III. COMMUNITY MITIGATION PLAN

This section outlines Maricopa County CWPP priorities for wildland fuels treatments, as well as the recommended methods of treatment and management strategies for mitigating the potential spread of catastrophic wildland fire throughout the WUI. This section also presents recommendations for enhanced wildland fire protection capabilities and public education, information, and outreach.

A. Fuel Reduction Priorities

After determining the areas at greatest risk for wildland fire (Section II of this CWPP), the Core Teams developed a series of proposed actions, including residential treatments; a series of firebreaks appropriate for the wildland fuel types; and fuel mitigation treatments for undeveloped landscape areas (Table 3.1). The Core Teams have proposed wildland fire mitigation projects for at-risk public, tribal trust, and private lands. These proposed actions are recommended to prevent wildfire spread from public lands onto private land and, conversely, to reduce the risk of fires spreading from private land onto public lands by reducing wildland fuels and creating a defensible space for wildland firefighters. A primary goal of the Maricopa County CWPP is for proposed treatments to be continuous across property boundaries, allowing for the most effective protection from wildfires.

Hazardous fuels reduction recommendations on public lands vary by constituting either a single firebreak in appropriate width and length within the WUI or broader land treatment applications of wildland fuel reduction and habitat restorations within the WUI. Additional firebreaks or hazardous fuels reduction projects may be developed over time and will conform to the types of treatment recommendations developed by the Core Teams. The MCDEM, ASFD, TNF, BLM, tribal and local fire departments and districts, and the Core Teams' participating resource specialists developed firebreak recommendations by vegetative fuel types. These recommendations are based on firebrand movement during the peak fire season under normal seasonal weather conditions in relation to slope and fuel type. The recommended land treatments and fuelbreaks will enhance public and firefighter safety, provide for community value protection, enhance restoration of native vegetation, and provide for wildlife habitat needs. Several designated wilderness areas are within or adjacent to the Maricopa County CWPP WUI: North and South Maricopa Mountains, Sierra Estrella, Hummingbird Springs, Big Horn Mountains, Signal Mountains, Woolsey Peak, Mazatal, Four Peaks, and Superstition Wilderness areas. Wildland fuel mitigation treatments within wilderness areas will be conducted by BLM and TNF under appropriate wilderness regulations. The Core Teams may recommend fuelbreaks along specific identified private in-holdings adjacent to wilderness boundaries to allow BLM and TNF to use appropriate management response (Appendix F).

Table3.1. Fuel modification and treatment plans

Treatment No.	1				2		3		4	
	Developed private parcels <2 acres				Undeveloped private parcels or single-structure parcels >2 acres		Grassland firebreaks		Oak/pinyon/juniper and shrublands within the WUI	
Treatment category	**Zone 1 (0–10 feet from structures)**	**Zone 2 (10–30 feet from structures)**	**Zone 3 (30–100 feet from structures)**	**Zone 4 (100–600 feet around home)**	**Slopes <20%**	**Streambeds, channels, and slopes ≥20%**	**Slopes <20%**	**Slopes ≥20%**	**Landscape treatment outside firebreaks**	**Firebreaks**
Vegetation	Remove ladder fuels by pruning the lower third of trees or shrubs up to a maximum of 10 feet to reduce flammable vegetation. Remove and destroy insect-infested, diseased, and dead trees and shrubs. Grasses and forbs may be cut with a mower to a 4-inch stubble. Remove dead plant material from ground; prune tree limbs overhanging roof; remove branches within 10 feet of chimney; remove flammable debris from gutters and roof surfaces.	Remove ladder fuels by pruning the lower third of trees or shrubs up to a maximum of 10 feet; remove and destroy insect-infested, diseased, and dead trees. Create separation between trees, tree crowns, and other plants based on fuel type, density, slope, and other topographical features. Reduce continuity of fuels by creating a clear space around brush or planting groups. Grasses and forbs may be cut with a mower to a 4-inch stubble. All snags and vegetation that may grow into overhead electrical lines, other ground fuels, ladder fuels, dead trees, and thinning from live trees must be removed.	Remove ladder fuels by pruning the lower third of trees or shrubs up to a maximum of 10 feet; remove and destroy insect-infested, diseased, and dead trees. Maximum density of trees (whichever is greater: 60 BA at 80–100 trees/acre *or* average density of 100 trees/acre). Grasses and forbs may be cut with a mower to a 4-inch stubble.	For natural areas, thin selectively and remove highly flammable vegetation. Carefully space trees; choose Firewise plants.[a]	Remove ladder fuels by pruning the lower third of trees or shrubs up to a maximum of 8 feet; remove and destroy insect-infested, diseased, and dead trees. Maximum density of trees (whichever is greater: 60 BA at 80–100 trees/acre *or* average density of 100 trees/acre) See fuel modification plan (this section) developed to promote riparian health, to prevent spread of fire to adjacent property, and to create defensible space with considerations for wildlife and groundwater protection. Single structure or structures on parcels exceeding 2 acres should include Treatment 1 in proximity to structures and Treatment 2 for remaining acres.	Remove dead, diseased, and dying trees. Fell dead trees away from stream channels with defined bed and banks. Areas should be hand-thinned and hand-piled; inaccessible areas may be treated with periodic Rx. Develop fuel modification plan (this section) for treatments.	Grassland types may be mechanically treated, including mowing, chopping, or mastication, to reduce or remove vegetation or may be grazed to a stubble height. Ensure that removal of vegetation within a designed firebreak of >1 chain (66 feet) in width and length is sufficient to protect federal, state, or private land values. Fuel reduction treatments within grassland vegetation types may include multiple-entry burns to maintain stand structure and reduce fine fuels. Trees and shrubs >8 inch drc should be thinned to a variable distance of 15–35 feet between trees. Trees and shrubs <8 inches drc should be removed. Mechanical/chemical or grazing treatment may be used to maintain firebreaks on private lands. See the fuel modification plan (this section) developed to prevent spread of fire to adjacent property and to create defensible space with considerations for wildlife and groundwater protection.	Same as for slopes <20%. Fuel treatments may require hand-thinning and hand-piling or grazing in steep slopes. Rx may be used to reduce high fire potential (see Treatment 5). Designated firebreaks may be increased to no more than 2 chains in steep slopes where herbaceous (fine fuels) and subshrub species fuel loads increase to pretreatment levels within 3 years. See fuel modification plan (this section) developed to promote forest health, to prevent spread of fire to adjacent property, and to create defensible space with considerations for wildlife and groundwater protection.	Spacing may be variable with a 20- to 35-foot minimum to promote (1) wildlife habitat while breaking horizontal fuel loading, which allows for patches of closely spaced trees for adequate cover, and (2) other habitat components while incorporating openings to increase herbaceous forage production, to maximize edge effect, and to promote fire-resilient stands. Mechanical thinning and Rx (see Treatment 5) can be used to reduce vegetative fuels and move stands toward potential natural vegetation groups as described in the *FRCC Interagency Handbook* (FRCC Interagency Working Group 2005a) or grazed to like conditions. All trees >10 inches drc will be targeted as "leave trees" unless removal is necessary to achieve the desired spacing.	Woodland and shrub trees <8 inches drc will be thinned to a spacing of 15 feet between trees, or Rx will be applied to achieve like conditions. Shrub and tree trunks will be severed <4 inches from the ground. Mechanical treatments, such as crushing, chipping, mastication, and Rx, may be used to create open stands that produce flame lengths of ≤4 feet to minimize crown-fire potential and to produce vegetative fuel conditions conducive to suppression action. Herbaceous and subshrub understory may be mechanically treated, including mowing, chopping, and masticating, or grazed to limit fine-fuel loading while protecting soil integrity from rainfall runoff.
Slash	Remove or reduce natural flammable material 2–4 feet above the ground around improvements. Remove vegetation that may grow into overhead electrical lines, ladder fuels, and dead trees. Thinning from live trees must be removed (chipped, etc.). Remove all leaf litter to a depth of 1 inch.	Control soil erosion from small waterflow channels by using rock or noncombustible velocity-reducing structures. Remove all leaf litter to a depth of 1 inch.	Same as Zones 1 and 2.	Slash may be burned, piled and burned, or chipped and removed. Slash from grassland treatments may be burned, removed, masticated, turned, or grazed for like treatment.	All slash, snags, and vegetation that may grow into overhead electrical lines; other ground fuels; ladder fuels; dead trees; and thinning from live trees must be removed, mechanically treated (chipped, etc.), or piled and burned along with existing fuels.	Clean dead and down debris in channels where debris may be mobilized in floods and thus create downstream jams. Some slash and debris can be scattered and retained in small, ephemeral streambeds in which slash can help retain runoff and sediment and provide headcut stabilization.	Slash from grassland treatments may be burned, removed, masticated, or turned (disked).	Same as for slopes <20%; however, slash may be hand-piled and ignited with Rx as the primary slash reduction treatment.	Slash may be burned, piled and burned, or chipped and removed. Slash from grassland treatments may be burned, removed, masticated, or turned.	Slash may be burned, piled and burned, or chipped and removed. Slash from grassland treatments may be burned, removed, masticated, or turned.

Continued

Table 3.1. Fuel modification and treatment plans

Treatment No.	5	6	7		8	9
	Prescribed fire	**Escape and resource transportation corridors (federal and nonfederal lands)**	**Riparian areas (federal, nonfederal, and private lands)**		**Conditional suppression areas (federal and nonfederal lands)**	**Saltcedar removal for restoration purposes (federal and nonfederal lands)**
Treatment category	**Federal, state, or private lands**	**Federal, state, or local government where designated as escape route**	**Federal or state lands**	**Firebreaks on private lands**	**Federal, state, or private lands**	**Federal, state, or private lands**
Vegetation	Rx will be used as a tool to accomplish specific resource management objectives in accordance with ASLD, ASFD, CNF, TNF, and/or BLM standards and guides. Rx on federal land is authorized if part of an approved Rx burn plan. As additional areas within the WUI are identified, Rx may be used as a treatment tool provided that a wildland fire implementation plan is in effect and that all conditions set forth have been met. Rx can occur at low, moderate, and high intensity. High-intensity fire will be used to create openings by removing all aboveground vegetation.	Reduce fuel loading by thinning trees <10 inches drc. Reduce trees to 15-foot spacing. Shrub and tree trunks will be cut no less than 4 inches from the ground. Stands will be variable across the landscape, such as retention of bands of higher-density vegetation with sufficient understory to maintain functionality of important wildlife movement corridors in areas of low structure density. Mechanical treatments may include chipping, piling and burning, or removal and Rx in the project area. Trees may be left in clumps with fuel ladders removed from below. Dead, diseased, and dying trees of all sizes will be emphasized for removal. Some trees >8 inches drc may be cut to reduce safety hazards or when needed to reach desired 15-foot spacing. Escape and resource transportation corridors may serve as firebreaks in all vegetative types. Firebreaks for each vegetative type, as described in this table, would be implemented at appropriate distance from the centerline of the escape and resource transportation corridors to produce fire-resilient stands and to enhance evacuation and response access. Emphasis will be placed on removing nonnative and flammable species. Grasses and forbs may be cut with a mower to 4-inch stubble.	Riparian treatments will be limited in scope. The majority of riparian areas that fall within the WUI boundary will be avoided unless deemed a fuel hazard. Clearing or cutting of any material by mechanized equipment within 10 feet of any stream on federal land may be prohibited to prevent the risk of accelerating erosion. Treatments may include some overstory removal of deciduous riparian trees and shrubs in areas where encroachment has increased heavy woody fuels (emphasizing removal and control of saltcedar and other invasive trees). Treatments will emphasize nonnative species. Snags >8 inches may be retained. All presettlement trees, including snags, will be targeted for retention. Restricting the removal of the vegetative overstory in the riparian areas to the period of October 15–March 31 will prevent the disturbance of any nesting by neotropical migrant bird species, including the southwestern willow flycatcher. Fuels reduction should occur October 15–March 31 in riparian areas, as long as fire danger is not extreme. Emphasis will be placed on removing species listed in Appendix A.	Private land treatment should use hand tools, chain saws, or mowers. Dead vegetation and slash should be removed. Ladder fuels, including limbs and branches, should be removed up to a maximum of 8 feet aboveground. All mechanized equipment must meet state and local fire-department/district standards. Perform treatments October–March annually. Treatment of annuals may be best when annuals are green.	This prescription includes lands with desert shrub/scrub vegetative types in which no fuel modification treatments have been identified as necessary to provide protection from wildland fire. The threat from catastrophic wildland fire is low or nonexistent. This includes areas in which fire never played a historical role in developing and maintaining ecosystems. Historically, in these areas, fire return intervals were very long. These are areas in the WUI in which fire could have negative effects unless fuel modifications take place. These include areas in which the use of fire may have ecological, social, or political constraints and areas in which mitigation and suppression are required to prevent direct threats to life or property. Wildland fire growth within these areas will be monitored for private-property, ecological, and cultural threats before initiating suppression. Agency and fire-department/district policy provisions will determine suppression response.	Areas of monotypic saltcedar or in mix with mesquite or other riparian tree species may be treated mechanically or chemically or by controlled burning and reburning to reduce stem density, canopy, and excessive fuel loading. Mechanical removal for saltcedar by cutting below the root collar during November–January is preferred. Mechanical whole-tree extraction has achieved as high as 90% mortality on initial treatments and may be considered a preferred treatment. Low-volume oil-based herbicide applications in late spring through early fall would be considered for controlling small plants (<2 inches drc). Low-volume cut-stump herbicide applications will be considered in combination with mechanical treatment. Preferred phenological stage for burning is peak summer months and postavian breeding months. Black lines and appropriate headfires should be initiated depending on site-specific vegetative and burning conditions. Maintenance, revegetation, restoration, and monitoring should follow as needed for each treatment area.
Slash	Slash, jack piles, and down logs may be burned as appropriate in consideration of local conditions and distance from private property. Pile or Rx can be used to remove fuel from private land as designated. Snags and down woody material may be retained in areas where fire resilience is not compromised.	Snags, slash, and down logs will be removed in proximity to private land. Pile burning or Rx can be used to remove fuel. Snags and down woody material may be retained in areas where fire resilience is not compromised. Vehicle pullouts should be planned in appropriate numbers and locations where vegetation, slope, and terrain permit.	After removal of heavy woody fuels, fine fuels may be maintained by cool-season low-intensity Rx that moves slowly downslope or into prevailing winds to midslope. Large down woody material and snags (≥12 inches) may be retained in riparian areas.	Fuel treatments and woody material removal will occur on existing roads. Cool-season low-intensity Rx may be used for maintenance of fine fuels. Pile or jackpot burning will not occur in ephemeral, intermittent, or perennial stream channels.	Response will be full suppression when firefighter and public safety, property, improvements, or natural resources are threatened.	Created slash will be made available for woody biomass use. If not used for wood-related products, slash will be piled with preexisting fuels and burned, or otherwise used for soil stabilization. Disturbed areas should be immediately revegetated with a native plant community that contains no invasive species and meets other land use objectives, such as wildlife habitat enhancements or recreational-use benefits.

Note: BA = basal area, R_x = prescribed fire, drc = diameter at root collar.

[a]List of Firewise plants can be found in the Firewise literature listed in Appendix C, Educational Resources.

The wildland vegetative fuel and firebreak recommended treatments meet the Maricopa County CWPP goals of enhancing firefighter and public safety, reducing hazardous wildland fuels on public and private lands, improving fire prevention and suppression, restoring riparian and rangeland health, involving the community, and expediting project implementation. To prioritize wildland fuel mitigation projects, the Core Teams analyzed wildland fuel hazards, fire history, and community values. This combined risk assessment was compiled in a single community base map depicting areas of low-, moderate-, and high-risk evaluations (see Figure 2.8). These risk areas were further identified and categorized into a total of 112 management site-specific areas (treatment management units) of the WUI, with an overall risk value determined for each management unit (Figures 3.1a and 3.1b).

The Core Teams described the location of each treatment management unit in the WUI and then assigned recommended treatments for each unit (Table 3.2).The management units listed in Table 3.2 do not always coincide with fire-department or fire-district boundaries or lie within established fire departments and districts. For example, the Harquahala community sub-WUI is much larger than the fire district bounday, and wildfire management areas are not in any fire departments or districts or under FS jurisdiction for fire protection; therefore, no fire departments or districts are responsible for that community's treatment management.

