II. Maricopa County CWPP Community Assessment and Analysis

The community risk assessment is an analysis of the potential for catastrophic wildland fire to Maricopa County communities and lands within the WUI identified by the Core Teams. This risk analysis incorporates the current fire regime-condition class, wildfire fuel hazards, risk of ignition, local preparedness and protection capabilities and at-risk community values. The Core Teams have reviewed the Arizona State Forester's *Identifying Arizona's Wildland/Urban Interface Communities at Risk: A Guide for State and Federal Land Managers* (2007) to ensure that the Maricopa County CWPP is compatible with and complementary to statewide CWPP planning efforts. The Core Teams have included all risk factors required by the Arizona State Forester in the analysis of this CWPP. The areas of concern for wildland fuel hazards, risk of ignition and wildfire occurrence, local preparedness, and protection capabilities and loss of community values are evaluated to determine areas of highest wildland fire risk.

The Maricopa County CWPP planning area includes all of Maricopa County, including tribal trust lands, divided into two analysis areas: one for the eastern portion of the county and one for the western portion of the county (Figures 2.1a and 2.1b). Gila River, Fort McDowell, Gila Bend, and Salt River Pima-Maricopa tribal trust lands are included in the total acreage of the WUI. The Maricopa County CWPP comprises 3,103,370 acres of land (Table 2.1).

Table 2.1. Land management within the WUI

Ownership type	Total acres	% of total
Barry M. Goldwater Air Force Range	6,456	0
BLM	465,326	15
Bureau of Reclamation	18,495	1
Maricopa County land	6,387	0
Fort McDowell Indian Reservation	24,869	1
Arizona Game and Fish Department	5,396	0
Gila Bend Indian Reservation	408	0
Tohono O'odham Nation San Lucy District	160,802	5
Hohokam Pima National Monument	626	0
Luke Air Force Base	2,823	0
Military Reservation	1,803	0
Painted Rock Wildlife Area	5,056	0
Private land	1,715,540	55
Salt River Pima-Maricopa Indian Reservation	53,711	2
State Trust land	445,061	14
TNF	90,040	3
Williams Air Force Base	2	0

Continued

Table 2.1. Land management within the WUI

Ownership type	Total acres	% of total
Buckeye Hills Regional Park	4,441	0
South Mountain Regional Park	15,677	1
Estrella Mountain Regional Park	18,531	1
White Tank Mountain Regional Park	29,195	1
McDowell Mountain Regional Park	21,076	1
Cave Creek Regional Park	2,763	0
Parks and recreation	397	0
Parks and recreation (other)	8,491	0
Total	3,072,461	100

*Actual total may not add to 100% because of rounding.

The Maricopa County CWPP planning area primarily includes private (55 percent), BLM (15 percent), ASLD (14 percent), and TNF (3 percent) lands.

Primary land ownership in the Maricopa County CWPP planning area is a mosaic of privately owned lands and lands administered by the BLM and ASLD (Table 2.1 and Figures 2.1a and 2.1b). Much of the land within the Maricopa County CWPP planning area is urban with associated adjacent urban development in proximity to undeveloped public and state lands (such as Anthem) and rural communities with minimal development (such as New River and Sunflower).

Of the publicly owned lands within the WUI, BLM is the largest land manager with 465,326 acres, or 15 percent of lands, located throughout the WUI. State Trust lands were established in 1912 under the terms of the Arizona Enabling Act. With statehood, Arizona was granted ownership of four sections per township. The ASLD manages State Trust lands to produce revenue for the Arizona State Trust beneficiaries, including the state's school system. Within the Maricopa County CWPP area, State Trust lands are managed primarily for recreation, natural resource protection, and livestock grazing.

Of the remaining publicly owned lands within the WUI, TNF lands compose 90,040 acres, or approximately 3 percent, of the WUI. These federal lands provide extensive and popular hiking, hunting, and recreational areas within or adjacent to the WUI. The potential for escaped campfires or the need to evacuate camping areas in the event of a wildfire warrants including these lands in the Maricopa County CWPP area.

Private land within the WUI composes the largest ownership within the WUI at 1,715,540 acres, or roughly 55 percent, of the WUI. Private lands are mostly clustered near the communities, with some scattered private inholdings located throughout the WUI. The municipalities of Phoenix, Scottsdale, Goodyear, Surprise, El Mirage, Glendale, Apache Junction, Queen Creek, Paradise Valley, Sun Lakes, Guadalupe, Mesa, Tempe, Fountain Hills, Gilbert, Salt River Pima-Maricopa Indian Community, Sun City, Sun City West, Buckeye, Gila Bend, Wickenburg, Avondale, Chandler, Tolleson, Litchfield Park, Youngtown,

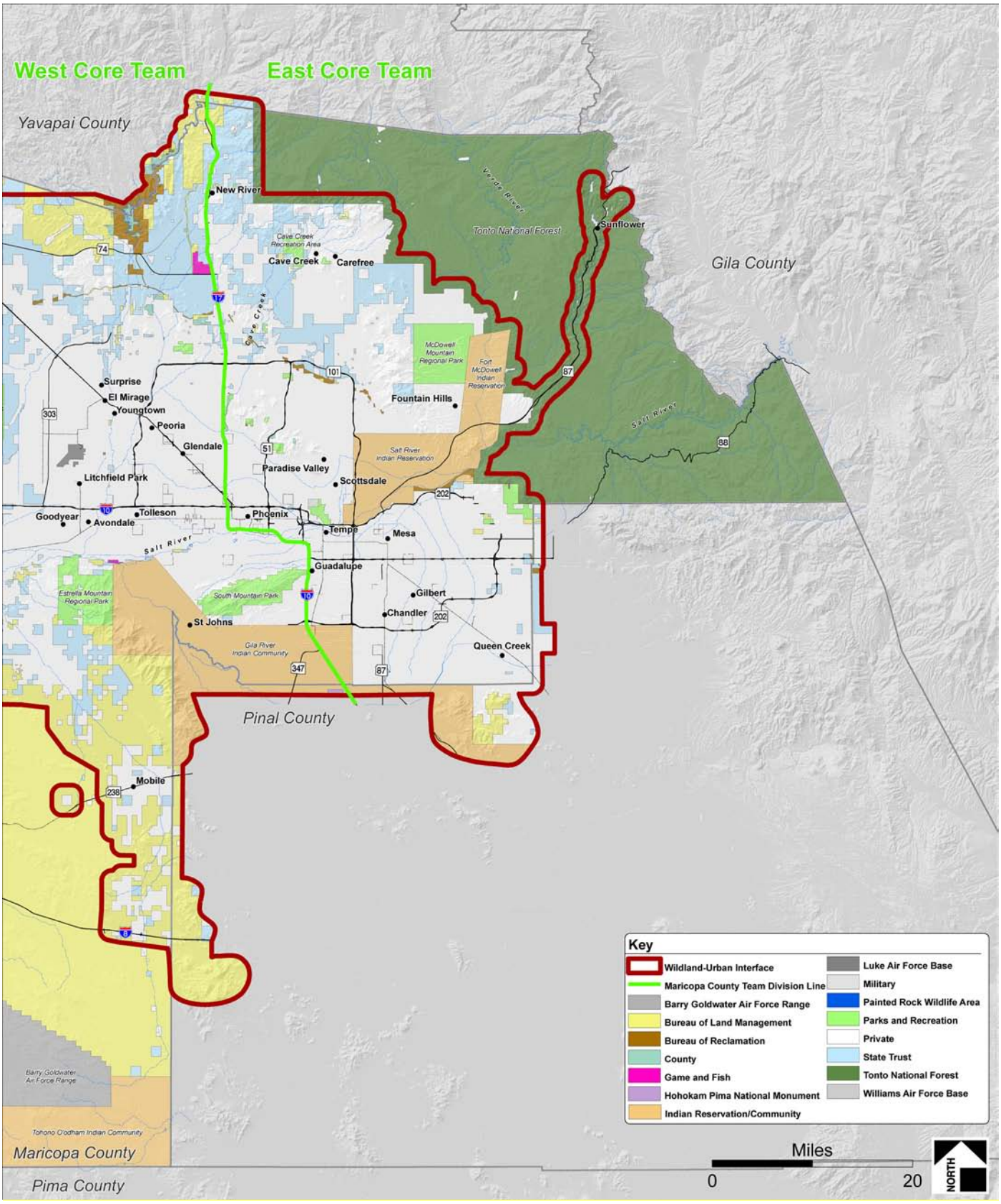

Figure 2.1a. Maricopa County CWPP WUI area, east

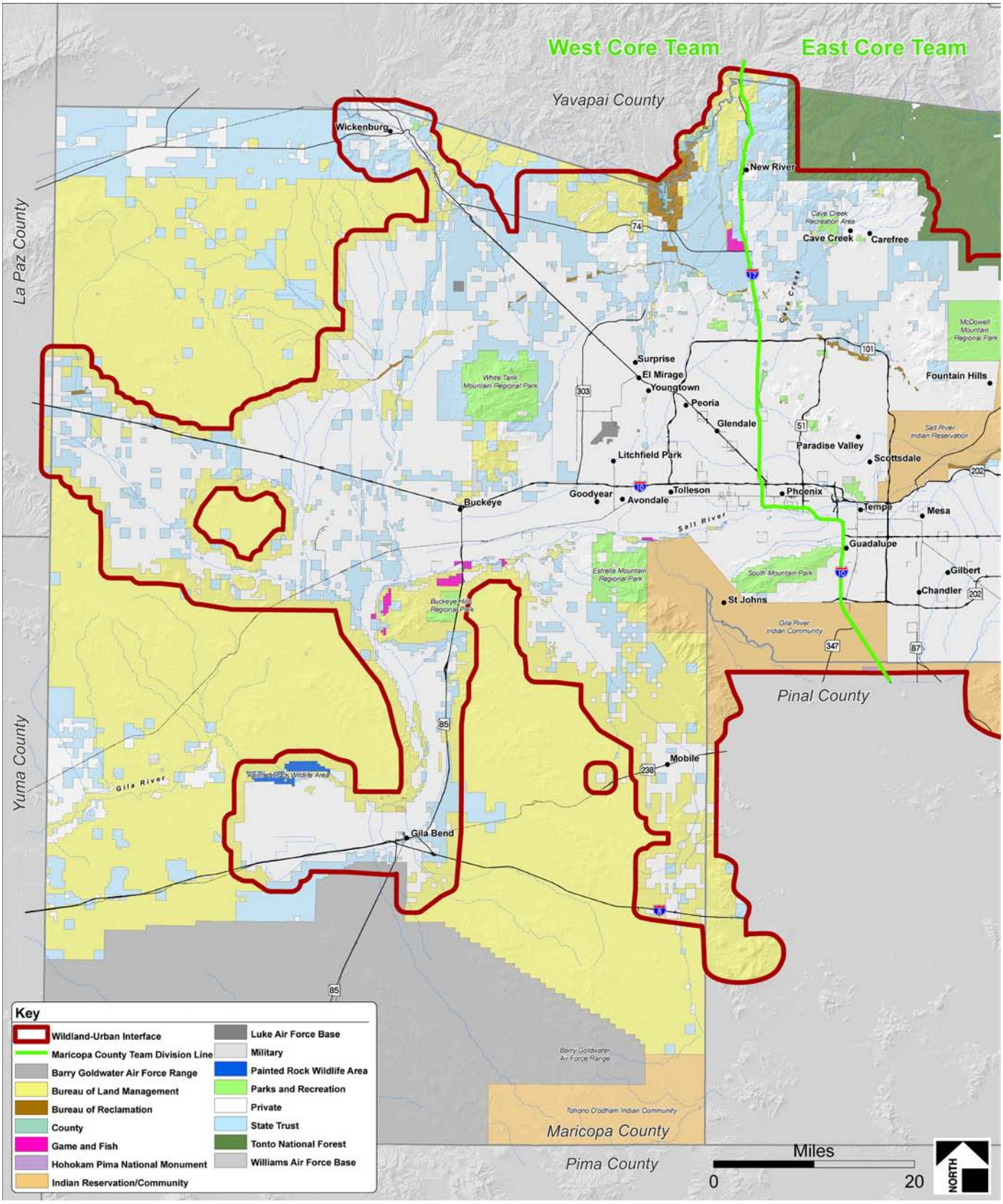

Figure 2.1b. Maricopa County CWPP WUI area, west

Carefree, Cave Creek, Circle City/Morristown, and New River contain the majority of private land acreage within the WUI. Commercial structures are clustered along state and federal highways and community centers, and they are assumed to remain as the principal commercial corridors within the Maricopa County at-risk communities.

Maricopa County has experienced considerable growth in population and housing during the recent decade. The population estimate for Maricopa County was reported as approximately 3,862,036 with slightly over 1,536,471 housing units, in 2008—this represents a 22 percent increase in housing units since the 2000 census (US Census Bureau 2009). Growth is anticipated to continue in both urban and rural settings in Maricopa County. Maricopa County and the Core Teams recognize that the WUI will continue to grow and that fire departments and districts will be challenged to provide fire response services to an increasing number of constituents.

The Maricopa County CWPP planning area boundary is identified in Figures 2.1a and 2.1b and is included within the *Statewide Strategy for Restoring Arizona's Forests* (Governor's Forest Health Councils, State of Arizona, 2007), which distinguishes nine forested landscapes. A portion of one of these identified forested landscapes, the Sky Islands, occurs in Maricopa County.

The Sky Islands region is located at the confluence of four major bioregions—the southern Rocky Mountains, the northern Sierra Madre Mountains, the Sonoran Desert, and the Chihuahuan Desert. The Sky Islands region of the *Statewide Strategy for Restoring Arizona's Forests* is circumscribed by the Gila Mountains to the north, the Baboquivari Mountains to the west, and the Mexican border to the south. The Eastern Core Team reviewed the current conditions and future restoration needs of the Four Peaks Wilderness area, within the Sky Islands landscape, to ensure that the Maricopa County CWPP is complementary to the recommendations of the *Statewide Strategy for Restoring Arizona's Forests.* Landscape vegetation ranges from madrean encinal to oak woodlands at elevations normally above 3,600 feet to desert shrublands at lower elevations. Due to high levels of topographical complexity and gradient within the portion of the Sky Islands landscape within the Maricopa County CWPP WUI, fire characteristics are variable. Single fires can cross multiple vegetation associations. Unnatural high fuel loads and drought continue to contribute to high wildland fire risk. Recommendations for "Future Restoration Needs" (Governor's Forest Health Councils State of Arizona 2007:115) of the Sky Islands landscape applicable to the Maricopa County CWPP include (1) conducting educational outreach to stakeholders that will highlight the ecological and socioeconomic benefits of ecological restoration; (2) providing incentives and assistance for restoration of privately owned forests (or lands within the Maricopa County CWPP); (3) integrating restoration planning with long-term planning and zoning processes, which will require outreach and education to planning and zoning commissions; (4) encouraging Firewise landscaping and building in communities; and (5) encouraging the restoration-based harvesting of firewood as opposed to importing firewood from Mexico. The Core Teams support the recommendations within the *Statewide Strategy for Restoring Arizona's Forests* and produced the Maricopa County CWPP to be complementary to those assessments and recommendations.

The climate of Maricopa County is varied—ranging from semiarid desert shrub-scrub vegetative associations with relatively low precipitation, low humidity, and high summer temperatures; to vegetative communities associated with the Gila, Salt, Verde, Agua Fria, and Hassayampa rivers and riparian

corridors of New River, Sycamore, and Cave creeks; and to oak and pinyon-juniper woodlands with mild summers and cool winters. Precipitation averages from 3.5 to 37.0 inches per year depending on elevation and occurs primarily during two rainy periods—summer rainfall, which usually occurs in local torrential convection showers, and winter rainfall, which is usually slow and can occur over several days. The average annual air temperature is 47 to 74 degrees Fahrenheit. The freeze free period averages from 255 to 285 days, decreasing in length with increasing elevation (NRSC 2010a and 2010b).

The planning area includes the Gila, Salt, Verde, Agua Fria, and Hassayampa rivers. The Verde River is a tributary to the Salt River. The Salt, Agua Fria, and Hassayampa rivers are all direct tributaries of the Gila River. The Gila River has its source in western New Mexico. It flows into Arizona, past the town of Safford, and along the southern slope of the Gila Mountains in Graham County. It emerges from the mountains into the valley southeast of Phoenix, where it crosses the Tohono O'odham Nation San Lucy District as an intermittent stream due to large irrigation diversions. West of Phoenix, the river bends sharply southward along the Gila Bend Mountains and then turns sharply westward near the town of Gila Bend. It then flows southwestward through the Gila Mountains in Yuma County, and finally it flows into the Colorado River at Yuma.

The Salt River is formed in eastern Arizona in eastern Gila County, by the confluence of the White and Black rivers. It flows northwest through Salt River Canyon, then southwest and west through the Tonto National Forest. It passes through the valley between the Mazatzal Mountains and Superstition Mountains, past Man Island, and supplies several consecutive reservoirs: Lake Roosevelt, Apache Lake, Canyon Lake, and Saguaro Lake. Near Fountain Hills it is joined by the Verde River. About five miles downstream of this point, the Granite Reef Diversion Dam diverts all remaining water into the Arizona and South canals, which deliver drinking and irrigation water to much of the Phoenix metropolitan area. The Salt River joins the Gila on the southwestern edge of Phoenix approximately 15 miles from the center of the city.

The head of the Verde River begins below the dam that catches water from the Big Chino Wash and Williamson Valley Wash combining to create Sullivan Lake in Yavapai County. This occurs during periods of sufficient precipitation. The Verde flows freely above- and belowground for 125 miles through private, state, tribal, and USDA Forest Service lands, specifically the TNF, before encountering the first of two dams that make Horseshoe Lake and Bartlett Lake. The Verde River converges with the Salt River near Fountain Hills.

The Agua Fria River is a 120-mile-long intermittent stream that flows generally south from 20 miles east-northeast of Prescott. Prescott draws much of its municipal water supply from the upper Agua Fria drainage. The Agua Fria runs through the Agua Fria National Monument and then flows through Black Canyon into Lake Pleasant. When flows are sufficient, the Agua Fria River flows into the Gila River. The Hassayampa River is a mostly underground river in Arizona. However, the river flows aboveground within the Hassayampa River Canyon Wilderness. The Hassayampa converges with the Gila River near the Buckeye Hills.

The majority of federally managed public lands within the Maricopa County CWPP are administered by BLM. In accordance with the *Approved Arizona Statewide Land Use Plan Amendment for Fire, Fuels, and Air Quality Management and Decision Record* (USDI BLM 2004a and USDI BLM 2004b), BLM-

administered public lands are assigned to one of two land use allocations for fire management. Allocation 1 lands include areas where fire is desired and there are few or no constraints for its use. Wildland fire may be used to achieve resource objectives, such as improved watershed or wildlife habitat. Where fuel loading is high and conditions are not initially suitable for wildland fire, fuel loads may be reduced by mechanical, chemical, or biological means to acceptable levels and to meet resource objectives. Allocation 2 lands include areas where mitigation and suppression are required to prevent direct threats to life or property. It also includes areas where fire never played a large role in ecosystem management and where unplanned ignitions would have negative effects on resources. In these areas BLM will implement programs to reduce unwanted ignitions and emphasize prevention, detection, and rapid suppression. In addition to both land use allocations, BLM will undertake education, enforcement, and administrative fire-prevention measures to reduce human-caused fire.

National forest lands are administered by the TNF and consist of four fire management units (FMUs): FMU 1–Desert, FMU 4–Woodland Brush, FMU 5–Wilderness, and FMU 6–WUI9 (USDA FS 2005) and USDA FS 2006).

FMU 1 consists of the Sonoran Desert and is represented by National Fire Danger Rating System (NFDRS) Fuel Model T (See Appendix B for NFDRS fuel model definitions). Areas that have burned at a high intensity have been converted from Sonoran Desert to desert grasslands composed of nonnative grasses. Fire intensities from the nonnative species have compounded the problem. The two species that classify this FMU are the saguaro cactus and the palo verde tree. Wildfire will be managed consistent with resource objectives. Capital investments within these areas will be protected from fire. Actions taken will be consistent with the appropriate management response (AMR) for this area. Wildfires, or portions of wildfires, that adversely affect forest resources, endanger public safety, or have a potential to damage private lands will be suppressed. Suppression efforts will be accomplished with minimal ground disturbance and least cost suppression methods will be initiated when possible (that is, using existing natural or human-made features as control lines).

FMU 4 consists of pinyon pine, juniper, and chaparral and is represented by NFDRS Fuel Model B. Much of this FMU contains a thick overstory and shrubby understory. Many of the chaparral stands contain old, decadent components. In areas where the pinyon pines and junipers are less dense, there is often a dense layer of herbaceous vegetation. Wildfires will be managed consistent with resource objectives. Wildland fire not meeting management objectives will receive an AMR. Fire management objectives for this area include providing a mosaic of age classes within the total type, which will provide for a mix of successional stages, and allowing fire to resume its natural ecological role within ecosystems. Wildfires, or portions of wildfires, will be suppressed when they adversely affect forest resources, endanger public safety, or have a potential to damage significant capital investments.

FMU 5 consists of the Four Peaks and Mazatzal Wilderness areas on the TNF and are represented mostly by NFDRS Fuel Models B and T and partly by Fuel Model U. This FMU contains fuel characteristics that are found in all the other FMUs, at all elevations, and contains much of the TNF's various vegetation types. Wildfires occurring within this FMU will receive an AMR and be managed consistent with Wilderness resource objectives. Wildfires may be allowed to burn, to function in their natural ecological role, and to

reduce unnatural fuel hazards as identified in the Forest Service Manual and approved Wilderness Implementation Plan.

FMU 6 consists of national forest lands adjacent to private lands with developments and most infrastructure sites on national forest lands. This land is defined by a 0.5-mile buffer on each side of a structure or private boundary. Wildfires occurring within this FMU will be immediately suppressed at the smallest acreage possible. Both mechanical treatment and prescribed fire will be used to reduce potential wildfire intensity.

A. Fire Regime and Condition Class

Before European settlement of North America, fire played a natural (historical) role in the landscape. Five historical fire regimes have been identified based on the average number of years between fires (fire frequency) combined with the severity (amount of overstory replacement) of fire on the dominant overstory vegetation (Table 2.2).

Table 2.2. Fire regime information

	Frequency	Severity[a]
Regime I	0–35 years	Low
Regime II	0–35 years	High
Regime III	35–100 years	Low
Regime IV	35–100 years	High
Regime V	200+ years	High

Source: Schmidt et al. 2002.

[a]Low = less than 75% of the dominant overstory vegetation replaced. High = greater than 75% of the dominant overstory vegetation replaced (stand replacement).

The condition class of wildland habitats describes the degree to which the current fire regime has been altered from its historical range, the risk of losing key ecosystem components, and the vegetative attribute changes from historical conditions. The following descriptions of condition classes are provided by the Arizona State Forester (2007:3):

> Condition Class 1:
>
> Fire regimes are within a historical range, and the risk of losing key ecosystem components is low. Vegetation attributes (species composition and structure) are intact and functioning within the historical range.
>
> Condition Class 2:
>
> Fire regimes have been moderately altered from their historical range. The risk of losing key ecosystem components is moderate. Fire frequencies have departed from historical frequencies by one or more return intervals (either increased or decreased). This results in moderate changes to one or more of the following: fire size, intensity and severity, and landscape patterns. Vegetation attributes have been moderately altered from their historical range.

Condition Class 3:

> Fire regimes have been significantly altered from their historical range. The risk of losing key ecosystem components is high. Fire frequencies have departed from historical frequencies by multiple return intervals. This results in dramatic changes to one or more of the following: fire size, intensity, severity, and landscape patterns. Vegetation attributes have been significantly altered from their historical range.

The Maricopa County WUI covers 3,072,461 acres, including 633,059 acres of land classified as developed and low-density open space and barren landscape (21% of WUI acres) and 377,229 acres of agricultural land (12% of WUI acres). The WUI includes 1,923,633 acres (63% of WUI acres) of Fire Regime Condition Class (FRCC) I lands, 137,526 acres (4% of WUI acres) of FRCC II lands, and 1,014 acres (<0.01% of WUI acres) of FRCC III lands, as described in *Development of Coarse-Scale Spatial Data for Wildland Fire and Fuel Management* (Schmidt et al. 2002).

