8%	3.43
21o	Improve labor-saving technologies for mopup.	21	0	10	11	0.0%	47.6%	52.4%	3.76
21p	Update catalog on hand-held infrared sensing devices.	22	0	11	11	0.0%	50.0%	50.0%	3.32

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INFO COLLECTION & EVALUATION		N	Total Number Each Category			Valid % Each Category			Overall Average
			No Need	Low Priority	High Priority	No Need	Low Priority	High Priority	
23a	Develop fast, accurate resource location and allocation.	23	0	6	17	0.0%	26.1%	73.9%	4.00
23b	Develop lightweight, portable night vision device.	23	0	13	10	0.0%	56.5%	43.5%	3.43
23c	Improve Global Positioning System to locate persons.	23	0	5	18	0.0%	21.7%	78.3%	3.91
23d	FLIR system to collect fireline imagery at night.	23	0	9	14	0.0%	39.1%	60.9%	3.57
23e	Improve effective use of information dissemination.	23	0	6	17	0.0%	26.1%	73.9%	3.91
23f	Improve fire weather information dissemination.	23	0	4	19	0.0%	17.4%	82.6%	4.17
23g	Improve remote site 24-hour weather monitoring.	23	1	9	13	4.3%	39.1%	56.5%	3.48
23h	Improve use of fire weather data.	23	0	8	15	0.0%	34.8%	65.2%	3.65
23i	Fire detection system for unstaffed lookout towers.	22	1	10	11	4.5%	45.5%	50.0%	3.23
23j	Develop a real-time satellite fire detection system.	22	0	11	11	0.0%	50.0%	50.0%	3.55
23k	Develop maps with latitude and longitude grids.	23	0	6	17	0.0%	26.1%	73.9%	4.00
23l	Develop technology for locating fires from towers.	23	1	10	12	4.3%	43.5%	52.2%	3.30
23m	Develop lightning detection system to predict ignition.	23	1	7	15	4.3%	30.4%	65.2%	3.52
23n	Handheld infrared imager for ground fire location.	22	1	8	13	4.5%	36.4%	59.1%	3.55

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LOGISTICS		N	Total Number Each Category			Valid % Each Category			Overall Average
			No Need	Low Priority	High Priority	No Need	Low Priority	High Priority	
25a	Develop an integrated fire camp electrical system.	22	1	11	10	4.5%	50.0%	45.5%	3.27
25b	Improve methods of insect control around fire camps.	22	1	9	12	4.5%	40.9%	54.5%	3.36
25c	Improve sleeping bags and pads.	22	0	11	11	0.0%	50.0%	50.0%	3.64
25d	Develop one-person sleeping tents.	22	4	11	7	18.2%	50.0%	31.8%	2.77
25e	Fire camp modules for uniformity of equipment.	22	0	14	8	0.0%	63.6%	36.4%	3.36
25f	Improve hot and cold food containers.	22	0	12	10	0.0%	54.5%	45.5%	3.23
25g	Means of getting people/supplies to remote camps.	22	0	13	9	0.0%	59.1%	40.9%	3.32
25h	Improve safety for transporting liquid fuels.	22	1	14	7	4.5%	63.6%	31.8%	2.95
25i	System for tracking and displaying resource allocation.	22	0	11	11	0.0%	50.0%	50.0%	3.36
25j	Design items so they can be easily recycled.	22	0	15	7	0.0%	68.2%	31.8%	2.91

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PERSONNEL		N	Total Number Each Category			Valid % Each Category			Overall Average
			No Need	Low Priority	High Priority	No Need	Low Priority	High Priority	
27a	Improve fire shelters.	23	0	9	14	0.0%	39.1%	60.9%	3.83
27b	Improve single-unit headlamps.	23	1	7	15	4.3%	30.4%	65.2%	3.61
27c	Improve low heat-stress protective clothing.	23	1	2	20	4.3%	8.7%	87.0%	4.13
27d	Improve devices to protect face from radiant heat.	23	1	7	15	4.3%	30.4%	65.2%	3.78
27e	Non-fog goggles with scratch-resistant lenses.	23	0	4	19	0.0%	17.4%	82.6%	4.30