Table 3.2. Identified treatment management units

Treatment management unit	Map ID	Risk value	Location and description	Recommended treatment[a]	Total acres	Federal acres	State Trust acres	Nonfederal acres	Tribal acres
Avondale	AD1	M	City of Avondale north and south of I-10	1,2,3,4,7,9	25,856	424	3,861	21,388	184
	AD2	M	Lands south of AD1, including portions of Estrella Mt. Park	1,2,3,8	8,958	2	2,631	2,273	6,325
Aguila	AG1	L	Lands immediately west of Wickenburg boundary	1,2,3,8,9	4,760	0	4,271	490	0
Apache Junction[b]	AJ1	L	Municipal boundary of Apache Junction in Maricopa County	1,2,3	3,329				
Buckeye	BE1	M	Lands in the NE corner of the municipal boundary	1,2,3,4,7,8,9	56,203	13,989	4,341	37,368	0
	BE2	M	Lands north of, and adjacent to, west boundary of White Tank Mt. Regional Park	1,2,3,4,7,8,9	48,435	1,672	14,469	32,295	0

Continued

Table 3.2. Identified treatment management units

Treatment management unit	Map ID	Risk value	Location and description	Recommended treatment[a]	Total acres	Federal acres	State Trust acres	Nonfederal acres	Tribal acres
	BE3	M	Lands NE of community center	1,2,3,4,7,8,9	41,963	1,843	6,261	33,859	0
	BE4	M	Lands NE of town and south of White Tank Mt. Regional Park	1,2,3,7,9	40,655	10,861	10,546	19,248	0
	BE5	L	Lands SW of town and north of Gila River, including Palo Verde Nuclear Generating Station	1,2,3,6,8	23,306	0	1,740	21,566	0
	BE6	L	Lands SE of town, north of Gila River	1,2,3,8	25,684	0	1,257	24,427	0
	BE7	L	Lands SE of town, including Gila River	1,2,3,4,5,6, 7, 9	28,798	5,289	1,511	21,998	0
	BE8	M	Lands south of Buckeye Hills Regional Park within and east of Gila River	1,2,3,4,5,6, 7, 9	25,818	7,182	4,727	13,909	0
Buckeye Valley	BV1	M	Lands west of the town of Buckeye adjacent to Hassayampa River	1,2,3,4,5,6, 7, 8,9	36,681	357	12,133	25,191	0
	BV2	L	Lands SE of Buckeye adjacent to north boundary of Buckeye Hills Regional Park	1,2,3,4,5,6, 7, 8,9	13,329	1,746	78	11,505	0
	BV3	M	Lands west of Buckeye Regional Park, including Gila and Hassayampa River confluence	1,2,3,4,5,6, 7, 8,9	26,893	11,304	5,980	9,609	0
Cave Creek	CC1	M	Town of Cave Creek, Cave Creek Recreation Area, north to TNF boundary	1,2,3,4,5,8	24,043	2,718	8,.556	12,769	0
	CC2	L	Lands NE of Cave Creek to TNF boundary	1,2,3,4,5, 8	7,551	2,424	676	4,452	0

Continued

Table 3.2. Identified treatment management units

Treatment management unit	Map ID	Risk value	Location and description	Recommended treatment[a]	Total acres	Federal acres	State Trust acres	Nonfederal acres	Tribal acres
Circle City/ Morristown	CCMT1	L	Town of Circle City/Morristown and immediate surrounding lands	1,2,3,4,5, 8	52,608	9,100	28,723	14,785	0
Carefree	CF1	M	Town of Carefree and immediate surrounding lands	1,2,3,4,5, 8	5,927	0	79	5,849	0
Chandler	CH1	L	Municipality of Chandler	1,2,3	43,241	0	90	43,151	0
El Mirage	EL1	L	Municipality of El Mirage	1,2,3	7,328	66	3	7,259	0
Fountain Hills	FH1	M	Town of Fountains Hills	1,2,3,4,8	12,515	0	0	12,486	29
Fort McDowell Indian Community	FMD1	M	Tribal trust lands of Fort McDowell Indian Community	1,2,3,4,7,8,9	25,126	76	42	152	24,855
Gila Bend	GB1	M	Lands SE of Gila Bend south of I-8	1,2,3,4,5,8	20,877	12,719	1,306	6,852	0
	GB2	M	Lands NE of Gila Bend north of I-8	1,2,3,4,5,8	11,886	4,073	6,445	1,368	0
	GB3	M	Lands NW of Gila Bend, primarily agricultural lands	1,2,3,5,7,8,9	11,393	1,265	1,746	8,159	224
	GB4	M	Lands in western municipal boundary of Gila Bend and north and south of I-8	1,2,3,5,7,8,9	30,441	8,895	2,424	18,938	184
	GB5	M	Lands north of Gila Bend along SR 85 corridor	1,2,3,5,7,8,9	17,508	6,245	3,601	7,662	0
Glendale	GD1	L	Lands on western municipality boundary	1,2,3,7,9	25,797	2,253	196	23,349	0
	GD2	L	Lands in eastern municipality, including SR 60 and SR 303 corridors	1,2,3,7,9	16,924	0	60	16,864	0
	GD3	L	Lands north of city center, north along the municipal boundary to SR 101	1,2,3,7,9	19,027	10	952	18,064	0
Gilbert	GIL1	L	Municipality of Gilbert	1,2,3,7,9	48,432	2	61	48,369	0

Continued

Table 3.2. Identified treatment management units

Treatment management unit	Map ID	Risk value	Location and description	Recommended treatment[a]	Total acres	Federal acres	State Trust acres	Nonfederal acres	Tribal acres
Gila River Indian Community	GRIC1	M	Tribal lands adjacent to Gila River, NW of St. Johns	1,2,3,5,6,7,8,9	26,135	0	40	854	25,251
	GRIC2	M	Tribal lands west of St. Johns on east-facing slopes of Estrella Mts.	1,2,3,5,6,7,8,9	24,827	11,962	3,241	674	8,950
	GRIC3	H	Community of St. Johns and surrounding Gila River riparian corridor	1,2,3,5,6,7,8,9	13,596	0	14	102	13,480
	GRIC4	M	Lands SW of St. Johns, along Gila River to Pinal County east to I-10 corridor	1,2,3,5,6,7,8,9	37,211	626	3	518	36,064
	GRIC5	M	Lands north of Beltline Road to north boundary of GRIC	1,2,3,5,6,7,8,9	17,712	0	0	0	17,752
	GRIC6	H	Lands along SR 347 east and west of I-10 corridor to the tribal boundary	1,2,3,5,6,7,8,9	18,426	0	0	0	18,426
	GRIC7	M	Lands east of I-10 corridor south of Maricopa County along Gila River riparian corridor	1,2,3,5,6,7,8,9	40,947	234	0	1,057	39,656
Guadalupe	GU1	L	Municipality of Guadalupe	1,2,3	699	0	0	699	0
Goodyear	GY1	L	Lands at the north municipal boundary north of I-10 corridor	1,2,3	12,223	0	1,572	10,651	0
	GY2	L	Community of Goodyear south of I-10 corridor	1,2,3	13,824	0	101	13,723	0
	GY3	M	Lands south of the city of Goodyear along west boundary of Estrella Mt. Regional Park, including the Gila River	1,2,3, 4,7,9	15,674	530	734	14,410	0

Continued

Table 3.2. Identified treatment management units

Treatment management unit	Map ID	Risk value	Location and description	Recommended treatment[a]	Total acres	Federal acres	State Trust acres	Nonfederal acres	Tribal acres
	GY4	M	Lands south of the city of Goodyear, including portions of Estrella Mt. Regional Park and Gila River	1,2,3, 4,7,9	14,453	137	8,765	5,552	0
	GY5	M	Lands south of Estrella Mt. Regional Park to the municipal boundary, including the community of Mobile and SR 238	1,2,3, 4,7,9	105,808	52,477	12,703	40,362	266
Harquahala Valley	H1	M	Lands on eastern boundary of WUI along I-10 corridor	1,2,3,4,5,8	61,838	21,038	18,033	22,767	0
	H2	M	Lands south of I-10 corridor, including Harquahala Valley and Centennial Wash	1,2,3,4,5,8	63,240	8,735	7,045	47,460	0
Litchfield Park	LP1	L	Municipality of Litchfield Park	1,2,3	2,183	0	0	2,183	0
Management Area 1	MA1	M	Open lands in NW portion of WUI	1,2,3,4,5,8	36,177	8,717	1,823	25,638	0
Management Area 2	MA2	M	Lands north of I-10 corridor, west of Buckeye city limits	1,2,3,4,5,8	72,563	7,956	6,150	58,457	0
Management Area 3	MA3	M	Lands to east, primarily south of Harquahala Valley and east of Tonopah	1,2,3,4,5,8	53,536	20,605	8,442	24,489	0
Management Area 4	MA4	M	Buckeye Hills Regional Park and surrounding lands west of SR 85	1,2,3,4,5,8	27,753	19,437	6,483	727	0
Management Area 5	MA5	M	Lands south of Buckeye/Arlington Valley along Gila corridor to north of Gila Bend	1,2,3,4,5,8	29,581	14,052	1,167	14,362	0
Management Area 6	MA6	M	Developed lands west of Gila Bend municipal boundaries along I-8 corridor	1,2,3,4,5,8	89,003	26,752	6,808	55,444	0

Continued

Table 3.2. Identified treatment management units

Treatment management unit	Map ID	Risk value	Location and description	Recommended treatment[a]	Total acres	Federal acres	State Trust acres	Nonfederal acres	Tribal acres
Management Area 7	MA7	M	Lands adjacent to Santa Cruz River, south of Gila/ Santa Cruz River confluence	1,2,3,4,5,7,8,9	23,456	11,524	3,086	8,846	0
Management Area 8	MA8	M	Lands north of I-8 along Santa Cruz River corridor to south of SR 238	1,2,3,4,5,7,8,9	58,727	38,271	1,480	18,976	0
Management Area 9	MA9	L	Lands north of I-8, west of the Santa Cruz River, north to the GRIC boundary	1,2,3,4,5,8	46,440	42,415	2,052	1,970	3
Management Area 10	MA10	M	White Tank Mt. Regional Park	1,2,3,4,5,8	44,898	0	40,826	4,026	0
Management Area 11	MA11	M	McDowell Mt. Regional Park	1,2,3,4,5,8	39,953	5,945	20,892	13,095	21
Management Area 12	MA12	L	Lands at SE WUI boundary, including portions of San Tan Mt. Regional Park	1,2,3,4,5,8	22,940	6,617	729	15,579	16
Mesa	ME1	L	City of Mesa south of SR 202/SR 87 to SR 60	1,2,3,4	49,838	126	949	48,252	511
	ME2	M	Lands east of Mesa south of SR 87, including SR 202 corridor	1,2,3,4,5,8	38,318	6,708	4,417	26,945	247
	ME3	M	Lands SE of Mesa north of Queen Creek, including SR 202 corridor	1,2,3,4,5,8	32,165	0	5,239	26,627	0
New River	NR1	L	Lands east of I-17 corridor, adjacent to Cave Creek Recreation Area, north to TNF boundary	1,2,3,4,5,8	41,375	8,739	24,253	8,383	0
	NR2	M	Lands immediately west of I-17, north of the community to New River to the WUI boundary	1,2,3,4,5,8	6,283	2,532	3,521	229	0
	NR3	M	Lands south of the community of New River to north of SR 74	1,2,3,4,5,8	8,859	172	1,937	6,750	0

Continued

Table 3.2. Identified treatment management units

Treatment management unit	Map ID	Risk value	Location and description	Recommended treatment[a]	Total acres	Federal acres	State Trust acres	Nonfederal acres	Tribal acres
	NR4	M	Lands north of New River, west of I-17 at Yavapai County boundary	1,2,3,4,5,8	6,158	5,173	78	907	0
	NR5	L	Lands NE of New River, west of I-17	1,2,3,4,5,8	19,512	10,074	5,232	4,206	0
Peoria	PE1	L	Lands north and south of SR 74, northwest of the community of Peoria	1,2,3,4,5,8	31,071	3,366	14,376	13,329	0
	PE2	L	Lands north and south of SR 74, north of the community of Peoria	1,2,3,4,5,8	68,295	23,123	19,382	25,790	0
	PE3	M	Lands north and south of SR 74, east of PE2, north of the community of Peoria	1,2,3,4,5,8	23,794	1,314	11,699	10,780	0
	PE4	M	Lands north and south of SR 74, south of PE3, north of the community of Peoria	1,2,3,4,5,8	11,882	180	844	10,859	0
	PE5	L	City of Peoria	1,2,3	22,323	2	588	21,733	0
Phoenix	PHX1	L	North of I-10/I-17 junction, east of Tolleson, west of I-17 north to the community of New River	1,2,3,4,5,8	91,637	2,419	34,608	54,610	0
	PHX2	M	South of Tolleson to South Mt. Regional Park, including Gila River	1,2,3,4,5,6,7,9	68,295	23,123	19,382	25,790	0
	PHX3	M	South Mt. Regional Park north of I-10 corridor	1,2,3,4,7,9	60,070	10	12,144	47,915	0
	PHX4	L	North and west of I-17 corridor to north of Cave Creek Road	1,2,3,4,7,9	158,978	819	33,766	124,393	0
Paradise Valley	PV1	L	Municipality of Paradise Valley	1,2,3	10,579	0	0	10,579	0
Queen Creek	QC1	M	Municipality of Queen Creek	1,2,3,5,8	25,457	0	1,547	23,910	0

Continued

Table 3.2. Identified treatment management units

Treatment management unit	Map ID	Risk value	Location and description	Recommended treatment[a]	Total acres	Federal acres	State Trust acres	Nonfederal acres	Tribal acres
Rio Verde	RV1	M	Lands north and east on Fort McDowell Indian Community	1,2,3,4,5,6,7,9	10,413	9,098	0	1,301	14
	RV2	L	Lands east of Fort McDowell Indian Community, east of Verde River, north of SR 87	SR 87 corridor to vicinity of Four Peaks Road	5,802	1,552	0	4,205	44
	RV3	M	SR 87 corridor, NE of Verde River	1,2,3,4,5,6,7,9	9,979	8,462	0	1,506	11
	RV4	M	SR 87 corridor to vicinity of Four Peaks Road	3,4,5,8	7,709	7,709	0	0	0
Scottsdale	S1	M	Lands east of Carefree to the TNF boundary to the north and east WUI boundary	1,2,3,5,8	42,332	9,269	13,136	19,926	0
	S2	M	Lands north of Salt River Pima-Maricopa Indian Community and SR 101 corridor	1,2,3,5,8	41,252	0	3,410	37,843	0
	S3	M	Lands adjacent to west boundary of McDowell Mt. Regional Park and Fountain Hills	1,2,3,5,8	21,467	0	4,603	16,864	0
	S4	L	City of Scottsdale	1,2,3	21,607	62	538	20,144	863
Sun City	SC1	L	City of Sun City	1,2,3	9,100	0	0	9,100	0
Sun City West	SCW1	L	City of Sun City West	1,2,3	17,517	378	3,793	13,346	
Sunflower	SF1	M	SR 89 corridor north of Four Peaks Road	2,3,4,5,8	6,901	6,871	0	30	0
	SF2	M	SR 89 corridor immediately south of Sunflower	2,3,4,5,8	6,633,	6,408	0	225	0
	SF3	M	Community of Sunflower	2,3,4,5,8	6,954	6,779	0	175	0
	SF4	H	Sunflower along Sycamore Creek	3,4,5,6,7,8,9,	1,320	1,320	0	0	0
	SF5	M	Lands NE of Sunflower, east of SR 87	2,3,4,5,8	5,079	4,868	0	211	0

Continued

Table 3.2. Identified treatment management units

Treatment management unit	Map ID	Risk value	Location and description	Recommended treatment[a]	Total acres	Federal acres	State Trust acres	Nonfederal acres	Tribal acres
Sun Lakes	SL1	L	Community of Sun Lakes	1,2,3	3,864	0	0	3,859	4
Salt River Pima-Maricopa Indian Community	SRPMIC1	M	East of Scottsdale boundary along Gila River	1,2,3,7,9	11,884	0	6	467	11,411
	SRPMIC2	L	East of Scottsdale boundary, north of Gila River	1,2,3	7,592	0	0	0	7,592
	SRPMIC3	M	East of Scottsdale boundary, north to the north SRPMIC boundary	1,2,3	7,165	0	0	104	7,061
	SRPMIC4	M	Northern SRPMIC boundary	1,2,3	10,716	0	0	244	10,472
	SRPMIC5	M	SRPMIC southern boundary, east along Gila River to east boundary and adjacent lands	1,2,3,7,9	20,200	3,326	0	1,443	15,431
Surprise	SU1	M	NE of the city of Surprise along the US 60 corridor, including Trilby Wash Basin	1,2,3,5,7,8,9	32,117	254	11,558	20,306	0
	SU2	M	Lands NE of the city of Surprise along US 60 corridor	1,2,3,5,8	20,455	0	3,476	16,978	0
	SU3	L	City of Surprise	1,2,3	24,964	0	97	24,867	0
Tempe	T1	L	Municipality of Tempe	1,2,3	23,898	84	555	23260	57
Tonto Hills	TH1	L	Tonto Hills subdivision	1,2,3	480	39	0	442	0
Tonopah Valley	TO1	M	Lands south of I-10, east of community of Tonopah, adjacent to Palo Verde Nuclear Generating Station	1,2,3,4,5,8	49,982	6,863	8,225	34,894	0
	TO2	M	Tonopah Valley, including community of Tonopah south of I-10 corridor	1,2,3,4,5,8	47,235	22,824	7,281	17,130	

Continued

Table 3.2. Identified treatment management units

Treatment management unit	Map ID	Risk value	Location and description	Recommended treatment[a]	Total acres	Federal acres	State Trust acres	Nonfederal acres	Tribal acres
Tolleson	TOL1	M	Community of Tolleson	1,2,3	3,967	0	3	3,964	0
Wickenburg	WB1	L	City of Wickenburg, Hassayampa River, and lands immediately west	1,2,3,4,5,7,8,9	26,927	1,078	11,818	14,030	0
	WB2	M	City of Wickenburg and lands immediately west	1,2,3,4,5,8	11,457	1,491	4,686	5,280	0
Wittmann	WT1	M	Lands surrounding the community of Wittmann	1,2,3,4,5,8	16,044	0	3,375	12,669	0
Youngtown	YT1	L	City of Youngtown	1,2,3	1,503	0	24	1,479	0

Note: L = low, M = moderate, H = high.

