RESOLUTION NO. 22-65

A RESOLUTION OF THE MAYOR AND CITY COUNCIL OF THE CITY OF MARICOPA, ARIZONA, APPROVING AND ADOPTING THE UPDATED PINAL COUNTY MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN 2022 AND REPLACING ALL PREVIOUSLY APPROVED MITIGATION PLANS.

WHEREAS the City of Maricopa has experienced damage from natural hazards such as flooding, wildfire, drought, severe winds, and others on many occasions in the past century, resulting in loss of property and/or life, economic hardship, and threats to public health and safety; and

WHEREAS, the City Council approved Resolution 17-33 on October 3, 2017, which adopted the City of Maricopa Mitigation Plan in conjunction with the Pinal County Multi-Jurisdictional Hazard Mitigation Plan 2016; and

WHEREAS, the Pinal County Multi-Jurisdictional Hazard Mitigation Plan 2022 (the Plan) has been developed after more than one year of review, research and update work by the Pinal County Multi-Jurisdictional Planning Team, in association and cooperation with the City of Maricopa, for the reduction of hazard risk to the community; and

WHEREAS, the Plan specifically addresses natural hazard vulnerabilities, mitigation strategies, and plan maintenance procedures for City of Maricopa; and

WHEREAS, the Plan recommends several hazard mitigation actions/projects that will mitigate specific natural hazards that impact City of Maricopa, in an effort to protect individuals and property from loss associated with those hazards; and

WHEREAS, an adopted Hazard Mitigation Plan is required as a condition of future funding for mitigation projects under multiple FEMA pre- and post- disaster mitigation grant programs.

NOW THEREFORE, BE IT RESOLVED by the Mayor and City Council of the City of Maricopa, Arizona as follows:

Section 1. That certain document known as the "Pinal County Multi-Jurisdictional Hazard Mitigation Plan 2022," a copy of which is available at the City Clerk's Office, is hereby approved and adopted.

Section 2. All previous Hazard Mitigations Plans including adopted by the City are hereby superseded and replaced with the Pinal County Multi-Jurisdictional Hazard Mitigation Plan 2022.

PASSED AND ADOPTED BY THE Mayor and Council of the City of Maricopa, Arizona, this 15th day of November, 2022.

Nancy Smith
Mayor

ATTEST:

Vanessa Bueras, MMC
City Clerk

CITY OF MARICOPA INCORPORATED 2003 MARICOPA, ARIZONA

APPROVED AS TO FORM:

Denis Fitzgibbons
City Attorney

Pinal County Multi-Jurisdictional Hazard Mitigation Plan

2022

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This Plan was developed in cooperation with:

Pinal County
City of Apache Junction
City of Casa Grande
City of Coolidge
City of Eloy
Town of Florence
Town of Kearny
Town of Mammoth
City of Maricopa
Town of Superior

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SECTION 1: INTRODUCTION

1.1 Purpose

This plan uses hazard mitigation to protect people, property, community assets, and land from the effects of hazards. It also demonstrates the participants' commitment to reducing risks caused by hazards and serves as a tool to help decision-makers direct mitigation activities and resources. The plan also serves to make the participants eligible for certain types of federal disaster assistance and hazard mitigation grant funding.

1.2 Background and Scope

Each year in the United States, disasters cause severe destructions, loss of life of hundreds, and injure thousands more. Many disasters are predictable, and much of the damage caused by these events can be alleviated or even eliminated. FEMA defines hazard mitigation as "any sustained action taken to reduce or eliminate long-term risk to human life and property from a hazard event." Taxpayers pay billions of dollars annually to help communities, organizations, businesses, and individuals recover from these disasters. The cost of restoration from disasters is only partially covered by tax dollars to cover the additional expenses to insurance companies and nongovernmental organizations; additional funding is needed. The results of a three-year congressionally mandated independent study to assess future savings from mitigation activities provide evidence that mitigation activities are highly cost-effective. On average, each dollar spends on mitigation saves society an average of $4 in avoided future losses in addition to saving lives and preventing injuries (National Institute of Building Science Multi-Hazard Mitigation Council 2005). Examples of hazard mitigation measures include, but are not limited to the following:

- Development of mitigation standards, regulations, policies, and programs
- Land use/zoning policies
- Strong building code and floodplain management regulations
- Dam safety program, seawalls, and levee systems
- Acquisition of flood-prone and environmentally sensitive lands
- Retrofitting/hardening/elevating structures and critical facilities
- Relocation of structures, infrastructure, and facilities out of vulnerable areas
- Public awareness/education campaigns
- Improvement of warning and evacuation systems

Hazard mitigation planning is the process of identifying hazards that threaten communities, determining the likely impact of those hazards, setting mitigation goals, prioritizing, and implementing the appropriate strategies to lessen those impacts. The plan identifies relevant hazards and risks; and identifies strategies to decrease vulnerability and increase resiliency and sustainability. Documentation of the planning process employed by the Planning Team is within the plan.

Per the Disaster Mitigation Action of 2000 and the implementing regulations outlined in the Federal Register (DMA2K), this plan follows the above-listed requirements. Also, it meets eligibility for certain

federal disaster assistance and hazards mitigation funding under the Robert T. Stafford Disaster Relief and Emergency Act.

The information in the plan is to help guide and coordinate mitigation activities and decisions for future land use. Proactive mitigation planning will help reduce the cost of disaster response and recovery to the community and its property owners by protecting structures, reducing exposure, and minimizing overall community impacts and disruption.

This multi-jurisdictional plan geographically covers the communities within the Pinal County boundaries (the Planning Area). The following communities participated in the planning process:

- Pinal County
- Apache Junction
- Casa Grande
- Coolidge
- Eloy
- Florence
- Kearny
- Mammoth
- Maricopa
- Superior

1.3 Assurances

This plan complies with the requirements of the Robert T Stafford Disaster Relief and Emergency Assistance Act of 1988 (as amended by the DMA); all pertinent presidential directives associated with the U.S. Department of Homeland Security and FEMA; all aspects of 44 CFR pertaining to hazard mitigation planning and grants pertaining to the mitigation of adverse effects of disasters; interim final rule and final rules issued by FEMA; and all Office of Management and Budget circulars and other federal government documents, guidelines, and rules.

The participants of this plan assure that they will continue to comply with all applicable federal statutes and regulations in effect with respect to the periods for which it receives grant funding, in compliance with 44 CFR 13.11(c). This plan will be amended whenever necessary to reflect changes in federal laws and statutes as required in 44 CFR 133.11(d).

1.4 Plan Organization

This Plan is organized as follows:

- Section 1: Introduction
- Section 2: Community Profile
- Section 3: Planning Process
- Section 4: Risk Assessment
- Section 5: Mitigation Strategy
- Section 6: Plan Maintenance

SECTION 2: COMMUNITY DESCRIPTIONS

2.1 County Overview

Geography

According to the Arizona Department of Commerce[1], Pinal County was formed in 1875 from parts of Maricopa and Pima Counties by the Eighth Territorial Legislation. Florence, established in 1866, was designated and has remained the county seat to this day. Gila River Indian Community, Tohono O'odham Nation, San Carlos Apache Tribe, as well as the Ak-Chin Indian Community are a part of the 3,441,920 acres that make up the county.

Pinal County is in the south-central portion of the state. Interstates 8 and 10, U.S. Highway 60, State Highways 77, 79, 84, 87, 88, 177, 187, 237, 287, 347, 387, and Indian Route 15; are the major roadway transportation routes through the county. Railroads include the Union Pacific, Magma Arizona, San Manuel Arizona Railroads, and the Copper Basin Railway.

Pinal County has two distinct regions, the western region is primarily low desert valleys and irrigated agriculture. The eastern portion is mountainous with elevations of 6,000 feet and copper mining. The terrestrial and environmental uniqueness of Pinal County is due to the three major and sometimes riparian watercourses associated with the San Pedro, Gila, and Santa Cruz Rivers. These three waterways help define the native ecosystem and their association of plant and animal species within the Upper Sonoran Desert Region. These same topographical features have also greatly influenced the county settlement, from prehistoric people to modern humankind. Mountains in the county break up the relatively flat valley floors and include the San Tans, Superstitions, Sierra Estrella, Santa Catalina, Table Top, Palo Verde, Casa Grande, Sacaton, Picacho Mountain, Sawtooth, Tortolita, Black, and Samaniego Hills.