Because condition-class categories are based on coarse-scale data that are intended to support national-level planning, any interpolation of national data for localized conditions may not be valid (FRCC Interagency Working Group 2005a, 2005b) due to invasive perennial and annual grasses, exotic forbs, and woody-species encroachment in native habitats altering local fire regimes. Therefore, local agencies are asked to provide data for localized vegetative conditions that reflect an accurate, current FRCC (USDA FS 2000). The amount of land disturbance causing the growth of flammable annuals (pigweed, Asian mustard, and thistles) and invasive grasses (such as buffelgrass, red brome, and Mediterranean grass) in affected WUI areas can rapidly alter the potential of a vegetation association to support unwanted wildland fire. In addition, increasing woody-species invasions, especially saltcedar within the riparian corridors, indicate that the perennial and ephemeral riparian, upland, and desert grassland habitats no longer conform to components of Condition Class 1 lands. Invasive nonnative plants have severe ecological impacts on vegetative structure (Arizona Wildlands Invasive Plant Working Group [AZ-WIPWG] 2005). Therefore, local conditions indicate that the majority of wildland habitats within the WUI may actually fall within Condition Classes 2 and 3.

As reported in the *Statewide Strategy for Restoring Arizona's Forests* (Governor's Forest Health Councils 2007:46), the majority of the Sky Islands landscape (92%) has been classified as Condition Classes 2 and 3 in which there is a "moderate to high risk of losing key ecosystem components to fire." Within the Sky Islands landscape, fire exclusion combined with recent drought has exacerbated heavy fuel loading in some areas that in turn increases the probability of uncharacteristic wildfire.

The desired future condition of federal land within the Maricopa County CWPP area is to return to or maintain wildland within Condition Class 1, as described in *Fire Regime and Condition Class (FRCC) Interagency Handbook Reference Conditions* (2005b):

> Open park-like savanna grassland, or woodland, or shrub structures maintained by frequent surface or mixed severity fires . . . Surface fires typically burn through the understory removing fire-intolerant species and small-size classes and removing less than 25 percent of the upper layer, thus maintaining an open single-layer overstory of relatively large trees . . . Mosaic fires create a

> mosaic of different-age, postfire grassland, savannah woodlands, or open shrub patches by leaving greater than 25 percent of the upper layer (generally less than 40 hectares [100 acres]). Interval[s] can range up to 50 [years] in systems with high temporal variability.

Desired future conditions for Great Basin Pinyon-Juniper Woodland, Interior Chaparral, Upland and Lower Sonoran Desert Scrub, Semidesert Grassland, and Riparian habitats, as described in the *Approved Arizona Statewide Land Use Plan Amendment for Fire, Fuels, and Air Quality Management and Decision Record* (USDI BLM 2004a:2–3), are as follows:

Great Basin Pinyon-Juniper Woodland:

> Annual weeds such as cheatgrass are controlled, ladder fuels and downed woody debris are limited or not present, and juniper and piñon pine tree densities and cover occur at their historic range of variation.

Interior Chaparral:

> Wildfire naturally maintains shrub cover while reducing annual grass cover, the invasion of woody plants such as juniper and pinyon pine are controlled and the average age of chaparral stands is reduced through controlled fire or mechanical treatment.

Upland Sonoran Desert Scrub

> An adequate cover of and mix of natural plant species that have good vigor. Wildland fire would control or reduce the exotic annual weeds such as red brome and to limit woody vegetation to non-hazardous levels.

Lower Sonoran Desert Scrub:

> An adequate cover of and mix of natural plant species that have good vigor. Wildland fire would control or reduce the exotic annual weeds such as red brome and to limit woody vegetation to non-hazardous levels.

Semidesert Grassland:

> Perennial grasses cover its historic range of variability, annual grass cover is reduced and fire naturally inhibits the invasion of woody plants such as juniper, tarbush, whitethorn and creosotebush.

Riparian habitat:

> Annual weed cover and density is controlled and ladder fuels and downed woody debris are limited or not present. Disturbances that can potentially reduce natural vegetation cover and vigor are managed to maintain cover and mix of native riparian plant species.

B. Fuel Hazards

The arrangement of vegetative fuel, relative flammability, and potential of vegetation to support wildland fire varies throughout the WUI. Wildland fuel hazards depend on a specific composition, type, arrangement, or condition of vegetation such that if the fuel were ignited, an at-risk community or its infrastructure could be threatened. Table 2.3 identifies the total amount of land in the WUI that was evaluated for overall wildland fire risk because of increased wildland vegetative fuel hazards. Historically, fire played an important role in keeping woody species in check and light ground fuels low (USDI BLM 2004b:3–8; Gori and Enquist 2003). However, with the suppression of natural wildfires within the last century, fire return intervals have increased, and invasions of desert grasslands by woody shrub (such as mesquite and juniper species) and nonnative grasses (such as buffelgrass, red brome, and Mediterranean grass) have altered native vegetative associations. The Core Teams reviewed vegetation associations within the WUI that were identified and mapped using Southwest Regional Gap Analysis Project (SWReGAP) data (USGS 2005; NatureServe 2004) (Figures 2.2a and 2.2b). These datasets provide the level of landscape description and vegetative landcover detail necessary for aligning wildland fuel flammability with existing vegetation. The major distinguishing types for each Maricopa County CWPP vegetation association were field verified.

The existing arrangement and flammability of vegetation associations largely determine wildland fire behavior. Flammability for the Maricopa County WUI is mapped in Figures 2.3a and 2.3b. The Core Teams and collaborators identified areas at risk from wildland fire by evaluating vegetative fuels on federal and nonfederal land in the WUI through spatial analysis using geographic information system (GIS) technology in a series of overlays. For the WUI, the vegetation type, density, and distribution were analyzed to help categorize areas at highest risk for fire intensity and spread from wildland fuels.

Vegetative data for predicting wildfire behavior was quantified by developing descriptions of associated fuel properties that are described as fuel models. The fuel model (as described by Anderson 1982 and Scott and Burgan 2005) and vegetation fuel fire-risk rating within the Maricopa County CWPP WUI are shown in Table 2.3. As described by the Arizona State Forester (2007:1),

> **"EVALUATE RISK TO COMMUNITIES:** Not all structures and/or communities that reside in an "interface" area are at significant risk from wildland fire. It is a combination of factors, including the composition and density of vegetative fuels, extreme weather conditions, topography, density of structures, and response capability that determines the relative risk to an interface community. The criteria listed below are intended to assist interagency teams at the state level in identifying the communities within their jurisdiction that are at significant risk from wildland fire. The application of these risk factors should allow for greater nationwide consistency in determining the need and priorities for Federal projects and funding."

Table 2.3. Fuel model, fire-danger ratings, and intensity levels on vegetation associations in the WUI

Fuel type	Vegetation association	Wildfire risk rating[a]	Anderson fuel model	Fire-danger rating model[b]	Flame length (ft)	Fire intensity level	Rate of spread ft/hr (ch/hr)	Fire behavior fuel model	Flame length (ft)—low dead fuel moisture	FIL	Rate of spread ft/hr (ch/hr)—low dead fuel moisture	Acres (%)
Desert shrub-scrub	Creosotebush, mixed desert, and thorn scrub	L	1,2	T	4–6	4	2310–5150 (35–78)	GR1 GR2	0.5–1.7 1.0–8.0	GR1: 1 GR2: 1–4	0–990 (0–15) 0–7920 (0–15)	85 (<1)
	Sonoran paloverde-mixed cacti desert scrub	M	1,3	L and T	4–6	3	2310–5150 (35–78)	GR1 or GR2	GR1, 0.5–1.7 GR2, 1.0–8.0	GR1, 1 GR2, 1–4	GR1, 0–990 (0–15) GR2, 0–7920 (0–120)	878,028 (29)
	Creosotebush-white bursage desert scrub	L	1	L and T	4–6	3	2110–5150 (32–78)	GR1 or SH1	GR1, 0.5–1.7 SH1, 0.2–0.7	GR1, 1 SH1, 1	GR1, 0–990 (0–15) SH1, 6.6–112.2 (0.1–1.7)	1,040,664 (34)
	Mixed-desert scrub	L	1,2	L and T	4–6	3	2310–5150 (35–78)	GR1 or GR2	GR1, 0.5–1.7 GR2, 1.0–8.0	GR1, 1 GR2, 1–4	GR1, 0–990 (0–15) GR2, 0–7920 (0–120)	58,368 (2)

Continued

Table 2.3. Fuel model, fire-danger ratings, and intensity levels on vegetation associations in the WUI

Fuel type	Vegetation association	Wildfire risk rating[a]	Anderson fuel model	Fire-danger rating model[b]	Flame length (ft)	Fire intensity level	Rate of spread ft/hr (ch/hr)	Fire behavior fuel model	Flame length (ft)—low dead fuel moisture	FIL	Rate of spread ft/hr (ch/hr)—low dead fuel moisture	Acres (%)
Shrublands	Mesquite upland scrub	M	1,3	B and T	4–12	6	5150–6860 (78–104)	GR1, GS1, SH1, SH2, or SH5	GR1, 0.5–1.7 GS1, 1.0– 6.0 SH1, 0.2–0.7 SH2, 1.0–4.5 SH5, 4.0–25.0+	GR1, 1 GS1, 1–3 SH1, 1 SH2, 1–3 SH5, 2–6	GR1, 0–990 (0–15) GS1, 0–3960 (0–60) SH1, 6.6–112.2 (0.1–1.7) SH2, 0–1188 (0–18) SH5, 0–16,500 (0–250+)	16,186 (1)
Grasslands	Semi-desert grassland and steppe	L	1,2	F and T	4–6	3	2310–5150 (35–78)	GS1, GR1 or GR2	GS1, 1.0–6.0 GR1, 0.5–1.7 GR2, 1.0–8.0	GS1, 1–3 GR1, 1 GR2, 1–4	GS1, 0–3960 (0–60) GR1, 0–990 (0–15) GR2, 0–7920 (0–120)	42 (<1)
Woodlands	Chaparral	H	4, 6	B and T	6–19	4–6	2110–4950 (32–75)	SH2 or SH5	SH2, 1.0–4.5 SH5, 4.0–25.0+	SH2, 1–3 SH5, 2–6	SH2, 0–1188 (0–18) SH5, 0–16,500 (0–250+)	6,900 (<1)

Continued

Table 2.3. Fuel model, fire-danger ratings, and intensity levels on vegetation associations in the WUI

Fuel type	Vegetation association	Wildfire risk rating[a]	Anderson fuel model	Fire-danger rating model[b]	Flame length (ft)	Fire intensity level	Rate of spread ft/hr (ch/hr)	Fire behavior fuel model	Flame length (ft)—low dead fuel moisture	FIL	Rate of spread ft/hr (ch/hr)—low dead fuel moisture	Acres (%)
	Encinal Oak Woodland	M	1,3	B and T	2.6–6	4	495–2310 (7.5–35)	GR2, GR4, or TL1	GR2, 1.0–8.0 GR4, 2.0–21+ TL1, 0.25–0.5	GR2, 1–4 GR4, 1–6 TL1, 1	GR2, 0–7920 (0–120) GR4, 0–33000 (0–500+) TL1, 6.6–46.2 (0.1–0.7)	7 (<1)
	Pinyon-juniper Woodland	H	2,3	F	6-19	4-6	2110-4950 (32-75)	GR1, SH2, SH5, SH6, TU3	GR1, 0.5–1.7 SH2, 1.0–4.5 SH5, 4-25+ SH6, 3-15 TU3, 2-16	GR1-1 SH2, 1–3 SH5, 2-6 SH6, 5-6 TU3, 2-6	GR1, 0–990 (0–15) SH2, 0–1188 (0–18) SH5, 0–16500 (0–250+) SH6, 0-7260 (0-110) TU3, 0-10560 (0-160)	4,570 (<1)
	Pine-oak Forest and Woodland	M	2,9	F and E	2.6-8	4-5	495-2310 (7.5-35)	SH8, TU3, TL3	SH8, 2-22 TU3, 2-16 TL3, 0.4-1.3	SH8,2-6 TU3, 2-6 TL3, 1-2	SH8, 0-7260 (0-110) TU3, 0-10560 (0-160) TL3 0-198 (0-3)	1,572 (<1)

Continued

Table 2.3. Fuel model, fire-danger ratings, and intensity levels on vegetation associations in the WUI

Fuel type	Vegetation association	Wildfire risk rating[a]	Anderson fuel model	Fire-danger rating model[b]	Flame length (ft)	Fire intensity level	Rate of spread ft/hr (ch/hr)	Fire behavior fuel model	Flame length (ft)—low dead fuel moisture	FIL	Rate of spread ft/hr (ch/hr)—low dead fuel moisture	Acres (%)
	Juniper savanna	M	2,6	F	6-8	4	2110-2310 (32-75)	GR1, SH2, SH5, SH6, TU1	GR1, 1.0–6.0 SH2, 1.0–4.5 SH5, 4-25+ SH6, 3-15 TU1, 1-4	GR1, 1 SH2, 1–3 SH5, 2-6 SH6, 5-6 TU1, 2-3	GR1, 0–990 (0–15) SH2, 0–1188 (0–18) SH5, 0–16500 (0–250+) SH6, 0-7260 (0-110) TU1, 0-990 (0-15)	213 (<1)
	Ponderosa Pine Woodland	H	2,9	E and T	2.6->8	4-5	495-2310 (7.5-35)	TU5, TL8	TU5, 2-14 TL8, 1-8	TU5, 6 TL8, 4	TU5, 0-2,772 (0-42) TK8, 0-2,640 (0-40)	125 (<1)
Deciduous Southwest Riparian	North American Warm Desert Riparian Mesquite Bosque	H	6,9	E and T	2.6–12	6	495–2110 (7.5–32)	SH2, SH5, or TL2	SH2, 1.0–4.5 SH5, 4.0–25.0+ TL2, 0.3–1.0	SH2, 1–3 SH5, 2–6 TL2, 1	SH2, 0–1188 (0–18) SH5, 0–16,500 (0–250+) TL2, 13.2–132 (0.2–2.0)	15,262 (<1)
	Invasive Southwest Riparian Woodland and Shrub	H	4	G and T	19	6	4950 (75)	SH2,SH5	SH2, 1.0-4.5 SH5, 4.5-25+	SH2, 1-3 SH5, 2-6	SH2, 0-1188 (0-18) SH5, 0-16,500 (0-250)	11,163 (<1)

Continued

Table 2.3. Fuel model, fire-danger ratings, and intensity levels on vegetation associations in the WUI

Fuel type	Vegetation association	Wildfire risk rating[a]	Anderson fuel model	Fire-danger rating model[b]	Flame length (ft)	Fire intensity level	Rate of spread ft/hr (ch/hr)	Fire behavior fuel model	Flame length (ft)—low dead fuel moisture	FIL	Rate of spread ft/hr (ch/hr)—low dead fuel moisture	Acres (%)
	Riparian Woodland and Shrubland	H	8 and 9	E and T	2.6-6	4-6	495-2110 (7.5-32)	SH2, SH4	SH2, 1.0-4.5 SH4, 1.0-16	SH2, 1-3 SH4, 2-6	SH2, 0-1188 (0-18) SH4, 0-11,550 (0-175)	13,032 (<1)
Other	Agriculture	L	NA	NA	NA	NA	NA	NB3	NA	NA	NA	377,641 (12)
	Developed, Open Space–Low Intensity	L	NA	NA	NA	NA	NA	NB1	NA	NA	NA	119,430 (4)
	Developed, Medium–High Intensity	L	NA	NA	NA	NA	NA	NB1	NA	NA	NA	515,175 (17)
	Barren Lands, Non-Specific	L	NA	NA	NA	NA	NA	NB9	NA	NA	NA	2,974 (<1)
	Volcanic Rock land and Cinder land	L	NA	NA	NA	NA	NA	NB9	NA	NA	NA	21 (<1)
	Recently mined or quarried	L	NA	NA	NA	NA	NA	NB9	NA	NA	NA	328 (<1)
	Open water	L	NA	NA	NA	NA	NA	NB9	NA	NA	NA	10673 (<1)
											Total	3,072,461

Source: National Fire Danger Rating System (USDA FS 1978; Burgan 1988).

[a]L = low, M = moderate, H = high, NA = not applicable.

[b]See Appendix B for the National Fire Danger Rating System definitions.