[a]See Table 3.1 for recommended treatments.

[b]Apache Junction is included in the 2009 Pinal County CWPP.

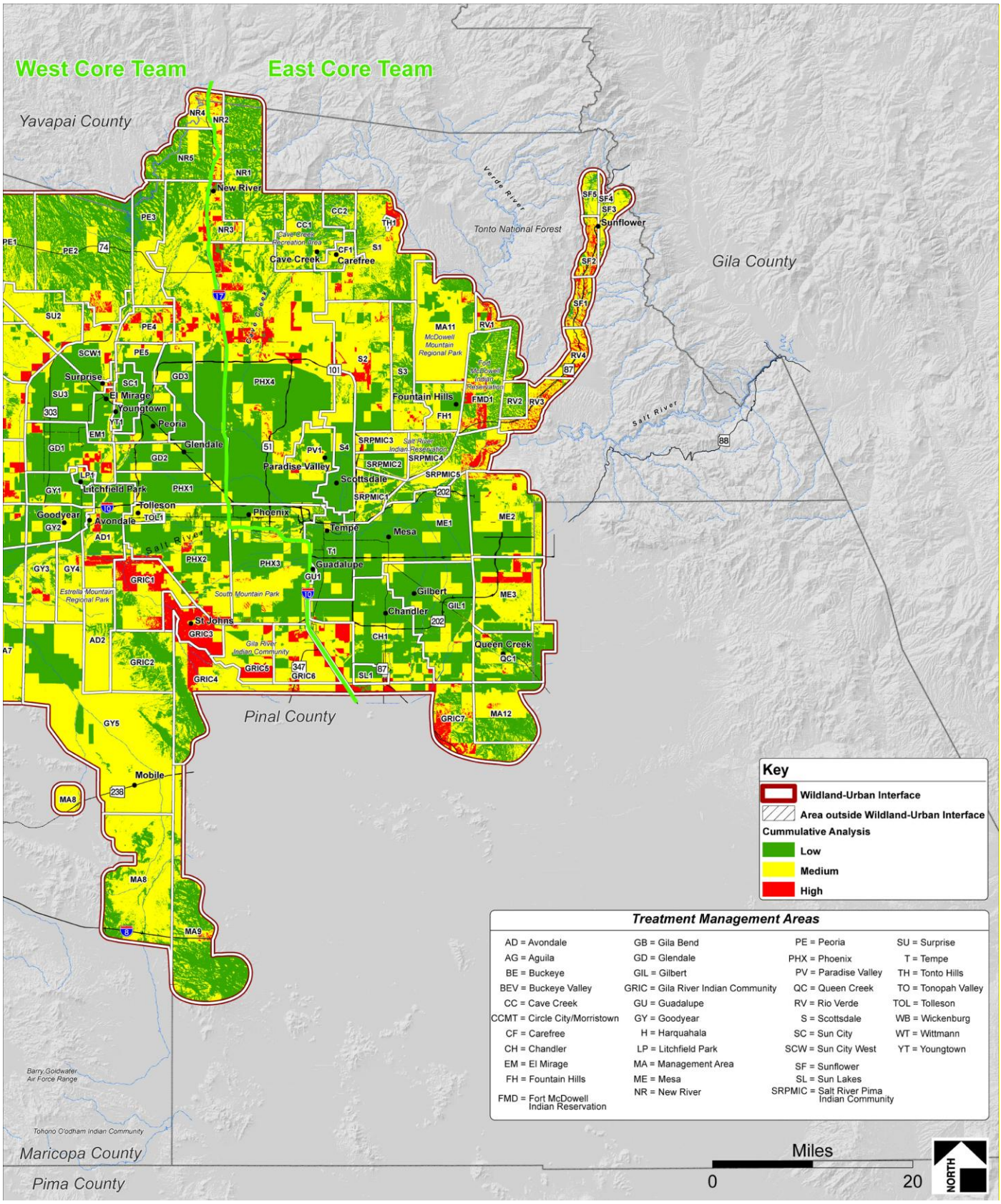

Figure 3.1a. Maricopa County CWPP treatment management units, east

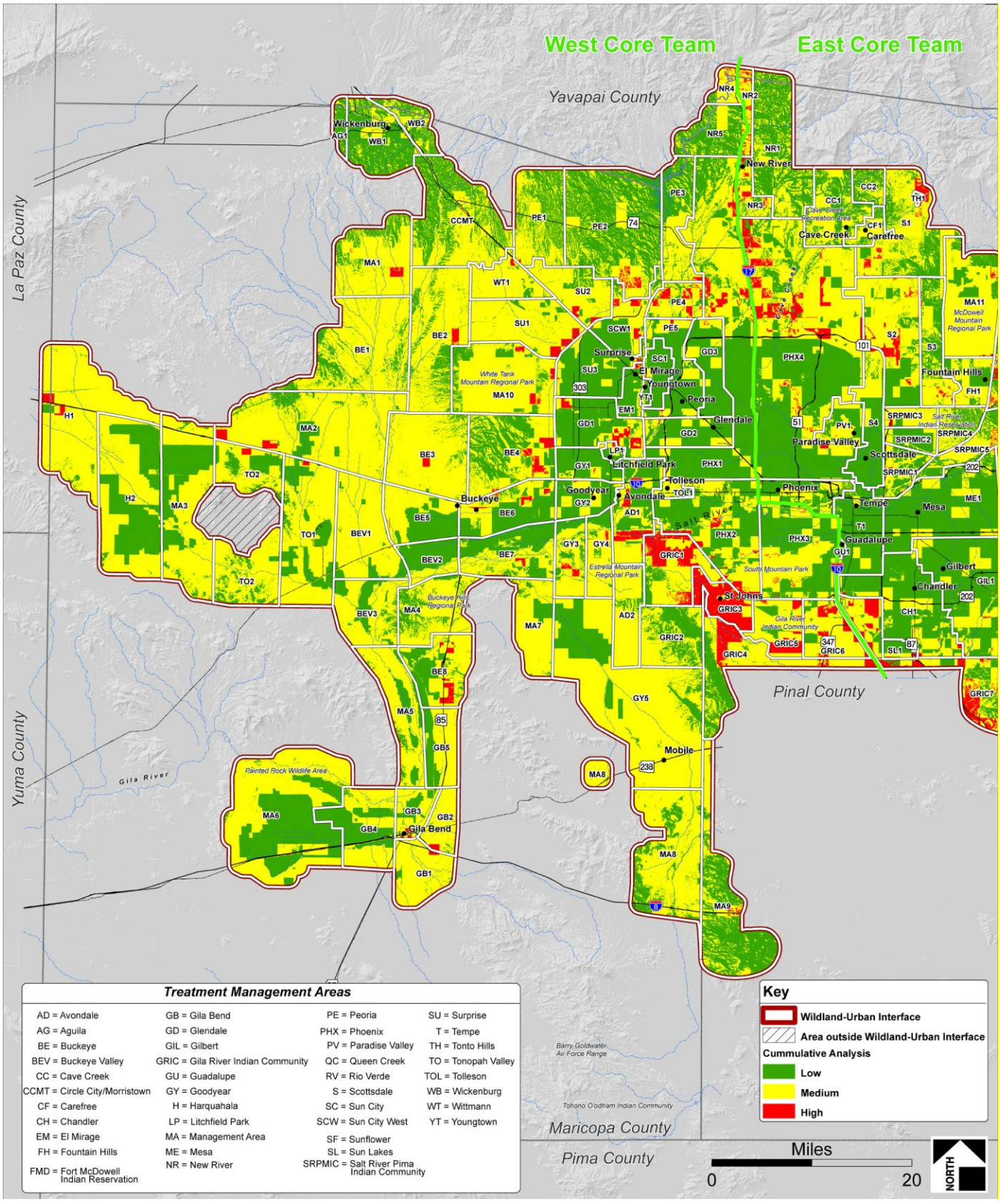

Figure 3.1b. Maricopa County CWPP treatment management units, west

Private land treatments in the WUI typically occur on small land parcels near power lines, structures, and other obstacles. In many cases, cut trees and slash cannot be piled and burned on small private land parcels, or it is not the preferred slash treatment by the owner of a small residential lot or by the local fire departments. Therefore, the Core Teams recommend that slash from wildland fuel reduction treatments on small residential parcels be removed, whole or chipped, and transported to a disposal site. The Core Teams do not oppose alternative vegetative treatments to achieve wildland vegetative fuel mitigation objectives, such as an experimental grazing program using primary grazers within the WUI, adjacent to state or federal lands. The Core Teams also recommend that fallow agricultural lands be restored through the planting of native vegetation species in accordance with the *National Conservation Practice Standards, Range Planting*, Code 550 (NRCS 2002). The Core Teams also recommend that firebreaks constructed on public and private lands to restrict wildland fire movement be maintained in accordance with the above-mentioned mitigation measures and stipulations on a rotating 2- or 3-year interval, or as deemed necessary, to ensure the integrity of the firebreak through removal of fine and light vegetative fuels.

Treatment of wildland fuels within the WUI is expected to generate considerable slash and vegetative waste material. Private individual use of wood products from fuel reduction treatments within the WUI is primarily for fuelwood. Commercial use of the woody material from fuel reduction treatments is also primarily limited to fuelwood, and any commercial value of treatment by-products will not significantly affect land treatment costs. Recent costs of fuels mitigation treatment on BLM lands within the WUI include $100.00/acre for mowing, $500.00/acre for mastication and if wildland fuel modification prescriptions require follow-up pile burning or herbicide application after vegetation treatment, the total cost per acre treated could be as high as $500.00 to $1,000.00/acre on small land parcels consisting mostly of treatments within riparian corridor treatments as high as $3,500.00 per acre for small acreage treatments in heavy chaparral/timber (USDA and New Mexico Energy, Minerals and Natural Resources Department, Forestry Division 2005; San Juan County Watershed Group 2005; Ken Shaver, BLM, pers. comm. 2009).

For private land treatments to be both fiscally reasonable and timely, the Core Teams investigated land treatment costs from a variety of sources. Equivalent land treatment costs are not directly available for the Maricopa County CWPP WUI.

The Core Teams recommend that when available, wildland fuel modification projects be contracted to ASFD to ensure that treatments are conducted in a timely fashion and at a reasonable cost. The estimates of daily costs, which include a 20-person inmate labor crew and a chipper for a 100-mile roundtrip to the project site by an ASLD Forestry Division crew carrier, are as follows:

- 8-hour day—$750.00
- 10-hour day—$830.00
- 12-hour day—$910.00

Cost estimates for treatments in the WUI are based on the estimates provided by the ASLD Forestry Division for the Fire and Fuels Crew costs for both federal and nonfederal land treatments (see Table 3.3). The ASLD Forestry Division Fire and Fuels Crews do not remove hazard trees or provide “climbers” for pruning or segmented tree removal sometimes required on private lands. The Core Teams do support and

encourage local business development that will complement wildland fuel mitigation needs within federal and nonfederal lands of the WUI. Vegetative fuel mitigation costs for this CWPP are estimated to be $350.00/acre, which is comparable to the estimated cost of the ASLD Forestry Division Fire and Fuels Crews and to estimated fuel-mitigation costs on adjacent federal lands.

Table 3.3. Acres of wildland fuels mitigation treatment conducted by ASFD Fire and Fuels Crew during an 8-hour on-site workday

Vegetation association	Average acres per day treated
Ponderosa pine/mixed conifer	0.5 to 1 acre per day
Pinyon/juniper	1 to 2 acres per day
Mesquite woodland	3 to 4 acres per day
Oak woodland	3 to 4 acres per day
Riparian	1 to 2 acres per day (depending on fuel loading)
Grassland	2 to 4 acres per day (depending on grass type and fuel loading)

The Core Teams recommend that private landowners who wish to adopt fuel modification plans other than those described in Table 3.1 have the plan prepared or certified by a professional forester, by a certified arborist, by other qualified individuals, or in conjunction with local fire department or fire districts recommendations that reference Firewise guidelines. Fuel modification plans for federal and state lands within 0.5 mile of private land may be prepared for wildlife and watershed benefits—including the retention of large snags or vegetative patches of high wildlife value in areas more than 600 feet from private lands in which fire resiliency is not impaired and will not compromise public or firefighter safety. A fuel modification plan should identify the actions necessary to promote rangeland, wildlife, or watershed health and to help prevent the spread of fire to adjacent properties by establishing and maintaining defensible space. The action identified by the fuel modification plan should be completed before development of the property or identified during project initiation on federal and state lands.

Alternate Federal, State, or Private Land Wildland Fuel Modification Plan

A fuel modification plan for federal and state lands will follow agency procedures, standards, and guidelines. Fuel modification treatment plans for private land parcels should at least include the following information:

- A copy of the site plan
- Methods and timetables for controlling, changing, or modifying fuels on the properties in a timely and effective manner
- Elements for removal of slash, snags, and vegetation that may grow into overhead electrical lines; removal of other ground fuels, ladder fuels, and diseased, dying, and dead trees; and thinning of live trees
- Methods and timetables for controlling and eliminating diseased or insect-infested vegetation

- A plan for the ongoing maintenance of the proposed fuel reduction and control measures for disease and insect infestations
- A proposed vegetation management plan for groupings of parcels under multiple ownership that has been accepted by all individual owners (subject to compliance with this section)

HFRA was designed to expedite administrative procedures for conducting hazardous wildland fuel reduction and restoration projects on federal lands. Regardless of priority treatments selected for federal lands, an environmental assessment must be conducted for fuel reduction projects. Although HFRA creates a streamlined and improved process for reviewing fuel reduction and restoration treatments, it still requires that appropriate environmental assessments be conducted and that collaboration be maintained.

The recommended treatments within the Maricopa County CWPP have been developed consistent with federal land-management action alternatives and are intended to be compliant with and facilitate efficient planning and decision making concerning fuels mitigation treatments or habitat rehabilitation of areas so as to reduce risks to communities caused by severe fires, and to restore fire-adapted ecosystems (USDA FS 2000).

B. Prevention and Loss Mitigation

The Maricopa County CWPP will be used as a resource to help coordinate long-term interagency mitigation of catastrophic wildfire events in at-risk communities within Maricopa County. The Maricopa County CWPP Core Teams established specific goals for wildland fire prevention and loss mitigation as follows:

- Improve fire prevention and suppression for firefighter and public safety and to protect private property
- Promote community collaboration, involvement, and education
- Recommend measures to reduce structural ignitability in the Maricopa County CWPP WUI
- Preserve the aesthetics and wildlife values within riparian areas
- Identify funding needs and opportunities
- Expedite project planning through partnerships with ASFD, BLM, and other private and public entities in managing wildland fire risk within the WUI

The Maricopa County CWPP will be reviewed and updated as needed. Successful implementation of this plan will require a collaborative process among multiple layers of government entities and a broad range of community interests. The MCDEM and Core Teams have also discussed the advantage of working cooperatively with Salt River Project (SRP) and Arizona Public Service (APS) utility companies in maintaining acceptable wildland fuel conditions within SRP and APS existing utility corridor rights-of-way and easements, within areas of the WUI at high risk. The Core Teams, APS, and SRP also recognize the benefits of working cooperatively to achieve acceptable wildland fuel conditions adjacent to APS and SRP easements and rights-of-way. APS has already undertaken a vegetative management program with its main power transmission lines that run northwest from Pima and Dynamite Road to the TNF. The Core Teams recognize existing agreements between SRP, APS, land-management agencies, and private

landowners for vegetative treatments within rights-of-way and easements, and agree that the Maricopa County CWPP does not bind or obligate SRP and APS in maintenance of vegetative fuels outside their rights-of-way or easements. The Core Teams believe that these agreements and resultant vegetative treatments are complementary to the objectives of the Maricopa County CWPP. Therefore, at the request of the MCDEM and the Core Teams, APS and SRP have agreed to be included as signatories to the Maricopa County CWPP and to become partners in implementation of action recommendations.