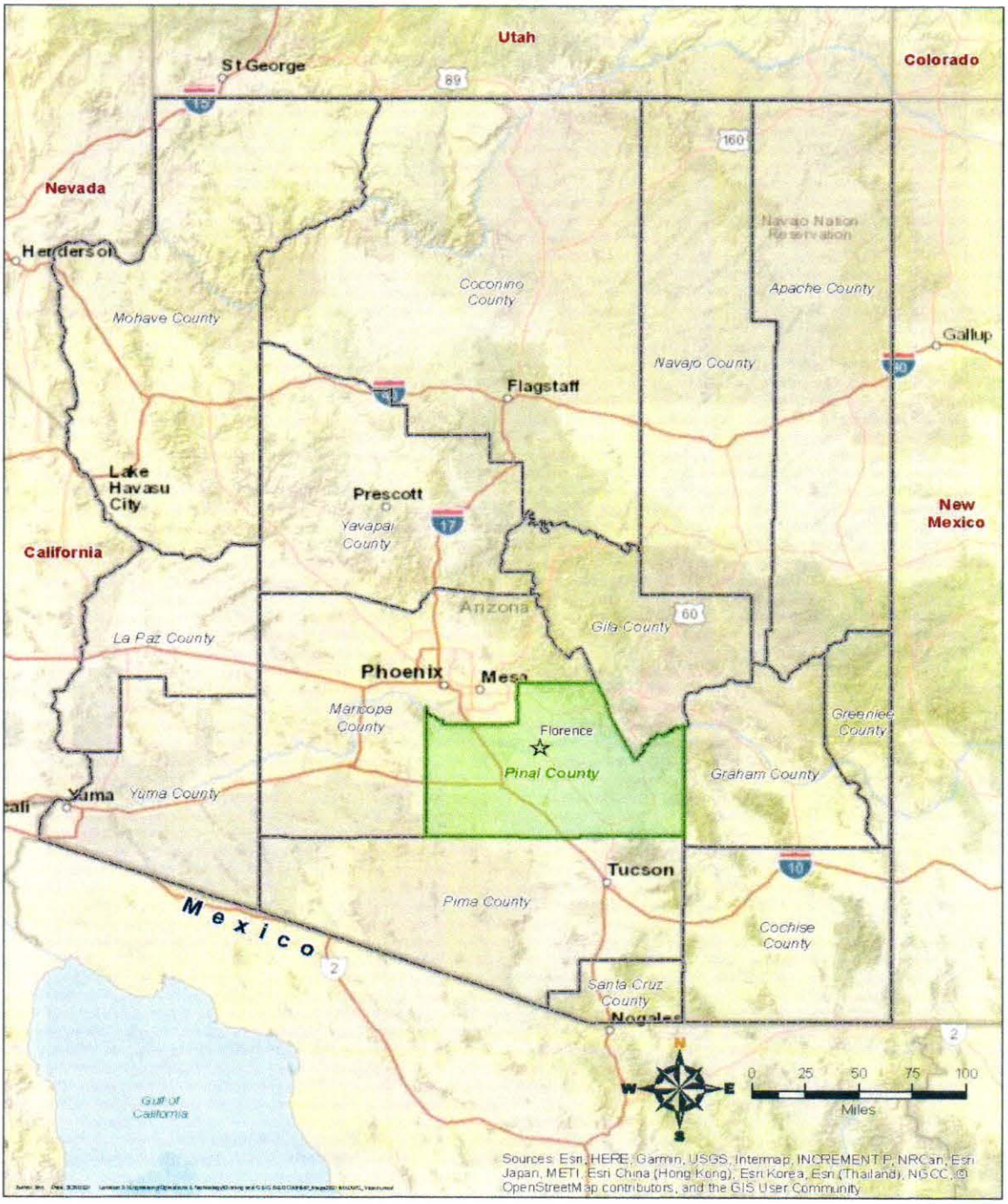
The geographical characteristics of Pinal County are four terrestrial ecoregions[2], and describes as the following:

- **Arizona Mountain Forests** – mountainous landscape moderate to steep slopes. Elevations from approximately 4,000-13,000 feet, resulting in comparatively cool summers and cold winters. Vegetation is typically high-altitude grasses, shrubs, brush, and conifer forests.
- **The Chihuahua Desert** – high altitude deserts, foothills, and is found in much of the southeastern portion of Arizona. Elevations vary between 3,000-4,500 feet. The average temperature tends to be cooler than the Sonoran Desert due to the elevation differences. However, like its lower elevation cousin, the summers are hot and dry with mild to cool winters.
- **Sierra Madre Occidental Pine-Oak Forest** – predominant in mountainous regions in southeast Arizona with elevations above 5,000 feet. It tends to be cool during the summer and cold in winter.
- **Sonoran Desert** – an arid environment that covers much of southwestern Arizona. Elevation varies from approximately sea level to 3,000 feet. Vegetation in this zone is mainly of Sonoran Desert Scrub and is one of the few locations where saguaro cactus's grow. It is typically hot and dry during the summer and mild during the winter.

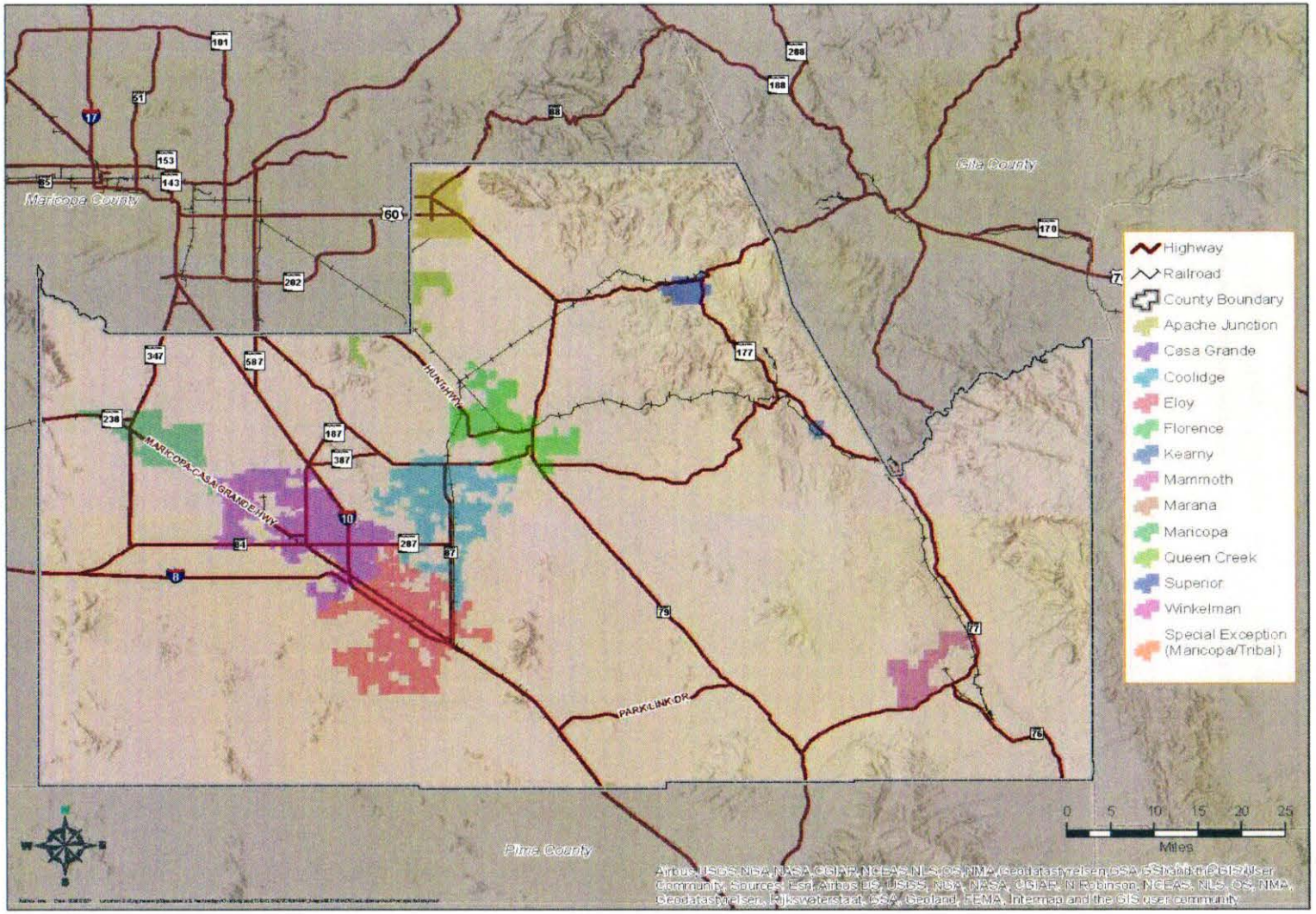
[1] Arizona Commerce Authority, 2018, *Community Profile for Pinal County*

[2] GIS Lounge, 2021, *Terrestrial Ecoregions GIS Data*

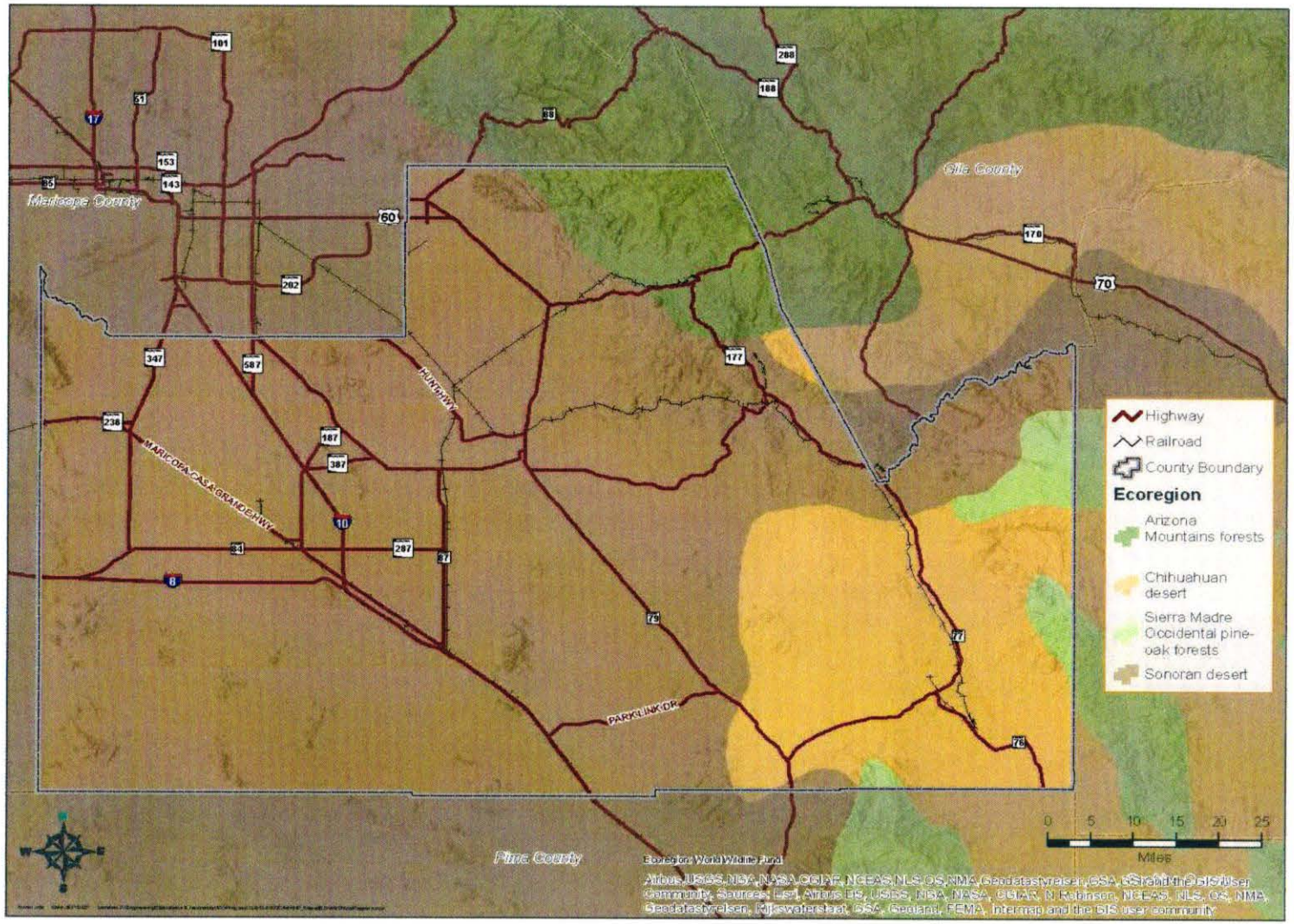
Land ownership within Pinal County is divided between Indian Reservation (32%), Private (29%), U.S. Forest Land (20%), State Trust Land (11%), Bureau of Land Management (7%), and other uses (1%).