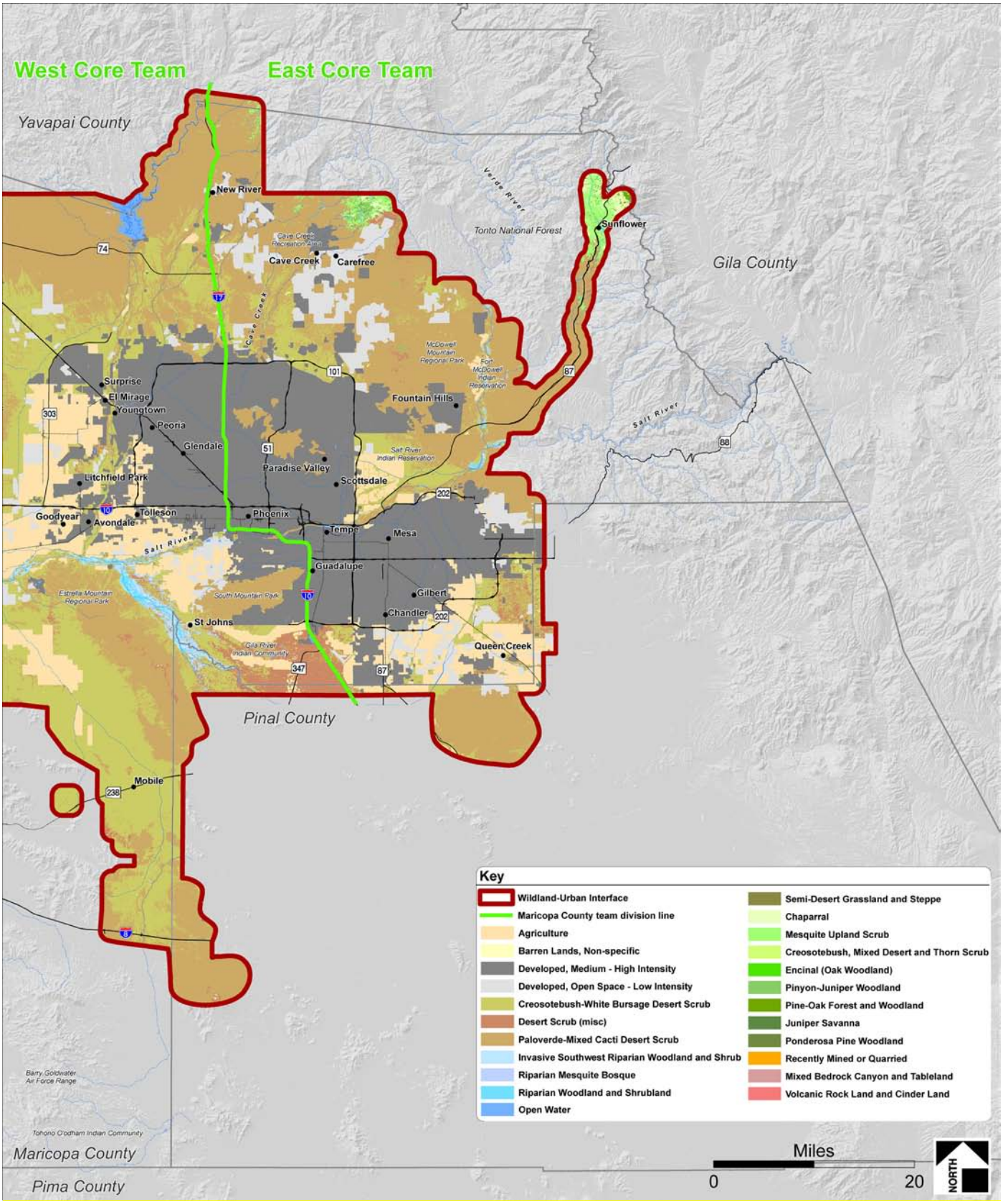

Figure 2.2a. Maricopa County CWPP vegetation associations, east

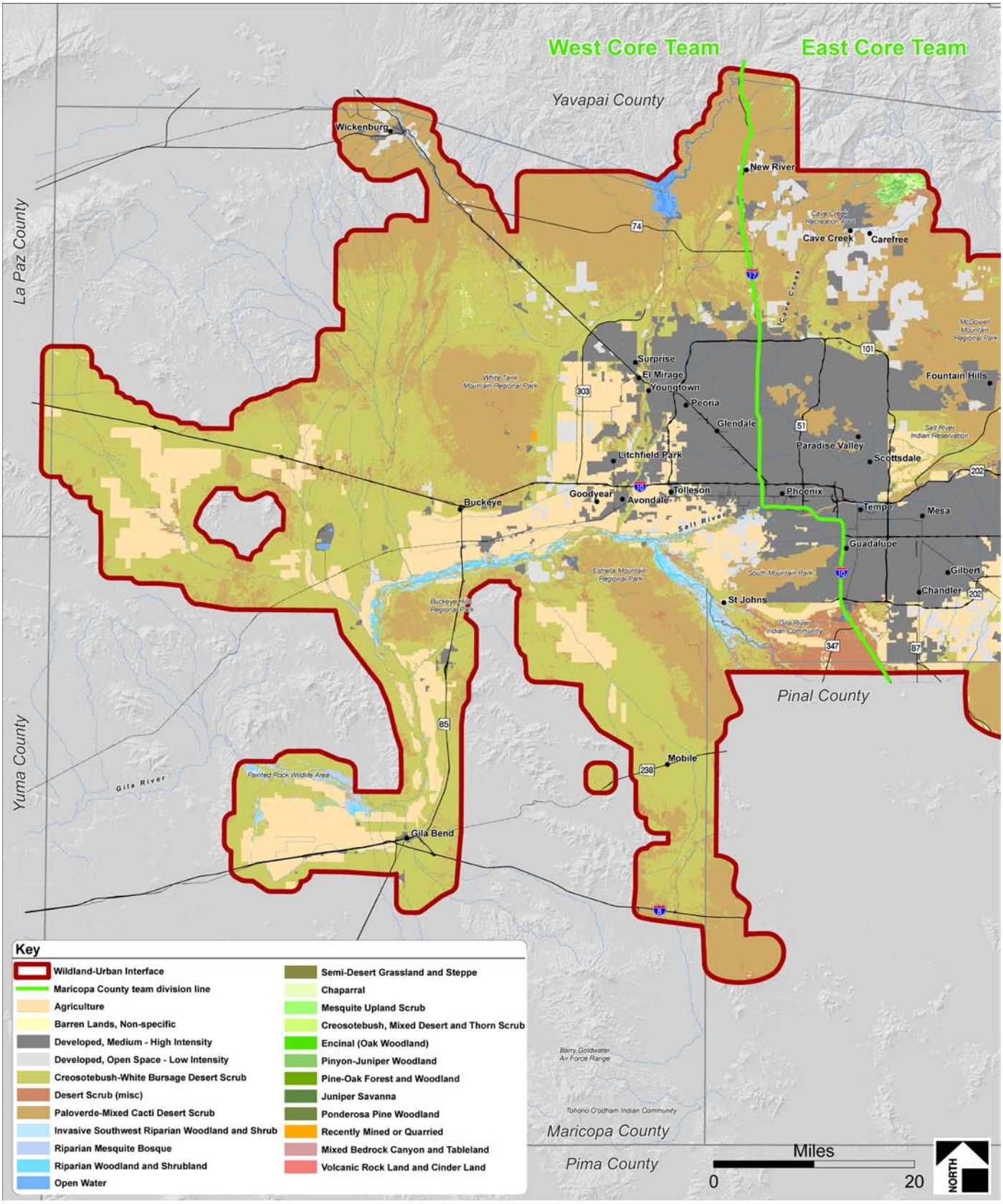

Figure 2.2b. Maricopa County CWPP vegetation associations, west

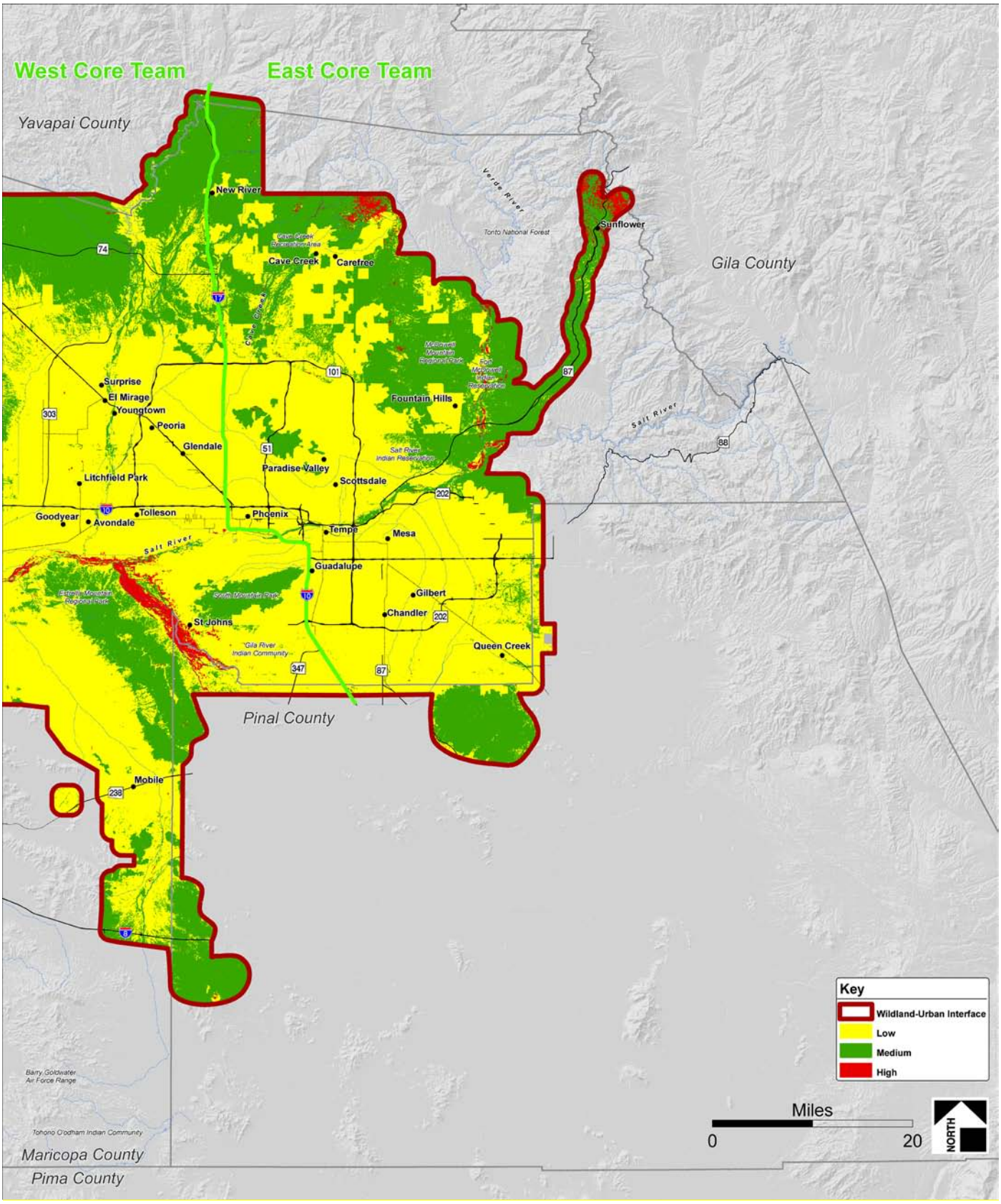

Figure 2.3a. Maricopa County CWPP flammability, east

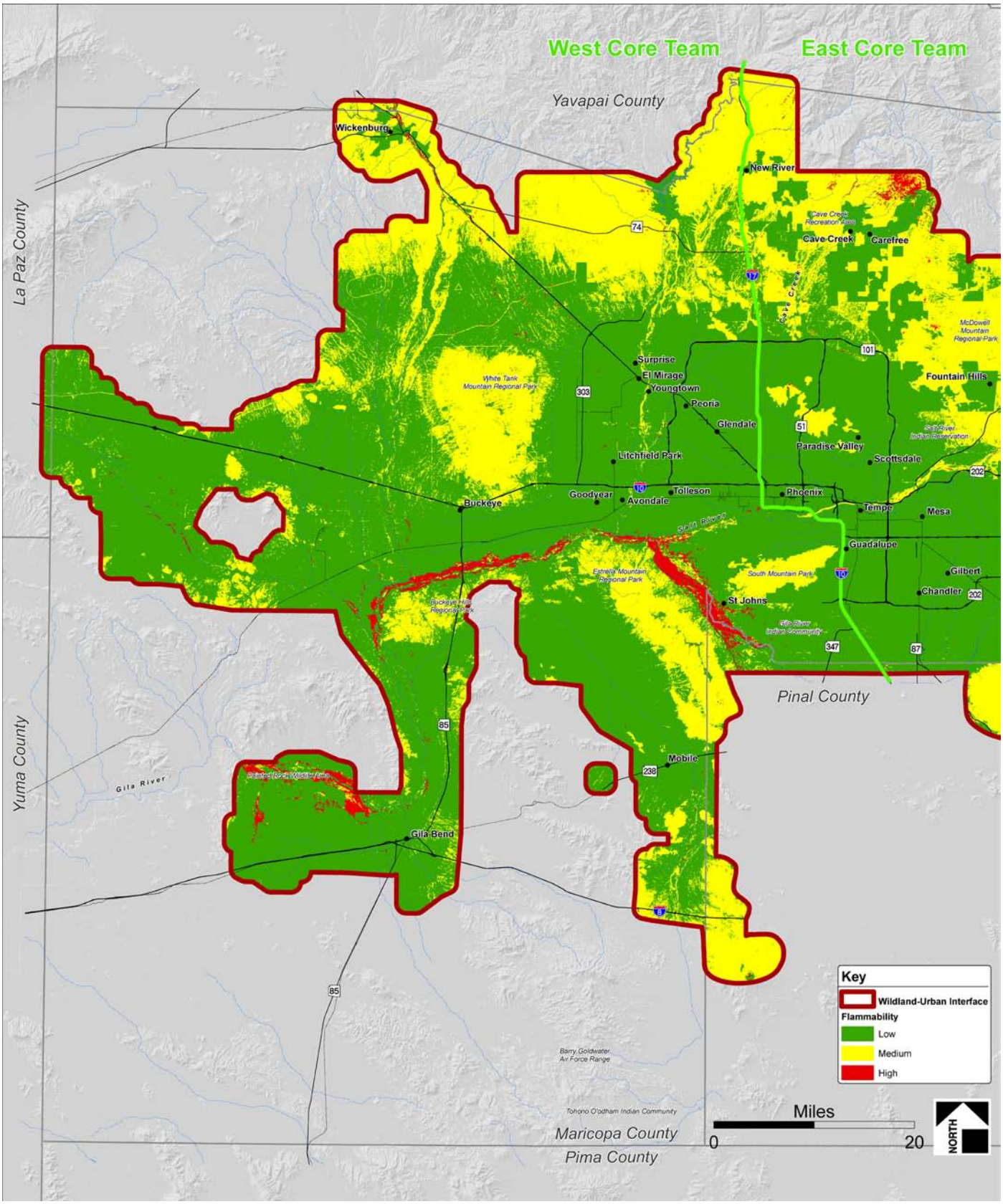

Figure 2.3b. Maricopa County CWPP flammability, west

The Core Teams reviewed the fire behavior potential in the WUI and determined that the risk classification is consistent with Situations 1, 2, and 3 as described by the Arizona State Forester (2007:1–2):

> Risk Factor 1: Fire Behavior Potential
>
> Situation 1: In these communities, continuous fuels are in close proximity to structures. The composition of surrounding fuels is conducive to crown fires or high intensity surface fires. Likely conditions include steep slopes, predominantly south aspects, dense fuels, heavy duff, prevailing wind exposure and/or ladder fuels that reduce fire fighting effectiveness. There is a history of large fire and/or high fire occurrence.
>
> Situation 2: In these communities, intermittent fuels are in proximity to structures. Likely conditions include moderate slopes and/or rolling terrain, broken moderate fuels, and some ladder fuels. The composition of surrounding fuels is conducive to torching, spotting, and/or moderate intensity surface fires. These conditions may lead to moderate fire fighting effectiveness. There is a history of some large fires and/or moderate fire occurrence.
>
> Situation 3: In these communities, fine and/or sparse fuels surround structures. There is infrequent wind exposure and flat terrain to gently rolling terrain. The composition of surrounding fuels is conducive to low intensity surface fires. Fire fighting generally is highly effective. There is no large fire history and/or low fire occurrence.

Maricopa County is composed of two major land resource areas (MLRAs) (Natural Resources Conservation Service [NRCS] 2007, 2010a, 2010b): Sonoran Basin and Range and Mogollon Transition. The Sonoran Basin and Range region is in the Sonoran Desert section of the Basin and Range province of the Intermontane Plateaus and is characterized by many short, fault-block mountain ranges trending southeast to northeast that rise abruptly from the smooth, gently sloping desert valley floors. Elevation ranges from 980 to 3600 feet in most areas, with mountains reaching 4590 feet. The Mogollon Transition region is within the Mexican Highland Section of the Basin and Range Province of the Intermontane Plateaus. The area is characterized by canyons and structural troughs and valleys with elevations ranging from 3000 to 5500 feet in most areas with mountains reaching 5100 to 7500 feet.

Vegetative production within these MLRAs ranges from over 4,000 lb/acre in highest-elevation sites in the >12-inch precipitation zone during favorable precipitation years to <50 lb/acre in lower desertscrub–mudstone hills range sites in the <7-inch precipitation zone during unfavorable precipitation years. Precipitation ranges from 7 to 14 inches annually, with a winter-summer rainfall ratio of 60:40. Warm-season rains (July–September) originate in the Gulf of Mexico and are usually brief and intense. Cool-season rains (December–March) originating in the Pacific Ocean are generally frontal, widespread, long, and less intense. May and June are the driest months of the year, with many natural fire ignitions occurring before the monsoon rains. Humidity is generally low, with mostly mild winters and hot summers in lower elevations to mild summers and cold winters in higher elevations. During May and June temperatures can exceed 100 degrees Fahrenheit. Cool-season vegetation growth begins in early spring and matures in early summer. Warm-season vegetation initiates growth after the summer rains and may remain green throughout the year in lower elevations.

The WUI includes 5 major vegetative fuel types composed of 16 major vegetation associations (including agricultural lands), 3 mostly nonvegetation associations, and 2 open-space residential developed land covers, as well as open water (NatureServe 2004). These different vegetative communities are listed and described in Appendix A. Each vegetative community is assigned to an array of fuel models that predicts the rate of spread, flame length, and fire-intensity levels possible for each vegetation association during an average fire season under average weather conditions. Assigning a fuel model to each vegetation association within the WUI will help predict wildfire behavior and thus proper suppression response (for detailed fuel model descriptions, see Anderson 1982 and Scott and Burgan 2005).

The mean fire return interval is highly variable among vegetation associations across the WUI. Habitat-replacement wildfires or wildfires resulting in a major loss of habitat components, in conjunction with drought, will be reduced in frequency and intensity in lower desert habitats. However, moist periods may increase fire frequency and intensity in desert habitats due to increased production of annual grasses and forbs and increased annual growth of perennial grasses and shrubs (FRCC Interagency Working Group 2005b), in synergy with increased production of invasive grasses and forbs. Total wildland fuel load ranges from less than 500 lb/acre in desert and scrub/shrub types to over 20 tons/acre in dense woodland habitats.

1. Vegetation Associations

The Desert Shrub-Scrub vegetation association is the largest natural land cover within the WUI; it occurs on drier upland sites and includes areas of bare ground and rock habitats supporting a variety of grass, herbaceous, scrub, and shrub species (Photo 2.1). This major vegetative fuel type ranges from lower desertscrub-creosotebush-bursage associations to mixed desert scrub types to paloverde-mixed cacti desertscrub association. The Desert Shrub-Scrub association constitutes 1,977,145 acres (65 percent) of the WUI. During normal rainfall years and the typical fire season, the majority of the lowest-elevation associations (mixed desert scrub and creosotebush-white bursage associations) do not support high-intensity wildfires with high rates of spread, and many wildfires self-extinguish from a lack of contiguous ground or aerial fuels. However, during periods of extraordinary rainfall in the fall, winter, and spring months, the growth of winter annuals and forbs, in synergy with the presence of invasive grasses and forbs (for example, buffelgrass, Mediterranean grass, red brome, and mustards), can produce areas with the potential for extreme rates of spread and enough intensity to ignite overstory vegetation.

Photo 2.1. Desert Shrub-Scrub association

The Shrublands vegetation association includes the mesquite upland scrub and is the largest naturally occurring upland vegetative type within the WUI, accounting for 16,186 acres (0.5 percent of the WUI) (Photo 2.2). The xeroriparian area within this association provides movement corridors and foraging areas for a variety of wildlife species. Adjacent vegetation associations are often a mix of semidesert grassland and desert scrub. The understory of the shrub types will vary from a mix of nonnative grass with some areas of native grasses, depending on canopy closure. Areas of higher canopy closure (>60%) support little herbaceous and perennial grass cover, which limits fine fuels needed for fire laddering and limits rate of spread. Stands of mature upland mesquite habitats can include trees with trunks and limbs greater than 6 inches diameter at breast height (dbh), providing habitat for a variety of cavity-nesting bird species. This shrubland association also provides recreational use, day use, and camping areas. Communities dominated by mature mesquites may include native or invaded graminoid understory, creating areas of open woodlands and savannas to areas of high canopy.

Photo 2.2. Shrublands association

The Woodland vegetative fuel type (Photo 2.3) includes the chaparral, pinyon-juniper, pine oak, juniper savannas, encinal oak woodlands, and ponderosa pine woodland associations. This fuel type covers 13,387 acres of the WUI (0.4 percent of all WUI acres) and is the second largest upland vegetative fuel type within the WUI. A major vegetative association of shrubland fuel types includes Mogollon chaparral. This ecological system occurs across central Arizona, western New Mexico, southwestern Utah, and southeast Nevada. It often dominates along the midelevation transition from the Mojave, Sonoran, and northern Chihuahuan deserts. It occurs on foothills, mountain slopes, and canyons in drier habitats below the encinal woodlands. Stands are often associated with more xeric and coarse-textured substrates such as limestone, basalt, or alluvium, especially in transition areas with more mesic woodlands. The moderate to dense shrub canopy includes species such as oak, sumac, and ceanothus. Most chaparral species are fire adapted, resprouting vigorously after burning or producing fire-resistant seeds. Substrates are normally shallow/rocky and shaley soils at lower elevations.

Photo 2.3. Woodland association

Encinal oak woodlands occur on foothills, canyons, bajadas, and plateaus in Mexico, extending north into sub-Mogollon Arizona. These woodlands are dominated by Madrean evergreen oaks along a low-slope transition normally occurring at higher elevations and within moister habitats than Mogollon chaparral. Lower-elevation stands are typically open woodlands or savannas where they transition into desert grasslands, chaparral, or, sometimes, desertscrub. Common evergreen oak species include oaks, and chaparral species. The graminoid layer usually prominent between trees is grassland or steppe that is dominated by warm-season grasses typical of semidesert grasslands. This association can also be composed of stands dominated by shrubby Madrean oaks, typically with a strong graminoid layer and, in some instances, invasive grasses and forbs. In transition areas with drier chaparral systems, stands of chaparral are not dominated by the madrean encinal association; however, it may extend down along drainages.

The Deciduous Southwest Riparian fuel type consists of the North American warm-desert riparian mesquite bosque, Southwest invasive riparian woodland and shrub, and riparian woodland and shrubland associations. This vegetative association covers 39,457 acres and is the second largest vegetative association within the WUI (1.3% of all WUI lands). The Maricopa County WUI includes the riparian corridors of the Gila, Verde, Salt, Hassayampa, and Agua Fria rivers. This ecological system consists of low-elevation riparian corridors along intermittent streams in valleys of southern Arizona into adjacent New Mexico and Mexico. Dominant trees include mesquite species, and dominant shrubs include desert broom and desert willow. Vegetation, especially the mesquites, tap groundwater below the streambed when surface flows stop with high local densities of mesquites being dependent on an annual rise in the water table for growth and reproduction. This association can be intermixed with an understory of grasses and shrubs and often includes areas of near monocultures of saltcedar. This vegetation association may be underrepresented because of some xeroriparian association acres included with the shrubland associations. This vegetation association, however, contributes significantly to vegetation and wildlife biodiversity as well as to the principal recreational use areas within the WUI (Photo 2.4). In general, riparian areas have characteristics that reduce the frequency and severity of fire relative to the surrounding uplands. These characteristics include less steep slopes, surface water, saturated soils, shade, fewer

lightning ignitions, higher human-caused ignitions, cooler air temperatures, lower daily maximum temperature, higher relative humidity, higher fuel moisture content, and lower wind speed. However, late seral-stage riparian vegetation supports wildland fire similar to the surrounding potential natural vegetation group (PNVG) when a replacement fire occurs in surrounding PNVG during extreme drought and wind events. Late seral-stage riparian and bosque habitats can support nonreplacement fire in greater proportion of total fire frequency than surrounding PNVGs (FRCC Interagency Working Group 2005b: PNVG Code RIPA).

Photo 2.4. Deciduous Southwest Riparian association

The desert grassland fuel type is primarily represented by the semi-desert grassland and steppe association. This is the smallest of the naturally occurring vegetative association, covering only 42 acres (less than .002 percent) of all WUI acres. This ecological system consists of a broadly defined desert grassland, mixed shrub-succulent, or tree savannas that are typical of the borderlands of Arizona, New Mexico, and northern Mexico, but it extends west to the Sonoran Desert, north into the Mogollon Rim, and throughout much of the Chihuahuan Desert. It is found on gently sloping bajadas that supported frequent fire throughout the Sky Islands and on mesas and steeper piedmont and foothill slopes in the Chihuahuan Desert. Diverse perennial grasses typically characterize this association. Common grass species include grama grasses*, Eragrostis intermedia, Muhlenbergia porteri, Muhlenbergia setifolia,* and succulent species of *Agave,* and *Yucca*, and tall shrub/short tree species of mesquite and various oaks. Many of the historical desert grassland and savanna areas have been converted, some to mesquite upland scrub types from woody species invasions through intensive grazing and other land uses.

Included within the total WUI are residential and open-space community lands occurring in the developed areas of the community. As depicted in the SWReGAP land cover shows that within the WUI approximately 634,605 acres (20 percent) of lands evaluated for wildland fire potential within the WUI are “developed,” with at least 20 percent of the land cover consisting of nonpervious surfaces (Photo 2.5). However, private lands within the WUI account for approximately 55 percent of all WUI lands. Therefore, much of the WUI lands analyzed include private lands that are predominantly naturally landscaped. Developed, Open

Space–Low Intensity lands include areas with some construction materials but mostly consist of native vegetation associations. Impervious surfaces account for less than 20 percent of total cover and most commonly include large-lot single-family housing units or multiple-acre private lands in single ownership, parks, golf courses, and vegetation planted in developed settings for recreation, erosion control, or aesthetic purposes. These areas most commonly include single-family housing units. Developed, Medium–High Intensity lands include areas with a mixture of constructed materials and vegetation. Impervious surface accounts for 50 to 79 percent of the total cover. These areas most commonly include single-family housing units, including highly developed areas where people reside or work in high numbers—examples include apartment complexes, row houses, and commercial/industrial areas. These lands may be considered at low risk for wildland fire. However, the threat of fire (structural or wildland ignition) spreading from developed lands to wildlands has been considered in determining risk within the WUI.

Photo 2.5. Developed lands within the WUI

Several fuel hazard components, including vegetation type and density, previously burned areas, and slope and aspect, were analyzed for wildland fire potential. For example, areas of the WUI can be heavily dissected, with some areas having slopes exceeding 20 percent that are heavily vegetated with shrubs. Slopes greater than or equal to 20 percent and areas with south-, southwest-, or west-facing slopes in areas of high wildland fuels were identified as having greater risks because of fuel-ladder fire effects and convectional preheating of vegetative fuels associated with steep terrain and decreased humidity associated with the microclimates created by southerly exposed aspects. Areas with moderate fuel hazards on slopes greater than or equal to 20 percent are considered a high fuel hazard, while the same fuel type on slopes less than 20 percent is still considered a moderate fuel hazard. During extraordinary rainfall years, when rainfall is above average during the fall, winter, and spring months, increased germination and growth of Mediterranean grass (*Schismus barbatus*), buffelgrass (*Pennisetum ciliare*), and other invasive species (see Appendix E and AZ-WIPWG 2005), as well as annual grasses and forbs, can result in more continuous fine fuel cover. This change in fine-fuel continuity can result in faster rates of spread and increased intensity levels in desert shrub-scrub and shrubland habitats that do not normally sustain

wildland fire. These areas of low-risk vegetation associations, including lower-elevation desert shrub-scrub associations in combination with “deep, coarse to fine textured, nearly level to gently sloping soils on floodplains and lower alluvial fans” (Hendricks 1985) will be favored by some invasive grasses (Hauser 2008 and Rogstad 2008) and will, under these extraordinary circumstances, become areas of extremely high wildfire risk.

Figures 2.4a and 2.4b shows areas of vegetative fuel hazard during a typical fire season. During a normal fire season, low-risk vegetative associations will be enhanced to a moderate level by influencing effects of slope and aspect; in a similar manner, moderate-risk vegetative associations will increase to high risk from these same influencing factors. Other untreated or unburned areas that fall under the category of moderate ground fuels and that do not overlap areas with steep slopes or with south, southwest, or west aspects are considered a moderate risk from fuel hazards. All other areas have a low risk from fuel hazards, including the areas that have been treated or burned within the last decade. The wildland fuel hazards component influence was compiled to depict areas of high, moderate, and low wildland fire potential based on vegetation type, density, and arrangement and to show areas with higher wildfire risk and therefore of greater concern to the Core Teams during years of extraordinary rainfall and enhanced fire conditions creating extreme fire behavior. Table 2.4 identifies these various fuel hazards components and their assigned values. Visual representations of these fuel hazard components during extreme fire seasons are mapped in Figures 2.5a and 2.5b.