The Core Teams and collaborators have made the following action recommendations to meet the goals of the Maricopa County CWPP:

1. Maricopa County CWPP Administration and Implementation

- Establish a countywide community Maricopa County CWPP Working Group—composed of Maricopa County fire chiefs, MCDEM, ASFD, BLM, TNF, community members, concurring agencies, and members of the Core Teams to coordinate individual agency implementation of the recommendations for fuel modification, public outreach, protection capability, and structural ignitability within the Maricopa County CWPP WUI, including fuel hazards removal on private lands within the WUI.

2. Improved Protection Capability and Reduction in Structural Ignitability

The Maricopa County CWPP considers the risks of wildland fire igniting and spreading throughout the WUI a serious threat. The Core Teams and collaborators believe that actions to reduce fire risks and promote effective responses to wildland fires must be undertaken. The following are recommendations to enhance protection capabilities for at-risk communities within Maricopa County:

- Obtain one fully functional Type 6 engine and one fully functional Type 1 engine for wildland fire response by local fire departments and districts.
- Obtain a medium-size water tender for local use by fire departments and districts; strategically locate additional water-storage tanks, wells, or other water sources for tender filling throughout the fire departments and districts; maintain helicopter landing sites; and update mapping capabilities of local fire departments and districts.
- Encourage fire departments and districts to participate in annual multi-agency wildland fire safety training conducted prior to the fire season.
- Improve dispatch and alerting capabilities by establishing a community emergency alert system. The County and local communities will continue to jointly investigate an emergency contact autophone redial system for emergency public communication.
- Obtain a chipper/shredder, tub grinder, air curtain destructor, and other equipment necessary for treatment and processing of vegetative slash for use by local fire departments and districts for wildland fuel mitigation projects.
- Obtain one multipurpose utility vehicle with attachments for chipping, brush cutting, and miniwater tending tool, such as the Bobcat Toolcat.

- Implement GIS and GPS (Global Positioning System) software and laptops to update mapping capabilities of local fire departments and districts.
- Arrange for the acquisition, operation, and maintenance of a green-waste disposal site within reasonable proximity to the citizens and encourage the use of the disposal site for all vegetative material removed during wildland fuel treatments on private lands within the WUI.
- Provide enhanced and coordinated firefighting training and equipment, such as personal protective equipment (PPE) and second-generation fire shelters, for newly certified wildland firefighters and volunteer firefighters.
- Develop and maintain mutual-aid agreements with neighboring fire departments or districts for wildland and structural fire response support and other emergency response.
- Meet annually with representatives from APS and SRP to mutually identify locations of needed vegetative treatments within rights-of-way in high-risk areas of the WUI and support the Core Team in obtaining grants and agreements necessary to implement vegetative fuel reduction projects adjacent to rights-of-way.
- Develop a presuppression plan with BLM and FS along the boundary of the WUI.
- Develop additional wildland fire preplans for all high-hazard locations across Maricopa County where they have not been adopted.
- Develop IGAs with Maricopa County on nuisance-abatement projects located in high-hazard communities.
- Meet annually, immediately before the fire season, to coordinate early suppression deployment and to determine training and equipment needs.

3. Promote Community Involvement and Improved Public Education, Information, and Outreach

Maricopa County, BLM, CNF, TNF, ASFD, local fire departments and districts, and the Core Teams will continue developing and implementing public outreach programs to help create an informed citizenry. The goal is to have residents support concepts of Firewise landscaping and naturally functioning wildland systems through restoration management and rapid response to wildland fire. The Maricopa County CWPP is intended to be a long-term strategic instrument containing prescriptive recommendations to address hazardous fuels. A grassroots collaborative structure of individual citizens, supported by local governments as full partners, will provide the most effective long-term means to achieve these goals and to maintain community momentum. Additional educational resources are listed in Appendix C. The components of such a structure include the following recommendations:

- Assist in implementing a Firewise Communities/USA Recognition program in communities where the program is supported by the local fire departments and districts. The Firewise Communities approach emphasizes community and individual responsibility for safer home construction and design, landscaping, and maintenance. The Core Teams will also help identify high-priority communities that would most benefit from a Firewise Communities program.
- Expand the use of current public information tools for fire-safe residential treatments as an immediate action step. This will be accomplished through information mailers to homeowners,

presentations by local fire departments and districts, and the development of specific promotional materials by Maricopa County.

- Place fire-danger information signs on major access roads throughout the WUI. Community bulletins and other public service announcements concerning wildfire threat and preparedness should be developed with assistance from ASFD, BLM, and Maricopa County.
- Place and maintain bilingual wildfire caution signs within camping areas and access routes in some areas of the WUI.
- Complete wildfire home assessments through the use of Redzone software, or an equivalent software system, and submit wildfire hazard mitigation strategies to landowners for each private property assessed within highest risk communities.
- Replace and maintain fencing adjacent to high-use and illegal off-road-vehicle use areas within or adjacent to the WUI.

4. Encourage Use of Woody Material from WUI Fuel Mitigation Programs

The Core Teams and their collaborators will continue to support and promote private contractors who perform Firewise mitigation work. The County will continue to support and promote new businesses involved in the wildland fuel reduction market. Maricopa County, CNF, TNF, BLM, and local fire departments and districts are committed to encouraging, as appropriate, the use of vegetative by-products from the WUI fuel management program for commercial or community-service organization use. Possible by-product uses encouraged by the Core Teams include the following:

- Bagged mesquite wood for sale to visitors and larger-community markets as “campfire cooking” for commercial or personal culinary uses
- Firewood marketed to local residents, visitors, and adjacent communities
- Mesquite, pinyon pine, and juniper wood marketed for artwork, furniture, and other specialty wood products

IV. MARICOPA COUNTY CWPP PRIORITIES: ACTION RECOMMENDATIONS AND IMPLEMENTATION

The Core Teams have developed action recommendations (see Section III of this CWPP) necessary to meet the plan's objectives. A series of recommendations that will reduce structural ignitability, improve fire prevention and suppression, and enhance public outreach have also been developed by the Core Teams. A unified effort to implement this collaborative plan requires timely decision making at all levels of government.

To meet Maricopa County CWPP objectives, the Core Teams have developed the following action recommendations. At the end of each year, projects implemented from these action recommendations will be monitored for effectiveness of meeting Maricopa County CWPP objectives. For the life of the Maricopa County CWPP, recommendations for additional projects will be made for each future year on the basis of project performance from the previous implemented projects.

A. Administrative Oversight

Generally, the most efficient way to manage the mitigation of wildland fire threat in the WUI is through identifying, delegating, implementing, and monitoring the action recommendations of the Maricopa County CWPP. Establishing a unified effort to collaboratively implement the Maricopa County CWPP embraces adaptive management principles that enhance decision making and reduce inconsistency at all levels of government.

The Core Teams recommend the establishment of a countywide community CWPP Working Group (CWPP Working Group)—composed of the fire chiefs from Maricopa County or their representatives, ASFD, MCDEM, TNF, and BLM—to work with the Core Teams and concurring agencies to accomplish the recommendations for outreach and structural ignitability within the Maricopa County CWPP WUI area, which include fuel hazards removal on private lands within the WUI. The CWPP Working Group should consist of community members; local fire departments and districts; and, as needed, additional representatives from the MCDEM, ASFD, ASLD, TNF, BLM, and other concurring agencies. MCDEM will be the lead agency responsible for coordinating the CWPP Working Group and producing the monitoring reports and future updating of the CWPP.

The CWPP Working Group will prioritize wildland fuel modification, structural ignitability, protection capability, and public outreach projects listed in the approved Maricopa County CWPP on a countywide basis, and will review these priority recommendations for possible reprioritization at least once annually subsequent to approval of the Maricopa County CWPP by ASFD. Fuel modification and community planning, outreach, and warning programs will be prioritized by the CWPP Working Group as a whole; other projects involving firefighter training, equipment, communications, facilities, and apparatus will be recommended by the fire chiefs from Maricopa County or their representatives in the CWPP Working Group.

The CWPP Working Group is expected to be an advocate for and provide support to fire departments and districts or other agencies in the submittal of grant applications and the solicitation of other funding

opportunities to implement wildland fuel modification, structural ignitability, protection capability, and public outreach projects established as priorities by the CWPP Working Group. Additionally, individual agencies will be able to seek letters of support from the CWPP Working Group or partner agencies in applying for funding for projects identified as priorities by the Working Group.

The CWPP Working Group will also compile annual monitoring and reporting from cooperating agencies to provide information on additional measures necessary to meet Maricopa County CWPP goals, including additional future recommendations from fire departments and districts and other agencies for inclusion in the priorities list. The CWPP Working Group may also act as an advisory group to Maricopa County Planning and Zoning and to developers in outlying areas to ensure adequate road conditions and to provide vegetation mitigation and landscaping recommendations, water supplies for emergency services, and recommendations for establishing and funding fire services and equipment in residential and commercial developments.

The following general criteria will be used for prioritizing proposed projects and action items:

1. Geographic/fuel-load/residential density:
    a. The New River, Sunflower, St. Johns, and Gila River riparian corridor from St. Johns through the Gila Bend Valley sub-WUIs will receive long-term priority due to high vegetative fuel risk, ignition history, and threatened structures and infrastructures.
    b. In any given year, the CWPP Working Group will evaluate countywide weather, vegetation, and fuel-load conditions and projections, as well as current residential and commercial densities, to determine short-term priority adjustments for projects in all WUI areas of the county for that year.
    c. In any given year, the CWPP Working Group will evaluate the progress of new developments and increasing residential and commercial densities to determine potential needs and priorities within the WUI for the next 3 years following that given year.
2. Categorical/functional criteria—priorities will generally be established in the order listed below; these priorities are subject to review and change by the Maricopa County CWPP Working Group on an ongoing basis:
    a. Fuel modification projects (first priorities will be for those projects within fire-department and fire-district, TNF, BLM, or ASFD jurisdictions within the New River, Sunflower, St. Johns, and Gila River riparian corridor sub-WUIs)
    b. Enhanced wildland firefighter training and acquisition of personal protection equipment (PPE)
    c. Wildland-fire suppression equipment and tools, including brush engines and tenders
    d. Water-storage sites and supply facilities
    e. Community planning and outreach activities, including warning signs/systems and identification and improvement of evacuation routes
    f. Radios for primary use by trained and designated wildland fire crews
    g. Helicopter pads for firefighter deployment or evacuation
    h. Fire stations in areas with sufficiently high threat and population densities as determined annually by the CWPP Working Group

i. Other communications projects

The agencies involved in the formation of this plan support local community efforts and will work with the communities as needed to accomplish action items. BLM, TNF, ASFD, MCDEM, and fire departments and districts will coordinate fuel mitigation projects on state, public, and forest lands, and also within SRP and APS utility corridors, within the WUI in coordination with the CWPP Working Group when established. The Core Teams and the proposed CWPP Working Group will be responsible for submitting grants and soliciting other opportunities to implement wildland fuel mitigation projects on private lands and to support public information, education, and outreach within the WUI. Successful award of grant funds will be used to implement the action recommendations for private land treatments, mitigation features for reduced structural ignitability, firefighting response, and public outreach. BLM, TNF, ASFD, MCDEM, fire departments and districts, and the Core Teams will pursue funding to construct and maintain firebreaks as well as broader applications of wildland fuel mitigation projects within the WUI. Annual monitoring and reporting compiled by the CWPP Working Group will provide information on additional measures necessary to meet Maricopa County CWPP goals.

B. Priorities for Mitigation of Hazardous Wildland Fuels

Table 4.1 displays the priority for constructing firebreaks and landscape wildland fuel treatments within the WUI as recommended by the Core Teams. These action recommendations will reduce wildfire potential to the community and have high valuations for reducing wildland fire risk. The Core Teams recognize that not all acres within a high-risk landscape can be treated. Site-specific analysis will determine treatment acres and methods that produce a fire-resilient vegetative stand appropriate for the habitat.

C. Identified Action Items for Protection Capability and Reduced Structural Ignitability

The Core Teams and collaborators will evaluate; maintain; and, where necessary, upgrade community wildfire preparation and response facilities, capabilities, and equipment. Table 4.2 lists the identified action items proposed by the Core Teams for consideration by individual fire departments and districts for structural ignitability and public outreach within their respective jurisdictions. Table 4.3 lists the future recommendations for wildland fire protection and reduced ignitability.

The CWPP Working Group will meet subsequent to the ASFD's final approval of the Maricopa County CWPP to prioritize projects on a countywide basis for the upcoming year and, thereafter, at least annually to reevaluate projects and reallocate priorities as needed. Such countywide prioritization will not impinge on or interfere with the fire departments' and districts' rights to independently seek funding for projects within their jurisdictions without CWPP Working Group support.

Table 4.1. Action recommendations for wildland fuel modification

Management area[a]	Location and description	Project partner	Estimated treatment cost[b]
SF2	Lands along SR 89 to the south of the community of Sunflower	MCDEM, ASFD, and TNF	2,153 high-risk acres, 30% of lands to be treated over 3 years estimated to be 215 acres/year in FY 2011–14 = $72,250.00/year; cost estimated to average $350.00/acre on federal, ASLD, and private lands
NR3	Lands along the I-10 corridor, south of the community of New River	MCDEM, ASLD, ASFD, and Daisy Mountain Fire District	1,412 high-risk acres, 30% of lands to be treated over 3 years estimated to be 140 acres/year in FY 2011–14 = $49,000.00/year; cost estimated to average $350.00/acre on federal, ASLD, and private lands
GRIC1	Gila River corridor west of St. Johns	MCDEM, Gila River Indian Community, and Bureau of Indian Affairs Pima Agency	8,180 high-risk acres, 30% of lands to be treated (riparian acres) over 3 years estimated to be 90 acres/year in FY 2011–14 = $315,00.00/year; cost estimated to average $350.00/acre on tribal lands
GB2	Gila Bend Valley north of the community of Gila Bend	MCDEM, ASFD, BLM, and Gila Bend Fire District	403 high-risk acres, 30% of lands to be treated (riparian acres) over 3 years estimated to be 40 acres/year in FY 2011–14 = $14,000.00/year; cost estimated to average $350.00/acre on private lands
Firebreak maintenance	1- to 2-year rotating maintenance of fine and light fuels in Firebreaks SF1, NR2, GR4, and GB2	ASLD, ASFD, CNF, TNF, MCDEM, and participating fire departments and districts	500 acres/year of light understory fuel treatments in excess of 4 acres treated/10-hour day at $830.00/day costs = $415,000.00/year

[a] SF = Sunflower; NR = New River; GRIC = Gila River Indian Community; GB = Gila Bend.

[b] Total acres to be treated during the life of the plan; one-third of acres estimated to be treated based on site-specific analysis, which will determine actual acres available for treatment in each area.

Table 4.2. Action recommendations for structural ignitability and public outreach

Project partner	Project	Specific recommendation	Estimated cost	Timeline
MCDEM and Queen Creek Fire Department	**E1**—Wildland Fire Protection and Reduced Ignitability	Purchase one Type 3 fire engine for use by Queen Creek Fire Department	New acquisition with standard equipment $210,000.00	Begin grant applications in 2010; purchase in 2011
MCDEM, TNF, CNF, ASFD, ASLD, and associated fire departments and districts	**A1**—Wildland Fire Protection and Reduced Ignitability	Construct a series of 5,000-gal water-storage facilities located strategically throughout residential areas	Install water-storage facilities/year: $5,000.00/facility	Locate and install one water-storage facility in 2010
MCDEM and Gilbert Fire Department	**A2**—Enhanced Public Education, Information, and Outreach	Wildfire Public Education Brochures	Produce and publish community specific wildfire informational brochures	Begin grant applications in 2010; continue on an ongoing basis in 2011
MCDEM and Rural/Metro, Cave Creek, and Carefree Fire Departments	**E2**—Wildland Fire Protection and Reduced Ignitability	Obtain one Type 6 brush truck for wildland fire response within the Cave Creek and Carefree communities	New acquisition with standard equipment $101,000.00	Begin grant applications in 2010; purchase in 2011
MCDEM, TNF, CNF, ASFD, ASLD, and associated fire departments and districts	**E3**—Wildland Fire Protection and Reduced Ignitability	Obtain 10 handheld programmable radios for firefighter dispatch and communication	King digital programmable handheld radios, $1,380.00/radio: $13,800.00	Obtain grant funding in 2010
	A2—Enhanced Public Education, Information, and Outreach	Work with land agencies for the acquisition, operation, and maintenance of a green-waste disposal site within reasonable proximity to community	Locate and coordinate with land management agency; excavate pit and fence: $20,000.00	Begin planning with agencies in FY 2009/10; implement in FY 2010/11
MCDEM, TNF, CNF, ASFD, ASLD, and associated fire departments and districts	**A3**—Enhanced Public Education, Information, and Outreach	Develop a fire-safety awareness program for community groups	Promote and conduct a community fire-awareness day at local fire departments and districts: $2,000.00	Solicit funds for promotion, brochures, and event materials in 2010; conduct in 2010
		Create fire-safety and fire-awareness posters for public places	Development, printing, and distribution costs: $5,000.00	Solicit funds for production and printing in 2010; publish and post in 2010

Table 4.2. Action recommendations for structural ignitability and public outreach

Project partner	Project	Specific recommendation	Estimated cost	Timeline
MCDEM and Glendale Fire Department	**E4**—Wildland Fire Protection and Reduced Ignitability	Obtain one Type 6 brush truck and a water tender for wildland fire response within Glendale	New acquisition with standard equipment $101,000.00; 1,500-gal water tender, 4-wheel drive: $85,000.00: $186,000	Begin grant applications in 2010; purchase in 2011

[a] Projects are designated by project type (E = equipment; A = administrative) but not ranked in order of importance.