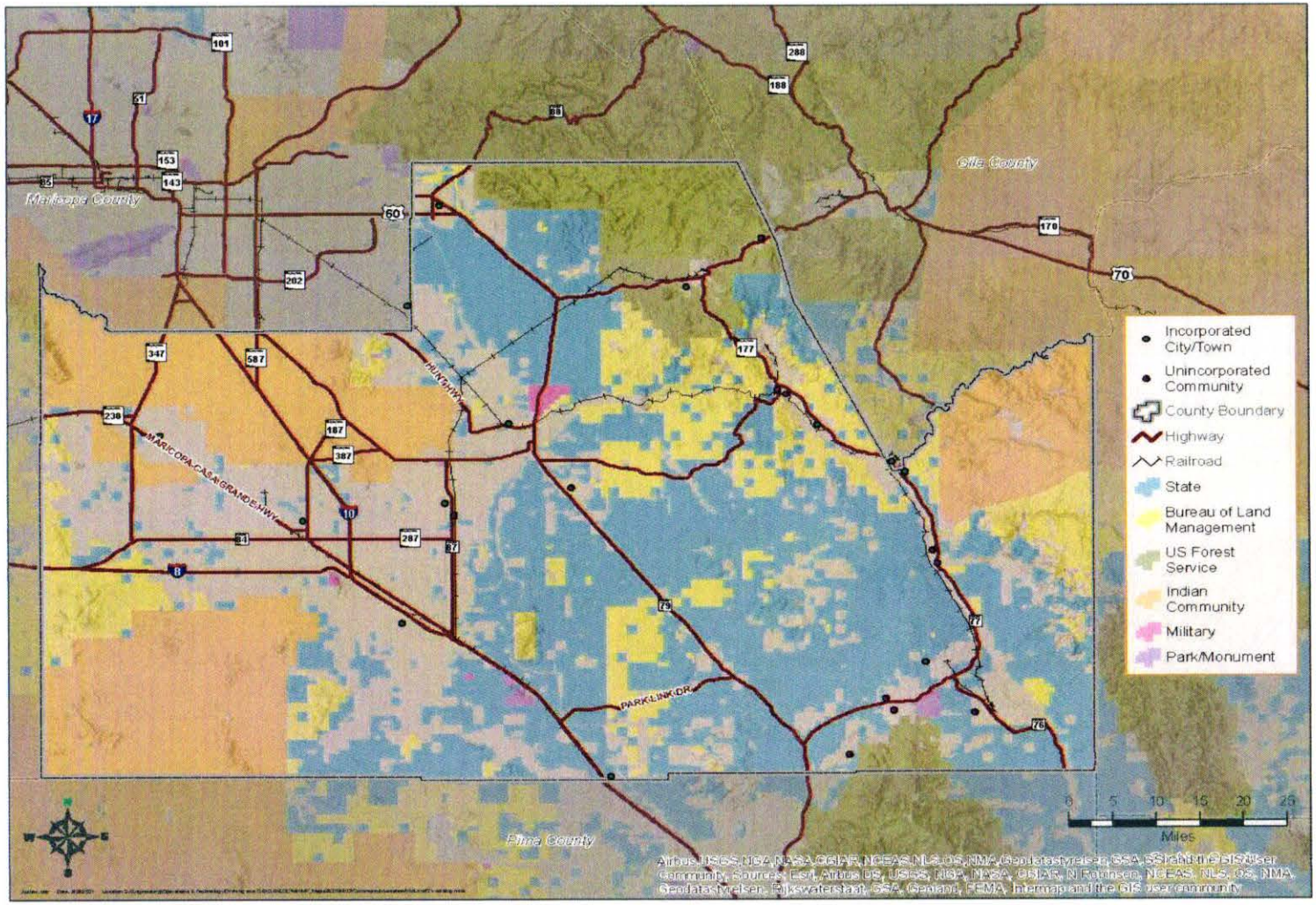
Map 2-1: Vicinity



Map 2-2: General Location and Transportation



Map 2-3: Ecoregions



Map 2-4: Community Location and Land Ownership

Climate

For the majority of Pinal County, the climate is typical to the Sonoran Desert areas of the state. In the relatively small areas of the county above 4,000 feet mean sea level, the climate tends to be more moderate. Climatic statistics for weather stations within Pinal County are produced by the Western Region Climate Center[3] and span records dating back to the early 1900's.

Average temperatures within the County range from near freezing during the winter months to over 100°F during the summer months. The severity of temperatures in either extreme is highly dependent upon the location, and more importantly the altitude, within the county. For instance, temperature extremes in the foothill communities will generally be about 10° less than those in the valley communities.

Precipitation throughout Pinal County is governed to a great extent by elevation and season of the year. From November through March, storm systems from the Pacific Ocean cross the state as broad winter storms producing mild precipitation events and snowstorms at the higher elevations. Summer rainfall begins early in July and usually lasts until mid-September. Moisture-bearing winds move into Arizona at the surface from the southwest (Gulf of California) and aloft from the southeast (Gulf of Mexico). The shift in wind direction, termed the North American Monsoon, produces summer rains in the form of thunderstorms that result largely from excessive heating of the land surface and the subsequent lifting moisture-laden air, especially along the primary mountain ranges. Thus, the strongest thunderstorms are usually found in the mountainous regions of the central southeastern portions of Arizona. These thunderstorms are often accompanied by strong winds, blowing dust, and infrequent hail storms.[4]

Table 2-1: Average Climate Based on Florence as Location

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Avg High Temp (F)	66	70	74	83	91	101	102	101	97	87	74	66
Avg Low Temp (F)	38	41	44	50	58	67	76	75	69	57	44	39
Avg Precip (Inches)	1.06	1.06	1.14	.39	.28	.16	.94	1.22	.91	.91	.75	1.22

Source: U.S. Climate Data, http://www.usclimatedata.com/

Population

As of January 2015, the total population for Pinal County is estimated to be 402,560 residents, which is nearly 200% greater than the 2003 estimate of 201,565 reported in the 2005 Plan. Most of the citizens still live in the incorporated communities or reservation portion of Pinal County. The largest community is Casa Grande. All five incorporated cities and four towns are geographically dispersed throughout the County from each other. The other un-incorporated communities and places located throughout the county are usually situated along a major highway and are mostly comprised of only one structure or landmark.

[3] Most of the data provided and summarized in this plan are taken from the WRCC website beginning at the following URL: http://www.wrcc.dri.edu/CLIMATEDATA.html

[4] Office of the State Climatologist for Arizona, 2021. Partially taken from the following weblink: https://azclimate.asu.edu/

Table 2-2: Population Estimates for Pinal County			
Jurisdiction	**2010**	**2014**	**2020**
Pinal County (Unincorporated)	187,868	199,215	235,715
Apache Junction	35,534	37,339	42,226
Casa Grande	48,664	50,821	60,135
Coolidge	11,855	12,027	17,698
Eloy	16,657	16,531	27,798
Florence	25,537	26,828	38,147
Kearny	1,947	1,989	2,107
Mammoth	1,425	1,451	1,801
Maricopa	43,598	46,708	63,861
Superior	2,835	2,869	3,189
Source: https://population.az.gov/population-estimates			