Table 2.4. Fuel hazard components

Component	Influence[a]
Vegetation type and density	
Woodlands in Fuel Models 4,6, and 9; Deciduous Riparian >100 stems/acre; or moderate fuel types in slopes ≥20%	H
Upland Shrubland associations in Fuel Models 1 and 3 and desert shrublands and grasslands 2, 3, and 6	M
Desert Scrub associations, barren land types, and agriculture and developed areas	L
Burned areas	L
Slopes ≥20%	H
Aspect (south-, southwest-, or west-facing slopes)	M

Source: Logan Simpson Design Inc.
[a] H = high, M = moderate, L = low

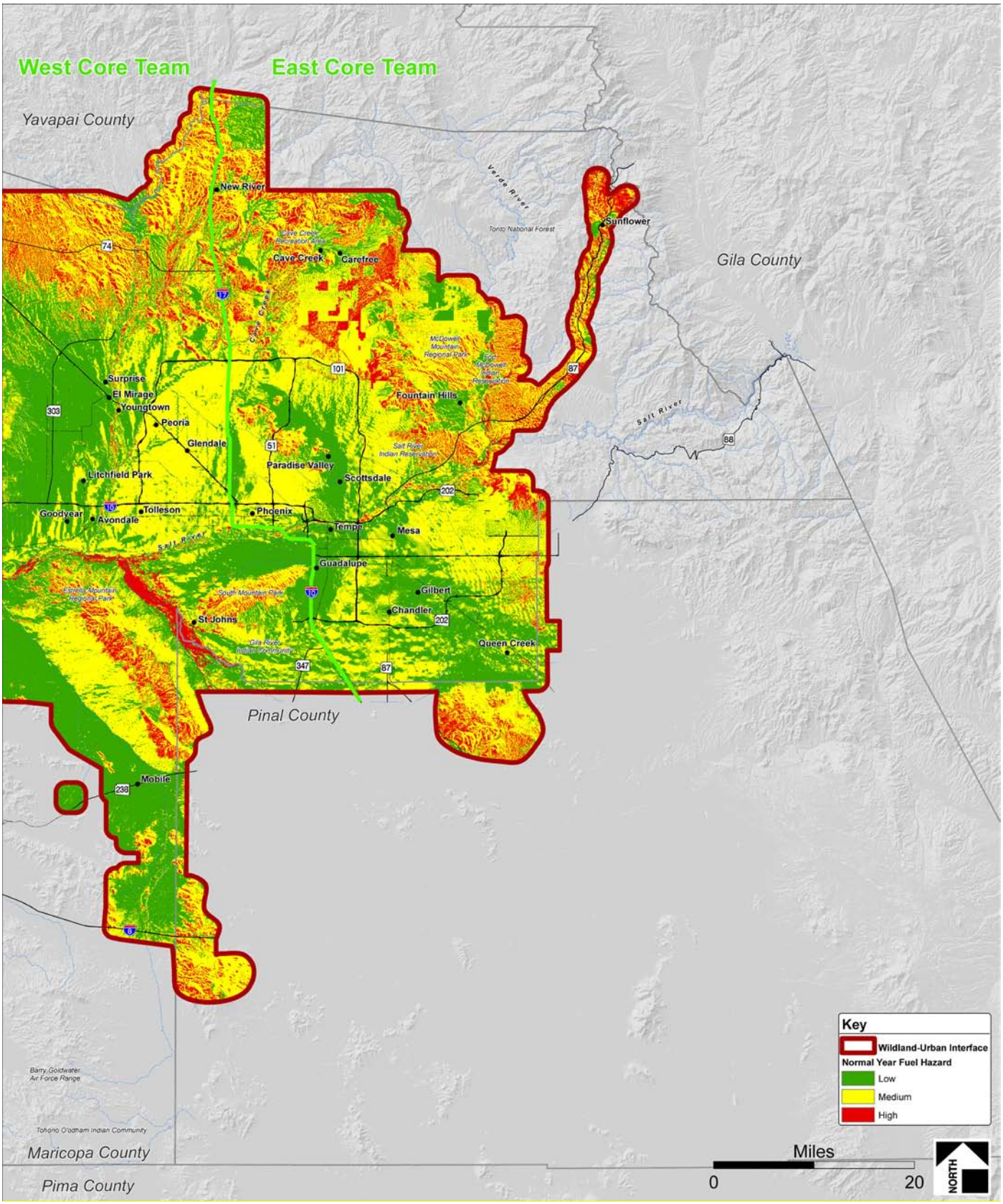

Figure 2.4a. Maricopa County CWPP wildland fuel hazards during typical fire season, east

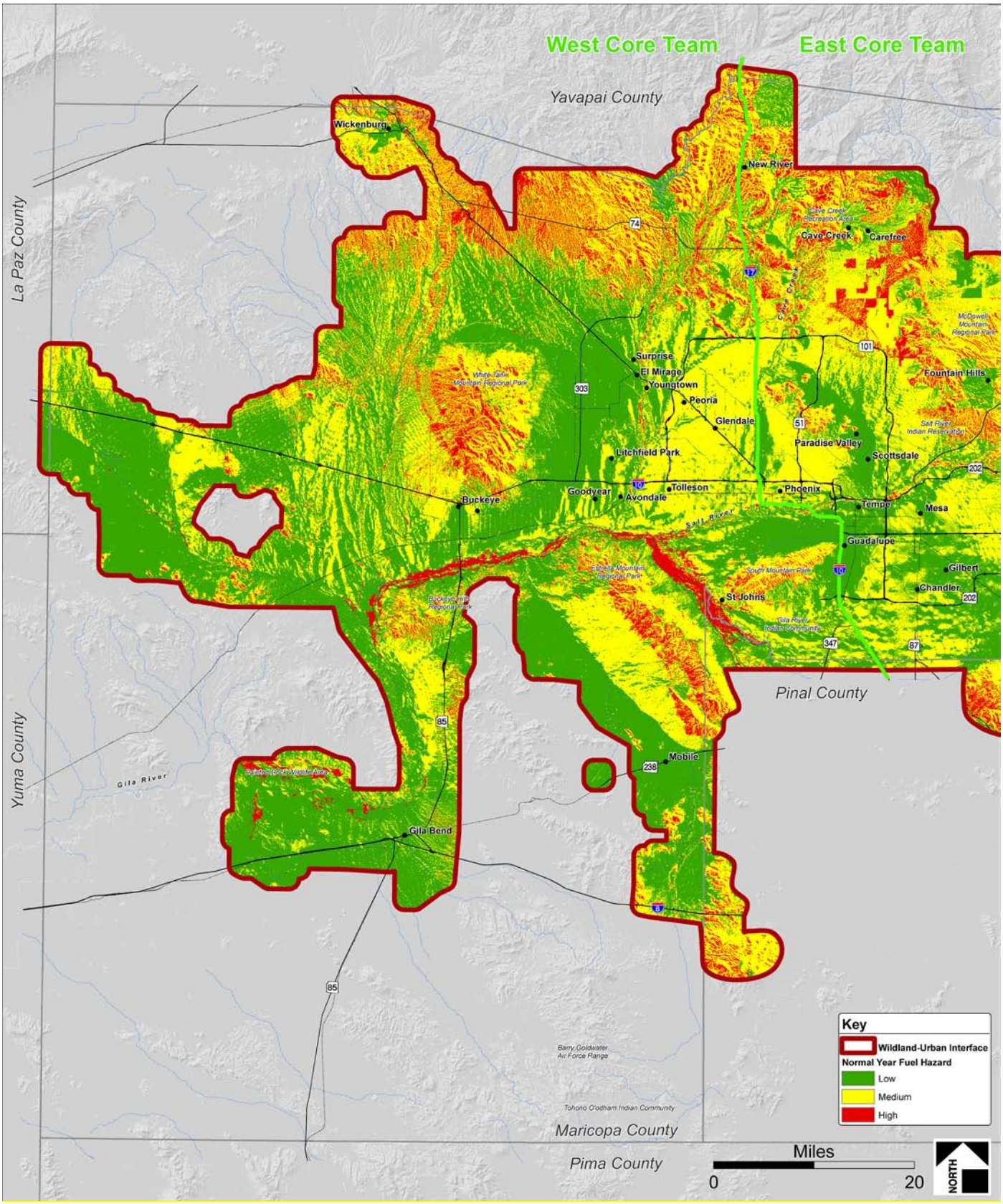

Figure 2.4b. Maricopa County CWPP wildland fuel hazards during typical fire season, west

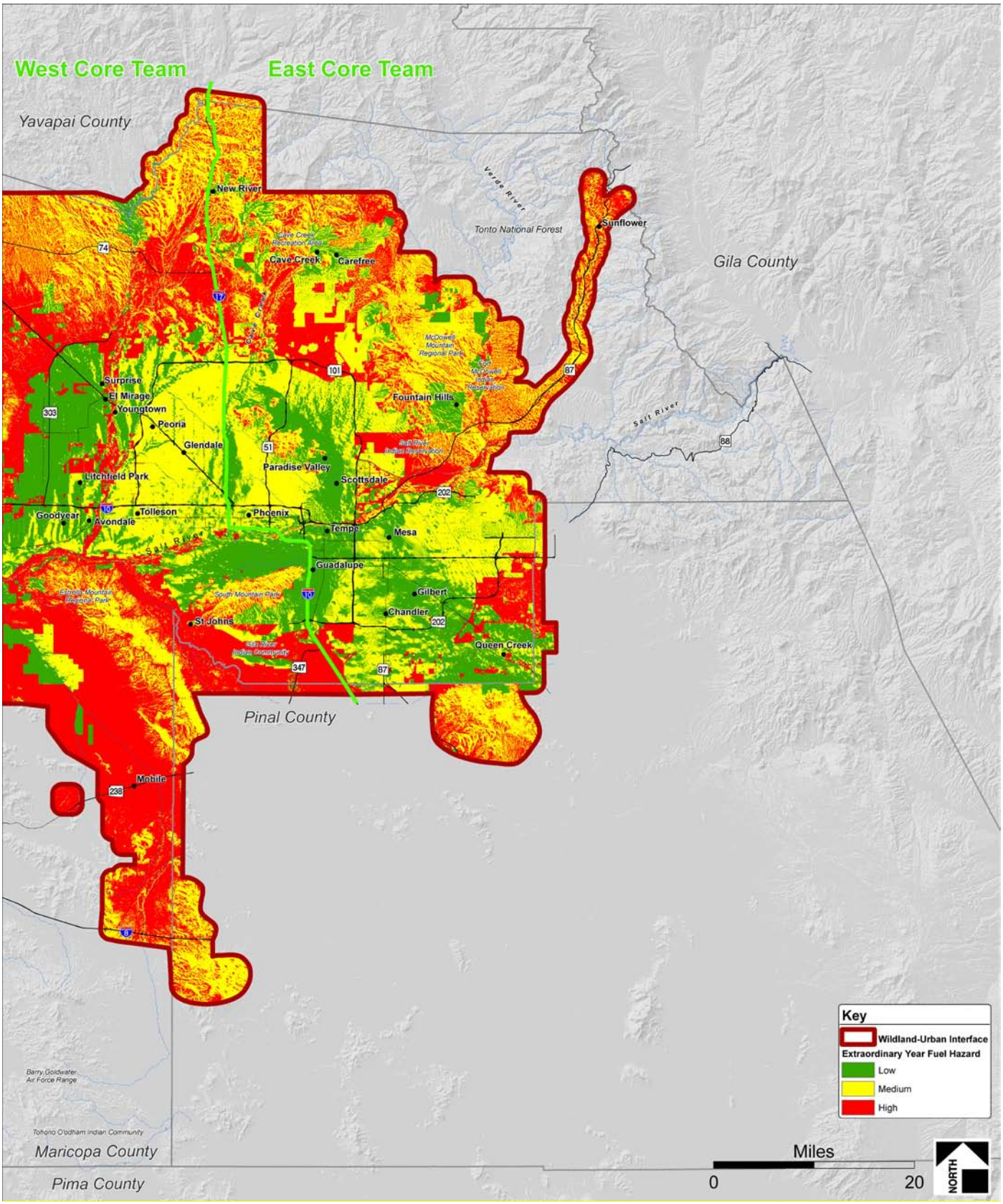

Figure2.5a. Maricopa County CWPP wildland fuel hazards during extraordinary rainfall years, east

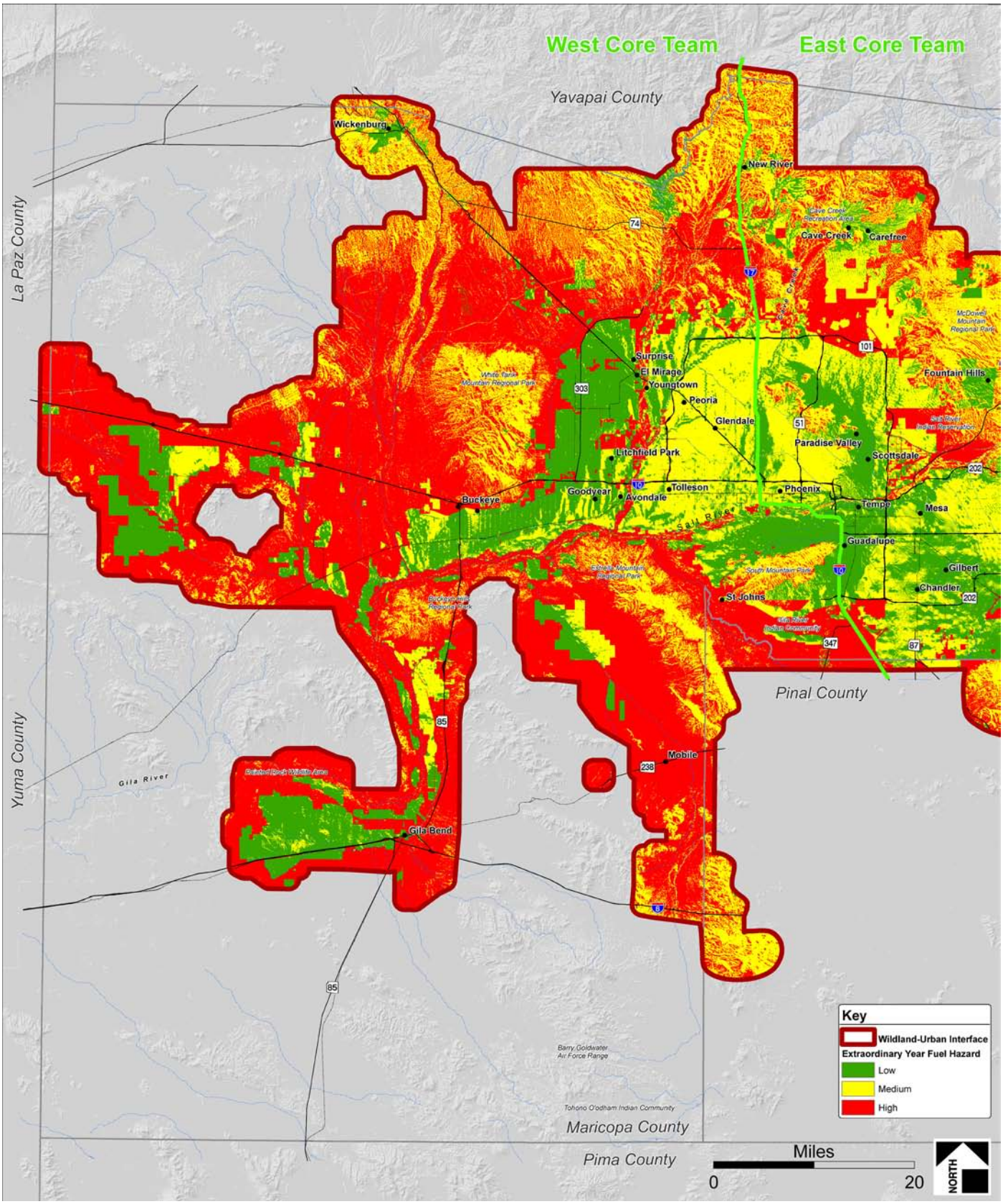

Figure2.5b. Maricopa County CWPP wildland fuel hazards during extraordinary rainfall years, west

Riparian corridors, shrublands, and vegetation associations occurring in steep slopes with a south or southwest aspect are the greatest wildland fuel hazards within the Maricopa County CWPP. Saltcedar-invaded and early-seral-stage riparian habitats constitute a second major wildland fire risk vegetative association. Shrubland areas constitute the next greatest wildland fire risk, in relation to high slopes and south or southwest aspects. In invaded riparian vegetation associations where riparian deciduous tree species are located, total wildland fuels can exceed 20 tons per acre and produce flame lengths greater than 6 feet above the overstory with a rate of spread of over 525 feet (8 chains) per hour. In addition, some shrublands with heavy invasions of nonnative grasses can produce wildfires of high intensity and high rates of spread that are capable of igniting adjacent overstory vegetation. Moderate wildland fuel risk is associated with the ecotone of the riparian and desert upland vegetation associations. In areas where shrub canopy exceeds 35 percent, light fuels produced by the herbaceous understory are reduced because of overstory shading and competition from overstory shrub species. Under extreme fire conditions, upland shrub communities can carry crown fires with moderate intensities and high rates of spread. Lower wildland fire risk occurs in desert scrub communities in which total fuel loading is low with no continuous arrangement of ground or aerial fuels. Desert upland vegetation associations are not fire-dependent communities, and wildfires within desert vegetation associations will be suppressed during years of above-normal rainfall when wildfires occurring in these vegetative associations may not self-extinguish.

C. Conditions of Ignition and Past Fire Occurrence

Past regional wildfire events are important for determining the potential of an area to support wildland fire. Because of the combination of current drought conditions and a regional history of fires, there will be wildland fire ignitions within the WUI that must be suppressed. The fire history of the planning area, including recent large wildfires that have occurred within or close to the WUI, has been included in this analysis to determine the most likely areas for either natural or human wildland fire ignition. Table 2.5 details the high, moderate, and low positive-influence values assigned to fire-start incidents. These include concentrated areas of lightning strikes and human-caused ignitions. High-potential areas have the greatest number of fire starts per 1,000 acres. Wildland fire ignition data is obtained from the Federal Wildland Fire Occurrence Internet Mapping Service (IMS) Web site and database (http://wildfire.cr.usgs.gov/firehistory/) and from the Arizona State Forester's Office. The Federal Fire Occurrence IMS is an interactive GIS for use in the wildland fire and GIS community. The datasets used in this GIS are based on official fire occurrence data collected from five federal and state agencies that have been merged into one fire history point layer. According to these data, 4,016 wildfire ignitions have been reported within the WUI since 1980. The areas with the greatest potential for fire ignition, either from natural or human (though unplanned) causes, are found within the Gila River corridor, along the northeastern portion of the WUI, including Sunflower and New River areas, and also within the riparian corridors in the central portion of the WUI. Moderate fire occurrences are found associated in proximity to higher ignition areas and along the northern portion of the San Tan Mountain Regional Park east to the Interstate 10 (I-10) corridor (Figures 2.6a and 2.6b).

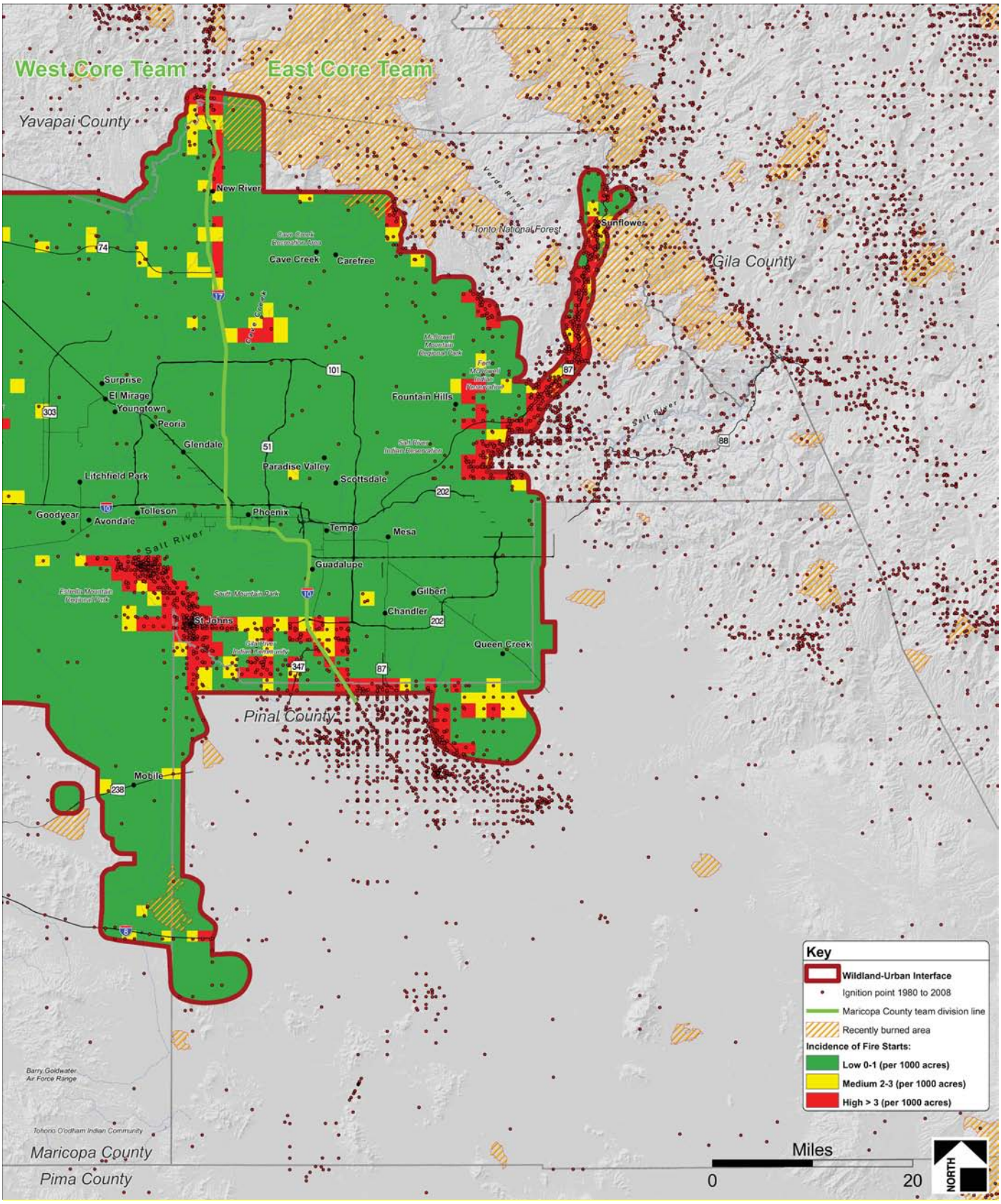

Figure 2.6a. WUI ignition history, east

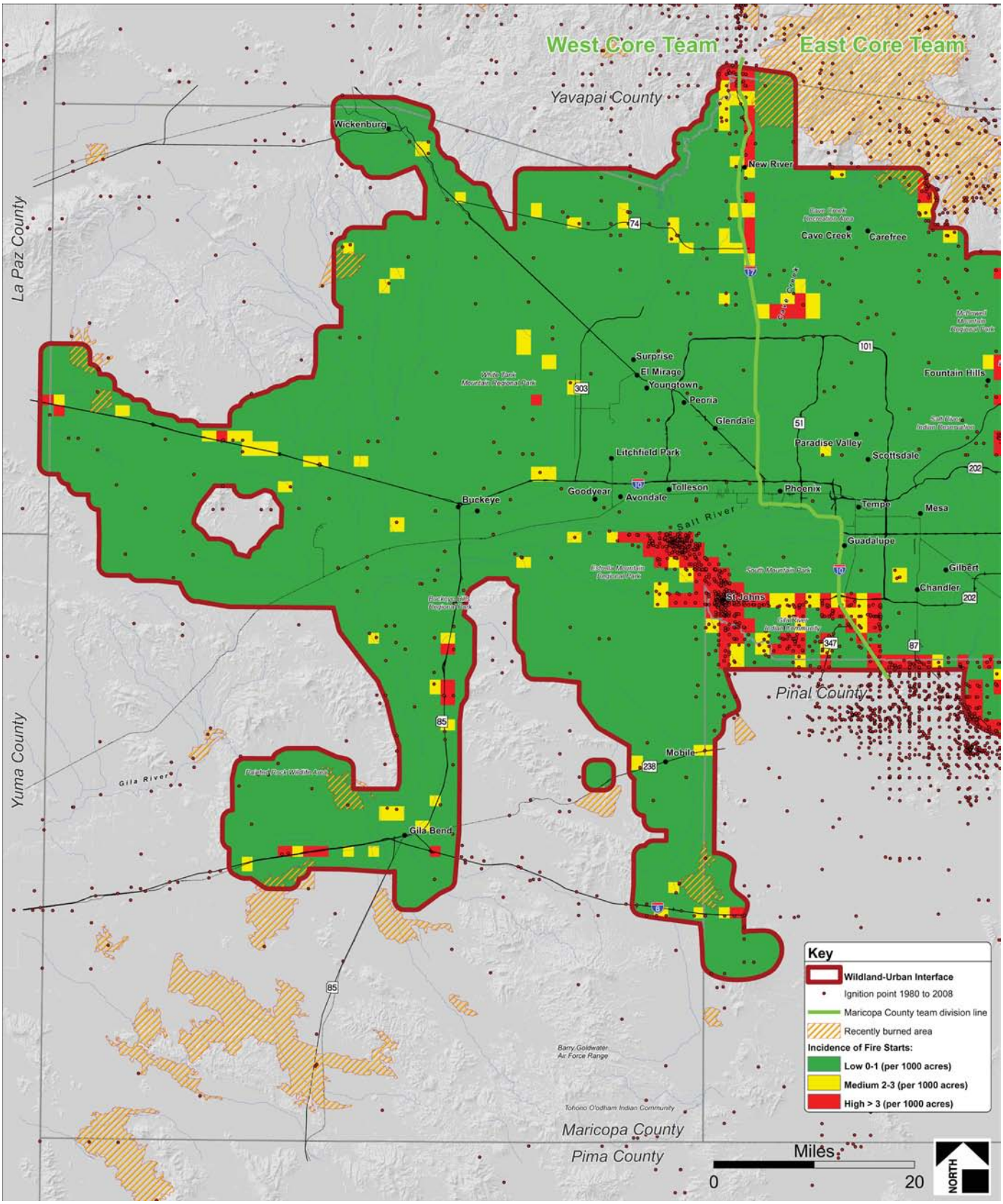

Figure 2.6b. WUI ignition history, west

Table 2.5. Ignition history and wildfire occurrence

Wildfire occurrence	Value
0–2 fire starts/1,000 acres	L
2–4 fire starts/1,000 acres	M
>4 fire starts/1,000 acres	H

D. Community Values at Risk

Valued at-risk community resources include private and community structures, communication facilities, power lines, local recreation areas, cultural and historic areas, sensitive wildlife habitat, watersheds, natural resources, and air quality. As agreed to by the Core Teams, developed land and other infrastructures within the area of highest flammability were given the highest priority for protection. In areas where community values occur within or adjacent to areas of high risk due to the fuel hazards of vegetation associations, a cumulative risk from catastrophic wildland fire was created.