27f	Info on significance of carbon monoxide hazards.	23	0	12	11	0.0%	52.2%	47.8%	3.35
27g	Info on fine particulate hazards during firefighting.	23	0	12	11	0.0%	52.2%	47.8%	3.30
27h	Reduce exposure to smoke with breathing devices.	23	0	14	9	0.0%	60.9%	39.1%	3.09
27i	Improve reflective material for fire safety clothing.	23	0	7	16	0.0%	30.4%	69.6%	3.91
27j	Improve hardhats to meet impact, penetration, heat.	23	1	8	14	4.3%	34.8%	60.9%	3.48
27k	Equipment carrying vest of a tough fishnet fabric.	22	1	7	14	4.5%	31.8%	63.6%	3.64
27l	Improve the fireline pack for hand crews.	23	2	5	16	8.7%	21.7%	69.6%	3.87
27m	Fire-resistant clothing and gear for cold weather.	23	1	9	13	4.3%	39.1%	56.5%	3.57

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TRANSPORTATION		N	Total Number Each Category			Valid % Each Category			Overall Average
			No Need	Low Priority	High Priority	No Need	Low Priority	High Priority	
29a	More use of All Terrain Vehicles (ATVs).	23	1	12	10	4.3%	52.2%	43.5%	3.30
29b	Specifications for vehicles for crew transport.	22	0	13	9	0.0%	59.1%	40.9%	3.59
29c	Evaluate suitability of the color of F.S. vehicles.	22	8	8	6	36.4%	36.4%	27.3%	2.05
29d	Establish standard markings and lighting for vehicles.	23	1	11	11	4.3%	47.8%	47.8%	3.22
29e	Improve existing systems to transport liquid fuels.	23	4	12	7	17.4%	52.2%	30.4%	2.43
29f	Develop Off Highway Vehicle (OHV) personnel carrier.	23	4	12	7	17.4%	52.2%	30.4%	2.57

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DISPATCHING		N	Total Number Each Category			Valid % Each Category			Overall Average
			No Need	Low Priority	High Priority	No Need	Low Priority	High Priority	
31a	System for tracking and displaying resources.	21	0	8	13	0.0%	38.1%	61.9%	3.95
31b	Improve accountability for cache inventory.	21	1	11	9	4.8%	52.4%	42.9%	3.24
31c	Improve interface between dispatch and vehicles.	21	1	9	11	4.8%	42.9%	52.4%	3.52
31d	Improve means of locating people while off-duty.	21	2	8	11	9.5%	38.1%	52.4%	3.33

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COMMUNICATIONS		N	Total Number Each Category			Valid % Each Category			Overall Average
			No Need	Low Priority	High Priority	No Need	Low Priority	High Priority	
33a	Improve communications systems in vehicles.	23	1	10	12	4.3%	43.5%	52.2%	3.48
33b	Improve the hand-held communication system.	23	0	6	17	0.0%	26.1%	73.9%	4.04
33c	Satellite or microwave links to reduce isolation.	23	0	5	18	0.0%	21.7%	78.3%	4.04
33d	VHF repeater for communication with helicopters.	23	1	10	12	4.3%	43.5%	52.2%	3.70
33e	Improve incident repeater systems.	23	0	8	15	0.0%	34.8%	65.2%	3.91
33f	Reduce dead spots in radio communications.	23	0	5	18	0.0%	21.7%	78.3%	4.17
33g	Establish common command channels among agencies.	23	0	5	18	0.0%	21.7%	78.3%	4.30
33h	Improve compatibility of communication equipment.	23	0	4	19	0.0%	17.4%	82.6%	4.43
33i	Improve radio mounts for vehicles.	23	3	13	7	13.0%	56.5%	30.4%	2.61
33j	Establish recycle power source for hand-held radios.	23	0	14	9	0.0%	60.9%	39.1%	3.43