Economy

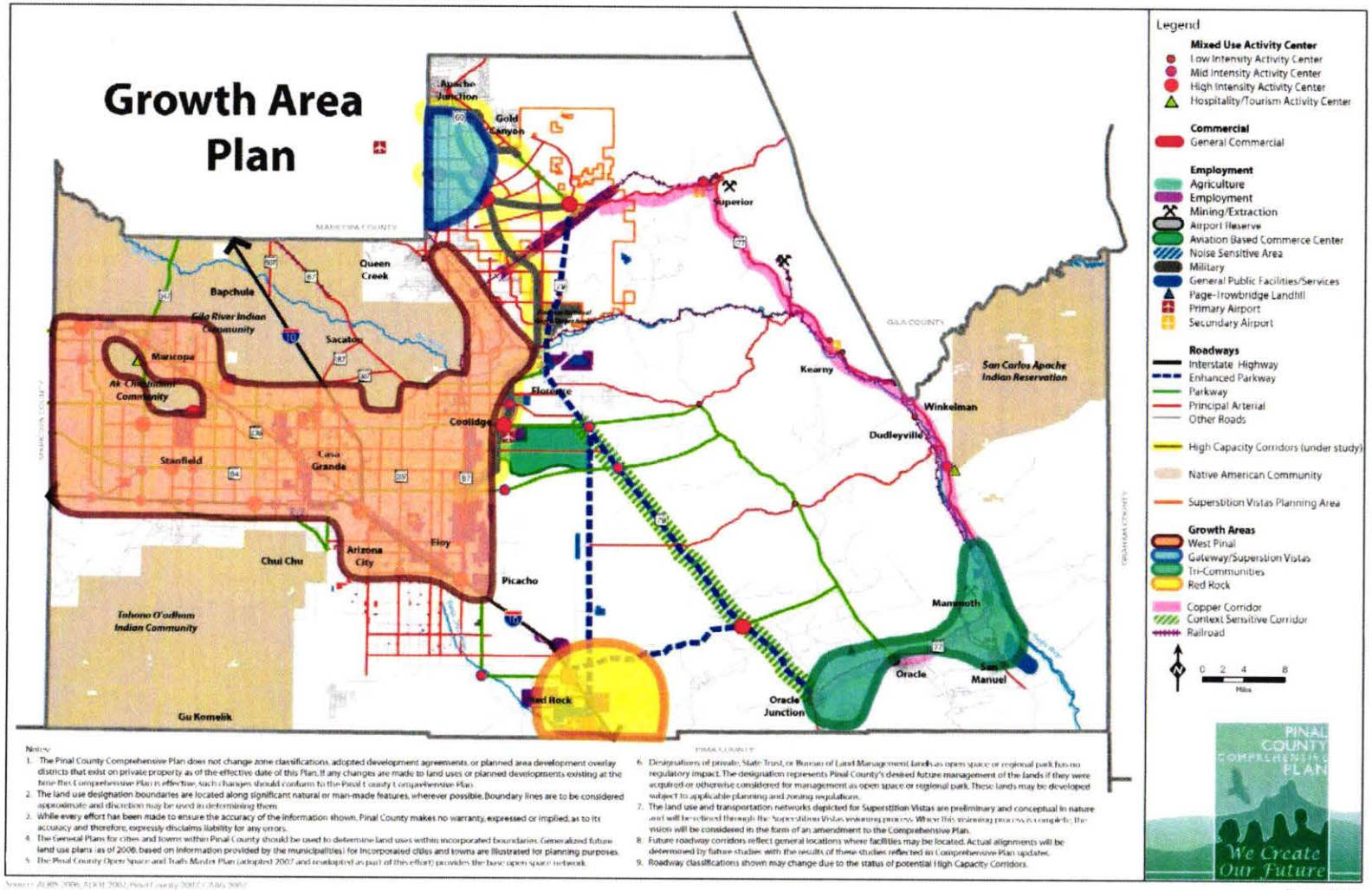
Many communities throughout Pinal County have been traditionally involved with copper mining, smelting, milling, and refining, while others have developed agriculture-based economies. The larger communities such as Maricopa, Apache Junction, Coolidge, Eloy, and especially Casa Grande have included manufacturing, transportation/logistics, trade, and services to diversify their economic base.

The residential and commercial/industrial growth experienced by Pinal County is through the expansion of the Sun Corridor which includes most of the county but more specifically areas in and around I-10 and I-8. The entire county is now included as part of Phoenix Federal Foreign Trade Zone #75 which carries significant tax reduction programs for manufacturing/warehousing companies that qualify. The balance of the county focuses on public administration, health services, retail trade, tourism, leisure, and hospitality.

Over the last 13 years, and especially during the period of 2004-2008, people have flocked to Pinal County because of the affordability of larger homes at a lower price and the rural living. Enhanced growth factors of economic opportunity, cheap housing and land, beneficial climate, and an active lifestyle are transforming the region from a primarily agricultural center to a vibrant commercial, industrial, and recreational hub. Growth in the northern areas of the county commonly bordering Maricopa County, are due to the steady expansion of the Phoenix metropolitan areas. This is especially true in the areas around Apache Junction and Maricopa. Other areas around Coolidge, Casa Grande, and Eloy are also significantly outpacing previous population projections. This rapid growth presents a significant challenge to the County in maintaining sustained economic prosperity, enhancing the quality of life, and safety of county residents. Pinal County still maintains a current annual growth rate of 1.9% or about 7,000-8,000 new residents each year.

As of March 2010, the labor force was estimated at 125,225 with an unemployment rate of 11.8%.[1] As of May 2015, the labor force was estimated at 152,200 with an unemployment rate of 5.8% which is a very good sign of economic prosperity returning to the county. As of March of 2020

[1] Source: Arizona Workforce Informer website at: http://www.workforce.az.gov/cgi/dataanalysis/?PAGEID=94&SUBID=142



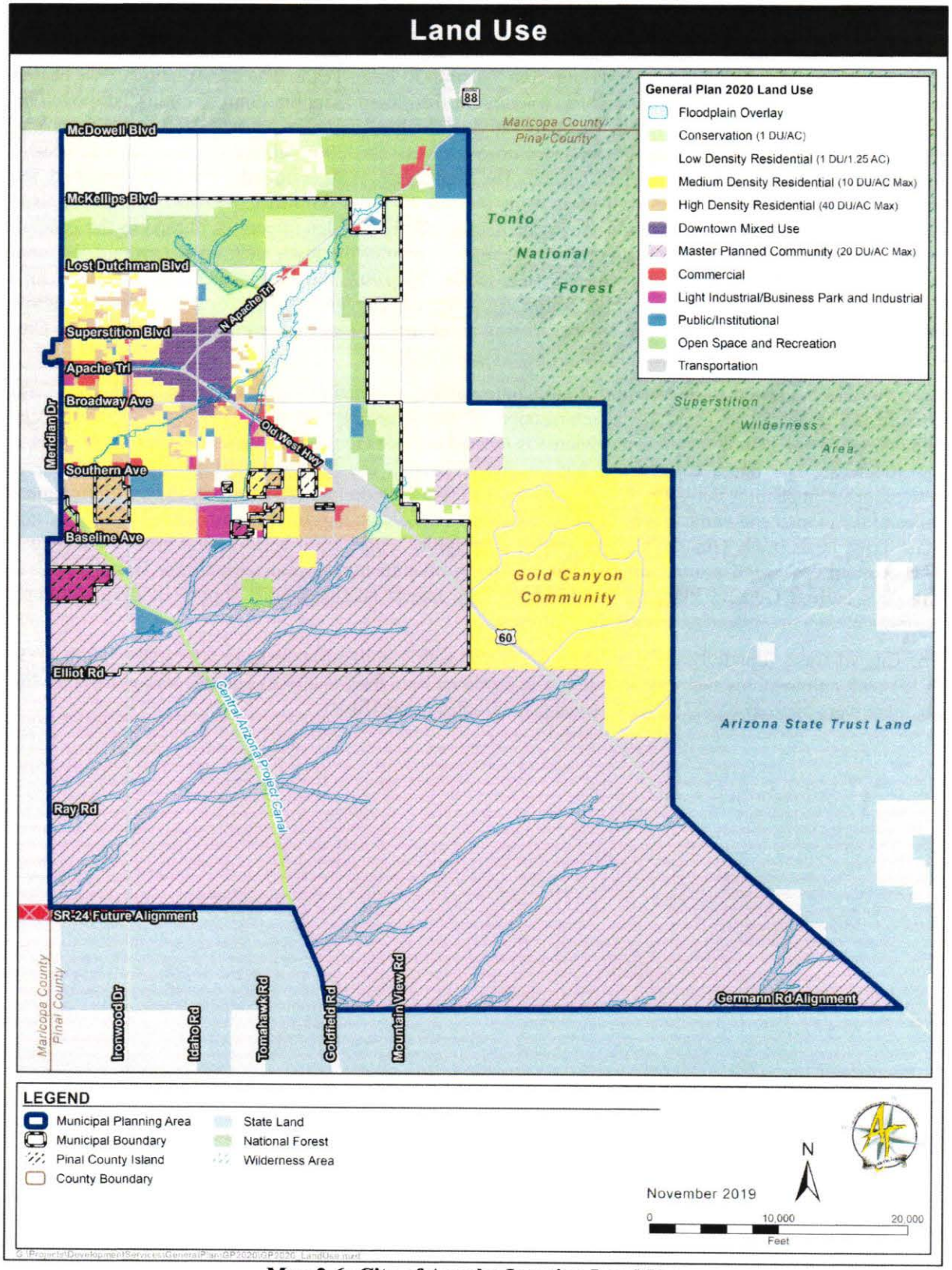
Map 2-5: Pinal County Growth Area

2.2 Jurisdictional Overviews

2.2.1 Apache Junction

In 1905, the Apache Trail created a route from Phoenix and Globe to the construction site of the Roosevelt Dam. Its proximity to the western end of the trail gave Apache Junction its name. The route helped to transport needed supplies and parallels the Apache Indian's ancient path through the canyons. Today, Apache Junction is the eastern gateway into the Phoenix metropolitan area, making the US Highway 60 (Superstition Freeway) traveler's primary route into the Phoenix valley. Apache Junction also acts as the western gateway to most of the Tonto National Forest's aquatic recreation venues for the metropolitan area via Superstition Freeway and State Route 88. The community retains a southwestern territorial feel characterized as an equestrian community surrounded by open space and a gateway to natural splendor dominated by the nearby Superstition and Goldfield Mountains.

Geographically, Apache Junction is in the extreme north-central portion of Pinal County. The city is at an elevation of 1,715 feet and encompasses 36.5 square miles a year-round population estimated at 43,700. Each year this number is estimated to double as the city welcomes over 40,000 seasonal winter residents. It is anticipated in 2021, the city will annex an additional 8,100 acres of State Trust Land that will have a significant impact on population growth in the next three to five years. State Route 88, Apache Trail, and the Old West Highway intersect at the heart of the city, and along with the Superstition Freeway, serve as the major roadway corridors through the city. Planned transportation corridors to accommodate growth include the SR24 extension and the planned North/South corridor.