These areas of cumulative risk are of greatest concern to the community. In accordance with Risk Factor 2: Risk to Social, Cultural and Community Resources identified by the Arizona State Forester (2007b:2), the Core Teams have determined that the Maricopa County WUI does include areas consistent with Risk Factor 2, Situations 1, 2, and 3, as follows:

> Risk Factor 2: Risk to Social, Cultural and Community Resources
>
> Situation 1: This situation most closely represents a community in an urban interface setting. The setting contains a high density of homes, businesses, and other facilities that continue across the interface. There is a lack of defensible space where personnel can safely work to provide protection. The community watershed for municipal water is at high risk of being burned to other watersheds within the geographic region. There is a high potential for economic loss to the community and likely loss of housing units and/or businesses. There are unique cultural, historical or natural heritage values at risk.
>
> Situation 2: This situation represents an intermix or occluded setting, with scattered areas of high-density homes, summer homes, youth camps, or campgrounds that are less than a mile apart. Efforts to create defensible space or otherwise improve the fire-resistance of a landscape are intermittent. This situation would cover the presence of lands at risk that are described under state designations such as impaired watersheds or scenic byways. There is a risk of erosion or flooding in the community of vegetation burns.
>
> Situation 3: This situation represents a generally occluded setting characterized by dispersed single homes and other structures that are more than a mile apart. This situation may also include areas where efforts to create a more fire-resistant landscape have been implemented on a large scale throughout a community or surrounding watershed.

1. Housing, Businesses, Essential Infrastructure, and Evacuation Routes

The Core Teams identified high-risk areas—including the major community cores and portions of I-10, Interstate 8 (I-8), Interstate 17 (I-17), US 60, SR 74, SR 85, SR 87, SR 88,—as the focus of commercial development. Residential community development is occurring throughout the WUI in a mix of high-density, single-family, and multiacre parcels. The Core Teams reviewed parcel data developed by Maricopa County to determine the distribution of private lands and lands uses within the WUI. These data were then portioned into risk categories depended on the level of development and presence of natural landcover types. This includes areas of highly developed lands that lack significant open space or natural land covers; moderately developed private lands where an intermingling of public and private lands occur and the major portion of the landscape are comprised as natural landcover types; and lightly developed private lands where the majority of land cover is composed of natural land cover. Areas of highest development were considered at low risk of wildfire, areas of moderate development are considered at high risk of wildfire, and areas of light development are considered areas at moderate risk of wildfire. Therefore, structures associated with housing and commercial development located in isolated subdivisions and in more dispersed areas of the WUI with higher Insurance Services Office (ISO) ratings are at highest risk.

The Core Teams identified transportation corridors that will serve as evacuation routes and resource distribution corridors during a wildland fire. The Core Teams have also recommended fuel modification treatments for evacuation corridors that will provide safe evacuation as well as emergency vehicle response during a catastrophic wildland fire in the WUI.

2. Recreation Areas/Wildlife Habitat

Recreational features within and adjacent to the WUI—including camping and recreation areas associated with several regional parks; designated camping and recreation areas in the TNF and on BLM-managed public lands; wildlife areas; and major Forest Service trailheads—are located throughout Maricopa County. These parks and recreational areas provide scenic vistas of deep canyons, dry washes, sheer cliffs, distant mountain ranges, colorful soils and rock formations, and mosaics of different vegetation.

These features are environmental, economic, and aesthetic resources for the surrounding communities and provide year-round recreational opportunities. Because of the benefits that these recreation areas provide to local citizens and community visitors and the potential for increased human-caused wildfire ignitions with increased recreational use, these areas have been analyzed as community values and have an influencing factor on wildland fire risk.

The WUI also includes known and potential habitat areas for several threatened, endangered, and sensitive (TES) species. Uplands within the WUI provide Sonoran Pronghorn (*Antilocapra Americana sonoriensis*), lesser long-nosed bat (*Leptonycteris curasoae yerbabuenae*), and Mexican spotted owl (*Strix occidentalis lucida*), while riparian corridors include southwestern willow flycatcher (*Empidonax traillii extimus*), bald eagle (*Haliaeetus leucocephalus*), California least tern (*Sterna antillarum browni*), Yuma clapper rail (*Rallus longirostris yumanensis*) and yellow-billed cuckoo (*Coccyzus americanus*) habitat. Aquatic habitats within Maricopa County support several species of fish, reptiles, and amphibians. The land-management agencies use accepted conservation strategies to mitigate risk to these species by implementing programs that meet natural-resource-management goals and objectives. Wildland fuel and

vegetative restoration treatments within sensitive-species habitat may require additional site-specific analysis due to the extraordinary circumstances created by the presence of sensitive species or their habitats. Before any vegetation treatment by the BLM, or TNF, a biological assessment and evaluation will be conducted by the appropriate district office wildlife biologist to determine the extent of impacts the treatments will have on TES species and habitats. The Core Teams reviewed Section 102.a.5.B of HFRA and understand that site-specific evaluations of individual recommended projects will determine whether sensitive wildlife species and habitats would benefit from habitat-enhancing treatments that would lessen the threat of catastrophic wildland fire in the vegetative communities of the WUI while also protecting the recreational values that local residents and visitors associate with the community.

3. Local Preparedness and Protection Capability

For many years, the ISO has conducted assessments and rated communities on the basis of available fire protection. The rating process grades each community's fire protection on a scale from 1 to 10 (1 is ideal and 10 is poor) based on the ISO's Fire Suppression Rating Schedule. Five factors make up the ISO fire rating: water supply—the most important factor—accounts for 40 percent of the total rating, while type and availability of equipment, personnel, ongoing training, and the community's alarm and paging system account for the remaining 60 percent of the rating. Some areas within the Maricopa County WUI are not within a fire district; the ISO rating for these areas is 10. Other communities and municipalities within the WUI are within a fire department or district and have ISO ratings ranging from 1 to 9; these areas are included in the overall risk analysis as reducing the potential of catastrophic wildland fire. ISO ratings will vary within fire departments and districts depending on housing densities and distance of structures isolated (usually 3 to 5 miles) from a fire station.

The wildland and structural fire response within the WUI is provided by local fire departments and districts. BLM, TNF, ASFD, and local fire departments and districts provide support for initial wildland fire attack for areas within and adjacent to the Maricopa County CWPP WUI. Initial-attack response from additional local fire departments and districts can occur under the authority of automatic aid system and mutual-aid agreements between individual departments or under the intergovernmental agreements (IGAs) that individual fire departments and districts have with the Arizona State Forester and adjacent fire departments and districts.

Land use in the planning area consists primarily of residences; agriculture; livestock production; community businesses; and community services, such as hospitals, schools, organized-sports facilities, and airports. Surrounding areas are dominated by state lands, BLM and TNF lands, and private properties. Land uses within or close to the WUI include fuelwood cutting, hunting, and other recreational activities (for example, hiking, bird watching, nature study, photography, and off-road-vehicle use). Section II.E of this CWPP provides a more detailed community assessment.

State Trust lands occur on the periphery of the communities and often surround developed private land parcels. State Trust lands are administered by ASLD, are managed for a variety of uses, and account for 14 percent (445,061 acres) of the WUI. State Trust lands within and adjacent to the WUI could be identified for sale for residential and commercial development or leased for commercial land development.

The primary block of federal land in the Maricopa County CWPP area consists of portions of BLM lands located throughout the WUI and TNF lands located in the northern and eastern portion of the WUI. Maricopa County provides extensive outdoor recreational opportunities. The open space provided by federal lands and recreational opportunities, in association with the significant wildlife habitats found within the county, provide the quality-of-life amenities that many county residents desire to protect and enhance.

Table 2.6 identifies the different values given to these community value components. Visual representations of these community value components are mapped in Figures 2.7a and 2.7b.

Table 2.6. Community values

Component	Value[a]
Housing and business structures and infrastructure in the WUI ≥1,000 households/mi^2	H
Recreation areas and infrastructure in the WUI ≥500 and <1,000 households/mi^2	M
All other areas	L

Source: Logan Simpson Design Inc.

[a]H= high; M = moderate; L = low

E. Summary of Community Assessment and Cumulative Risk Analysis

The elected and appointed officials of Maricopa County and 26 participating jurisdictions within Maricopa County, demonstrated their commitment to hazard mitigation in 2003-2004 by preparing the first Maricopa County Multi-Jurisdictional Hazard Mitigation Plan (2004 Plan). The 2004 Plan was comprised of a multi-jurisdictional, county-wide umbrella plan and 27 jurisdiction specific annexes that addressed specific planning elements for each jurisdiction. The 2004 Plan was approved by FEMA on November 29, 2004 and requires a full, FEMA approved, update prior to the November 29, 2009 expiration (MCDEM 2009).

Maricopa County and local jurisdictions recognize the consequences of disasters and the need to reduce the impacts of natural and human-caused hazards. The County and jurisdictions also know that with careful selection, mitigation actions in the form of projects and programs can become long-term, cost effective means for reducing the impact of natural and human-caused hazards. In response, MCDEM secured a federal planning grant and hired JE Fuller/ Hydrology & Geomorphology, Inc. to assist the County and participating jurisdictions with the update process. MCDEM reconvened a multi-jurisdictional planning team (MJPT) comprised of veteran and first-time representatives from each participating jurisdiction, various county departments and organizations, Arizona Division of Emergency Management, National Weather Service, Arizona Geologic Survey, and APS. The MJPT met monthly through July 2009 in a collaborative effort to review, evaluate, and update the 2004 Plan into a single, consolidated Maricopa County Multi-Jurisdictional Hazard Mitigation Plan (Plan). The Plan also contains a Tribal Annex for each of the two participating Indian Tribes that address Tribal specific planning elements. The Plan will continue to guide the County and participating jurisdictions toward greater disaster resistance in full harmony with the character and needs of the community and region (MCDEM 2009).

The Plan has been prepared in compliance with Section 322 of the Robert T. Stafford Disaster Relief and Emergency Assistance Act (Stafford Act or the Act), 42 U.S. C. 5165, enacted under Sec. 104 the Disaster Mitigation Act of 2000, (DMA 2000) Public Law 106-390 of October 30, 2000, as implemented at CFR 201.6 and 201.7 dated October, 2007. The Plan identifies hazard mitigation measures intended to eliminate or reduce the effects of future disasters throughout the County, and was developed in a joint and cooperative venture by members of the Maricopa County MJPT (MCDEM 2009). The Maricopa County CWPP was developed to be complimentary to the Plan by developing a quantitative analysis of wildland fire risk across Maricopa County, designing mitigation measures and priority needs to implement mitigation measures, whether wildland fire fuel manipulations, resource response, reduced structural ignitibility or public education and outreach.

The major concerns identified by the Core Teams and collaborators are during the development of the MCCWPP include (1) delayed response time by available mutual-aid fire departments; (2) obtainment of additional firefighting equipment and training; and (3) insufficient dispatch and communication capabilities on initial response units. Additionally, many residences in the identified WUIs were not designed with adequate general or emergency vehicle access. Private structures without adequate access and readily available water supplies increase the risk of greater habitat and structural losses from large wildland fires. Recommendations to landowners for wildfire risk mitigation are included in Section III of this CWPP. Additional recommendations for remote private lands include identifying properties by placing names or addresses on identification placards, road signs, and wells or surface water sources that could be used to replenish water supplies for fire response equipment—both ground-based drafting and aerial bucketing. Water-source names can be placed on placards or road signs as a direction resource to responding firefighters. The Core Teams recommend researching the possibility of an emergency contact autophone redial system for emergency alert notifications within portions of the WUI where this service has not been instituted.

The communities within each WUI are described below in more detail. The community descriptions include data on population and housing units, major transportation routes, major vegetation associations, and a summary of where in the WUI the highest risk of wildland fire occurs. Information (name, location, size) on fires within the last 3 years is included when available. Population and housing data was obtained from the US Census Bureau 2000 data unless noted otherwise. Population data from 2008 was obtained from the Arizona Department of Commerce community profiles, US Census Bureau updated data, and compiled data from the Arizona Department of Economic Security Research Division.

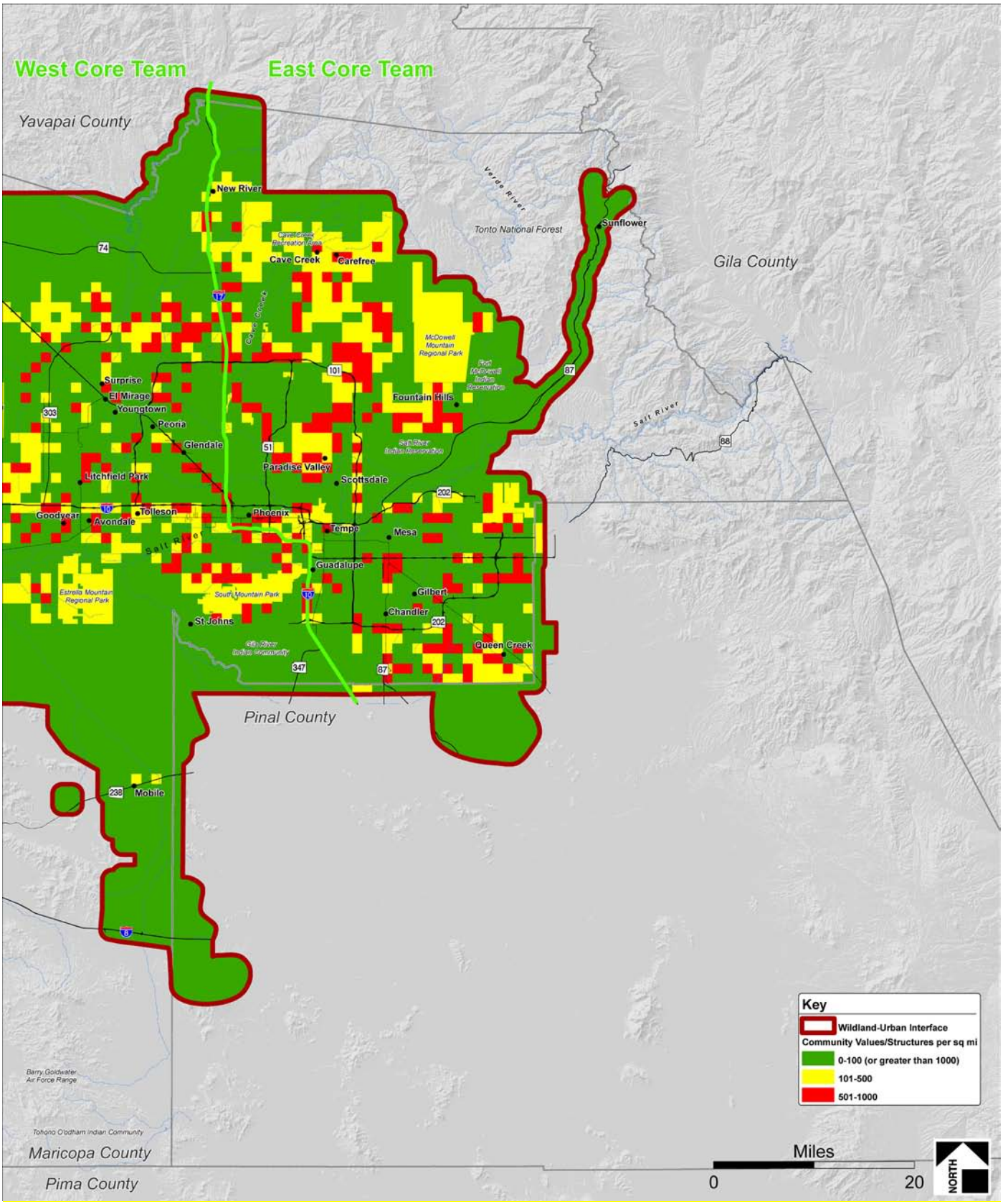

Figure 2.7a. Maricopa County CWPP community values, east

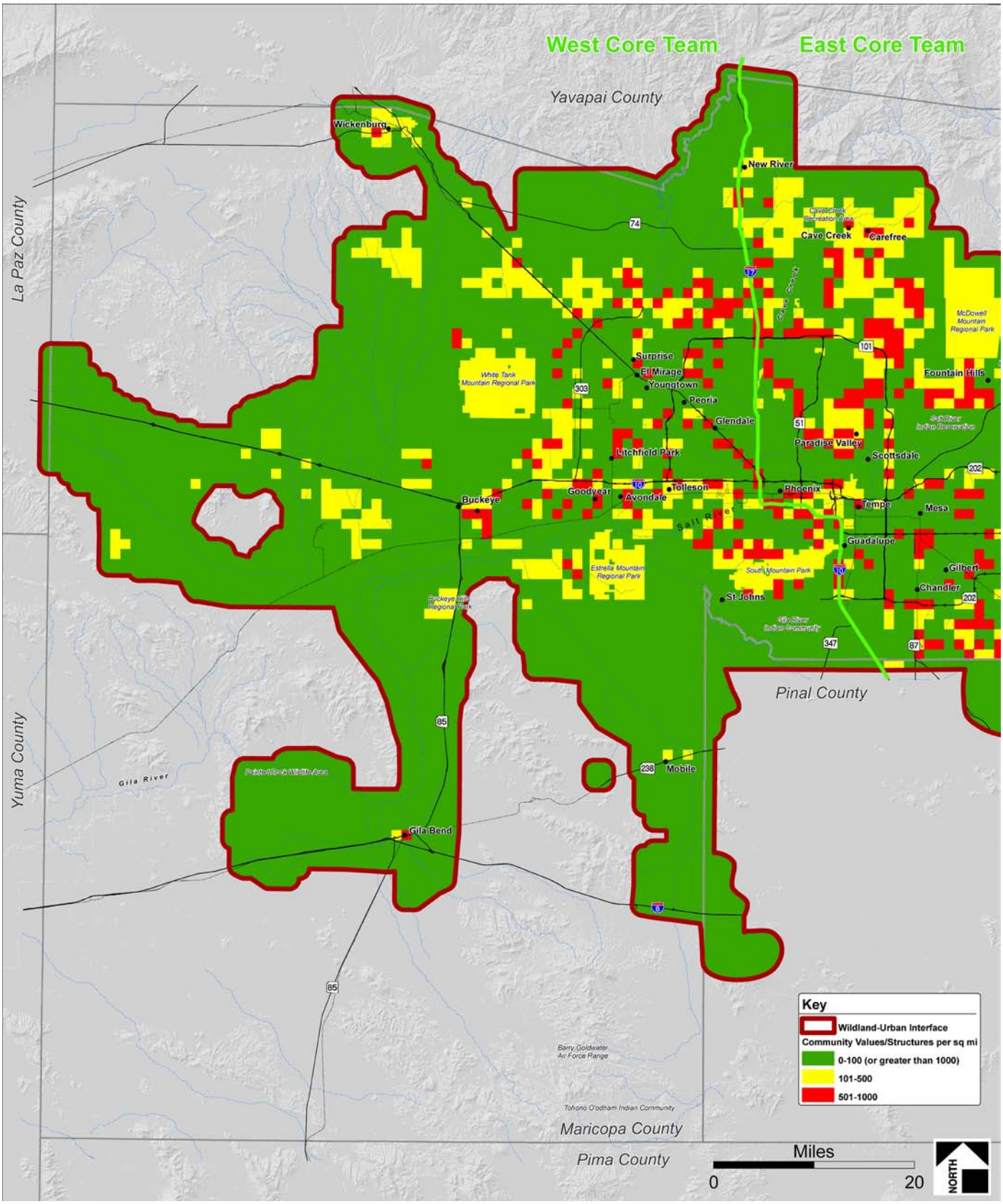

Figure 2.7b. Maricopa County CWPP community values, west

In addition, largely unincorporated areas of the WUI that are not under the jurisdiction of a fire department or fire district and that may or may not be serviced by individual subscriptions to Rural/Metro Fire Department are described as "management areas." These management areas are included with the nearest community sub–WUI descriptions and potential wildland fire risk rating.

1. Eastern Sub-WUI Communities

Sunflower Sub-WUI

The Sunflower sub-WUI includes the rural areas surrounding the community of Sunflower, including Sycamore Creek and Diamond Mountain. "Sunflower was a cavalry water station in 1868 and was a side station to Camp Reno. Known as Camp O'Connell, there was one building by the roadside on a military road from Fort McDowell to Camp Reno and to Payson. The military camp left Sunflower in April 1870. Sunflower was a short-lived PO in Maricopa County (1943–1949); the area was known locally as Diamond Ranch (T6N R9E). The Sunflower area is also home to the Sunflower Mine otherwise known as the National Mine . . . The Sunflower mine produced mercury . . . The mine works building still stands and the processing machinery can still be seen" (http://www.ghosttowns.com/states/az/sunflower.html). Transportation routes into Sunflower include SR 87 (Beeline Highway) and Sycamore Creek Road. The community of Sunflower is included within the *Arizona-Identified Communities at Risk* (Arizona State Forester 2009) to be at a low risk of wildland fire. The Sunflower sub-WUI is primarily composed of palo-verde mixed cacti vegetative communities at lower elevations, with chaparral and other woodland and riparian associations dominating higher elevations. These vegetative fuel types are conducive to intensive wildland fire due to contiguous aerial and ground fuels. Additionally, this sub-WUI has a history of high numbers of wildland fire ignitions. There are no major communities within this portion of the sub-WUI, and the number of private land parcels is reported as low. The area at highest wildfire risk within the WUI occurs along the SR 87 corridor immediately south of the private lands; this area's high vegetative fuel risk is associated with recurring slope and high ignition history. Sunflower has an ISO rating of 10 and there is no fire district within the WUI. Private lands within the Sunflower area are adjacent to TNF lands. TNF responds to wildland fire within this sub-WUI. Due to a primarily high wildfire risk, a high ignition history, a low to moderate density of community values, and no responding fire department or district, the overall wildland fire risk rating of the sub-WUI is high.

Carefree Sub-WUI

The Carefree sub-WUI includes the community of Carefree and surrounding natural areas. Carefree is a residential community with a heavy emphasis on resort-style living. Tourism composes a large portion of the area's economy. A substantial number of retail and commercial establishments serve the community's residents. The primary transportation corridor into Carefree is Cave Creek Road. The population of Carefree, according to the Arizona Department of Economic Security and the US Census Bureau (2008), is 3,948 people, which is up from 2,927 in 2000. In 2000 there were 1,834 housing units (1,397 occupied: 1,227 owner occupied; 170 renter occupied) in Carefree, which is a density of 207 houses/condos per square mile. Carefree's fire protection is provided through a master contract with Rural/Metro Fire Department. Rural/Metro Fire Department is a private fire protection company that serves incorporated

communities through master contracts or subscriptions with individual homeowners. Carefree has codified its fire department and owns the fire stations and associated equipment within the incorporated community. Rural/Metro provides firefighters, management oversight, and support services to the town. The Carefree Fire Department has responded to 38 wildland fires from 2001 through 2009 within this WUI. Carefree does recognize potential wildfire issues with slope and vegetation and with some washes that have heavy vegetative growth. Carefree prefers to maintain a program of public information and firefighter education. The public education program has been an ongoing project delivered primarily through mailings in residents' monthly water bills in the spring and through the local newspaper. The program has been very successful, and defensible space around private residences is the norm rather than the exception. Firefighter training is delivered by Rural/Metro Fire Department to Carefree Fire Department's employees. Rural/Metro has a long history of responding to wildland fires with crews highly trained in wildland fire suppression. Carefree is also a member of the Arizona Mutual Aid Compact and has an IGA with ASLD. The Carefree Fire Department has an ISO rating of 3/9. The Carefree sub-WUI is composed primarily of paloverde-mixed cacti vegetation associations and developed, open space–low intensity lands. The area at highest risk for wildland fires within the WUI occurs within areas of increased slope to the north of the community (Continental Mountain area) and to the Seven Springs area northeast of the community. This portion of the sub-WUI also includes areas of low wildfire ignitions. Due to a primarily moderate wildfire risk, a low ignition history, and a low to moderate density of community values, the overall wildland fire risk rating of the sub-WUI is moderate.