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PREVENTION - GENERAL		N	Total Number Each Category			Valid % Each Category			Overall Average
			No Need	Low Priority	High Priority	No Need	Low Priority	High Priority	
35a	Improve spark arrester systems.	22	1	17	4	4.5%	77.3%	18.2%	2.45
35b	Develop a spark arrester guide.	22	1	15	6	4.5%	68.2%	27.3%	2.55
35c	Inspection process for residences/power lines/equip.	22	1	8	13	4.5%	36.4%	59.1%	3.45
35d	Improve the Smokey Bear suit.	20	5	14	1	25.0%	70.0%	5.0%	1.60
35e	Improve poster material to withstand weather.	22	3	15	4	13.6%	68.2%	18.2%	2.18
35f	Improve visibility of poster material.	22	3	16	3	13.6%	72.7%	13.6%	2.23
35g	Improve content of posters.	22	3	17	2	13.6%	77.3%	9.1%	1.77
35h	Improve resistance of posters to vandalism.	22	4	13	5	18.2%	59.1%	22.7%	2.14
35i	Improve bilingual posters and fire prevention materials.	22	5	13	4	22.7%	59.1%	18.2%	2.05
35j	Improve investigation tools and equipment.	22	1	14	7	4.5%	63.6%	31.8%	2.95
35k	Improve fire prevention audiovisual support equipment.	22	1	12	9	4.5%	54.5%	40.9%	2.91

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FUELS MANAGEMENT		N	Total Number Each Category			Valid % Each Category			Overall Average
			No Need	Low Priority	High Priority	No Need	Low Priority	High Priority	
37a	Info on cost/production of fuel management techniques.	18	3	10	5	16.7%	55.6%	27.8%	2.33
37b	Develop a system to gather and cut firewood/fuelwood.	18	2	10	6	11.1%	55.6%	33.3%	2.61
37c	Efficient method of reducing fuel in young plantations.	18	2	12	4	11.1%	66.7%	22.2%	2.39
37d	Improve ground ignition systems for prescribed burning.	18	2	13	3	11.1%	72.2%	16.7%	2.17
37e	Improve sprinkler technology f/retardant effect of water.	19	3	9	7	15.8%	47.4%	36.8%	2.84
37f	Improve aerial ignition systems.	18	2	12	4	11.1%	66.7%	22.2%	2.00
37g	Improve mixing/application guidelines for fuel gelling.	17	3	7	7	17.6%	41.2%	41.2%	2.44
37h	Develop a king-size (approx. 200 gallons) helitorch.	17	3	11	3	17.6%	64.7%	17.6%	2.53
37i	Develop minimal environmental impact fireline.	17	3	10	4	17.6%	58.8%	23.5%	1.76
37j	Improve material to cover machine and hand piles.	18	3	13	2	16.7%	72.2%	11.1%	2.00
37k	Chemical systems to replace hand line broadcast burning	17	3	12	2	17.6%	70.6%	11.8%	1.94
37l	System to pre-treat leave trees in underburning ops.	17	3	12	2	17.6%	70.6%	11.8%	2.35

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OTHER		N	Total Number Each Category			Valid % Each Category			Overall Average
			No Need	Low Priority	High Priority	No Need	Low Priority	High Priority	
39a	Improve the standard trauma kit.	22	0	10	12	0.0%	45.5%	54.5%	2.12
39b	Improve individual first aid kits.	22	1	9	12	4.5%	40.9%	54.5%	3.50
39c	Improve crew (belt) first aid kits.	22	1	9	12	4.5%	40.9%	54.5%	3.36
39d	Improve mass casualty equipment.	22	0	14	8	0.0%	63.6%	36.4%	3.45
39e	Improve Blood Borne Pathogens (BBP) equipment.	22	1	11	10	4.5%	50.0%	45.5%	3.00
39f	Improve injured employee transport system.	22	0	10	12	0.0%	45.5%	54.5%	3.09
39g	Improve equipment to mitigate HAZMAT exposures.	22	1	12	9	4.5%	54.5%	40.9%	3.64