Map 2-6: City of Apache Junction Land Use

2.2.2 Casa Grande

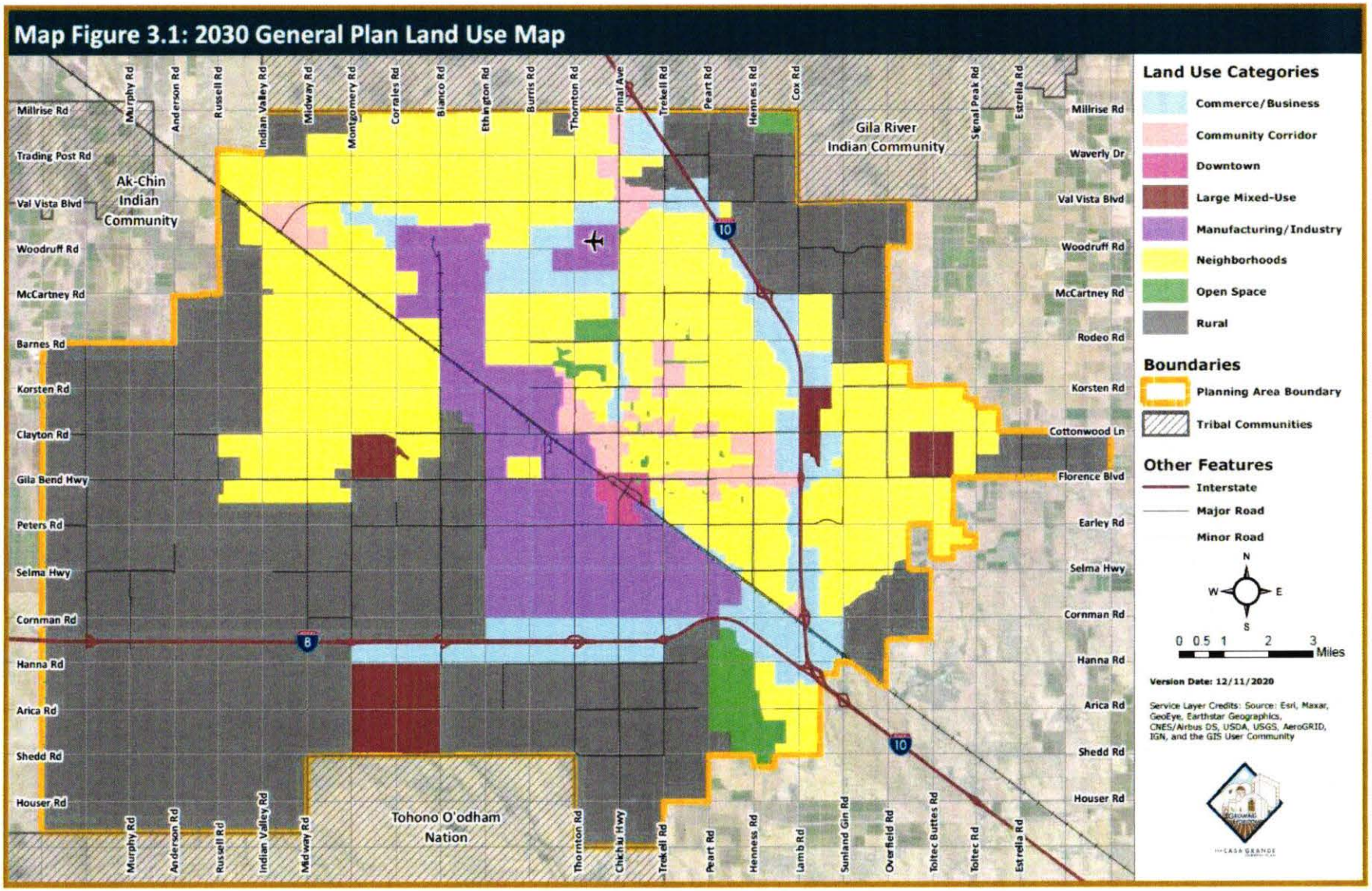
The City of Casa Grande traces its beginnings to the summer of 1879 when Southern Pacific Railroad stopped work on the rail line it was building from Yuma to El Paso, Texas. The construction crews ceased work due the hot temperatures. As supplies piled up at this desert stopping point, the railroad moved on leaving the community of Terminus, meaning "end-of-the-line" which consisted of five residents and three buildings, remaining. The railroad's construction boss and 300 Chinese laborers arrived shortly thereafter and began laying track to Tucson. By September 1880, railroad executives renamed the settlement Casa Grande, for the prehistoric ruins located 20 miles northeast. By 1882, the mines used Casa Grande as the railhead. Twice in the same decade all the wooden structures burned to the ground, but community leaders and merchants rallied together to rebuild the town each time. During a national mining slump, Casa Grande nearly died in the 1890s. By 1902, the business district dwindled to a mercantile store, saloon, and two smaller stores. Agriculture became a mainstay for the community, while preventing the town from becoming another mining ghost town. Since its incorporation in 1915, the City has grown to be the largest community in western Pinal County.

Casa Grande is located in mid-central Pinal County and is situated at an elevation of 1,398 feet. Casa Grande is strategically located at the intersection of two interstate highways (I-8 and I-10) in an area known as Arizona's Golden Corridor. Phoenix is located 45 miles to the northwest and Tucson 70 miles to the southeast. The Santa Cruz Wash and its North Branch are the two most prominent ephemeral watercourses impacting the City. The City limits of Casa Grande include approximately 113.76 square miles of developed and undeveloped land.[5] Casa Grande's location is primarily surrounded by Private and State Trust lands. Casa Grande is a progressive community with a rural heritage and hometown appeal. The economy is based around retail trade, shopping, manufacturing and agriculture. Based on Casa Grande's current General Plan, the predominant land use is neighborhoods supported by agriculture, business/commerce, manufacturing/industrial uses.

The City of Casa Grande has a population of 53,658 with a civilian labor force of 26,886 (ACS 2015-2019) with an unemployment rate of 6.8%, a little higher than the State (6.6) and the Nation (5.4). In FY 20, there were approximately $1.8 billion of taxable sales in the City.[6]

[5] City of Casa Grande G.I.S. 2021

[6] City of Casa Grande Finance Department, Arizona Department of Revenue



Map 2-7: City of Casa Grande Land Use

2.2.3 Coolidge

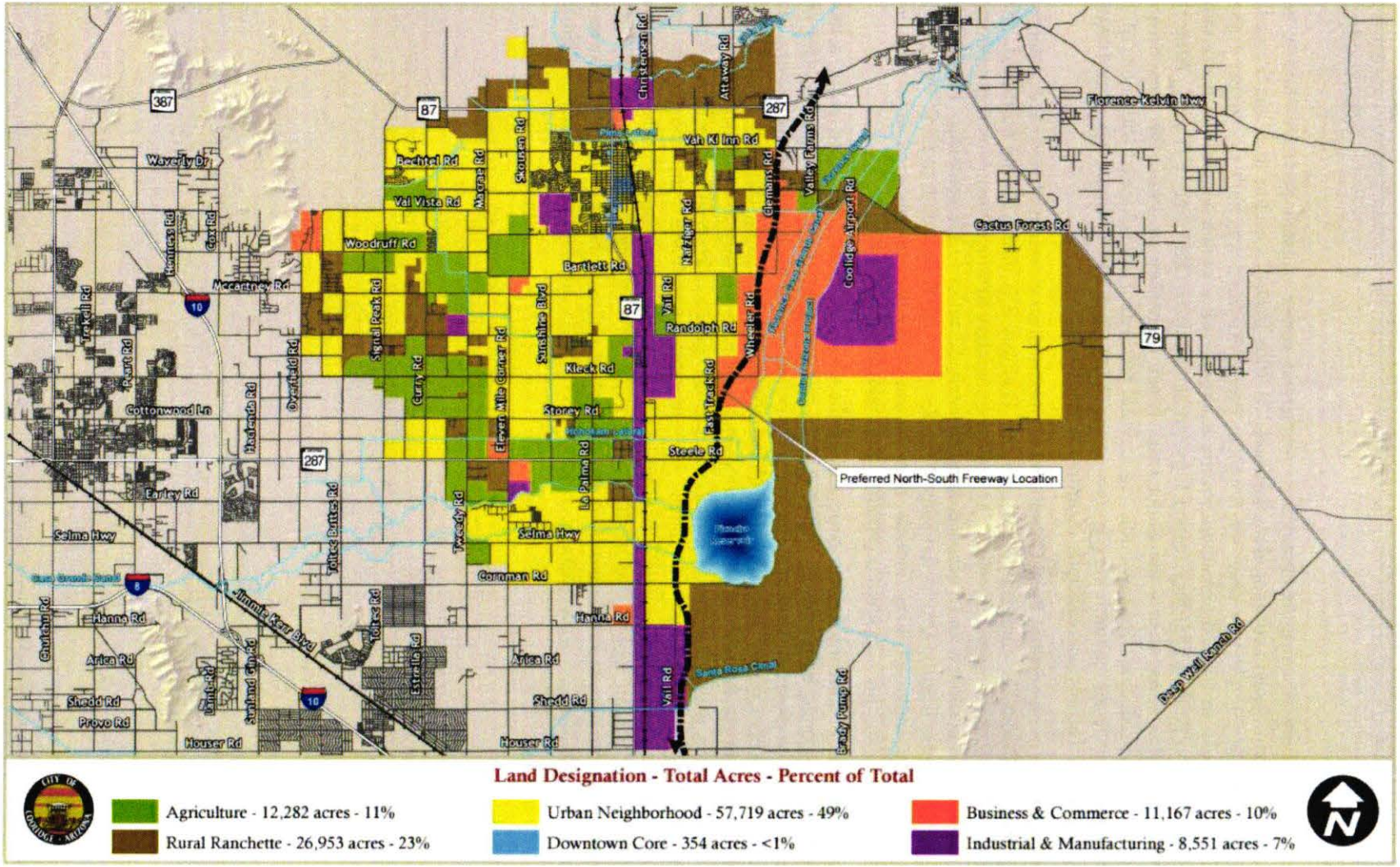
Founded in 1925 and incorporated in 1945, Coolidge is the commercial center of Arizona's cotton industry. According to the AZ Department of Commerce[7], Coolidge was founded by R. J. Jones when he laid out an 80-acre site following the construction of Coolidge Dam and the delivery of precious irrigation water to flat desert lands. The city was named in honor of President Calvin Coolidge who dedicated the dam in 1930. Coolidge is also the home of the Casa Grande Ruins National Monument, which features a four-story caliche structure built around 1350 A.D. by the Hohokam people. It was the first historic site created by the United States Government, on June 22, 1892.

Coolidge is located in mid-central Pinal County and is situated at an elevation of 1,418 feet. State Routes 87 and 287 form the northern boundary of Coolidge with the southern extension of State Route 87 dividing the city. Phoenix is approximately 51 miles to the northwest and Tucson is approximately 67 miles to the southeast. The primary watercourse impacting the city is the Gila River, which is located approximately one-mile north of the city. The city limits of Coolidge include approximately 62 square miles of developed and undeveloped land. Coolidge's location is primarily surrounded by private lands. Based on Coolidge's current General Plan, planned land uses vary from single family densities, commercial, industrial, and mix uses.