Cave Creek Sub-WUI

The Cave Creek sub-WUI includes the community of Cave Creek and the surrounding natural areas, including Cave Creek Wash and the Cave Creek recreation area. Cave Creek is a residential community with a heavy emphasis on resort-style living. Tourism composes a large portion of the area's economy. A substantial number of retail and commercial establishments serve the community's residents. The primary transportation corridor into Cave Creek is Cave Creek Road. The population of Cave Creek, according to the Arizona Department of Economic Security and the US Census Bureau (2008), is 5,132 people, which is up from 3,728 in 2000. As of the 2000 census, there were 1,753 housing units, which is an average density of 62.1 houses/condos per square mile. Fire protection for Cave Creek is provided through subscriptions to Rural/Metro Fire Department. During 2001 through 2009 the Cave Creek Fire Department responded to 89 wildland fires within and adjacent to the community. The communality of Cave Creek does recognize potential wildland fire issues with slope and with high-risk vegetation associations, including invasive species. Cave Creek prefers to maintain programs aimed at public education and outreach and firefighter training. Cave Creek has a work group that has been pursuing grants for invasive-species abatement but has yet to obtain such a grant. Cave Creek will continue to pursue grant opportunities. The Town of Cave Creek does have an IGA with ASLD for wildland fire response and is a member of the Arizona State Mutual Aid Compact. Rural/Metro Fire Department responds to wildland fires for this WUI. Rural/Metro Fire Department has an ISO rating of 5/9 for the Cave Creek area. The areas of highest wildfire risk are located along Cave Creek Wash and the foothills north and west of town. Major vegetation associations include the paloverde-mixed cacti desert scrub within the community, with mesquite upland and chaparral associations occurring in higher elevations to the north of the community. This portion of the sub-WUI does include

areas of moderate vegetation risk during extraordinary rainfall years. Wildfire ignitions within the Cave Creek sub-WUI are low; however, the Cave Creek recreation area is considered a moderate risk to high human use in undeveloped areas of the sub-WUI. Due to a low/moderate wildfire risk, a low ignition history, and a low to moderate density of community values, the overall wildland fire risk rating of the sub-WUI is moderate.

New River Sub-WUI

The New River sub-WUI includes the community of New River and the surrounding natural area, including New River Wash for which the community was named. New River has largely retained its rural character; however, its future as a rural community is uncertain as the city of Phoenix expands into the region. As of the 2000 census, the population of New River was 10,781, and there were 4,494 housing units (3,929 occupied: 3,621 owner occupied; 308 renter occupied), which is a housing density of 63 houses/condos per square mile. Transportation routes into New River are I-17, Lake Pleasant Road, and New River Road. New River is serviced by the Daisy Mountain Fire District; this fire district also responds to wildland fire threats within the WUI. The community of New River is included within the *Arizona-Identified Communities at Risk* (Arizona State Forester 2009) to be at a moderate risk of wildland fire. Areas of highest wildfire risk are located along the I-10 corridor both south and north of the community. The primary vegetation association within the sub-WUI is paloverde-mixed cacti. During extraordinary rainfall years this portion of the sub-WUI lies within the slopes of the foothills of the New River Mountains. The paloverde-mixed cacti association occurring in slopes of excess of 20 percent with a southerly exposure can produce high wildland risk conditions. This portion of the sub-WUI does include areas of high risk based on wildfire ignitions within the I-10 corridor. Due to areas of high vegetation wildfire risk, areas of high ignition history, and a low to moderate density of community values, the overall wildland fire risk rating of the sub-WUI is high.

Fountain Hills and Management Area 11 Sub-WUI

The Fountain Hills sub-WUI includes the town of Fountain Hills and natural areas such as the McDowell Mountain Regional Park (Management Area 11) and the Verde River corridor. The population of Fountain Hills, according to the Arizona Department of Economic Security and the US Census Bureau (2008), is 25,995 people, which is up from 20,235 in 2000. In 2000 there were 10,498 housing units (8,647 occupied: 7,237 owner occupied; 1,410 renter occupied) in Fountain Hills, which is a housing density of 578 houses/condos per square mile. Fountain Hills offers a broad range of community facilities, including a community center, library, several parks, children's playground, tennis and basketball courts, baseball fields, and a 25-acre park. Transportation routes into the area are SR 87 (Beeline Highway), Shea Boulevard, and Rio Verde Drive. Fire protection to the town of Fountain Hills is provided through a master contract with Rural/Metro Fire Department. The Town of Fountain Hills has codified its fire department. The Fountain Hills Fire Department includes two Type 1, one Type 2, and one Type 7 fire engines. Rural/Metro Fire department provides 28 firefighters trained in wildfire suppression. The Fountain Hills Fire Department responds to wildland fire threats within the WUI and maintains an ISO rating of 3. The highest wildfire risk occurs in the community core and in areas with slope and southerly aspect effects on paloverde-mixed cacti vegetative associations during extraordinary rainfall years. This portion of the sub-WUI does include

areas of moderate risk based on wildfire ignitions in proximity to the Verde River riparian corridor. Due to areas of high to moderate wildfire risk, a moderate ignition history, and a high to moderate density of community values, the overall wildland fire risk rating of the sub-WUI is moderate.

Paradise Valley Sub-WUI

The Paradise Valley sub-WUI includes the town of Paradise Valley and the surrounding natural areas such as the Phoenix Mountain Preserve. Paradise Valley is generally an upscale residential community known for its excellent school system. The population of Paradise Valley, according to the Arizona Department of Economic Security and the US Census Bureau (2008), is 14,444 people, which is up from 13,664 in 2000. Transportation routes into the area are Shea Boulevard and Pima Road. In 2000 there were 5,499 housing units (5,034 occupied: 4,885 owner occupied; 149 renter occupied) within Paradise Valley. The Town of Paradise Valley contracts with the City of Phoenix to provide community fire services. The highest wildfire risk occurs in the community core and in the Phoenix Mountain Preserve and Camelback Mountain areas where slope and southerly aspect effects on paloverde-mixed cacti vegetative associations occur during extraordinary rainfall years. This portion of the sub-WUI does include areas of low risk based on wildfire ignitions. Due to areas of high to moderate wildfire risk, a low ignition history, and a high to moderate density of community values, the overall wildland fire risk rating of the sub-WUI is moderate.

Scottsdale Sub-WUI

The Scottsdale sub-WUI includes the city of Scottsdale and the surrounding open space. The city boundary officially covers 184 square miles, and the community offers a wide range of cultural, recreational, and natural environmental features, including the McDowell Sonoran Preserve. When completed, the preserve will cover approximately 36,400 acres—57 square miles (or one-third of the community)—a unique 7.5-mile greenbelt offering an endless range of local recreational opportunities; and the Westworld event complex that hosts a wide range of major equestrian and visitor activities, including signature events like the Barrett-Jackson Classic Car Auction. Scottsdale is physically bordered by Phoenix and Paradise Valley to the west, Carefree and the TNF to the north, and unincorporated areas and the Salt River Pima-Maricopa Indian Community to the east.

The population of Scottsdale, according to the Arizona Department of Economic Security and the US Census Bureau (2008), is 242,337 people, which is up from 202,705 in 2000. In 2000 there were 104,949 housing units (90,643 occupied: 63,089 owner occupied; 27,545 renter occupied) within Scottsdale, which is a housing density of 570 houses/condos per square mile. The primary transportation routes for the community are the east and north segments of the Loop 101 freeway, along with the following major surface streets: Bell Road/Frank Lloyd Wright (east-west), Shea Boulevard (east-west), Dynamite/Rio Verde Drive (east-west), Scottsdale Road (north-south), Hayden Road (north-south), and Pima Road (north-south).

The Scottsdale Fire Department, with an ISO community rating of 3, is responsible for responding to wildland fire threats within the local WUI. These areas are primarily located along the Shea Boulevard corridor and north and east of the Loop 101 freeway and the CAP Canal. Approximately 128 of the city's 184 square miles are located in this area, which also includes the McDowell Sonoran Preserve, along with

the southwest slopes and alluvial-fan areas of the McDowell Mountains. The commercial and residential developments in this area are covered by an ESLO (Environmentally Sensitive Land Ordinance) and by NAOS (Natural Area Open Space) overlay requirements. The core segments of the community in this area have the highest risk of wildfire in the WUI. These high Sonoran Desert locations have many lush areas covered with paloverde-mixed cacti vegetative models, which can increase the fuel loads dramatically during extraordinary rainfall years. Because of the identified risk and large WUI area, the Scottsdale Fire Department has aggressively obtained resources and worked with various community groups to address the wildfire threat. The City has a response agreement with TNF for a 1-mile-in/1-mile-out area along their shared borders. Scottsdale also has two 2,500-gallon water tenders; four Type 6 brush trucks; one four-wheel-drive gator outfitted with a brush pack; and one wildland cache/support truck with additional hand tools, hoses, and adaptors. The Scottsdale Fire Department regularly conducts wildland fire training for its full-time firefighters, and all of the city's engine companies are outfitted for initial WUI fire attack. Meetings with individual homeowners and the numerous associations that are adjacent to the open preserve areas have resulted in a tremendous amount of fuel management activities and defensible space being established. Community handouts that identify how to establish proper defensible space in these sensitive areas have been developed and distributed. In addition, an invasive-plant brochure was developed with assistance from the McDowell Sonoran Preserve Commission; this educational brochure has received a very positive response from the residents in the WUI areas of the community. The extensive community outreach effort in these WUI areas has resulted in Ancala West receiving the first official Firewise Community certification in Maricopa County. The Scottsdale Fire Department expects that several other local homeowner organizations and master-planned communities will be able to meet the guidelines and become Firewise certified in the near future.

This portion of the sub-WUI does include areas of low risk based on wildfire ignition in proximity to the McDowell Mountains. Due to areas of high to moderate wildfire risk, a low ignition history, and a high to moderate density of community values, the overall wildland fire risk is moderate.

Phoenix Sub-WUI

The Phoenix sub-WUI includes the city of Phoenix, surrounding communities, and natural areas such as Papago Park and South Mountain Park. Phoenix is the seventh largest city in the nation. The hub of the rapidly growing Southwest, it is Arizona's capital and the Maricopa County seat. The population of Phoenix, according to the Arizona Department of Economic Security and the US Census Bureau (2008), is 1,561,485 people, which is up from 1,321,045 in 2000. In 2008 there were 554,468 housing units (484,796 occupied: 297,041 owner occupied; 187,755 renter occupied). Transportation routes into the area are I-17, I-10, US 60, and the Burlington Northern Santa Fe and Union Pacific railroads. The Phoenix Fire Department responds to wildland fire threats within the WUI. The highest wildfire risk occurs in the community core and in the areas of Squaw Peak, North Mountain, Shaw Butte, and Lookout Mountain where slope and southerly aspect effects on paloverde-mixed cacti vegetative associations occur during extraordinary rainfall years. This portion of the sub-WUI does include areas of low risk based on wildfire ignitions in proximity to these areas of higher slope. Due to areas of high to moderate wildfire risk, a low ignition history, and a low density of community values, the overall wildland fire risk rating of the sub-WUI is low.

Mesa Sub-WUI

The Mesa sub-WUI includes the city of Mesa and surrounding communities and natural areas. Mesa offers a quality urban experience supported by a diversified economic base in proximity to a variety of outdoor recreational opportunities—including plentiful hiking trails at Usery Mountain Recreation Area in northeast Mesa and Lost Dutchman State Park near the Superstition Mountains; tubing on the Salt River; and the Apache Trail, a scenic drive that includes Goldfield Ghost Town, Canyon Lake, and Tortilla Flat Saloon and Restaurant. The population of Mesa, according to the Arizona Department of Economic Security and the US Census Bureau (2008), is 459,682 people, which is up from 396,375 in 2000. There are 193,952 housing units (169,028 occupied: 112,988 owner occupied; 56,040 renter occupied) in Mesa. This sub-WUI also includes the unincorporated areas of Maricopa County east of the city of Mesa. Fire protection for this area is serviced by the Rural/Metro Fire Department on an individual subscription basis or through master agreements with specific homeowner associations. This area is bounded by the Pinal County line on the south, SR 79 seven miles to the east, Power Road on the west, and the TNF on the north. The ISO rating for this area is 4/9. The Rural/Metro Fire Department maintains 70 personnel all trained in wildland fire suppression, including five type 1 fire engines, one Type 2 tender, two Type 6 fire engines, and one Type 3 fire engine. The Mesa Fire Department responds to wildland fire threats within the WUI. Mesa has an ISO rating of 3. Resources include 388 sworn fire personnel, 20 Type 1 pumpers, 5 Type I ladder trucks, 1 Type 2 water tender, and 4 Type 6 fire brush trucks. The highest wildfire risk is associated with paloverde-mixed cacti vegetation in the southeastern area of the city and in open space areas between the community of Queen Creek and the city of Mesa during extraordinary rainfall years. This portion of the sub-WUI does include areas of low risk based on wildfire ignitions in proximity to these open spaces. Due to areas of primarily low to moderate wildfire risk, a low ignition history, and primarily low to moderate density of community values, the overall wildland fire risk rating of the sub-WUI is low.

Tempe Sub-WUI

The Tempe sub-WUI includes the city of Tempe and surrounding communities. Tempe is an urban community located in the center of the Phoenix metropolitan region and is home to Arizona State University, Tempe Town Lake, and Tempe Beach Park. The population of Tempe, according to the Arizona Department of Economic Security and the US Census Bureau (2008), is 162,468 people, which is up from 158,625 in 2000. There are 66,145 housing units (58,741 occupied: 29,101 owner occupied; 29,640 renter occupied) in Tempe. Transportation routes into the area are US 60, Loop 101, Loop 202, and the Union Pacific Railroad. The Tempe Fire Department, with an ISO rating of 2, responds to wildland fire threats within the WUI. Areas of highest wildfire risk are located adjacent to the Salt River corridor as it passes through the community. This portion of the sub-WUI does include areas of low risk based on wildfire ignitions in proximity to the Salt River. Due to areas of low wildfire risk, a low ignition history, and a low density of community values, the overall wildland fire risk rating of the sub-WUI is low.

Guadalupe Sub-WUI

The Guadalupe sub-WUI includes the community of Guadalupe, a Yaqui Indian and Mexican community between Phoenix and Tempe at the base of South Mountain. The population of Guadalupe, according to the Arizona Department of Economic Security and the US Census Bureau (2008), is 5,990 people, which is

up from 5,228 in 2000. In 2000 there were 1,184 housing units (1,110 occupied: 761 owner occupied; 349 renter occupied) in Guadalupe, with a housing density of 1,543 houses/condos per square mile. I-10 is the major transportation route into the area. The risk of wildland fire is minimal within the community of Guadalupe. Due to areas of low wildfire risk, a low ignition history, and a low density of community values, the overall wildland fire risk rating of the sub-WUI is low.

Gilbert Sub-WUI

The Gilbert sub-WUI includes the city of Gilbert and Gilbert County Island Fire District area. The population of Gilbert, according to the Arizona Department of Economic Security and the US Census Bureau (2008), is 214,820 people, which is up from 109,697 in 2000. There are 66,398 housing units (61,630 occupied: 48,251 owner occupied; 13,379 renter occupied) in Gilbert. The Gilbert Fire Department, with an ISO rating of 4/9, responds to wildland fire threats within the WUI. There is less than 200 acres of high wildland fire risk areas within the Gilbert sub-WUI. Vegetation associations are primarily creosotebush types, which have a low potential to support or transport wildfire and a low history of wildland fire ignitions. Due to areas of low wildfire risk, a low ignition history, and a low density of community values, the overall wildland fire risk rating of the sub-WUI is low.

Chandler Sub-WUI

The Chandler sub-WUI includes the city of Chandler and the surrounding communities. The population of Chandler, according to the Arizona Department of Economic Security and the US Census Bureau (2008), is 244,376 people, which is up from 176,581 in 2000. There are 96,434 housing units (87,265 occupied: 59,723 owner occupied; 27,542 renter occupied) in Chandler. Transportation routes into the area are Loop 101, US 60, and the Union Pacific Railroad. The Chandler Fire Department, with an ISO rating of 3, responds to wildland fire threats within the WUI. The Chandler Fire Department maintains wildland fire response and suppression capabilities including one Type 1 and one Type 6 fire engine. The Chandler Fire Department has a formal agreement with ASLD to provide labor and resources when needed for wildland fire suppression within the state. There is less than 600 acres of high wildland fire risk areas within the Chandler sub-WUI. Vegetation associations are primarily creosotebush types, with low potential to support or transport wildfire and a low history of wildland fire ignitions. Due to areas of low wildfire risk, a low ignition history, and a low density of community values, the overall wildland fire risk rating of the sub-WUI is low.

Rio Verde/Tonto Hills and Unincorporated Sub-WUI

Within the northern area of the eastern WUI communities, Rural/Metro serves the unincorporated areas of the Rio Verde corridor (bounded by TNF to the north, 136 Street to the west, 171 Street to the east, and Pinnacle Vista to the south) and the unincorporated areas between Scottsdale, Phoenix, Carefree, and Cave Creek (Dynamite Road on the south, Scottsdale Road on the east, 40th Street on the west, and Carefree Highway on the north). These areas have an ISO rating of 9. These unincorporated areas are serviced by two Type 1 engines, one Type 6 engine, and one Type 2 tender. There are 31 firefighters trained for wildland fire response and suppression. All of these areas have mutual-aid agreements with Scottsdale, Phoenix, and the Rio Verde Fire District for assistance when needed in their respective

communities. Additionally, Tonto Hills has a volunteer fire department. Some of these are formal agreements through an individual town, and some are through agreements with Rural/Metro. The Rural/Metro Fire Department maintains a wildfire response group. This group is composed of an overhead team (ratings at engine boss and above). Seven personnel are assigned to the group and are on call year-round for wildland fire response. The Rural/Metro Fire Department also employs 10 seasonal wildland firefighters during the active fire season and maintains 12 reserve firefighters on call year-round. All firefighters in this group are trained in wildland fire suppressions ("red carded"). This group is supported by Type 6 fire engines, water tenders, and Type 3 fire engines from the Maricopa County operations and also has access to Pinal County units. The Rural/Metro Fire Department has an IGA with ASLD that includes all service areas, including those communities that have their own formal agreement. The Rural/Metro Fire Department has a 1-mile-in/1-mile-out agreement with TNF along their shared boundaries. The Rural/Metro Fire Department has its own dispatching system linked to both the Mesa and Phoenix Regional Dispatching systems for mutual-aid response. All units have the capability for integrated communication with other cooperating agencies, including ASF, TNF, and adjoining fire departments and districts. Areas of highest wildfire risk are located within the Verde River corridor and within areas of higher slope and chaparral vegetation communities along the northern and eastern WUI boundary. The Rio Verde Fire Department has responded to 57 wildland fires from 2001 through 2009. This portion of the sub-WUI does include areas of high risk based on wildfire ignitions in proximity to these areas of higher slope. Due to areas of high to moderate wildfire risk, areas of high ignition history, and a low to moderate density of community values, the overall wildland fire risk rating of the sub-WUI is moderate.

Fort McDowell Yavapai Indian Nation Sub-WUI

The Fort McDowell Yavapai Indian Nation is centrally located within Maricopa County. Its topography ranges from tree-lined river bottoms to cactus-studded rolling desert. Created by executive order on September 15, 1903, the 24,680-acre reservation is home to the Yavapai people. The reservation is only a small parcel of land that was once considered ancestral territory of these nomadic bands of people who hunted and gathered food in central Arizona and the Mogollon Rim country. Fort McDowell was named after General Irwin McDowell. The reservation post was one of the most important outposts in the Southwest during the Apache Wars between 1865 and 1891. Fort McDowell's prime economic activity is its casino; built in 1984, it now occupies nearly 150,000 square feet and has 950 employees. Other businesses included a large sand and gravel quarry operation; a concrete plant; a 2,000-acre farm; a gas station; and western-adventures catering facility. Nearby is the Out of Africa Wildlife Park. The Arizona Department of Commerce and the US Census Bureau reported the population of the Fort McDowell Yavapai Indian Nation at 602 in 1990 and 743 in 2000. The Fort McDowell Yavapai Indian Nation sub-WUI is composed primarily of paloverde-mixed cacti and creosotebush-bursage vegetation associations that do not, under normal circumstances, support wildland fire. This portion of the sub-WUI includes areas of low risk based on wildfire ignitions. Due to limited areas of low wildfire risk, low ignition history, and areas of low density of community values, the overall wildland fire risk rating of the sub-WUI is low.

Queen Creek and Management Area 12 Sub-WUI

The Queen Creek sub-WUI includes the town of Queen Creek and the San Tan Mountains Regional Park (Management Area 12). The population of Queen Creek, according to the Arizona Department of Economic Security and the US Census Bureau (2008), is 23,827 people, which is up from 4,316 in 2000. There are 10,256 housing units (9,016 occupied: 7,623 owner occupied; 1,393 renter occupied) in Queen Creek. Transportation routes into the area are Power Road, Chandler Heights Road, and the Union Pacific Railroad. The Queen Creek Fire Department responds to wildland fire threats within the WUI; it maintains two Type 1 fire engines for structure protection, one Type 1 tactical water tender, and one Type 6 brush truck and has firefighters trained in wildland fire suppression. In addition, the Town of Queen Creak Fire Department has developed and published the *Town of Queen Creek Fire Department 2009 Wildland Fire Risk Assessment* (Assessment). This Assessment divides the town into four quadrants, delineates and describes areas of concern, and makes recommendations for enhanced firefighter and public safety enhancements; these recommendations are included in Section 3 of the Maricopa County CWPP. The Assessment concludes that the Town of Queen Creek does have a moderate to high chance for catastrophic fire within the town limits. The Town of Queen Creek does have an IGA with ASLD for wildland fire response and is a member of the Arizona State Mutual Aid Compact. The Queen Creek Fire Department has an ISO rating of 6/9. Areas of highest wildfire risk are located to the south of the community within the unincorporated areas north of the San Tan Mountains adjacent to the San Tan Mountain Regional Park. This portion of the sub-WUI does include areas of moderate risk based on wildfire ignitions in proximity to these areas of higher slope, which are highly infested with buffelgrass. Additionally, the riparian corridors of Queen Creek and Sonoqui Wash are highly infested with saltcedar. Due to areas of moderate to high wildfire risk, areas of moderate ignition history, and a moderate density of community values, the overall wildland fire risk rating of the sub-WUI is moderate.

Salt River Pima-Maricopa Indian Community Sub-WUI

The Salt River Pima-Maricopa Indian Community (SRPMIC) sub-WUI includes the communities under the jurisdiction of the SRPMIC. US census data were not readily available for this analysis. The SRPMIC is a compact tribe that manages its own wildland fire program with recommendations from the regional office. There are fire-control objectives identified by the Fire Management Office with respect to response times, control resources, control limits by acreage, and development of extended-attack mutual-aid agreements. Fire-control restraints within the community that have been identified include aerial support from at least one aircraft, a limited number of Type 4 through 6 engines, and limited access to portions of the community. During 2009 the SRPMIC Fire Department responded to 12 wildfire fires; all of these were kept to acceptable acreage limits with initial-attack resources. The SRPMIC Fire Department operates from four stations located throughout the community. There are three Type 1 and one Type 6 engines that are available for initial-attack response. In addition, there are two Type 1 engines that can be placed in service from reserve, one of which could be deployed outside the community. There are 25 trained personnel working per shift. Each firefighter is trained to National Wildland Coordinating Group (NWCG) standards and has been issued personal protective equipment (PPE) that includes one fire shelter per position. The fire department receives recurring preparedness funding from the BIA through the Office of Self-Governance. The last fiscal year funding was $28,400.00. These funds are received by the Office of Self-

Governance and set aside by the SRPMIC in a fund earmarked specifically for the wildland fire program. It is the fire department's basic policy to suppress all wildland fires within the community. There are standard operating guidelines (SOGs) that prescribe the proper and safe methods for activities on wildland fire incidents. The BIA has given the authority to the SRPMIC Fire Department to suppress all wildland fires within the community. There are some mutual-aid agreements that the SRPMIC has approved with neighboring jurisdictions to assist in initial-attack operations. An MOU has been developed between the BIA and the USDA Forest Service for those wildland areas where there are contiguous borders. The majority of the fire management philosophy comes from the *Wildland and Prescribed Fire Management Plan* (May 2000), which was developed for the Salt River Agency.