Table 4.3. Future recommendations for wildland fire protection and reduced ignitability

Project partner	Project[a]	Equipment/expense	Timeline
MCDEM, ASFD, FS, and associated fire departments and districts	**E5**—Obtain a medium-size water tender to better traverse rural landscape than larger units	1,500-gal water tenders, 4-wheel drive: $85,000.00	Acquire tender in FY 2010/11; assess additional tender needs in FY 2010/11
MCDEM, ASFD, FS, and associated fire departments and districts	**I1**—Retrofit existing wells or water supplies for local fire department/district use (outlet pipes, valves, and hose thread adaptors); maintain sites; cost-share hose and nozzle for immediate protection at site	Pipe and valve installation and site maintenance: $10,000.00 initial, $2,500.00 annually	Begin in FY 2010/11; maintain annually
MCDEM, ASFD, CNF, TNF, BLM, and associated fire departments and districts	**A4**—Develop and maintain written mutual-aid agreements with neighboring fire departments and districts for wildland fire, structure fire, and other emergency response	Staff time, coordination efforts, research, and meetings: $5,000.00	Inventory existing agreements; determine deficiencies and implement any needed agreements in FY 2011/12
MCDEM, ASFD, CNF, TNF, BLM, and associated fire departments and districts	**A5**—Work with Maricopa County to develop a notification and evacuation plan for the community	Staff time, coordination efforts, research, and meetings: $5,000.00	Begin planning in FY 2010/11; implement in FY 2012
MCDEM, ASFD, CNF, TNF, BLM, APS, SRP, and associated fire departments and districts	**A6**—Work with SRP and APS on vegetative management treatments within and adjacent to utility corridors where opportunities exist	Staff time, coordination efforts, research, and meetings: $5,000.00	Begin planning in FY 2010/11; implement in FY 2012

[a] Projects are designated by project type (E = equipment, I = infrastructure, A = administrative) but not ranked in order of importance.

D. Priorities for Promoting Community Involvement through Education, Information, and Outreach

The MCDEM and the Core Teams will implement public outreach and education programs for residents to heighten awareness and understanding of the threat that wildland fire poses to the communities.

Table 4.4 displays the Maricopa County CWPP priority recommendations to promote community involvement. Additional programs that could be used or developed to enhance community outreach and education may be developed and implemented in the future. The Core Teams will use the resources of the

ASFD, TNF, and BLM for additional public education programs and community outreach. Community bulletins and other public service announcements concerning wildfire threat and preparedness should be developed with assistance from ASFD, TNF, and BLM.

Table 4.4. Future recommendations for enhanced public education, information, and outreach

Project partner	Project[a]	Equipment/expense	Timeline
MCDEM, CNF, TNF, BLM, ASFD, and associated fire departments and districts	**A7**—Establish and maintain roadside fire-danger warning signs and other informational and directional road signs along major roads as determined by the Maricopa County Fire Officers Association	Construction and placement: $5,000.00	Construct and implement in FY 2010/11
	A8—Create and distribute community bulletins	Development, printing, and distribution costs: $5,000.00	Develop in FY 2010; distribute continually
	I2—Acquire Redzone, or equivalent software, and field data recorders or PDAs (personal digital assistants) to complete home fire assessments and implement fire-safe recommendations	Software and data recorder: $1,300.00 Assessment completion: $2,000.00	Acquire software and complete assessments in FY 2010/11; implement recommendations in FY 2011
	I3—Encourage private businesses that perform Firewise land treatments; encourage market development of WUI by-products from vegetative fuel mitigation programs	Marketing plan to be developed	Initiate community marketing planning meetings in FY 2011
	I4—Replace and maintain fencing adjacent to high OHV (off-highway vehicle) use areas	Assess in 2011, initial plan for 1 mile of new or repaired fencing	Estimate $6,000.00m per mile of standard 4-wire fencing

[a] Projects are designated by project type (A = administrative; I = infrastructure) but not ranked in order of importance.

V. MONITORING PLAN

Monitoring is essential to ensure that Maricopa County CWPP goals are met. The Maricopa County CWPP administrators, the local fire departments and districts, MCDEM, ASFD, TNF, and BLM will actively monitor the progress of the Maricopa County CWPP action recommendations to determine the effectiveness of ongoing and completed projects in meeting Maricopa County CWPP objectives, as well as to recommend future projects necessary to meet Maricopa County CWPP goals.

In accordance with Section 102.g.5 of HFRA, Maricopa County CWPP communities will participate in any multiparty monitoring program established by state and federal agencies, or other interested parties, to assess progress toward meeting Maricopa County CWPP objectives. This authority to participate in multiparty monitoring will be vested in the CWPP Working Group. The Core Teams believe that participation in multiparty monitoring will provide effective and meaningful ecological and socioeconomic feedback on landscape and site-specific fuel reduction projects and watershed enhancements and will also help BLM, TNF, ASFD, ASLD, MCDEM, local municipalities, and fire departments and districts with land-management planning.

The CWPP Working Group will request participation in any post-wildfire analysis and burned area emergency response (BAER) planning with lead state or federal agencies. Immediate post-wildfire analysis and planning is essential to Maricopa County to enhance public safety from possible flood and debris flows, municipal watershed pollution, and other post-wildfire habitat and community impacts.

This section details the performance measures that will be used to assess the effectiveness of implementing the Maricopa County CWPP action recommendations. Monitoring will include assessing and evaluating the success of individual Maricopa County CWPP project implementation and a given project's effectiveness in furthering Maricopa County CWPP objectives.

A. Administrative Oversight, Monitoring, and Maricopa County CWPP Reporting

The CWPP Working Group, composed of Maricopa County fire chiefs, MCDEM, TNF, ASFD, and BLM, will be mutually responsible for implementing and monitoring Maricopa County CWPP action recommendations in coordination with a future established CWPP Working Group. The CWPP Working Group should identify appropriate grant and other funding mechanisms necessary to implement the action recommendations of the Maricopa County CWPP. Grant information should be routinely searched to identify updated grant application cycles. In addition to the resources listed in Appendix C of this CWPP, the following is a list of federal, state, and nongovernmental Web sites that can be monitored to obtain updated information about grant application cycles:

Federal

- www.fs.fed.us/r3
- www.fs.fed.us/r3/partnerships/
- www.fireplan.gov
- www.firegrantsuport.com
- www.az.nrcs.usda.gov

- www.blm.gov/az
- www.firewise.org
- www.ncwg.gov

State

- www.azsf.az.gov
- www.azgfd.gov
- www.cals.arizona.edu/firewise
- www.southwestareagrants.org

Nongovernmental

- www.iwjv.org
- www.sonoran.org
- www.iafc.org

As needed, the MCDEM, in coordination with the future-established countywide community CWPP Working Group, will produce a report detailing the success of Maricopa County CWPP project implementation and overall progress toward meeting Maricopa County CWPP goals. The CWPP Working Group should report successful grant awards received for implementing the Maricopa County CWPP action recommendations to the Maricopa County CWPP signatories. The CWPP Working Groups' report will also include recommendations to the signatories for updating the Community Mitigation Plan and the Prevention and Loss Mitigation Plan portions of the Maricopa County CWPP, through the use of the principles of adaptive management. This information will ensure timely decision making for all levels of government and will provide input necessary for developing future work plans and for prioritizing project recommendations over the life of the Maricopa County CWPP. Appendix D provides information on the data used in the analysis of the Maricopa County CWPP and the appropriate contacts for updating the Maricopa County CWPP. Once the Maricopa County CWPP is updated, it will be submitted to the MCDEM, the Arizona State Forester, all cooperating fire departments and districts, municipal governments, TNF, and BLM for their concurrence. Once concurrence is achieved, the action recommendations of the updated Maricopa County CWPP are to be forwarded for funding through HFRA and other appropriate funding sources.

B. Effectiveness Monitoring

Table 5.1 outlines the performance measures that the CWPP Working Group will use to assess Maricopa County CWPP performance against goals for the fiscal year. In addition to monitoring the listed performance measures, Maricopa County CWPP administrators should assess the current status of wildland fuel hazards and look for any new or developing issues not covered by the Maricopa County CWPP. As new issues arise, such as new invasive-species infestations, further risks and recommendations for treatment should be identified, and the Maricopa County CWPP should be updated or amended as necessary to meet the Maricopa County CWPP goals. To help track fuel treatments being planned and completed through local, state, and federal programs, the Maricopa County CWPP administrators will cooperate by providing requested detailed mapping information to the Arizona State Forester's office.

Table 5.1. Performance measures to assess Maricopa County CWPP progress

Goal	Performance measure
Improve fire prevention and suppression	Reduction of wildland fire occurrence and acres burned (unplanned) in the WUI: • Green-waste disposal sites available in high-risk communities. • Type 3 fire engine acquired by Queen Creek Fire Department. • Type 6 brush truck acquired for use in Carefree and Cave Creek sub-WUIs. • Effectiveness monitoring of fire prevention and suppression will include the following: — Acres burned and degree of severity of wildland fire — Percentage of wildland fire controlled on initial attack — Number of homes and structures lost to wildland fire • New water sources developed in key areas. • Consistent fire training in use. • Wildland firefighter PPE (personal protection equipment) acquired as needed.
Reduce hazardous vegetative fuels	Effective treatment of high-risk areas by acre: • Number of treated acres of nonfederal WUI lands that are in Condition Class 2 or 3 are identified as high priorities by the Maricopa County CWPP and should be moved to Condition Class 1 or another acceptable level of wildland fuel loading and continuity. • Acres treated to acceptable fuel levels within priority treatment management areas. • Total acres treated through any fuel-reduction measures, including prescribed fire, that are conducted in, or adjacent to, the WUI. The change of condition class should be determined for small projects or treatment areas through the use of the LANDFIRE database.
Restore watershed health	Acres of fuel reduction or watershed enhancement treatments that meet restoration treatment guidelines for riparian habitats: • Coordination with and support of MCDEM, ASFD, ASLD, TNF, and BLM in implementing and determining social, economic, and environmental effects of riparian restoration treatments (Treatments 7 and 9, see Table 3.1 in mitigation plan). • Acres of saltcedar-invaded riparian areas identified and undergoing restoration treatments.
Promote community involvement	Initiation of public outreach programs: • Countywide community CWPP Working Group initiated. • Public outreach programs and promotions implemented to enhance volunteer efforts to reduce hazardous fuels. • Number and areas (community or dispersed residents) of private landowners supporting and implementing fuel reduction projects. • MCDEM and local fire departments and districts developed and implemented evacuation plans for identified high-risk areas. • Roadside fire-danger warning signs in English and Spanish installed at strategic points within the WUI. • Green-waste disposal and processing site secured and operational. • Fire-awareness articles printed in local newspapers. • Fire-safety awareness program, posters, and information available in public places.
Encourage economic development	Wood-products industry growth and diversification to use all sizes of material removed by fuel-reduction treatments: • Number of value-added wood products developed by the community. • Number of new markets (local firewood sales) for local products created.

VI. DECLARATION OF AGREEMENT AND CONCURRENCE

The following partners in the development of the Maricopa County Community Wildfire Protection Plan have reviewed and do mutually agree or concur with its contents:

Agreement

Maricopa County Board of Supervisors	Date
City of Aguila	Date
City of Apache Junction	Date
City of Avondale	Date
City of Buckeye	Date
Town of Carefree	Date
City of Cave Creek	Date
City of Chandler	Date
Town of Circle City-Morristown	Date
Town of El Mirage	Date
Town of Fountain Hills	Date
Town of Gila Bend	Date

Town of Gilbert	Date
City of Glendale	Date
City of Goodyear	Date
Town of Guadalupe	Date
City of Litchfield Park	Date
City of Mesa	Date
City of Paradise Valley	Date
City of Peoria	Date
City of Phoenix	Date
Town of Queen Creek	Date
City of Tempe	Date
City of Tolleson	Date
City of Scottsdale	Date
City of Sun City	Date

City of Sun City West — Date

City of Sun Lakes — Date

City of Surprise — Date

Town of Wickenburg — Date

Town of Wittmann — Date

Town of Yountown — Date

Arizona Public Service Company — Date

Chief, Aguila Fire District — Date

Chief, Apache Junction Fire Department — Date

Chief, Avondale Fire Department — Date

Chief, Buckeye Fire Department — Date

Chief, Buckeye Valley Rural Fire District — Date

Chief, Carefree Fire Department — Date

Chief, Cave Creek Fire Department — Date

Chief, Chandler Fire Department — Date

Chief, Circle City-Morristown Vol. Fire Department — Date

Chief, Daisy Mountain Fire District — Date

Chief, El Mirage Fire Department — Date

Chief, Fountain Hills Fire Department — Date

Chief, Gilbert Fire Department — Date

Chief, Glendale Fire Department — Date

Chief, Goodyear Fire Department — Date

Chief, Guadalupe Fire Department — Date

Chief, Fountain Hills Fire Department — Date

Chief, Gila Bend Vol. Fire Department — Date

Chief, Mesa Fire Department — Date

Chief, Paradise Valley Fire Department — Date

Chief, Peoria Fire Department — Date

Chief, Phoenix Fire Department	Date
Chief, Queen Creek Fire Department	Date
Chief, Scottsdale Fire Department	Date
Chief, Sun City Fire District	Date
Chief, Sun City West Fire District	Date
Chief, Sun Lakes Fire District	Date
Chief, Surprise Fire Department	Date
Chief, Rio Verde Fire District	Date
Chief, Tempe Fire Department	Date
Chief, Wickenburg Fire Department	Date
Chief, Wittmann Fire District	Date
Chief, Youngtown Fire Department	Date

Concurrence

Arizona State Forester Arizona State Forestry Division	Date
Phoenix District Manager Bureau of Land Management	Date
Cave Creek District Ranger Tonto National Forest	Date
Emergency Manager Salt River Pima-Maricopa Indian Community	Date

VII. REFERENCES

Anderson, H. E. 1982. *Aids to Determining Fuel Models for Estimating Fire Behavior.* INT-122. National Wildlife Coordinating Group, Washington, DC.

Arizona Department of Commerce. 2009. Community Profiles. http://www.azcommerce.com.

Arizona Wildlands Invasive Plant Working Group (AZ-WIPWG). 2005. *Invasive Non-Native Plants that Threaten Wildlands In Arizona: A Categorized List Developed by the Arizona Wildland Invasive Plant Working Group*. August.

Arizona State Forester. 2004. *Arizona Wildland Urban Interface Assessment*. http://www.azstatefire.org.

Arizona State Forester. 2007. *Identifying Arizona's Wildland/Urban Interface Communities at Risk: A Guide for State and Federal Land Managers*.

Arizona State Forester. 2009. *Arizona-Identified Communities at Risk.* http://www.azstatefire.org.

Buffelgrass Working Group. 2008. *Southern Arizona Buffelgrass Strategic Plan.* February.

Burgan, R. E. 1988. *1988 Revisions to the 1978 National Fire-Danger Rating System*. Research Paper SE-273. USDA Forest Service, Southeastern Forest Experiment Station, Asheville, NC.

Central Arizona Wildland Response Team. 2007. *Strategic Plan 2007-2012*.

Cohen, J. 2008. *The Wildland Urban Interface Fire Problem A Consequence of the Fire Exclusion Paradigm.* Forest History Today. Forest History Society. http://www.ForestHistory.org.

Communities Committee of the Seventh American Forest Congress, Society of American Foresters, the National Association of State Foresters (NASF), the National Association of Counties, and the Western Governors Association (WGA). 2004. *Preparing a Community Wildfire Protection Plan: A Handbook for Wildland-Urban Interface Communities*.

Fire Regime Condition Class (FRCC) Interagency Working Group. 2005a. *Interagency Fire Regime Condition Class Guidebook*. Fire Regime Condition Class Version 1.2. http://www.frcc.gov/docs/1.2.2.2/Complete_Guidebook_V1.2.pdf.

FRCC Interagency Working Group. 2005b. *Fire Regime Condition Class (FRCC) Interagency Handbook Reference Conditions*. Fire Regime Condition Class Potential Natural Vegetation Group (BpS) Descriptions. http://www.frcc.gov/pnvgSummaries.html.

Gori, D. F., and C. A. F. Enquist. 2003. *An Assessment of the Spatial Extent and Condition of Grasslands in Central and Southern Arizona, Southwestern New Mexico and Northern Mexico*. The Nature Conservancy, Arizona Chapter.

Governor's Arizona Forest Health Oversight Council. 2006. *2006 Status Report and Recommendations.* Executive Order 2003-16. Final. April 25.