Up until the 1950s, the economy was primarily agriculture, and has since diversified into manufacturing, tourism and regional trade and services for agricultural producers and farm families. The 500-acre Pima-Coolidge Industrial park on the Gila River Indian Reservation has boosted manufacturing. The major public employers include City of Coolidge, Coolidge Unified School District, and Central Arizona College. The private employers include Wal-Mart Supercenter, Stinger Welding, and Bright International.

Population in 2019: 13,130 (91% urban, 9% rural) this is an increase from 2000 of +68.6%. Unemployment percentage of 7.3% is lower than the state average of 7.6%, with a record of sustained growth from 2016.

[7] Arizona Department of Commerce, 2015, *Community Profile for Coolidge, Arizona.*



Map 2-8: City of Coolidge Land Use

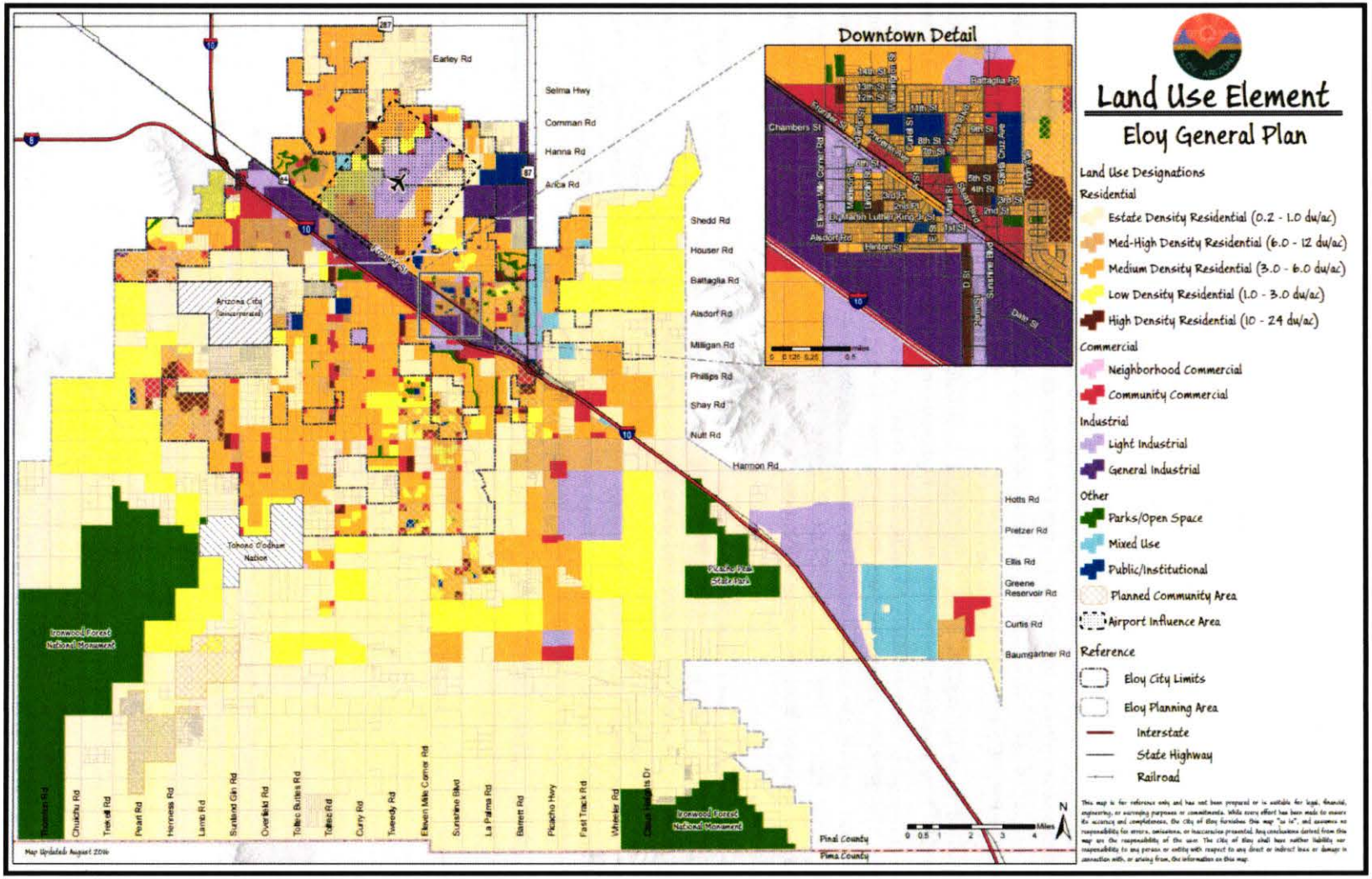
2.2.4 Eloy

The City of Eloy is an agricultural/travel/commercial center situated between Phoenix and Tucson in a major growth corridor along Interstate 10. Eloy traces its origins to a time before the beginning of the 20th Century when the Southern Pacific Railroad was built to connect Tucson and Casa Grande. In 1902, the Southern Pacific Railroad built a switch approximately six miles west of Picacho Peak, which they named Eloy, an acronym for 'East line of Yuma'. After the construction of a levee across the Santa Cruz River near Eloy in 1908, the area became recognized for producing cotton and other agricultural products. Eloy is located within one of the state's most fertile agricultural areas known as the Santa Cruz Basin, which has over 100,000 irrigable acres. The city was officially incorporated in 1949.

Eloy is located in mid-central Pinal County and is situated at an elevation of 1,565 feet. Interstate Highway 10 divides the community and Interstate Highway 8 is nearby to the northwest. State Routes 87 and 287 are near the eastern and northern boundary of Eloy. Phoenix is approximately 69 miles to the northwest and Tucson is approximately 52 miles to the southeast. The primary watercourse impacting the City is the Santa Cruz River, which flows south to north through the City. The city limits of Eloy include approximately 119 square miles of developed and undeveloped land. Eloy's location is primarily surrounded by private lands.

Agriculture has historically been a large part of the City's economy. In recent years, a more diversified economic base had developed with over three-quarters of the city's business and nearly half its employment now in the industrial, wholesale/retail trade, and service sectors. Eloy continues to evolve from a primarily agricultural economy to a diverse economy in one of the best locations in the Interstate system. With over 10 miles of freeway front-age, adjacent to the 1-10 intersection with I-8, numerous truck services and paralleled/served by the Union Pacific railroad, Eloy is a City committed to attracting warehouse/distribution/ecommerce, manufacturing, retail and hospitality. Currently, the City of Eloy's population is estimated at 19,000. The civilian labor force in 2017 was 3,773 with an unemployment rate of 6.4%. Education, health care & social assistance was the highest ranked industry in terms of number of people employed, accounting for 17.9% of the labor force.[9]