The SRPMIC consists of a 56,000-acre fire management zone (FMZ). The FMZ is broken into two initial-attack zones (IAZs) that identify the different attack strategies. One of the IAZs is a 19,000-acre preserve that is only used by community members, that has a dedicated ranger, and that has the most potential for large acreage loss. This IAZ is located in the far eastern portion of the community and has limited access. The other IAZ is composed of the WUI zone adjacent to agriculture plots. This IAZ is more specifically located in and around agricultural areas and those centered in the central and western portions of the community. SPRMIC Fire Department does not protect any other areas as an initial-attack responder. There are no contracts with other agencies for initial-attack responses within the community. Mutual-aid agreements exist between the SRPMIC and the Fort McDowell Yavapai Nation, the City of Mesa, and the City of Scottsdale. There is an MOU between the BIA and the USDA Forest Service for initial attack along the river/preserve areas. This MOU states that both agencies can take initial-attack actions on fires within 1 mile of their shared border if they have been notified of a fire. The responding agency must notify the other agency that it is responding into the other's jurisdiction. Once the host agency has resources on the fire, they must either release the mutual-aid responders or request for extended-attack resources.

General fire occurrence is only available for fiscal year 2000–2001. During that period of time there were 12 fires of less than 20 acres that were managed with the initial-attack resources. All of this fire occurred within the WUI IAZ. Fire season within the unit runs from April through July, with some incidents in October. SRPMIC Fire Department objectives include the following:

- Preserve Zone—to respond and keep fire incidents under 1 acre 90 percent of the time. To respond and keep fire incidents under 5 acres 95 percent of the time.
- Wildland Urban Interface/Agriculture Zone—to respond and keep fire incidents under 1 acre 90 percent of the time. To respond and keep fires incidents under 5 acres 95 percent of the time. To respond to and protect all residential and commercial structures from wildland fire incidents 100 percent of the time.

Within the SRPMIC sub-WUI the areas of highest wildfire risk are located within the Salt River corridor. Vegetation within the riparian corridor can produce intense wildfire within large areas of contiguous heavy vegetative fuels. This portion of the sub-WUI does include areas of moderate risk based on wildfire ignitions in proximity to these riparian corridors. Due to areas of high to moderate wildfire risk, a moderate ignition history, and areas of low-density community values, the overall wildland fire risk rating of the sub-WUI is moderate.

2. Western WUI Communities

Surprise Sub-WUI

The Surprise sub-WUI includes the city of Surprise. Surprise is in the fast-growing northwestern part of the Phoenix Valley, along US 60 and SR 93. White Tank Regional Park, which borders the city to the west, has unusual Indian petroglyphs in its 26,000 acres where camping, hiking, and picnicking are popular activities. Surprise is also home to the world-class retirement community Sun City Grand. The population of Surprise, according to the Arizona Department of Economic Security and the US Census Bureau (2008), is 112,020 people, which is up from 30,848 in 2000. There are 46,975 housing units (39,628 occupied: 32,345 owner occupied; 7,283 renter occupied) in Surprise. Transportation routes into the area are along US 60, SR 93, SR 74, Loop 303, and the Burlington Northern Santa Fe Railroad. The Surprise Fire Department maintains an ISO rating of 4 within the urban core and an ISO rating of 5 in the rural areas of the sub-WUI. The Surprise Fire Department does respond to wildland fire threats within the WUI. Areas of highest wildfire risk are located within the Trilby Wash Basin and the Agua Fria river corridor. Vegetation within these riparian areas can produce intense wildfire within large areas of contiguous heavy vegetative fuels. This portion of the sub-WUI does include areas of moderate risk based on wildfire ignitions in proximity to these riparian corridors. Due to areas of high to moderate wildfire risk, a moderate ignition history, and areas of high-density community values, the overall wildland fire risk rating of the sub-WUI is moderate.

El Mirage Sub-WUI

The El Mirage sub-WUI includes the city of El Mirage. El Mirage is a residential community with a pleasant small-town environment on the west bank of the usually dry Agua Fria River. The population of El Mirage, according to the Arizona Department of Economic Security and the US Census Bureau (2008), is 35,332 people, which is up from 7,609 in 2000. There are 10,361 housing units (9,318 occupied: 6,856 owner occupied; 2,462 renter occupied) in El Mirage. Transportation routes into the area are US 60 and the Burlington Northern Santa Fe Railroad. The El Mirage Fire Department responds to wildland fire threats within the WUI. Areas of highest wildfire risk are located within the Agua Fria River corridor. Vegetation within this riparian area can produce intense wildfire within large areas of contiguous heavy vegetative fuels. This portion of the sub-WUI does include areas of low risk based on wildfire ignitions in proximity to the riparian corridor. Due to areas of high to moderate wildfire risk within the riparian corridor, a low ignition history, and areas of primarily low-density community values, the overall wildland fire risk rating of the sub-WUI is low.

Youngtown Sub-WUI

The Youngtown sub-WUI lies between the El Mirage and Peoria sub-WUIs. Youngtown is the nation's oldest retirement community. The population of Youngtown, according to the Arizona Department of Economic Security and the US Census Bureau (2008), is 6,522 people, which is up from 3,010 in 2000. In 2000 there were 1,783 housing units (1,641 occupied: 1,015 owner occupied; 626 renter occupied) in Youngtown. Transportation routes into the area are US 60 and the Burlington Northern Santa Fe Railroad. The Youngtown Fire Department, with an ISO rating of 9, responds to wildland fire threats within the WUI.

An area of moderate wildfire risk is located within the Agua Fria River corridor. The Youngtown sub-WUI consists of less than 10 acres of high wildland fire risk. This portion of the sub-WUI does include areas of low risk based on wildfire ignitions in proximity to the riparian corridor. Due to limited areas of high to moderate wildfire risk within the riparian corridor, a low ignition history, and areas of primarily low-density community values, the overall wildland fire risk rating of the sub-WUI is low.

Peoria Sub-WUI

The Peoria sub-WUI includes the city of Peoria. Peoria is a rapidly growing suburban community. Formerly an agricultural town, today it is a business and medical hub for the Northwest Valley. The population of Peoria, according to the Arizona Department of Economic Security and the US Census Bureau (2008), is 151,693 people, which is up from 108,364 in 2000. There are 58,092 housing units (52,914 occupied: 41,613 owner occupied; 11,301 renter occupied) in Peoria. Transportation routes into the area are I-17, US 60, and Loops 101 and 303. The Peoria Fire Department responds to wildland fire threats within the WUI. Areas of highest wildfire risk are located within the northern portion of the sub-WUI. This area consists of paloverde-mixed cacti vegetation communities and riparian vegetation associated with the Agua Fria River corridor south of SR 74 that can support wildland fire during extraordinary rainfall years and that can produce intense wildfire within large areas of contiguous heavy vegetative fuels. This portion of the sub-WUI does include areas of low risk based on wildfire ignitions in proximity to the riparian corridor. Due to areas of high to moderate wildfire risk within the riparian corridor, a low ignition history, and limited areas of high- to moderate-density community values, the overall wildland fire risk rating of the sub-WUI is low.

Glendale Sub-WUI

The Glendale sub-WUI includes the city of Glendale. Glendale, Arizona's fourth largest city, is the commercial, industrial, and educational hub of the northwest portion of the Phoenix metropolitan area. The population of Glendale, according to the Arizona Department of Economic Security and the US Census Bureau (2008), is 248,435 people, which is up from 218,112 in 2000. There are 85,705 housing units (76,262 occupied: 48,233 owner occupied; 28,029 renter occupied) in Glendale. Transportation routes into the area are I-17, I-10, US 60, Loop 101, and the Burlington Northern Santa Fe Railroad. The Glendale Fire Department, with ISO ratings of 2 and 9, responds to wildland fire threats within the WUI. This area consists primarily of densely developed lands—of which approximately 80 percent of the land cover is impervious surface—but also includes Thunderbird Conservation Park and land adjacent to the White Tank Mountains and Conservation Area. Therefore, the risk of unwanted wildland fire occurring within or immediately adjacent to the municipality is low. This portion of the sub-WUI does not include areas of moderate to high risk based on wildfire ignitions. Due to areas of low wildfire risk, a low ignition history, and limited areas of high- to moderate-density community values, the overall wildland fire risk rating of the sub-WUI is low.

Litchfield Park Sub-WUI

The Litchfield Park sub-WUI includes the city of Litchfield Park. Litchfield Park is a planned residential community boasting a small town atmosphere and casual lifestyle. The population of Litchfield Park, according to the Arizona Department of Economic Security and the US Census Bureau (2008), is 5,093

people, which is up from 3,810 in 2000. In 2000 there were 1,633 housing units (1,508 occupied: 1,313 owner occupied; 195 renter occupied) in Litchfield Park. Transportation routes into the area are I-10. Fire protection is provided to Litchfield through individual subscriptions, as is the protection for the unincorporated areas bounded by 160th Avenue on the west, Pinnacle Peak Road on the north, the Gila River to the south, and 75th Avenue to the east. Fire-response apparatus and personnel include two Type 1 fire engines, one Type 2 fire engine, and one Type 7 fire engine. There are 28 firefighters trained in wildfire response. Litchfield Park has an ISO rating of 3, while the unincorporated areas have an ISO rating of 4/9. Areas of highest wildfire risk are located within the Agua Fria River corridor. Vegetation within this riparian area can produce intense wildfire within large areas of contiguous heavy vegetative fuels. This portion of the sub-WUI does include areas of low risk based on wildfire ignitions in proximity to the riparian corridor. Due to limited areas of high to moderate wildfire risk within the riparian corridor, a low ignition history, and areas of primarily low-density community values, the overall wildland fire risk rating of the sub-WUI is low.

Tolleson Sub-WUI

The Tolleson sub-WUI includes the city of Tolleson. Tolleson, measuring approximately 6 square miles, is a self-contained community west of downtown Phoenix. The population of Tolleson, according to the Arizona Department of Economic Security and the US Census Bureau (2008), is 6,833 people, which is up from 4,974 in 2000. In 2000 there were 1,485 housing units (1,432 occupied: 940 owner occupied; 492 renter occupied) in Tolleson. Transportation routes into the area are I-10 and Loop 101. The City of Tolleson Fire Department responds to wildland fire threats within the WUI. Vegetation within the Tolleson sub-WUI consists of lower-elevation desert scrub types adjacent to areas of dense development. These vegetative communities and densely developed areas do not normally support wildland fire; therefore, the potential of unwanted wildland fire is low. This portion of the sub-WUI includes areas of low risk based on wildfire ignitions in proximity to the I-10 corridor. Due to low wildfire risk, a low ignition history, and areas of primarily moderate-density community values along the I-10 corridor, the overall wildland fire risk rating of the sub-WUI is low.

Avondale Sub-WUI

The Avondale sub-WUI includes the city of Avondale. Nestled at the base of the scenic Estrella Mountains where the Agua Fria and Gila rivers meet, Avondale is on the I-10 and the Loop 101 corridors, just a 15-minute commute from the heart of Phoenix. The population of Avondale, according to the Arizona Department of Economic Security and the US Census Bureau (2008), is 76,648 people, which is up from 35,883 in 2000. There are 23,237 housing units (20,345 occupied: 13,819 owner occupied; 6,526 renter occupied) in Avondale. Transportation routes into the area are I-10 and Loop 101. The Avondale Fire Department, with ISO ratings of 4 and 9, responds to wildland fire threats within the WUI. Areas of highest wildfire risk are located within the Agua Fria river corridor. Vegetation within these riparian areas can produce intense wildfire within large areas of contiguous heavy vegetative fuels. This portion of the sub-WUI does include areas of low risk based on wildfire ignitions in proximity to these riparian corridors. Due to areas of high to moderate wildfire risk, a moderate ignition history, and areas of high-density community values, the overall wildland fire risk rating of the sub-WUI is moderate.

Goodyear and Management Areas 7, 8, and 9 Sub-WUI

The Goodyear sub-WUI includes the city of Goodyear. Management Area 9 includes the area of the Pinal-Maricopa County border immediately south of I-8, including the Table Top Wilderness area and the primarily agricultural lands associated with the Pinal County community of Stanfield. Management Area 8 includes the Vekol Wash area from I-8 to north along the eastern boundary of the South Maricopa Mountain Wilderness area. Management Area 8 also includes the landfill site to the west of the community of Mobile and the Goodyear city limits. Management Area 7 includes the Waterman Wash area and the Rainbow Valley area along the western edge of the Estrella Mountain Regional Park. Goodyear is a suburban community southwest of metro Phoenix and was founded by Goodyear Tire/Rubber Co. for the farming of cotton. The population of Goodyear, according to the Arizona Department of Economic Security and the US Census Bureau (2008), is 59,436 people, which is up from 18,911 in 2000. There are 20,854 housing units (18,721 occupied: 15,231 owner occupied; 3,490 renter occupied) in Goodyear. Transportation routes into the area are I-10 and SR 85. In 2007, Mobile was annexed into the city of Goodyear as part of a 67-square-mile expansion, part of an agreement with Montage Holdings, a local developer, to develop a master-planned community in the area. The master-planned community, named Amaranth—envisioned as a self-sustaining community with a regional mall, employment centers, and eventually home to over 50,000 people—has been placed on hold until at least 2010 due to the economic slowdown. The delay, as well as the developer's inability to meet financial obligations to the City, has forced Goodyear to cut back on emergency services to the area. Transportation routes into the area are SR 238. The Goodyear Fire Department responds to wildland fire threats within the WUI. Guadalupe Fire Department also responds to wildland fire within the vicinity of Mobile through an automatic-aid agreement with the City of Goodyear. The area at highest risk for wildland fire within the WUI occurs within the Gila River riparian corridor, near the Waterman Wash confluence with the Gila River. Vegetation within the Gila River riparian corridor is composed of areas that are heavily infested with saltcedar. Saltcedar-infested riparian vegetation can produce intense wildfire within large areas of contiguous heavy vegetative fuels, sending fire brands in excess of 700 feet in front of the headfire. This portion of the sub-WUI includes areas of low risk based on wildfire ignitions in proximity to the Gila River riparian corridor. Due to limited areas of high to moderate wildfire risk, low ignition history, and areas of moderate- to high-density community values, the overall wildland fire risk rating of the sub-WUI is moderate.

Gila River Indian Community and St. Johns Sub-WUI

The Gila River Indian Community consists of 372,000 acres approximately 25 miles south of Phoenix and 70 miles north of Tucson. The tribal administrative offices and departments are located in Sacaton, Arizona, and serve residents within seven community districts. The community of St. Johns is listed as moderate risk within the *Arizona-Identified Communities at Risk* (Arizona State Forester 2009) and is located adjacent to the Gila River within the Gila River sub-WUI. St. Johns is adjacent to the Gila River near the confluence with the Santa Cruz Wash. Census data for the St. Johns area was not readily available; the population of the zip code that includes the St. Johns area (85326) is 22,019. There are 6,245 housing units (5,774 occupied: 4,290 owner occupied; 1,484 renter occupied) in the zip code. Transportation routes into the area are Beltline Road, 51st Avenue, and I-10.The principal land use within the sub-WUI is agricultural, with steadily increasing industrial, retail, and recreational development. The

community owns and operates three industrial parks—the Lone Butte Park is considered one of the most successful tribal industrial parks. Structural and wildland fire protection is provided to the communities by the Gila River Fire Department. The 2000 census reported the population of the Gila River Indian Community at 11,257. The vegetation of the sub-WUI consists primarily of desert scrub-shrub vegetation associations. Creosotebush flats dominate the upland landscape and are not conducive to intensive wildland fire due to noncontiguous aerial or ground fuels. However, during extreme rainfall years the deep loamy soils can produce abundant light fuels from invasive annual and perennial grasses. The highest wildland fire risk within the sub-WUI is related to the Gila River and Santa Cruz Wash riparian corridors that have been heavily invaded by saltcedar. Wildland fires within dominant stands of saltcedar can burn at high intensities and have relatively high rates of spread. During normal burning conditions, fire brands commonly move in excess of 700 feet in front of the headfire. The Gila River sub-WUI does have a history of a high number of wildland fire ignitions. Many of these ignitions have occurred within agricultural lands and are consistent with normal agricultural practices. However, ignitions, whether natural or human caused, within proximity to the riparian corridor have the potential to create unwanted wildfire. Wildfires that occur within riparian corridors can have significant watershed and community water supply impacts due to ash, increased heavy metals, and soil erosion following extreme wildfire behavior that removes vegetative cover. The majority of the sub-WUI has a low to moderate population density. Due to a generally low upland and high riparian wildfire risk, a high ignition history, and a low to moderate density of community values, the overall wildland fire risk rating of the sub-WUI is moderate.

Wickenburg Sub-WUI

The Wickenburg sub-WUI includes the town of Wickenburg and surrounding areas within the WUI. Wickenburg lies in the foothills of the Bradshaw Mountains, along the banks of the Hassayampa River. The population of Wickenburg, according to the Arizona Department of Economic Security and the US Census Bureau (2008), is 6,442 people, which is up from 5,082 in 2000. In 2000, there were 2,691 housing units (2,341 occupied: 1,519 owner occupied; 822 renter occupied) in Wickenburg. Transportation routes into the area are US 60, SR 93, and the Burlington Northern Santa Fe Railroad. The Wickenburg Fire Department maintains an ISO rating of 4 within the municipal water system, an area of approximately 21 square miles. The remainder of the fire department service area is beyond the “1,000-foot distance from a water hydrant” range and has an ISO rating of 8b. The Wickenburg Fire Department service area covers 88 square miles within and adjacent to the town, within the counties of Maricopa and Yavapai. The portion of the fire department’s service area within Yavapai County is included within the Yavapai County CWPP. The Wickenburg Fire Department does respond to wildland fire threats within the WUI. The area at highest risk for wildland fire within the WUI occurs within the Hassayampa River riparian corridor. Vegetation within the Hassayampa River riparian corridor is composed of extensive riparian woodlands. Some areas within the Hassayampa River have become heavily infested with saltcedar. Saltcedar-infested riparian vegetation can produce intense wildfires within large areas of contiguous heavy vegetative fuels, creating extreme wildland fire behavior. This portion of the sub-WUI includes areas of moderate risk based on wildfire ignitions in proximity to the Hassayampa River riparian corridor. Due to limited areas of high to moderate wildfire risk, low ignition history, and areas of moderate-density community values, the overall wildland fire risk rating of the sub-WUI is moderate

Buckeye, Management Area 1, Management Area 4 (Buckeye Hills Recreation Area), and Management Area 10 (White Tank Mountain Regional Park) Sub-WUI

The Buckeye sub-WUI includes the town of Buckeye, located at the confluence of the Gila and Hassayampa rivers, and spans approximately 650 square miles of incorporated mixed land use. This sub-WUI also includes the area within and adjacent to the White Tank Mountain Regional Park, unincorporated areas to the northwest of the municipal boundary, and the Buckeye Hills Regional Park. The population of Buckeye, according to the Arizona Department of Economic Security and the US Census Bureau (2008), is 50,143 people, which is up from 8,497 in 2000. There are 11,256 housing units (10,161 occupied: 7,457 owner occupied; 2,704 renter occupied) in Buckeye. The Buckeye sub-WUI includes the Palo Verde Nuclear Generating Station. Emergency evacuation of the nuclear-generating station will include Maricopa County Road 85, within the Buckeye sub-WUI. Transportation routes into the area are I-10 and SR 85 and the Union Pacific Railroad. The Buckeye Valley area is included within the *Arizona-Identified Communities at Risk* (Arizona State Forester 2009) to be at a moderate risk of wildland fire. The Buckeye Fire Department maintains an ISO rating of 4 within the incorporated master-planned communities and town limits. Areas within the Buckeye sub-WUI that are undeveloped open land, including BLM and State Trust lands, have an ISO rating of 9. The Buckeye Fire Department responds to several brush and grass fires annually. From January 2001 to October 2009 the fire department responded to 292 grass- and brush-related fires. The highest incidents occurred during the extreme fire year of 2005 when the fire department responded to 54 wildland fires. The highest wildland fire risk within the sub-WUI is related to the Gila, Hassayampa, Agua Fria, and New River riparian corridors that have been heavily invaded by saltcedar. Wildland fires within dominant stands of saltcedar can burn at high intensities and have relatively high rates of spread. During normal burning conditions, fire brands will commonly move in excess of 700 feet in front of the headfire. The Gila River sub-WUI does have a history of a high number of wildland fire ignitions. Many of these ignitions have occurred within agricultural lands and are consistent with normal agricultural practices. However, ignitions, whether natural or human caused, within proximity to the riparian corridor have the potential to create unwanted wildfire. Wildfires that occur within riparian corridors can have significant watershed and community water supply impacts due to ash, increased heavy metals, and soil erosion following extreme wildfire behavior that removes vegetative cover. The majority of the sub-WUI has a low to moderate population density. Due to areas of generally low upland and high riparian wildfire risk, limited areas of moderate to high ignition history, and a low to moderate density of community values, the overall wildland fire risk rating of the sub-WUI is moderate.

Buckeye Valley, Management Area 5 Sub-WUI

This sub-WUI includes the area to the west of the municipality of Buckeye along the Hassayampa River corridor and south along the western uplands of the Gila River corridor, including agricultural areas north of the community of Gila Bend. The Buckeye Valley area is included within the *Arizona-Identified Communities at Risk* (Arizona State Forester 2009) to be at a moderate risk of wildland fire. This is an area of limited development and sparsely populated. The highest area of wildland fire risk in Buckeye Valley includes uplands and agricultural areas within the Gila River riparian corridor. The majority of the sub-WUI has a low wildland fire risk, low wildland fire ignition history, a low density of community values; the overall wildland fire risk rating of the sub-WUI is moderate.

Gila Bend, Tohono O'odham Nation San Lucy District, Management Area 6 (Painted Rock Wildlife Area) Sub-WUI

The Gila Bend sub-WUI is on a desert plain in southwestern Maricopa County and includes the town of Gila Bend, the Tohono O'odham Nation San Lucy District and the Painted Rock Wildlife Area, located near a sharp bend in the Gila River. This sub-WUI includes upland areas north of the community along SR 85, agricultural areas within the Gila Bend Valley, west to the Painted Rock Wildlife area, the Gila River riparian corridor and upland agricultural areas adjacent to I-8. The population of Gila Bend, according to the Arizona Department of Economic Security and the US Census Bureau (2008), is 1,899 people, which is down from 1,980 in 2000. In 2000 there were 766 housing units (659 occupied: 384 owner occupied; 275 renter occupied) in Gila Bend. Transportation routes into the area are I-8, SR 85, and the Union Pacific Railroad. The San Lucy District of the Tohono O'odham Indian Nation is located adjacent to the Town of Gila Bend. The San Lucy District has a tribal enrollment of 1,850 persons with 625 living on the reservation (http://www.tonation-nsn.gov/districts.aspx Jan. 2010). The Gila Bend Fire Department responds to wildland fire threats within the WUI. The Gila Bend area is included within the *Arizona-Identified Communities at Risk* (Arizona State Forester 2009) to be at a moderate risk of wildland fire. The highest wildland fire risk within the sub-WUI is related to the Gila River riparian corridor that has been heavily invaded by saltcedar. Wildland fires within dominant stands of saltcedar can burn at high intensities and have relatively high rates of spread. During normal burning conditions, fire brands commonly move in excess of 700 feet in front of the headfire. The Gila Bend sub-WUI does have a history of moderate to high numbers of wildland fire ignitions. Many of these ignitions have occurred within agricultural lands and are consistent with normal agricultural practices. However, ignitions, whether natural or human caused, within proximity to the riparian corridor have the potential to create unwanted wildfire. Wildfires that occur within riparian corridors can have significant watershed and community water supply impacts due to ash, increased heavy metals, and soil erosion following extreme wildfire behavior that removes vegetative cover. The majority of the sub-WUI has a low to moderate population density. Due to areas of generally low upland and high riparian wildfire risk, limited areas of moderate to high ignition history, and a low to moderate density of community values, the overall wildland fire risk rating of the sub-WUI is moderate.

Aguila Sub-WUI

Aguila is a small unincorporated community in Maricopa County. It is located on US 60 approximately 20 miles west of Wickenburg, or at approximately 50000 N. 510th Avenue. Major economic activities include cantaloupe farming and formerly included mining. Aguila uses the same street numbering system as Phoenix. Aguila is included in the 85320 zip code. The population was 1,064—including 753 total housing units, of which 293 were single-family homes—as of the 2000 census. Fire protection is provided to the residents by the Aguila Fire District. The Aguila sub-WUI within the Maricopa County CWPP analysis area does not include high wildland fire risk acres. Vegetation within this sub-WUI is primarily paloverde-mixed cacti association, which during extraordinary rainfall years can support wildland fire. This portion of the sub-WUI includes areas of low risk based on wildfire ignitions in proximity to the riparian corridor. Due to areas of low wildfire risk, a low ignition history, and areas of primarily low-density community values, the overall wildland fire risk rating of the sub-WUI is low.