Governor's Forest Health Councils, State of Arizona. 2007. *The Statewide Strategy for Restoring Arizona's Forests*, edited by E. Aumack, T Sisk, and J. Palumbo. Arizona Public Service, Phoenix. June.

Hauser, A. S. 2008. *Pennisetum ciliare.* In *Fire Effects Information System*. US Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory. http://www.fs.fed.us/database/feis/.

Hendricks, D. M. 1985. *Arizona Soils*. College of Agriculture, University of Arizona. Tucson.

Maricopa County Department of Emergency Management (MCDEM) and JE Fuller / Hydrology and Geomorphology. 2009. *Maricopa County Multi-Jurisdictional Hazard Mitigation Plan*.

National Association of State Foresters. 2003. *Field Guidance: Identifying and Prioritizing Communities At Risk.* http://www.stateforesters.org/reports/COMMUNITIESATRISKFG.pdf.

National Fire and Aviation Executive Board. 2007. Clarification of Appropriate Management Response. http://www.nifc.gov/fire_policy/.

National Wildfire Coordinating Group. 2006. *Re-release of NWCG Interagency Wildland Fire Key Messages.* National Interagency Fire Center, Boise, ID.

Natural Resource Conservation Service (NRCS). 2002. *National Conservation Practice Standards, Range Planting*. Code 550.

NRCS. 2007. *National Cooperative Soil Survey Rangeland Productivity and Plant Composition-Pima County, Eastern Part*.

NRCS. 2010. *MLRA Explorer Custom Report. D-Western Range and Irrigated Region 40-Sonoran Basin and Range.* USDA Agriculture Handbook 296. http://soils.usda.giv/MLRAExplorer (accessed January 2010).

NRCS. 2010. *MLRA Explorer Custom Report. D-Western Range and Irrigated Region 38-Mogollon Transition.* USDA Agriculture Handbook 296 http://soils.usda.giv/MLRAExplorer (accessed January 2010).

NatureServe. 2004. *Southwest ReGAP Analysis Project- Land Cover Data Legend Descriptions*. http://earth.gis.usu.edu/swregap/legend_desc.html.

Presidential Policy. 2002. *Healthy Forests: An Initiative for Wildfire Prevention and Stronger Communities*. August 22.

Rogstad, Alex. Ed. 2008. *Southern Arizona Bufflegrass Strategic Plan. A Regional Guide for Control, Mitigation and Restoration*. Arizona-Sonora Desert Museum, Tucson.

San Juan County Watershed Group. 2005. *San Juan Basin Watershed Management Plan*.

Schmidt, K. M., J. P. Menakis, C. C. Hardy, W. J. Hann, and D. L. Bunnell. 2002. *Development of Coarse-Scale Spatial Data for Wildland Fire and Fuel Management.* RMRS-87. USDA Forest Service, Washington, DC.

Scott, Joe H., and Robert E. Burgan. 2005. *Standard Fire Behavior Fuel Models: A Comprehensive Set for Use with Rothermel's Surface Fire Spread Model*. Gen. Tech. Rep. RMRS-GTR-153. US Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fort Collins, CO.

Southwest Strategy. 2009. *Southwest Community Wildfire Protection Plan Guide*. Southwest Strategy Wildland Urban Interface Task Team. http://azsf.az.gov/UserFiles/PDF/wildfire_plan_guide.pdf (accessed October 2009).

US Census Bureau. 2008. Maricopa County, Arizona, ACS [American Community Survey] Demographic and Housing Estimates: 2007. American FactFinder. http://factfinder.census.gov/.

US Department of Agriculture Forest Service (USDA FS). 1978. *The National Fire Danger Rating System*. GTR INT-39.

USDA FS. 2000. *USDA Forest Service Handbook 1909*. Washington, DC.

USDA FS. 2003. *Fire Regime and Condition Class (FRCC) Field Procedures—Standard and Scorecard Methods.* FIREMON v1.1 – 10/30/03-1. Washington, DC.

USDA FS. 2005. *Tonto National Forest Land and Resource Management Plan.* Tonto National Forest, Mesa.

USDA FS. 2006. *Amendment 25 to the Tonto National Forest Land and Resource Management Plan*. Tonto National Forest, Mesa.

USDA FS and New Mexico Energy, Minerals and Natural Resources Department, Forestry Division. 2005. *Strategy for Long-Term Management of Exotic Trees in Riparian Areas for New Mexico's Five River Systems, 2005-2014*.

USDA FS and USDI Bureau of Land Management (USDI BLM). 2002. *A Collaborative Approach for Reducing Wildland Fire Risks to Communities and the Environment: 10-Year Comprehensive Strategy Implementation Plan*. Washington, DC.

USDA FS and USDI BLM. 2004a. *The Healthy Forests Initiative and Healthy Forests Restoration Act: Interim Field Guide.* FS-799. Washington, DC.

USDA FS and USDI BLM. 2004b. *National Fire Plan*. Washington, DC. http://www.fireplan.gov (accessed March 2008).

USDA FS and USDI BLM. 2009. *Guidance for Implementation of Federal Wildland Fire Management Policy.* Fire Executive Council. February 13, 2009

USDA and USDI. 2001a. "Urban Wildland Interface Communities within the Vicinity of Federal Lands That Are at High Risk from Wildfire," *Federal Register* Vol. 66, no. 3, pp. 751–777. January 4.

USDA and USDI. 2001b. "Urban Wildland Interface Communities within the Vicinity of Federal Lands That Are at High Risk from Wildfire" (update), *Federal Register* Vol. 66, no. 160, pp. 43383–43435. August 17.

USDI BLM. 2004a. *Approved Arizona Statewide Land Use Plan Amendment for Fire, Fuels, and Air Quality Management and Decision Record*.

USDI BLM. 2004b. Wildland Fire Suppression (Including Wildland Fire Use) and Rehabilitation in Riparian and Aquatic Habitats (RA).

USDI and USDA 2005. *Wildland Fire Use Implementation Procedures Reference Guide*. May 2005.

US Geological Survey (USGS) National GAP Analysis Program. 2005. Southwest Regional GAP Analysis Project—Land Cover Data Legend Descriptions. RS/GIS Laboratory, College of Natural Resources, Utah State University. http://ftp.nr.usu.edu/swgap/legend_desc.html.

Wildland Fire Leadership Council. 2002. Memorandum of Understanding. http://www.fireplan.gov/leadership/memorandum.html.

Zouhar, K. 2003. *Tamarix* spp. Fire Effects Information System (online). USDA Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory(Producer). http://www.fs.fed.us/database/feis/.

VIII. GLOSSARY OF FIRE MANAGEMENT TERMS

A

Aerial Fuels: All live and dead vegetation in the forest canopy or above surface fuels, including tree branches, twigs and cones, snags, moss, and high brush.

Aerial Ignition: Ignition of fuels by dropping incendiary devices or materials from aircraft.

Air Tanker: A fixed-wing aircraft equipped to drop fire retardants or suppressants.

Agency: Any federal, state, county, or city government organization participating with jurisdictional responsibilities.

Anchor Point: An advantageous location, usually a barrier to fire spread, from which to start building a fire line. An anchor point is used to reduce the chance of firefighters being flanked by fire.

Appropriate Tools: Methods for reducing hazardous fuels including prescribed fire, wildland fire use, and various mechanical methods such as crushing, tractor and hand piling, thinning (to produce commercial or pre-commercial products), and pruning. They are selected on a site-specific case and are ecologically appropriate and cost effective.

Aramid: The generic name for a high-strength, flame-resistant synthetic fabric used in the shirts and jeans of firefighters. Nomex, a brand name for aramid fabric, is the term commonly used by firefighters.

Aspect: Direction toward which a slope faces.

B

Backfire: A fire set along the inner edge of a fireline to consume the fuel in the path of a wildfire and/or change the direction of force of the fire's convection column.

Backpack Pump: A portable sprayer with hand-pump, fed from a liquid-filled container fitted with straps, used mainly in fire and pest control. (see Bladder Bag)

Bambi Bucket: A collapsible bucket slung below a helicopter. Used to dip water from a variety of sources for fire suppression.

Behave: A system of interactive computer programs for modeling fuel and fire behavior that consists of two systems: BURN and FUEL.

Bladder Bag: A collapsible backpack portable sprayer made of neoprene or high-strength nylon fabric fitted with a pump. (see Backpack Pump)

Glossary adapted from the NIFC, http://www.nifc.gov/fireinfo/glossary.html (2006). See also the *Glossary of Wildland Fire Terminology*, http://www.nwcg.gov (National Wildfire Coordinating Group, Incident Operations Standards Working Team, 2007).

Blow-up: A sudden increase in fire intensity or rate of spread strong enough to prevent direct control or to upset control plans. Blow-ups are often accompanied by violent convection and may have other characteristics of a fire storm. (see Flare-up)

Brush: A collective term that refers to stands of vegetation dominated by shrubby, woody plants, or low growing trees, usually of a type undesirable for livestock or timber management.

Brush Fire: A fire burning in vegetation that is predominantly shrubs, brush and scrub growth.

Bucket Drops: The dropping of fire retardants or suppressants from specially designed buckets slung below a helicopter.

Buffer Zones: An area of reduced vegetation that separates wildlands from vulnerable residential or business developments. This barrier is similar to a greenbelt in that it is usually used for another purpose such as agriculture, recreation areas, parks, or golf courses.

Bump-up Method: A progressive method of building a fire line on a wildfire without changing relative positions in the line. Work is begun with a suitable space between workers. Whenever one worker overtakes another, all workers ahead move one space forward and resume work on the uncompleted part of the line. The last worker does not move ahead until completing his or her space.

Burnable Acres: Any vegetative material/type that is susceptible to burning.

Burned Area Rehabilitation: The treatment of an ecosystem following fire disturbance to minimize subsequent effects. (1995 Federal Wildland Fire Policy.)

Burn Out: Setting fire inside a control line to widen it or consume fuel between the edge of the fire and the control line.

Burning Ban: A declared ban on open air burning within a specified area, usually due to sustained high fire danger.

Burning Conditions: The state of the combined factors of the environment that affect fire behavior in a specified fuel type.

Burning Index: An estimate of the potential difficulty of fire containment as it relates to the flame length at the most rapidly spreading portion of a fire's perimeter.

Burning Period: That part of each 24-hour period when fires spread most rapidly, typically from 10:00 a.m. to sundown.

Burn Intensity: The amount and rate of surface fuel consumption. It is not a good indicator of the degree of chemical, physical and biological changes to the soil or other resources. (see Fire Severity)

C

Campfire: As used to classify the cause of a wildland fire, a fire that was started for cooking or warming that spreads sufficiently from its source to require action by a fire control agency.

Candle or Candling: A single tree or a very small clump of trees that is burning from the bottom up.

Catastrophic: Fire that burns more intensely than the natural or historical range or variability, thereby fundamentally changing the ecosystem, destroying communities and/or rare or threatened species/habitats, or causing unacceptable erosion [definition added from the *Proposed Statewide Land Use Plan for Fire, Fuels and Air Quality Management* (USDI Bureau of Land Management 2004)]. (see Severe Wildland Fire)

Chain: A unit of linear measurement equal to 66 horizontal feet.

Closure: Legal restriction, but not necessarily elimination of specified activities such as smoking, camping, or entry that might cause fires in a given area.

Cold Front: The leading edge of a relatively cold air mass that displaces warmer air. The heavier cold air may cause some of the warm air to be lifted. If the lifted air contains enough moisture, the result may be cloudiness, precipitation, and thunderstorms. If both air masses are dry, no clouds may form. Following the passage of a cold front in the Northern Hemisphere, westerly or northwesterly winds of 15 to 30 or more miles per hour often continue for 12 to 24 hours.

Cold Trailing: A method of controlling a partly dead fire edge by carefully inspecting and feeling with the hand for heat to detect any fire, digging out every live spot, and trenching any live edge.

Command Staff: The command staff consists of the information officer, safety officer and liaison officer. They report directly to the incident commander and may have assistants.

Community Impact Zone (CIZ): The zone around a community that may be impacted by wildfire. Similar to Defensible Space, but on a community level.

Complex: Two or more individual incidents located in the same general area, which are assigned to a single incident commander or unified command.

Condition Class: Based on coarse scale national data, Fire Condition Classes measure general wildfire risk as follows:

> *Condition Class 1*. For the most part, fire regimes in this Fire Condition Class are within historical ranges. Vegetation composition and structure are intact. Thus, the risk of losing key ecosystem components from the occurrence of fire remains relatively low.
>
> *Condition Class 2*. Fire regimes on these lands have been moderately altered from their historical range by either increased or decreased fire frequency. A moderate risk of losing key ecosystem components has been identified on these lands.
>
> *Condition Class 3*. Fire regimes on these lands have been significantly altered from their historical return interval. The risk of losing key ecosystem components from fire is high. Fire frequencies have departed

from historical ranges by multiple return intervals. Vegetation composition, structure and diversity have been significantly altered. Consequently, these lands verge on the greatest risk of ecological collapse. (Cohesive Strategy 2002, in draft)

Contain a Fire: A fuel break around the fire has been completed. This break may include natural barriers or manually and/or mechanically constructed line.

Control a Fire: The complete extinguishment of a fire, including spot fires. Fireline has been strengthened so that flare-ups from within the perimeter of the fire will not break through this line.

Control Line: All built or natural fire barriers and treated fire edge used to control a fire.

Cooperating Agency: An agency supplying assistance other than direct suppression, rescue, support, or service functions to the incident control effort; e.g., Red Cross, law enforcement agency, telephone company, etc.

Coyote Tactics: A progressive line construction duty involving self-sufficient crews that build fire line until the end of the operational period, remain at or near the point while off duty, and begin building fire line again the next operational period where they left off.

Creeping Fire: Fire burning with a low flame length and spreading slowly.

Crew Boss: A person in supervisory charge of usually 16 to 21 firefighters and responsible for their performance, safety, and welfare.

Critical Ignition Zones: Those areas that are likely to be key in the formation of large wildfires if ignition occurs at that location. These include locations such as at the bottom of a hill, or in fuels that will ignite easily and sustain growth of fire with increasing flame lengths and fire intensity.

Crown Fire (Crowning): The movement of fire through the crowns of trees or shrubs more or less independently of the surface fire.

Curing: Drying and browning of herbaceous vegetation or slash.

D

Dead Fuels: Fuels with no living tissue in which moisture content is governed almost entirely by atmospheric moisture (relative humidity and precipitation), dry-bulb temperature, and solar radiation.

Debris Burning: A fire spreading from any fire originally set for the purpose of clearing land or for rubbish, garbage, range, stubble, or meadow burning.

Defensible Space: An area either natural or manmade where material capable of causing a fire to spread has been treated, cleared, reduced, or changed to act as a barrier between an advancing wildland fire and the loss to life, property, or resources. In practice, “defensible space” is defined as an area a minimum of 30 feet around a structure that is cleared of flammable brush or vegetation. (see Survivable Space)

Deployment: See Fire Shelter Deployment.

Detection: The act or system of discovering and locating fires.

Direct Attack: Any treatment of burning fuel, such as by wetting, smothering, or chemically quenching the fire or by physically separating burning from unburned fuel.

Dispatch: The implementation of a command decision to move a resource or resources from one place to another.

Dispatcher: A person employed who receives reports of discovery and status of fires, confirms their locations, takes action promptly to provide people and equipment likely to be needed for control in first attack, and sends them to the proper place.

Dispatch Center: A facility from which resources are directly assigned to an incident.

Division: Divisions are used to divide an incident into geographical areas of operation. Divisions are established when the number of resources exceeds the span-of-control of the operations chief. A division is located with the Incident Command System organization between the branch and the task force/strike team.

Dozer: Any tracked vehicle with a front-mounted blade used for exposing mineral soil.

Dozer Line: Fire line constructed by the front blade of a dozer.

Drip Torch: Hand-held device for igniting fires by dripping flaming liquid fuel on the materials to be burned; consists of a fuel fount, burner arm, and igniter. Fuel used is generally a mixture of diesel and gasoline.

Drop Zone: Target area for air tankers, helitankers, and cargo dropping.

Drought Index: A number representing net effect of evaporation, transpiration, and precipitation in producing cumulative moisture depletion in deep duff or upper soil layers.

Dry Lightning Storm: Thunderstorm in which negligible precipitation reaches the ground. Also called a dry storm.

Duff: The layer of decomposing organic materials lying below the litter layer of freshly fallen twigs, needles, and leaves and immediately above the mineral soil.

E

Ecosystem: A spatially explicit, relative homogeneous unit of the Earth that includes all interacting organisms and components of any part of the natural environment within its boundaries. An ecosystem can be of any size, e.g., a log, pond, field, forest, or the Earth's biosphere (Society of American Foresters, 1998).

Ecosystem Integrity: The completeness of an ecosystem that at geographic and temporal scales maintains its characteristics diversity of biological and physical components, composition, structure, and function (Cohesive Strategy, 2000).

Energy Release Component (ERC): The computed total heat released per unit area (British thermal units per square foot) within the fire front at the head of a moving fire.