[9] http://www.azcommerce.com/a/profiles/ViewProfile/57/Eloy



Map 2-9: City of Eloy Land Use

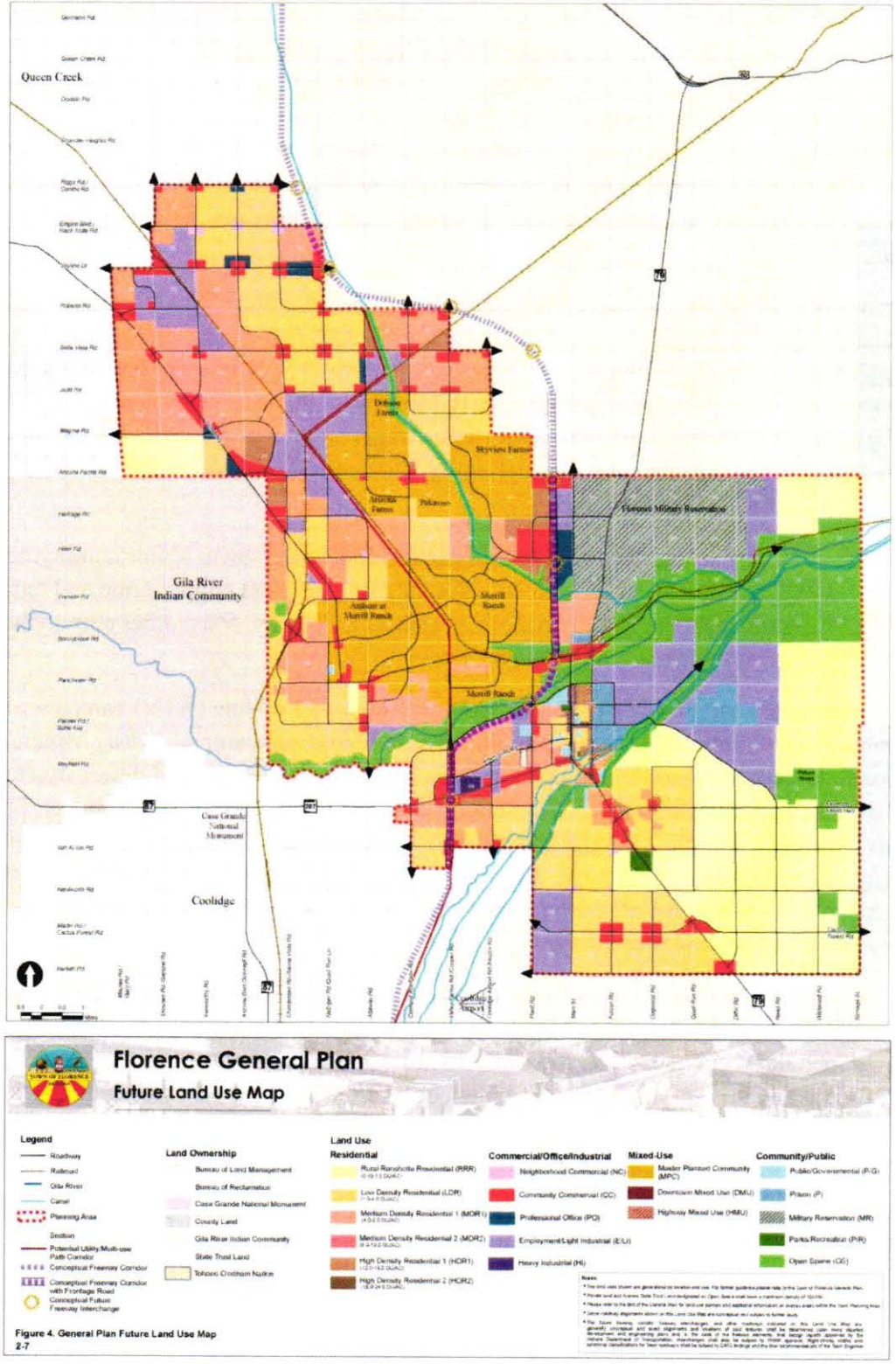
2.2.5 Florence

The Town of Florence is the County seat and home to the Pinal County government complex and the Arizona State Prison. The town was first platted in 1866 by Colonel Levi Ruggles, an Indian Agent. In the 1920s, the Florence area became the agricultural center for the county. A few months after Florence was established as the county seat, silver was discovered in the mountains nearby. The Silver King Mine drew miners and entrepreneurs to Florence as well as a major stagecoach hub and pony express route. During the height of silver boom, Florence boasted 28 saloons being in business. In 1889, the mine closed and a sharp decline in population resulted. The town was incorporated in 1900 and in 1909 the Territorial Prison was moved from Yuma to Florence. During World War II, a prisoner of war camp was established just north of Florence to house German and Italian prisoners. In the 1960s, the site was converted into a retirement community, with lots sold for recreational vehicles and manufactured homes. An inventory of historical buildings was initiated in 1982 and over 125 buildings and sites were recognized and listed in the National Register of Historic Places. In the last decade, the town has experienced the same building boom as the rest of Pinal County.

Florence is located in north central Pinal County and is situated at an elevation of 1,500 feet. State Highway 79 and 87 traverses the community. Nearby highways include Interstate 10, State Route 287 and Hunt Highway. Phoenix is approximately 61 miles to the northwest and Tucson is approximately 70 miles to the southeast. The primary watercourse impacting the town is the Gila River, which flows east to west through the central part of the town limits. The major transportation routes and land features around Florence are shown below. The town limits of Florence include approximately 62 square miles of developed and undeveloped land. Florence's location is primarily surrounded by private and state trust lands.

The civilian labor force in 2014 was 3,170 with an unemployment rate of 8.3%. Major sources of employment for Florence include the State of Arizona and numerous private correctional facilities, a federal immigration center, and the county and town government. Public administration was the highest ranked industry in terms of number of people employed, accounting for 27.4% of the labor force. The mining industry still contributes to the local economy, but has dwindled greatly in the last decade. Other economic sectors include waste management, food services, retail trade, and travel accommodations. Agricultural products such as cotton, cattle, grains, and grapes make up the rest of the economy.

Based on Florence's current General Plan, land use planning includes various densities of residential development, commercial, industrial, and mixed land uses as illustrated below in Map 2-9.



Map 2-10: Town of Florence Land Use

2.2.6 Kearny

Kearny was named after General Stephen Watts Kearny, who passed through the area on November 7, 1846, while leading 100 dragoons to California. The town was built by the Kennecott Mining Company in 1958 as a planned community to accommodate the populations of nearby Ray, Sonora and Barcelona, which were about to be swallowed by Kennecott's expanding open-pit copper mine. While many of houses in the town were newly built, some mine employees had their homes moved down the road. Kearny was officially incorporated in 1959.

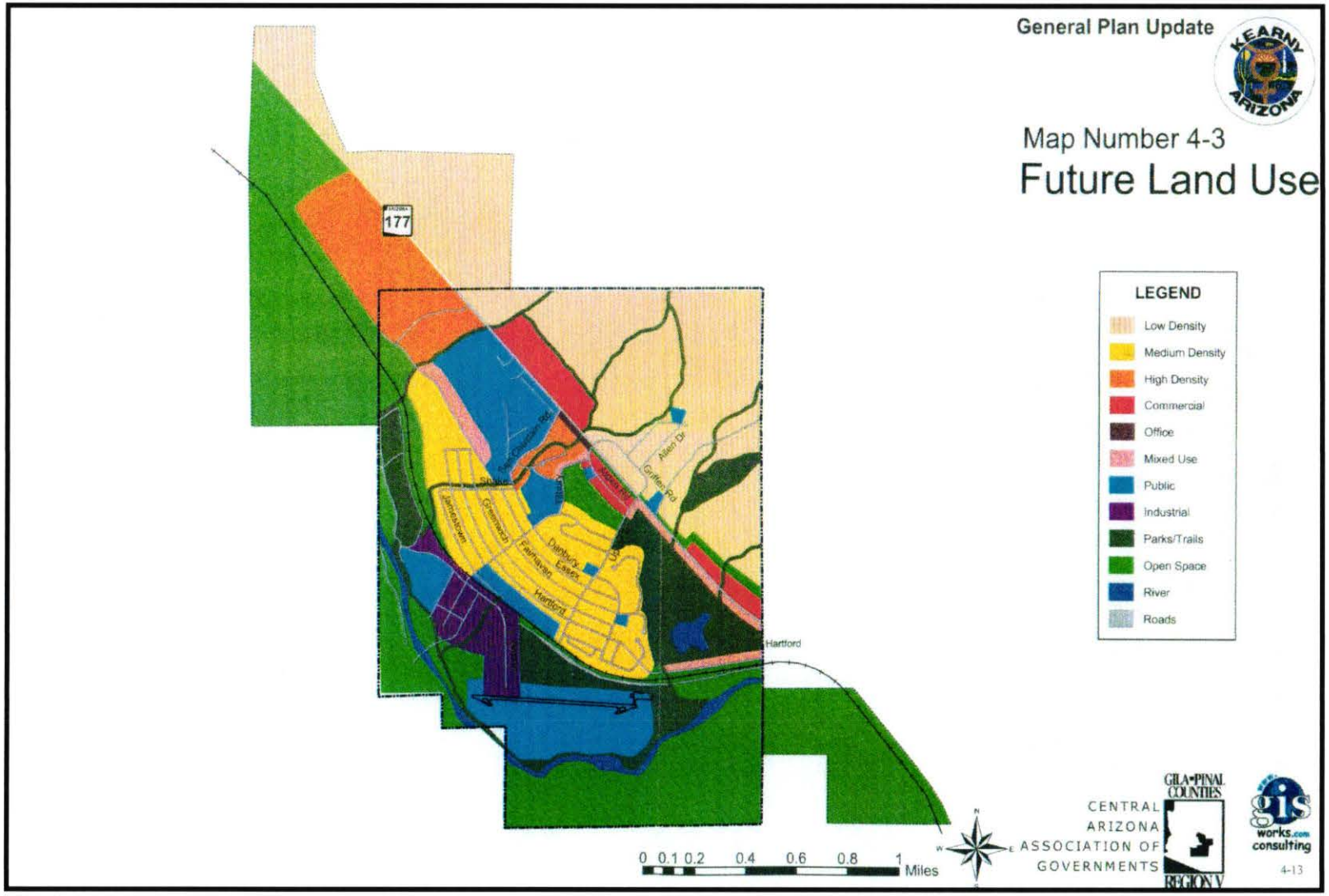
Kearny sits near the Gila River in the Copper Basin area in eastern Pinal County, Arizona, with a total land area of 2.8 square miles at an elevation of 2,020 feet. State highway 177 passes through the community. Other nearby highways include U.S. Highway 60 running from Superior to Globe. Phoenix is approximately 78 miles to the west and Tucson is approximately 80 miles to the south. The primary watercourse impacting the Town is the Gila River, which flows from the south to the north through town. The town is primarily surrounded by private and Bureau of Land Management land.

As of the 2010 census, there were 1,950 people residing in the town. Major employment comes from ASARCO (Grupo Mexico) who operates the large open-pit copper mine and reduction plant provides much of the employment for residents in Kearny. Most other employment in Kearny is in the commercial and services sectors.

Kearny is in the heart of ATV country and has off-highway vehicle (ATV) campsites in the mountain foothills and an 11-acre fishing lake with hiking and campsites. Ray Mines, one of Arizona's largest open-pit mining operations, is 11 miles north. Hills and desert vegetation of the area provide opportunities for the rockhound, photographer, historian, bird watcher, botanist and hunter. Fishing, camping, walking and picnicking are popular along portions of the Gila River. Kearny has a nine-hole golf course. Area highways provide dramatic mountain and canyon scenery. A few miles west of nearby Superior is the Thompson Southwest Arboretum, famous for its variety of southwestern flora.

The town of Kearny has a library, community center, three parks, one 9-hole golf course and many athletic facilities including Little League, football, softball and baseball fields. Kearny's uptown includes the General Kearny Inn, bars, cafes, a large grocery store, a drugstore and several commercial establishments. Its wide boulevard is used for many community festivals. Kearny has a downtown commercial area which includes an airport, restaurants and livestock corrals. The Copper Basin Railroad runs through the lower portion of the town.

Based on Kearny's current General Plan, and use planning includes various densities of residential development, commercial, and mixed land uses as illustrated in Map 2-11.



Map 2-11: Town of Kearny Land Use

2.2.7 Mammoth

Mammoth is located in southeastern Pinal County and is situated at an elevation of 2,350 feet. State Highway 77 passes through the community. Other nearby highways includes Interstate 10 and State Route 177. Phoenix is approximately 140 miles to the northwest and Tucson is approximately 40 miles southwest. The primary watercourse impacting the Town is the San Pedro River, which flows to the north on eastside of town. The town limits of Mammoth include approximately 26 square miles of developed and undeveloped land. Mammoth's location is primarily surrounded by Private and State Trust lands. Land uses represent a typical small town mix of residential, commercial, industrial and open space areas. The Town of Mammoth is a predominantly low-income community with deep roots in the mining and ranching industry. The water sewer and cemetery are all owned and operated by the Town of Mammoth. The town has struggled with low property values, deteriorating infrastructure and poor economic growth.