Apache Junction Sub-WUI

Apache Junction is a rural community located along US 60 approximately 30 miles east of Phoenix. US 60 is the major transportation route into this community; SR 77 also serves as a transportation route into Apache Junction. The Apache Junction Fire District encompasses 62 square miles and serves the city of Apache Junction and unincorporated areas of Gold Canyon, Superstition Foothills, and the Goldfield Foothills area. A small area of Apache Junction is located within Maricopa County. The majority of Apache Junction is included with the Pinal County CWPP. In accordance with that analysis the overall wildland fire risk rating for Apache Junction is moderate. For additional information on the wildland fire analysis for this sub-WUI, refer to the 2009 Pinal County CWPP.

Circle City/Morristown Sub-WUI

Circle City is an unincorporated community in Maricopa County. It derives its name from the Workmen's Circle, a Jewish fraternal organization formed during the early twentieth century. It is located 14 miles northwest of Surprise, Arizona, on US 60 within the 85361 zip code area. As of 2000 it had a population of 4,147 residents and 1,511 total housing units, of which 401 are single-family homes. The Circle City/Morristown Volunteer Fire Department provides fire protection to the residents of this sub-WUI. The Circle City/Morristown sub-WUI is composed primarily of paloverde-mixed cacti and creosotebush-bursage vegetation associations that do not, under normal circumstances, support wildland fire. This portion of the sub-WUI includes areas of low risk based on wildfire ignitions. Due to limited areas of low wildfire risk, low ignition history, and areas of a low density of community values, the overall wildland fire risk rating of the sub-WUI is low.

Harquahala, Management Area 3 Sub-WUI

This sub-WUI is in the unincorporated community of Harquahala, west of Phoenix. The Harquahala Fire District covers 432 square miles, including a 20-mile stretch of the I-10. The Harquahala Fire District has 12 full-time firefighters, aided by paid on-call reserves, and 3 administrative members. Harquahala Fire District uses a 48-hour-on/96-hour-off rotation schedule with an A, B, and C shift to ensure the safety and security of residents within the district. The Harquahala Fire District handles all medical issues, fires, hazardous material incidents, vehicle extractions, and other calls for assistance as needed within the district. Additionally, the department serves as needed for backup on large incidents on the mutual-aid system. The Harquahala sub-WUI is composed primarily of paloverde-mixed cacti and creosotebush-bursage vegetation associations that do not, under normal circumstances, support wildland fire. Limited areas of moderate to high wildfire risk occur along the I-10 corridor at the La Paz–Maricopa County boundary. This portion of the sub-WUI includes areas of low risk based on wildfire ignitions. Due to limited areas of low wildfire risk, low ignition history, and areas of a low density of community values, the overall wildland fire risk rating of the sub-WUI is low.

Sun Lakes Sub-WUI

Sun Lakes is a 3,500-acre master-planned community for active adults. Located 7 miles south of Chandler in metropolitan Phoenix, Sun Lakes offers a small-town atmosphere with world-class resort amenities. Established in 1972 by Edward J. Robson of Robson Communities, Sun Lakes is home to more than

15,000 residents who enjoy an active, healthy lifestyle. The exceptional quality of life available at Sun Lakes has been recognized locally and nationally. *New Choices Magazine*, a Reader's Digest publication, has listed Sun Lakes as one of the "Top 20 Retirement Communities in America" for the past several years. The majority of Sun Lakes residents are retired, and income is derived from social security, stocks and bonds, investments, and savings. The surrounding communities are a center for the high-tech industry. Motorola and Intel have four plants in the area. Other high-tech industries include Rogers, Avnet, Aircraft Gear, ST Microwave, Orbital Sciences, and Microchip Technology. The population of Sun Lakes, according to the Arizona Department of Economic Security and the US Census Bureau (2000), is 11,936 residents, a significant increase from the 6,578 residents reported in 1990. In 2000 there were 7,746 total housing units, of which 5,472 were single-family homes. The major transportation route into the area is I-10. The Sun Lakes Fire Department responds to wildland fire threats within the WUI. The Sun Lakes sub-WUI is composed primarily of paloverde-mixed cacti and creosotebush-bursage vegetation associations that do not, under normal circumstances, support wildland fire. This portion of the sub-WUI includes areas of low risk based on wildfire ignitions. Due to limited areas of low wildfire risk, low ignition history, and areas of a low density of community values, the overall wildland fire risk rating of the sub-WUI is low.

Sun City Sub-WUI

Sun City is the quintessential retirement community, known for the active lifestyle of its senior citizens. There are over 350 clubs and civic organizations and 7 recreation centers. Sun City began as a partnership between builder Del Webb and cotton farmer J. G. Boswell who owned the land. It opened on New Year's Day in 1960 with a three-bedroom, two-bath house selling for $11,300. The community was an instant success; 237 homes were sold in the first three days. Sun City deed restrictions require that at least one resident per household be 55 years or older. It encompasses 8,900 acres, of which 1,200 are golf courses, making it a "golfers' paradise." The electric golf cart is a favorite form of transportation. Sun City residents are almost all retired, and income derives from social security, stocks and bonds, investments, and savings. Annual income is estimated at $1 billion, and net worth at $8 billion. Residents spend about $300 million annually for local goods and services. Employment is found in several shopping centers, numerous restaurants, service centers, and real estate companies. Its taxes are one-half to two-thirds lower than in most other area communities. The Sun City Fire Department provides fire protection to the residents of Sun City sub-WUI. The population of Sun City, according to the Arizona Department of Economic Security and the US Census Bureau (2000), is 38,309 residents, a fairly stable population compared with the 38,128 residents reported in 1990. In 2000 there were 27,731 total housing units, of which 18,101 were single-family homes. The major transportation route into the area is US 60. The Sun City sub-WUI is composed primarily of paloverde-mixed cacti and creosotebush-bursage vegetation associations that do not, under normal circumstances, support wildland fire. This portion of the sub-WUI includes areas of low risk based on wildfire ignitions. Due to limited areas of low wildfire risk, low ignition history, and areas of a low density of community values, the overall wildland fire risk rating of the sub-WUI is low.

Sun City West Sub-WUI

Sun City West, about 12 miles northwest of Phoenix, is a master-planned active-adult community for people 55 and over. It began in 1978 when all available land in Sun City, which is 2 miles east, was built

upon. The community, together with Sun City, has been rated the third best location out of 100 top-rated retirement communities in the nation. Nearly 24,000 residents call Sun City West home, and when the community is fully completed, there will be a population of 32,000. With eight golf courses and four recreation centers, it is designed for an active way of life. Numerous clubs and civic organizations are available. Residents are often said to be “too busy to retire.” The majority of Sun City West residents are retired, and income is derived from social security, stocks and bonds, investments, and savings. Sun City West has a high employment rate because of the number of businesses servicing its sizable population; most of the people employed in Sun City West live in El Mirage, Surprise, Glendale, and Peoria. The Sundome Center for the Performing Arts has more than 7,000 seats and brings in top-name entertainment. The population of Sun City West, according to the Arizona Department of Economic Security and the US Census Bureau (2000), is 26,344 residents, an increasing population from the 15,997 residents recorded by the 1990 census. In 2000 there were 17,359 total housing units (659 occupied: 384 owner occupied; 275 renter occupied), of which 13,374 were single-family homes. The major transportation route into the area is US 60. The Burlington Northern Santa Fe Railroad passes through the community. Fire protection is provided to the residents by the Sun City West Fire District. The district has an ISO rating of 2. The district has one Type 6 and two Type 1 fire engines with wildland/brush response capabilities. The district maintains a wildland firefighting team that responds to wildfires on state and federal lands. The team is composed of 10 members who train year-round for wildland fire suppression as a specialty group. Each frontline firefighter outside the wildland fire team is also given annual refresher training in wildland fire response. Sun City West recently annexed a large land area expected to increase the community WUI. The Sun City West Fire Department has responded to 37 wildland fire incidents within the community between January 2000 and November 2009. The majority of wildland fire response occurred during the active fire season of 2005 and 2006 (11 and 10 responses, respectively). Areas of highest wildfire risk are located within the Agua Fria River corridor adjacent to the eastern portion of the community. Vegetation within this riparian area can produce intense wildfire within large areas of contiguous heavy vegetative fuels. This portion of the sub-WUI includes areas of low risk based on wildfire ignitions in proximity to the riparian corridor. Due to areas of high to moderate wildfire risk only within the riparian corridor, a low ignition history, and areas of primarily low-density community values, the overall wildland fire risk rating of the sub-WUI is low.

Tonopah Valley, Management Area 2 Sub-WUI

Tonopah is surrounded by mountains to the north (Belmont Mountains), west (Saddle Mountain), and south (Palo Verde Hills) and opens to the east into the Hassayampa River. The mountains are of volcanic origin and are formed of a similar material, which underlies the Tonopah Basin. One of the outstanding features of the area is the thermal water, which led to the construction of hot-bath houses in the 1930s. Mining became popular in the 1920s when the Belmont Mine opened. The first school was built in 1929. In 1951, the area’s first cotton crops were planted in the area that is now downtown Tonopah. Area employment includes the Palo Verde Nuclear Generating Station and farming and agriculture. Wal-Mart (bulk storage and packaging) and Schult Homes (manufactured housing) in nearby communities also provide employment. The town is located in the Maricopa County Westside Enterprise Zone, which offers income tax credits and other incentives (up to $5,000 per employee) for companies locating or expanding into the

zone. There are several areas surrounding Tonopah that offer hiking, hunting, bird watching, and other scenic and recreational opportunities. Visitors can chose from three wilderness areas, visit the El Dorado Hot Springs, or hike along Saddle Mountain. Each year the community holds an annual Spring Fling, Fourth of July celebration, and a winter carnival. The Tonopah Valley Fire District provides fire protection to the residents of this sub-WUI. Census data for the Tonopah Valley sub-WUI is not directly available. The major transportation route into the area is I-10 and Buckeye Road. The Tonopah Valley sub-WUI is composed primarily of paloverde-mixed cacti and creosotebush-bursage vegetation associations that do not, under normal circumstances, support wildland fire. This portion of the sub-WUI includes areas of low risk based on wildfire ignitions. Due to limited areas of low wildfire risk, low ignition history, and areas of a low density of community values, the overall wildland fire risk rating of the sub-WUI is low.

Wittmann Sub-WUI

Wittmann is a small unincorporated community in Maricopa County, located along US 60 in the central part of Arizona, about 35 miles northwest of central Phoenix. Although it is technically located within the Phoenix metropolitan area, it is generally regarded by locals to be just outside of it. According to the 2000 census, 4,174 residents were recorded as living within the 85361 zip code and thus having a Wittmann address. There are 1,511 total housing units, of which 401 are single-family homes. Wittmann does not have any official or census-designated boundaries. Wittmann is located in an area of rapid growth, and the locale has suffered from numerous growing pains. The Nadaburg Elementary School District located in Wittmann, which had long been considered a small rural school, was forced to construct a larger, modernized school in 2004 to accommodate the influx of students; the district is already planning for a second school nearby. Increased traffic along US 60 necessitated a widening of the highway. The highway's location parallel to the Burlington Northern Santa Fe Railroad tracks unfortunately meant that the widening would claim a number of homes and local businesses, including the only prominent service station between Phoenix and Wickenburg, as well as the community's landmark overpass footbridge servicing the elementary school. Past efforts to incorporate the community failed largely due to opposition from local landowners, and thus there has been no real local government or planning agency. The nearby City of Surprise has in recent years annexed much of the land near and around the town, and has included it as part of its general plan. Fire protection is provided by the Wittmann Fire District. The Wittmann sub-WUI is composed primarily of paloverde-mixed cacti and creosotebush-bursage vegetation associations that do not, under normal circumstances, support wildland fire. This portion of the sub-WUI includes areas of low risk based on wildfire ignitions. Due to limited areas of low wildfire risk, low ignition history, and areas of a low density of community values, the overall wildland fire risk rating of the sub-WUI is low.

3. Cumulative Risk Analysis

The cumulative risk analysis synthesizes the risk associated with fuel hazards, wildfire ignition points, wildfire occurrence, and community values. These different components were analyzed spatially, and an overall cumulative risk for the WUI was calculated. Table 2.7 and Figures 2.8a and 2.8b display the results of the cumulative risk analyses, identifying the areas and relative percentages of WUI areas of high, moderate, and low risk.

Table 2.7. Cumulative risk levels, by percentage of the WUI area

Maricopa County CWPP community sub-WUI	High risk (%)	Acres	Moderate risk (%)	Acres	Low risk (%)	Acres	Total acres
Aguila	0	0	17	728	83	3,692	4,420
Apache Junction							3,239*
Wickenburg	<1	34	34	12,837	65	24,338	37,209
Circle City/Morristown	<1	42	45	23,029	55	28,648	51,719
Buckeye	2	6303	66	190,471	32	92,722	289,497
Peoria	3	3,994	44	69,920	53	82,569	156,483
Chandler	1	568	29	12,317	70	30,356	43,241
Tonopah Valley	1	601	72	69,087	27	26,180	95,868
El Mirage	3	228	19	1,392	78	5,709	7328
Buckeye Valley	0	0	73	56,010	27	20,692	76,703
Gila Bend	1	1,015	73	65,602	26	23,719	90,336
Harquahala	1	1,247	74	91,175	25	31,015	123,436
Goodyear	1	998	70	112,438	29	47,723	161,159
Youngtown	1	8	25	374	74	1,123	1,503
Gila River Indian Community	24	42,324	53	94,066	23	39,725	176,114
Phoenix	5	18,568	44	157,858	51	185,007	361,433
Cave Creek	0	0	52	16,437	48	15,122	31,560
Sunflower	18	4,536	65	16,033	17	4,252	24,820
Scottsdale	4	5,642	58	72,237	38	48,307	126,185
Tempe	<1	5	13	3,062	87	20,832	23,989
Rio Verde	18	5,740	58	18,744	24	7,616	32,100
Mesa	3	4,012	40	46,981	57	67,805	118,798
Gilbert	<1	191	29	14,013	71	34,228	48,432

Continued

Table 2.7. Cumulative risk levels, by percentage of the WUI area

Maricopa County CWPP community sub-WUI	High risk (%)	Acres	Moderate risk (%)	Acres	Low risk (%)	Acres	Total acres
Guadalupe	0	0	1	10	99	689	699
Queen Creek	1	254	36	9,032	63	15,895	25,181
Carefree	<1	37	67	3,952	33	1,938	5,927
Paradise Valley	1	133	51	5,409	48	5,037	10,579
Fountain Hills	1	116	63	7,836	36	4,563	12,515
Salt River Pima-Maricopa Indian Community	5	2,968	57	32,475	38	21,866	57,309
Avondale	6	2,585	63	27,968	31	13,983	44,537
Litchfield Park	7	164	31	659	62	1,360	2,183
Glendale	4	2,199	25	15,666	71	43,882	61,747
Fort McDowell Indian Community	11	2,834	42	10,355	48	11,937	25,126
Surprise	3	2,670	63	48,967	33	25,898	77,535
Sun City	1	120	9	726	90	8,254	9,100
Sun City West	7	1310	46	8004	47	8203	17,517
Sun Lakes	5	210	29	1,121	66	2,533	3,864
Tonto Hills	11	55	19	87	70	338	480
Tolleson	<1	11	69	2,727	30	1,230	3,967
Wittmann	1	189	91	14,547	8	1,308	16,044
New River	5	3,769	45	36,469	50	40,568	80,807
Management Area 1	2	816	78	27,502	20	7,116	35,433
Management Area 2	2	1,385	84	60,714	14	10,110	72,209
Management Area 3	0	0	72	37,765	36	19,006	52,771

Continued

Table 2.7. Cumulative risk levels, by percentage of the WUI area

Maricopa County CWPP community sub-WUI	High risk (%)	Acres	Moderate risk (%)	Acres	Low risk (%)	Acres	Total acres
Management Area 4	0	0	72	19,636	28	7,677	27,313
Management Area 5	0	0	74	21,261	26	7,514	28,775
Management Area 6	<1	70	57	50,048	42	36,691	86,810
Management Area 7	0	0	84	18,934	16	3,655	22,589
Management Area 8	0	0	78	44,611	22	12,791	57,402
Management Area 9	1	322	38	17,129	61	27,541	44,992
Management Area 10	3	1,197	82	37,155	15	6,547	44,898
Management Area 11	1	513	79	31,179	20	7,730	39,422
Management Area 12	2	270	49	11,118	49	11,095	22,483
Total*	4	120,252	57	1,749,492	39	1,202,717	3,072,461

Source: Logan Simpson Design Inc.

*Treatment areas not equal to area risk assessment due to data-rounding errors.

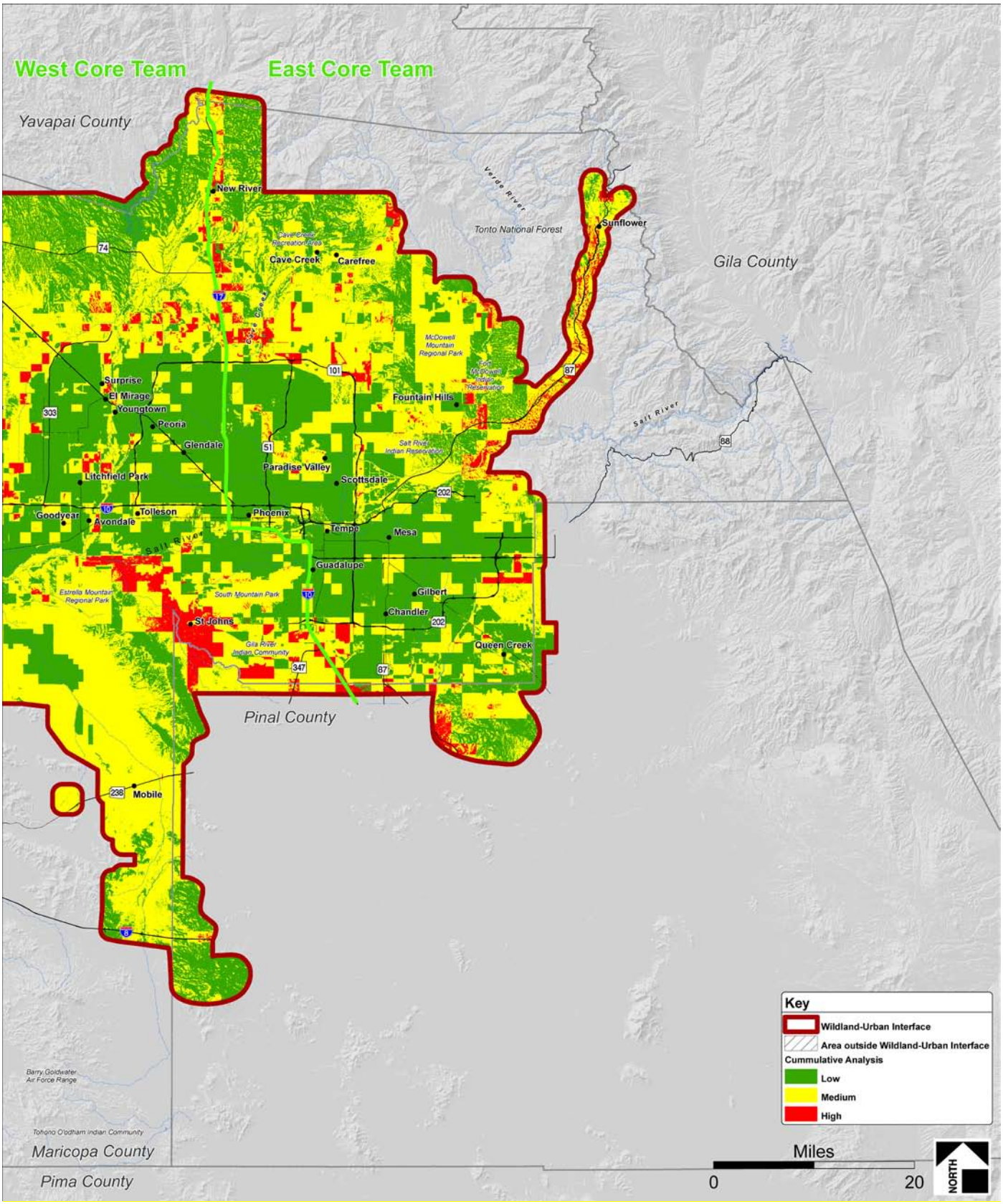

Figure 2.8a. Maricopa County CWPP cumulative risk analysis, east

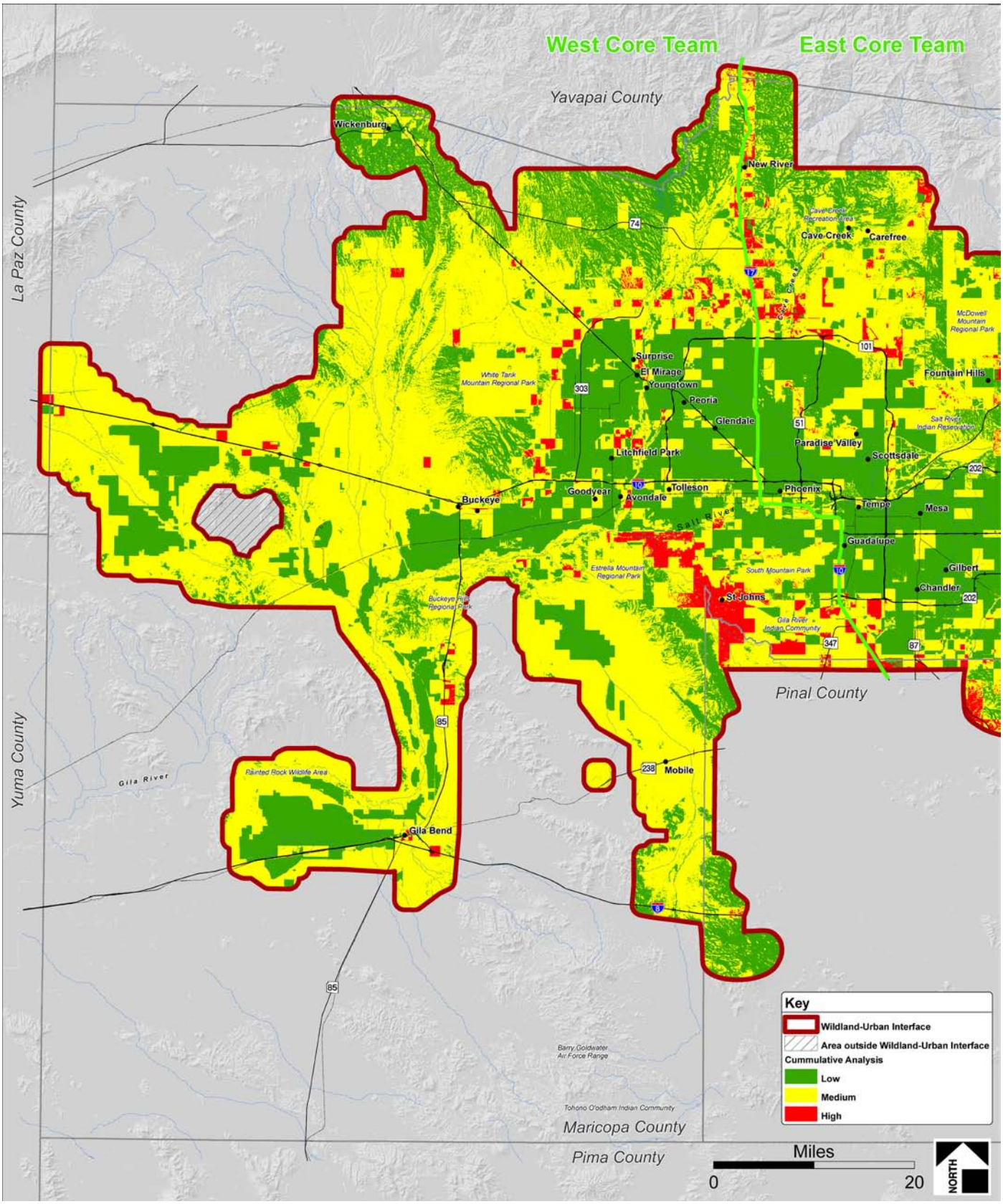

Figure 2.8b. Maricopa County CWPP cumulative risk analysis, west