Engine: Any ground vehicle providing specified levels of pumping, water and hose capacity.

Engine Crew: Firefighters assigned to an engine. The *Fireline Handbook* defines the minimum crew makeup by engine type.

Entrapment: A situation where personnel are unexpectedly caught in a fire behavior-related, life-threatening position where planned escape routes or safety zones are absent, inadequate, or compromised. An entrapment may or may not include deployment of a fire shelter for its intended purpose. These situations may or may not result in injury. They include “near misses.”

Environmental Assessment (EA): EAs were authorized by the National Environmental Policy Act (NEPA) of 1969. They are concise, analytical documents prepared with public participation that determine if an Environmental Impact Statement (EIS) is needed for a particular project or action. If an EA determines an EIS is not needed, the EA becomes the document allowing agency compliance with NEPA requirements.

Environmental Impact Statement (EIS): EISs were authorized by the National Environmental Policy Act (NEPA) of 1969. Prepared with public participation, they assist decision makers by providing information, analysis and an array of action alternatives, allowing managers to see the probable effects of decisions on the environment. Generally, EISs are written for large-scale actions or geographical areas.

Equilibrium Moisture Content: Moisture content that a fuel particle will attain if exposed for an infinite period in an environment of specified constant temperature and humidity. When a fuel particle reaches equilibrium moisture content, net exchange of moisture between it and the environment is zero.

Escape Route: A preplanned and understood route firefighters take to move to a safety zone or other low-risk area, such as an already burned area, previously constructed safety area, a meadow that won’t burn, natural rocky area that is large enough to take refuge without being burned. When escape routes deviate from a defined physical path, they should be clearly marked (flagged).

Escaped Fire: A fire that has exceeded or is expected to exceed initial attack capabilities or prescription.

Extended Attack Incident: A wildland fire that has not been contained or controlled by initial attack forces and for which more firefighting resources are arriving, en route, or being ordered by the initial attack incident commander.

Extreme Fire Behavior: “Extreme” implies a level of fire behavior characteristics that ordinarily precludes methods of direct control action. One of more of the following is usually involved: high rate of spread, prolific crowning and/or spotting, presence of fire whirls, strong convection column. Predictability is difficult because such fires often exercise some degree of influence on their environment and behave erratically, sometimes dangerously.

F

Faller: A person who fells trees. Also called a sawyer or cutter.

Field Observer: Person responsible to the Situation Unit Leader for collecting and reporting information about an incident obtained from personal observations and interviews.

Fine (Light) Fuels: Fast-drying fuels, generally with a comparatively high surface area-to-volume ratio, which are less than 1/4-inch in diameter and have a timelag of one hour or less. These fuels readily ignite and are rapidly consumed by fire when dry.

Fingers of a Fire: The long narrow extensions of a fire projecting from the main body.

Fire Behavior: The manner in which a fire reacts to the influences of fuel, weather and topography.

Fire Behavior Forecast: Prediction of probable fire behavior, usually prepared by a Fire Behavior Officer, in support of fire suppression or prescribed burning operations.

Fire Behavior Specialist: A person responsible to the Planning Section Chief for establishing a weather data collection system and for developing fire behavior predictions based on fire history, fuel, weather and topography.

Firebreak: A natural or constructed barrier used to stop or check fires that may occur or to provide a control line from which to work.

Fire Cache: A supply of fire tools and equipment assembled in planned quantities or standard units at a strategic point for exclusive use in fire suppression.

Fire Crew: An organized group of firefighters under the leadership of a crew leader or other designated official.

Fire Defense System: The cumulative effect of the fire suppression system of a community, including fuels reduction programs, fire breaks, defensible space, and the response capabilities of emergency personnel.

Fire Frequency: The natural return interval for a particular ecosystem.

Fire Front: The part of a fire within which continuous flaming combustion is taking place. Unless otherwise specified the fire front is assumed to be the leading edge of the fire perimeter. In ground fires, the fire front may be mainly smoldering combustion.

Fire Hazard Reduction Zone: Home ignition zone area, where fuel reduction and home fire resistant projects should take place to reduce the risk of a wildfire damaging a structure.

Fire Intensity: A general term relating to the heat energy released by a fire.

Fire Line: A linear fire barrier that is scraped or dug to mineral soil.

Fire Load: The number and size of fires historically experienced on a specified unit over a specified period (usually one day) at a specified index of fire danger.

Fire Management Plan (FMP): A strategic plan that defines a program to manage wildland and prescribed fires and documents the Fire Management Program in the approved land use plan. The plan is supplemented by

operational plans such as preparedness plans, preplanned dispatch plans, prescribed fire plans, and prevention plans.

Fire Management Planning: A generic term referring to all levels and categories of fire management planning, including: preparedness, prevention, hazardous risk assessment, and mitigation planning.

Fire Perimeter: The entire outer edge or boundary of a fire.

Fire-prone ecosystem: Ecosystems that historically burned intensely at low frequencies (stand replacing fires), those that burned with low intensity at a high frequency (understory fires), and those that burned very infrequently historically, but are not subject to much more frequent fires because of changed conditions. These include fire-influenced and fire-adapted ecosystems (Cohesive Strategy, 2000).

Fire Regime: A generalized description of the role fire plays in an ecosystem. It is characterized by fire frequency, predictability, seasonality, intensity, duration, scale (patch size), as well as regularity or variability. Five combinations of fire frequency, expressed as fire return interval in fire severity, are defined:

> *Groups I and II* include fire return intervals in the 0–35 year range. Group I includes Ponderosa pine, other long needle pine species, and dry site Douglas fir. Group II includes the drier grassland types, tall grass prairie, and some Pacific chaparral ecosystems.
>
> *Groups III and IV* include fire return internals in the 35–100+ year range. Group III includes interior dry site shrub communities such as sagebrush and chaparral ecosystems. Group IV includes lodgepole pine and jack pine.
>
> *Group V* is the long interval (infrequent), stand replacement fire regime and includes temperate rain forest, boreal forest, and high elevation conifer species.

Fire-Return Interval: The number of years between successive fire events at a specific site or an area of a specified size.

Fire Risk Reduction Zone: A zone targeted for risk reduction, including measures such as fuels reduction, access protection, and construction of structures to minimize the risk of ignition from wildfire.

Fire Season: (1) Period(s) of the year during which wildland fires are likely to occur, spread, and affect resource values sufficient to warrant organized fire management activities. (2) A legally enacted time during which burning activities are regulated by state or local authority.

Fire Severity: The amount of heat that is released by a fire and how it affects other resources. It is dependent on the type of fuels and the behavior of the fuels when they are burned. (see Burn Intensity)

Fire Shelter: An aluminized tent offering protection by means of reflecting radiant heat and providing a volume of breathable air in a fire entrapment situation. Fire shelters should only be used in life-threatening situations, as a last resort.

Fire Shelter Deployment: The removing of a fire shelter from its case and using it as protection against fire.

Firestorm: A fire of great size and intensity that generates and is fed by strong inrushing winds from all sides; the winds add fresh oxygen to the fire, increasing the intensity.

Fire Triangle: Instructional aid in which the sides of a triangle are used to represent the three factors (oxygen, heat, fuel) necessary for combustion and flame production; removal of any of the three factors causes flame production to cease.

Fire Use Module (Prescribed Fire Module): A team of skilled and mobile personnel dedicated primarily to prescribed fire management. These are national and interagency resources, available throughout the prescribed fire season, that can ignite, hold and monitor prescribed fires.

Fire Use: The combination of wildland fire use and prescribed fire application to meet resource objectives.

Fire Weather: Weather conditions that influence fire ignition, behavior and suppression.

Fire Weather Watch: A term used by fire weather forecasters to notify using agencies, usually 24 to 72 hours ahead of the event, that current and developing meteorological conditions may evolve into dangerous fire weather.

Fire Whirl: Spinning vortex column of ascending hot air and gases rising from a fire and carrying aloft smoke, debris, and flame. Fire whirls range in size from less than one foot to more than 500 feet in diameter. Large fire whirls have the intensity of a small tornado.

Firewise: A public education program developed by the National Wildland Fire Coordinating Group that assists communities located in proximity to fire-prone lands. (For additional information, see http://www.firewise.org)

Firefighting Resources: All people and major items of equipment that can or potentially could be assigned to fires.

Flame Height: The average maximum vertical extension of flames at the leading edge of the fire front. Occasional flashes that rise above the general level of flames are not considered. This distance is less than the flame length if flames are tilted due to wind or slope.

Flame Length: The distance between the flame tip and the midpoint of the flame depth at the base of the flame (generally the ground surface); an indicator of fire intensity.

Flaming Front: The zone of a moving fire where the combustion is primarily flaming. Behind this flaming zone, combustion is primarily glowing. Light fuels typically have a shallow flaming front, whereas heavy fuels have a deeper front. Also called fire front.

Flanks of a Fire: The parts of a fire's perimeter that are roughly parallel to the main direction of spread.

Flare-up: Any sudden acceleration of fire spread or intensification of a fire. Unlike a blow-up, a flare-up lasts a relatively short time and does not radically change control plans.

Flash Fuels: Fuels such as grass, leaves, draped pine needles, fern, tree moss and some kinds of slash, that ignite readily and are consumed rapidly when dry. Also called fine fuels.

Forb: A plant with a soft, rather than permanent woody stem, that is not a grass or grass-like plant.

Fuel: Combustible material. Includes, vegetation, such as grass, leaves, ground litter, plants, shrubs and trees, that feed a fire. (see Surface Fuels)

Fuel Bed: An array of fuels usually constructed with specific loading, depth and particle size to meet experimental requirements; also, commonly used to describe the fuel composition in natural settings.

Fuel Loading: The amount of fuel present expressed quantitatively in terms of weight of fuel per unit area.

Fuel Model: Simulated fuel complex (or combination of vegetation types) for which all fuel descriptors required for the solution of a mathematical rate of spread model have been specified.

Fuel Moisture (Fuel Moisture Content): The quantity of moisture in fuel expressed as a percentage of the weight when thoroughly dried at 212 degrees Fahrenheit.

Fuel Reduction: Manipulation, including combustion, or removal of fuels to reduce the likelihood of ignition and/or to lessen potential damage and resistance to control. Incorporated within this are treatments to protect, maintain, and restore land health and desired fire cycles.

Fuel Type: An identifiable association of fuel elements of a distinctive plant species, form, size, arrangement, or other characteristics that will cause a predictable rate of fire spread or difficulty of control under specified weather conditions.

Fusee: A colored flare designed as a railway-warning device and widely used to ignite suppression and prescription fires.

G

General Staff: The group of incident management personnel reporting to the incident commander. They may each have a deputy, as needed. Staff consists of operations section chief, planning section chief, logistics section chief, and finance/administration section chief.

Geographic Area: A political boundary designated by the wildland fire protection agencies, where these agencies work together in the coordination and effective utilization of firefighting resources.

Ground Fuel: All combustible materials below the surface litter, including duff, tree or shrub roots, dried out dead wood, peat, and sawdust that normally support a glowing combustion without flame.

H

Haines Index: An atmospheric index used to indicate the potential for wildfire growth by measuring the stability and dryness of the air over a fire.

Hand Line: A fire line built with hand tools.

Hazard Reduction: Any treatment of a hazard that reduces the threat of ignition and fire intensity or rate of spread.

Hazardous Fuels Reduction: "Fuel Reduction" is defined as the manipulation or removal of fuels, including combustion, to reduce the likelihood of ignition and/or to lessen potential damage and resistance to control. Incorporated within this are treatments to protect, maintain, and restore land health and desired fire cycles. "Hazard Reduction" is defined as any treatment of a hazard that reduces the threat of ignition and fire intensity or rate of spread.

Head of a Fire: The side of the fire having the fastest rate of spread.

Heavy Fuels: Fuels of large diameter such as snags, logs, large limb wood, that ignite and are consumed more slowly than flash fuels.

Helibase: The main location within the general incident area for parking, fueling, maintaining, and loading helicopters. The helibase is usually located at or near the incident base.

Helispot: A temporary landing spot for helicopters.

Helitack: The use of helicopters to transport crews, equipment, and fire retardants or suppressants to the fire line during the initial stages of a fire.

Helitack Crew: A group of firefighters trained in the technical and logistical use of helicopters for fire suppression.

Holding Actions: Planned actions required to achieve wildland prescribed fire management objectives. These actions have specific implementation timeframes for fire use actions but can have less sensitive implementation demands for suppression actions.

Holding Resources: Firefighting personnel and equipment assigned to do all required fire suppression work following fireline construction but generally not including extensive mop-up.

Home Ignitability: The ignition potential within the Home Ignition Zone.

Home Ignition Zone: The home and its immediate surroundings. The home ignition zone extends to a few tens of meters around a home not hundreds of meters or beyond. Home ignitions and, thus, the WUI fire loss problem principally depend on home ignitability.

Hose Lay: Arrangement of connected lengths of fire hose and accessories on the ground, beginning at the first pumping unit and ending at the point of water delivery.

Hotshot Crew: A highly trained fire crew used mainly to build fireline by hand.

Hotspot: A particular active part of a fire.

Hotspotting: Reducing or stopping the spread of fire at points of particularly rapid rate of spread or special threat, generally the first step in prompt control, with emphasis on first priorities.

I

Incendiary: Causing or capable of causing fire.

Incident: A human-caused or natural occurrence, such as wildland fire, that requires emergency service action to prevent or reduce the loss of life or damage to property or natural resources.

Incident Action Plan (IAP): Contains objectives reflecting the overall incident strategy and specific tactical actions and supporting information for the next operational period. The plan may be oral or written. When written, the plan may have a number of attachments, including: incident objectives, organization assignment list, division assignment, incident radio communication plan, medical plan, traffic plan, safety plan, and incident map.

Incident Command Post (ICP): Location at which primary command functions are executed. The ICP may be co-located with the incident base or other incident facilities.

Incident Command System (ICS): The combination of facilities, equipment, personnel, procedure and communications operating within a common organizational structure, with responsibility for the management of assigned resources to effectively accomplish stated objectives pertaining to an incident.

Incident Commander: Individual responsible for the management of all incident operations at the incident site.

Incident Management Team: The incident commander and appropriate general or command staff personnel assigned to manage an incident.

Incident Objectives: Statements of guidance and direction necessary for selection of appropriate strategy(ies), and the tactical direction of resources. Incident objectives are based on realistic expectations of what can be accomplished when all allocated resources have been effectively deployed.

Indigenous Knowledge: Knowledge of a particular region or environment from an individual or group that lives in that particular region or environment, e.g., traditional ecological knowledge of American Indians (FS National Resource Book on American Indian and Alaskan Native Relations, 1997).

Infrared Detection: The use of heat sensing equipment, known as Infrared Scanners, for detection of heat sources that are not visually detectable by the normal surveillance methods of either ground or air patrols.

Initial Attack: The actions taken by the first resources to arrive at a wildfire to protect lives and property, and prevent further extension of the fire.

J

Job Hazard Analysis: This analysis of a project is completed by staff to identify hazards to employees and the public. It identifies hazards, corrective actions and the required safety equipment to ensure public and employee safety.

Jump Spot: Selected landing area for smokejumpers.

Jump Suit: Approved protection suite work by smokejumpers.

K

Keech Byram Drought Index (KBDI): Commonly used drought index adapted for fire management applications, with a numerical range from 0 (no moisture deficiency) to 800 (maximum drought).

Knock Down: To reduce the flame or heat on the more vigorously burning parts of a fire edge.

L

Ladder Fuels: Fuels that provide vertical continuity between strata, thereby allowing fire to carry from surface fuels into the crowns of trees or shrubs with relative ease. They help initiate and assure the continuation of crowning.

Large Fire: (1) For statistical purposes, a fire burning more than a specified area of land, for example, 300 acres. (2) A fire burning with a size and intensity such that its behavior is determined by interaction between its own convection column and weather conditions above the surface.

Lead Plane: Aircraft with pilot used to make dry runs over the target area to check wing and smoke conditions and topography and to lead air tankers to targets and supervise their drops.

Light (Fine) Fuels: Fast-drying fuels, generally with a comparatively high surface area-to-volume ratio, which are less than 1/4-inch in diameter and have a timelag of one hour or less. These fuels readily ignite and are rapidly consumed by fire when dry.

Lightning Activity Level (LAL): A number on a scale of 1 to 6 that reflects frequency and character of cloud-to ground lightning. The scale is exponential, based on powers of 2 (i.e., LAL 3 indicates twice the lightning of LAL 2).

Line Scout: A firefighter who determines the location of a fire line.

Litter: Top layer of the forest, scrubland, or grassland floor, directly above the fermentation layer, composed of loose debris of dead sticks, branches, twigs, and recently fallen leaves or needles, little altered in structure by decomposition.

Live Fuels: Living plants, such as trees, grasses, and shrubs, in which the seasonal moisture content cycle is controlled largely by internal physiological mechanisms, rather than by external weather influences.

M

Micro-Remote Environmental Monitoring System (Micro-REMS): Mobile weather monitoring station. A Micro-REMS usually accompanies an incident meteorologist and ATMU to an incident.

Mineral Soil: Soil layers below the predominantly organic horizons; soil with little combustible material.

Mobilization: The process and procedures used by all organizations, federal, state and local for activating, assembling, and transporting all resources that have been requested to respond to or support an incident.

Modular Airborne Firefighting System (MAFFS): A manufactured unit consisting of five interconnecting tanks, a control pallet, and a nozzle pallet, with a capacity of 3,000 gallons, designed to be rapidly mounted inside an unmodified C-130 (Hercules) cargo aircraft for use in dropping retardant on wildland fires.

Mop-up: To make a fire safe or reduce residual smoke after the fire has been controlled by extinguishing or removing burning material along or near the control line, felling snags, or moving logs so they won't roll downhill.

Multiagency Coordination (MAC): A generalized term that describes the functions and activities of representatives of involved agencies and/or jurisdictions who come together to make decisions regarding the prioritizing of incidents and the sharing and use of critical resources. The MAC organization is not a part of the on-scene ICS and is not involved in developing incident strategy or tactics.

Mutual Aid Agreement: Written agreement between agencies and/or jurisdictions in which they agree to assist one another upon request, by furnishing personnel and equipment.

N

National Environmental Policy Act (NEPA): NEPA is the basic national law for protection of the environment, passed by Congress in 1969. It sets policy and procedures for environmental protection, and authorizes Environmental Impact Statements and Environmental Assessments to be used as analytical tools to help federal managers make decisions.

National Fire Danger Rating System (NFDRS): A uniform fire danger rating system that focuses on the environmental factors that control the moisture content of fuels.

National Wildfire Coordinating Group (NWCG): A group formed under the direction of the Secretaries of Agriculture and the Interior and comprised of representatives of the US Forest Service, Bureau of Land Management, Bureau of Indian Affairs, National Park Service, US Fish and Wildlife Service, and Association of State Foresters. The group's purpose is to facilitate coordination and effectiveness of wildland fire activities and provide a forum to discuss, recommend action, or resolve issues and problems of substantive nature. NWCG is the certifying body for all courses in the National Fire Curriculum.

Nomex: Trade name for a fire-resistant synthetic material used in the manufacturing of flight suits and pants and shirts used by firefighters. (see Aramid)

Normal Fire Season: (1) A season when weather, fire danger, and number and distribution of fires are about average. (2) Period of the year that normally comprises the fire season.

O

Operations Branch Director: Person under the direction of the operations section chief who is responsible for implementing that portion of the incident action plan appropriate to the branch.

Operational Period: The period of time scheduled for execution of a given set of tactical actions as specified in the Incident Action Plan. Operational periods can be of various lengths, although usually not more than 24 hours.

Overhead: People assigned to supervisory positions, including incident commanders, command staff, general staff, directors, supervisors, and unit leaders.

P

Pack Test: Used to determine the aerobic capacity of fire suppression and support personnel and assign physical fitness scores. The test consists of walking a specified distance, with or without a weighted pack, in a predetermined period of time, with altitude corrections.

Paracargo: Anything dropped, or intended for dropping, from an aircraft by parachute, by other retarding devices, or by free fall.

Participating Agency: 1) an agency that has an interest in, is consulted about, and has the opportunity to become involved in a project or program; or 2) an agency invited to be included in the production, review, development of plans or process for a project without authority to act or does not intent to act with respect to the project

Peak Fire Season: That period of the fire season during which fires are expected to ignite most readily, to burn with greater than average intensity, and to create damages at an unacceptable level.

Performance Measures: A quantitative or qualitative characterization of performance (Government Performance and Results Act of 1993).

Personal Protective Equipment (PPE): All firefighting personnel must be equipped with proper equipment and clothing in order to mitigate the risk of injury from, or exposure to, hazardous conditions encountered while working. PPE includes, but is not limited to, 8-inch-high laced leather boots with lug soles, fire shelter, hard hat with chin strap, goggles, ear plugs, aramid shirts and trousers, leather gloves, and individual first aid kits.

Preparedness: Condition or degree of being ready to cope with a potential fire situation.

Prescribed Fire: Any fire ignited by management actions under certain, predetermined conditions to meet specific objectives related to hazardous fuels or habitat improvement. A written, approved prescribed fire plan must exist, and NEPA requirements must be met, prior to ignition.

Prescribed Fire Plan (Burn Plan): This document provides the prescribed fire burn boss information needed to implement an individual prescribed fire project.

Prescription: Measurable criteria that define conditions under which a prescribed fire may be ignited, guide selection of appropriate management responses, and indicate other required actions. Prescription criteria may include safety, economic, public health, environmental, geographic, administrative, social, or legal considerations.

Prevention: Activities directed at reducing the incidence of fires, including public education, law enforcement, personal contact, and reduction of fuel hazards.

Project Fire: A fire of such size or complexity that a large organization and prolonged activity is required to suppress it.

Pulaski: A combination chopping and trenching tool, which combines a single-bitted axe-blade with a narrow adze-like trenching blade fitted to a straight handle. Useful for grubbing or trenching in duff and matted roots. Well-balanced for chopping.

R

Radiant Burn: A burn received from a radiant heat source.

Radiant Heat Flux: The amount of heat flowing through a given area in a given time, usually expressed as calories/square centimeter/second.

Rappelling: Technique of landing specifically trained firefighters from hovering helicopters; involves sliding down ropes with the aid of friction-producing devices.

Rate of Spread: The relative activity of a fire in extending its horizontal dimensions. It is expressed as a rate of increase of the total perimeter of the fire, as rate of forward spread of the fire front, or as rate of increase in area, depending on the intended use of the information. Usually it is expressed in chains or acres per hour for a specific period in the fire's history.

Reburn: The burning of an area that has been previously burned but that contains flammable fuel that ignites when burning conditions are more favorable; an area that has reburned.

Red Card: Fire qualification card issued to fire rated persons showing their training needs and their qualifications to fill specified fire suppression and support positions in a large fire suppression or incident organization.

Red Flag Warning: Term used by fire weather forecasters to alert forecast users to an ongoing or imminent critical fire weather pattern.

Rehabilitation: The activities necessary to repair damage or disturbance caused by wildland fires or the fire suppression activity.

Relative Humidity (Rh): The ratio of the amount of moisture in the air, to the maximum amount of moisture that air would contain if it were saturated. The ratio of the actual vapor pressure to the saturated vapor pressure.

Remote Automatic Weather Station (RAWS): An apparatus that automatically acquires, processes, and stores local weather data for later transmission to the GOES Satellite, from which the data is re-transmitted to an earth-receiving station for use in the National Fire Danger Rating System.

Resiliency: The capacity of an ecosystem to maintain or regain normal function and development following disturbance (Society of American Foresters, 1998).

Resources: (1) Personnel, equipment, services and supplies available, or potentially available, for assignment to incidents. (2) The natural resources of an area, such as timber, grass, watershed values, recreation values, and wildlife habitat.

Resource Management Plan (RMP): A document prepared by field office staff with public participation and approved by field office managers that provides general guidance and direction for land management activities at a field office. The RMP identifies the need for fire in a particular area and for a specific benefit.

Resource Order: An order placed for firefighting or support resources.

Response Time: The amount of time it takes from when a request for help is received by the emergency dispatch system until emergency personnel arrive at the scene.

Retardant: A substance or chemical agent that reduces the flammability of combustibles.

Restoration: The active or passive management of an ecosystem or habitat toward its original structure, natural compliment of species, and natural functions or ecological processes (Cohesive Strategy, 2000).

Run (of a fire): The rapid advance of the head of a fire with a marked change in fire line intensity and rate of spread from that noted before and after the advance.

Running: A rapidly spreading surface fire with a well-defined head.

Rural Fire Assistance: The Department of the Interior Rural Fire Assistance program is a multi-million dollar program to enhance the fire protection capabilities of rural fire districts. The program will assist with training, equipment purchase, and prevention activities, on a cost-share basis.

S

Safety Zone: An area cleared of flammable materials used for escape in the event the line is outflanked or in case a spot fire causes fuels outside the control line to render the line unsafe. In firing operations, crews progress so as to maintain a safety zone close at hand allowing the fuels inside the control line to be consumed before going ahead. Safety zones may also be constructed as integral parts of fuel breaks; they are greatly enlarged areas, which can be used with relative safety by firefighters and their equipment in the event of a blow-up in the vicinity.

Scratch Line: An unfinished preliminary fire line hastily established or built as an emergency measure to check the spread of fire.

Severe Wildland Fire (catastrophic wildfire): Fire that burns more intensely than the natural or historical range of variability, thereby fundamentally changing the ecosystem, destroying communities and / or rate or threatened species /habitat, or causing unacceptable erosion (GAO / T-RCED-99-79) (Society of American Foresters, 1998).

Severity Funding: Funds provided to increase wildland fire suppression response capability necessitated by abnormal weather patterns, extended drought, or other events causing abnormal increase in the fire potential and/or danger.

Single Resource: An individual, a piece of equipment and its personnel complement, or a crew or team of individuals with an identified work supervisor that can be used on an incident.

Size-up: To evaluate a fire to determine a course of action for fire suppression.

Slash: Debris left after logging, pruning, thinning or brush cutting; includes logs, chips, bark, branches, stumps and broken understory trees or brush.

Sling Load: Any cargo carried beneath a helicopter and attached by a lead line and swivel.

Slop-over: A fire edge that crosses a control line or natural barrier intended to contain the fire.

Slurry: A mixture typically of water, red clay, and fertilizer dropped from air tankers for fire suppression.

Smokejumper: A firefighter who travels to fires by aircraft and parachute.

Smoke Management: Application of fire intensities and meteorological processes to minimize degradation of air quality during prescribed fires.

Smoldering Fire: A fire burning without flame and barely spreading.

Snag: A standing dead tree or part of a dead tree from which at least the smaller branches have fallen.

Spark Arrester: A device installed in a chimney, flue, or exhaust pipe to stop the emission of sparks and burning fragments.

Spot Fire: A fire ignited outside the perimeter of the main fire by flying sparks or embers.

Spot Weather Forecast: A special forecast issued to fit the time, topography, and weather of each specific fire. These forecasts are issued upon request of the user agency and are more detailed, timely, and specific than zone forecasts.

Spotter: In smokejumping, the person responsible for selecting drop targets and supervising all aspects of dropping smokejumpers.

Spotting: Behavior of a fire producing sparks or embers that are carried by the wind and start new fires beyond the zone of direct ignition by the main fire.

Staging Area: Locations set up at an incident where resources can be placed while awaiting a tactical assignment on a three-minute available basis. Staging areas are managed by the operations section.

Strategy: The science and art of command as applied to the overall planning and conduct of an incident.

Strike Team: Specified combinations of the same kind and type of resources, with common communications, and a leader.

Strike Team Leader: Person responsible to a division/group supervisor for performing tactical assignments given to the strike team.

Structure Fire: Fire originating in and burning any part or all of any building, shelter, or other structure.

Suppressant: An agent, such as water or foam, used to extinguish the flaming and glowing phases of combustion when direction applied to burning fuels.

Suppression: All the work of extinguishing or containing a fire, beginning with its discovery.

Surface Fuels: Loose surface litter on the soil surface, normally consisting of fallen leaves or needles, twigs, bark, cones, and small branches that have not yet decayed enough to lose their identity; also grasses, forbs, low and medium shrubs, tree seedlings, heavier branchwood, downed logs, and stumps interspersed with or partially replacing the litter.

Survivable Space: The distance between vegetational fuels and a structure necessary to protect the building from radiant heat and its ignition mechanics. The separation distance was formerly called “defensible space” due to the implication that the fire department could intervene. The term “survivable space” eliminates the dependence on manual suppression and implies that the distance alone provides the protection. (see Defensible Space)

Swamper: (1) A worker who assists fallers and/or sawyers by clearing away brush, limbs and small trees. Carries fuel, oil and tools and watches for dangerous situations. (2) A worker on a dozer crew who pulls winch line, helps maintain equipment, etc., to speed suppression work on a fire.

T

Tactics: Deploying and directing resources on an incident to accomplish the objectives designated by strategy.

Tanker: Either a tank truck used to deliver water from a water source to the scene of a fire, or a fixed wing aircraft used for fire suppression by dropping slurry on the flank or head of a fire.

Temporary Flight Restrictions (TFR): A restriction requested by an agency and put into effect by the Federal Aviation Administration in the vicinity of an incident that restricts the operation of nonessential aircraft in the airspace around that incident.

Terra Torch: Device for throwing a stream of flaming liquid, used to facilitate rapid ignition during burn out operations on a wildland fire or during a prescribed fire operation.

Test Fire: A small fire ignited within the planned burn unit to determine the characteristic of the prescribed fire, such as fire behavior, detection performance and control measures.

Timelag: Time needed under specified conditions for a fuel particle to lose about 63 percent of the difference between its initial moisture content and its equilibrium moisture content. If conditions remain unchanged, a fuel will reach 95 percent of its equilibrium moisture content after four timelag periods.

Torching: The ignition and flare-up of a tree or small group of trees, usually from bottom to top.

Two-way Radio: Radio equipment with transmitters in mobile units on the same frequency as the base station, permitting conversation in two directions using the same frequency in turn.

Type: The capability of a firefighting resource in comparison to another type. Type 1 usually means a greater capability due to power, size, or capacity.

U

Uncontrolled Fire: Any fire that threatens to destroy life, property, or natural resources and (a) is not burning within the confines of firebreaks or (b) is burning with such intensity that it could not be readily extinguished with ordinary tools commonly available [Parts a and b of definition added from the National Wildfire Coordinating Group's *Glossary of Wildland Fire Terminology*, http://www.nwcg.gov/pms/pubs/glossary]. (see Wildfire)

Underburn: A fire that consumes surface fuels but not trees or shrubs. (see Surface Fuels)

Unplanned and Unwanted Wildland Fires: An unplanned and unwanted fire is one burning outside the parameters as defined in land use plans and fire management plans for that location (including areas where the fire can be expected to spread) under current and expected conditions. Unplanned and unwanted fires include fires burning in areas where fire is specifically excluded; fires that exhibit burning characteristics (intensity, frequency, and seasonality) that are outside prescribed ranges, specifically including fires expected to produce severe fire effects; unauthorized human caused fires (arson, escaped camp fires, equipment fires, etc.); and fires that occur during high fire dangers, or resource shortage, where the resources needed to manage the fire are needed for more critical fire management needs. Unplanned is not the same as unscheduled. The time of a lightning fire ignition is not known; however, a lightning-caused fire could still be used to meet fuels and ecosystem management objectives if that type of fire is expected to burn within the parameters of an approved plan; the fire is burning within the parameters for the area; is not causing, or has the potential to cause, unacceptable effects; and funding and resources to manage the fire are available.

V

Vectors: Directions of fire spread as related to rate of spread calculations (in degrees from upslope).

Volunteer Fire Department (VFD): A fire department of which some or all members are unpaid.

W

Water Tender: A ground vehicle capable of transporting specified quantities of water.

Weather Information and Management System (WIMS): An interactive computer system designed to accommodate the weather information needs of all federal and state natural resource management agencies. Provides timely access to weather forecasts, current and historical weather data, the National Fire Danger Rating System (NFDRS), and the National Interagency Fire Management Integrated Database (NIFMID).

Wet Line: A line of water, or water and chemical retardant, sprayed along the ground, that serves as a temporary control line from which to ignite or stop a low-intensity fire.

Wildfire: An unplanned, unwanted wildland fire including unauthorized human-caused fires, escaped wildland fire use events, escaped prescribed fire projects, and all other wildland fire where the objective is to put the fire out [definition added from the National Wildfire Coordinating Group's *Glossary of Wildland Fire Terminology*, http://www.nwcg.gov/pms/pubs/glossary]. (see Uncontrolled Fire; Wildland Fire)

Wildland: Wildland is an area of land where plants and animals exist free of human interference. Ecologists assert that wildlands promote biodiversity, that they preserve historic genetic traits and that they provide habitat for wild flora and fauna [definition added from Wikipedia, http://en.wikipedia.org/wiki/Wildland].

Wildland Fire: Any nonstructure fire, other than prescribed fire, that occurs in the wildland.

Wildland Fire Implementation Plan (WFIP): A progressively developed assessment and operational management plan that documents the analysis and selection of strategies and describes the appropriate management response for a wildland fire being managed for resource benefits.

Wildland Fire Situation Analysis (WFSA): A decision-making process that evaluates alternative suppression strategies against selected environmental, social, political, and economic criteria. Provides a record of decisions.

Wildland Fire Use: The management of naturally ignited wildland fires to accomplish specific, planned resource management objectives in predefined geographic areas outlined in Fire Management Plans. Wildland fire use is not to be confused with "fire use," which includes prescribed fire.

Wildland Urban Interface (WUI): The line, area or zone where structures and other human development meet or intermingle with undeveloped wildland or vegetative fuels (Glossary of Wildland Fire Terminology, 1996).

Wind Vectors: Wind directions used to calculate fire behavior.