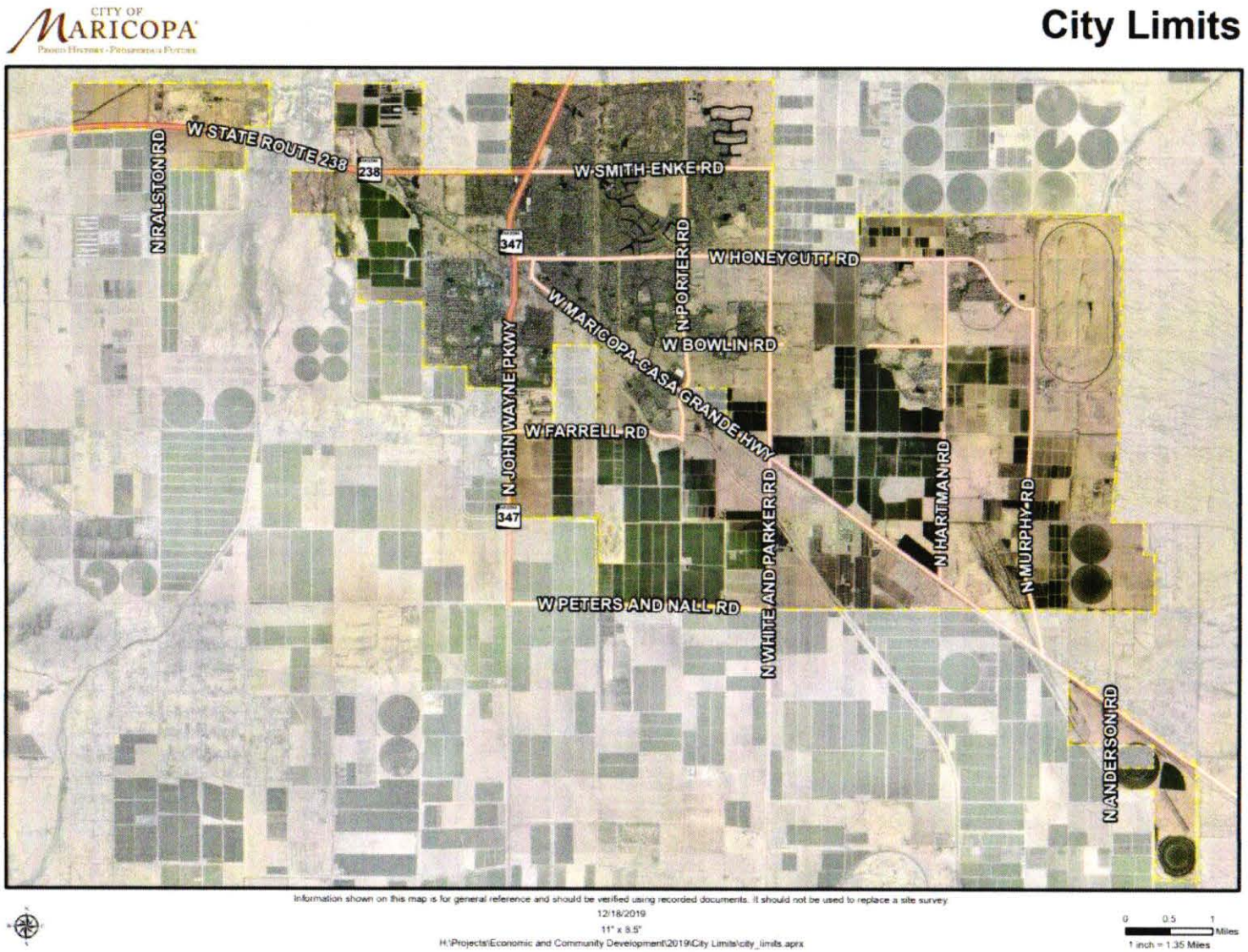
2.2.8 Maricopa

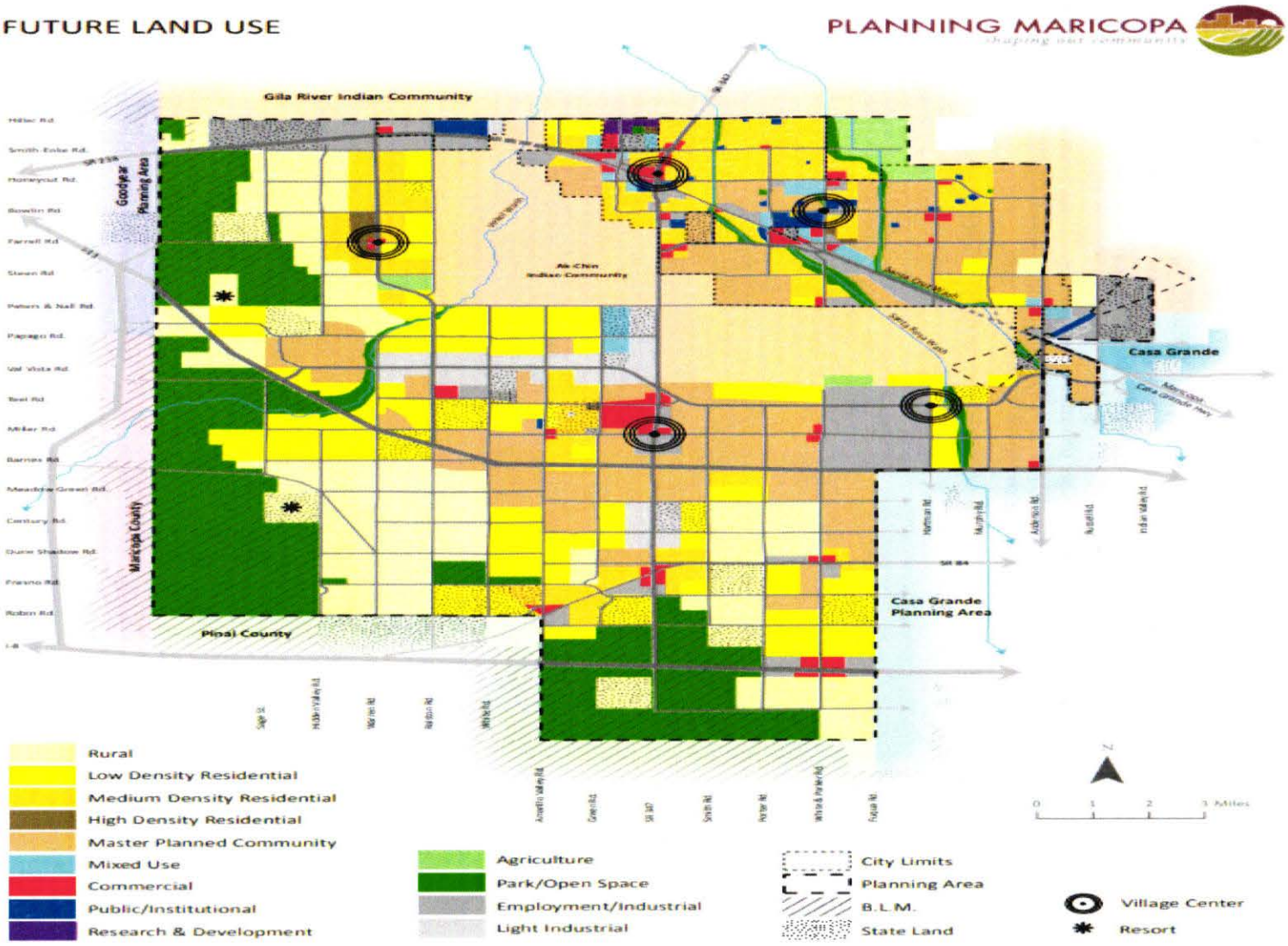
Maricopa's long and rich history starts over 300 years ago beginning with a 1694 journal entry by Father Eusebio Francisco Kino describing this area and calling it Maricopa Wells. During the mid – 1800s, it was a dependable source of water along the Gila Trail. This location became an important and well-known stage stop, offering food, water, and support to weary travelers on the Butterfield Stage Line traveling between San Antonio and San Diego. In the 1870s, the railroad was constructed south of the wells. At that time, Phoenix was just a little village exercising its political influence which led to the building of a spur line from Maricopa to Phoenix. In July of 1887, Maricopa became a major junction for two railroads, the Southern Pacific Railroad and Maricopa & Phoenix (M&P) Railroad, hundreds of people could be seen daily, waiting at the station or one of the two hotels for traveling to Tempe and Phoenix. The M&P suffered difficulties including frequent floods that washed out the line causing the trains to be days or weeks late. In 1935, the M&P was shut down and tracks were pulled up all the way to Phoenix. Maricopa's pace slowed down considerably due to lack of travelers from the north. The community once again relied considerably on a robust and consistent agricultural production, with cotton being the staple crop through the 1950s and 1960s. In the 1970s and 1980s hundreds of acres of farmland were sold to developers who subdivided it into three and a third acre mini farms which attracted large numbers of residents from all walks of life and occupations, bringing with them a dream for a better life and a desire to raise their children in the country. The city incorporated on October 15, 2003, and has transitioned from a predominantly agricultural community to a residential bedroom community within easy commuting distance to Phoenix or Casa Grande. Since its incorporation in October 2003, the City of Maricopa has become Arizona's fastest growing community, transforming from an agricultural community of under 2000 to a city of 60,000 today. The population is projected to be of 106,000 residents by 2040. The average household size in Maricopa is currently 3.0. The number of families is 23,956. Maricopa's labor pool is highly educated with 65% holding a bachelor's degree or higher.

The City of Maricopa is located in northwestern Pinal County and is situated at an elevation of 1,176 feet. State Highway 347 and 238 intersect within the community and other nearby highways include Interstate 8 and 10. Phoenix is approximately 15 miles to the north and Tucson is approximately 68 miles southeast. The primary watercourses impacting the city are Vekol, Santa Rosa and Santa Cruz Washes. The major transportation routes are the railroad tracks located center of the city. The railroad divides the city in two when regular trains travel, and passenger commuter trains stop to load and unload passengers. The city limits of Maricopa include approximately 56 square miles of land. Maricopa's location is primarily surrounded by private, state trust and Indian lands.

In the fall of 2014, the City Council launched a comprehensive citizen-driven project to create a strategic plan designed to guide Maricopa into the next 25 years of its future. The Maricopa 2040 Vision and Strategic Plan is a broad blueprint for positive change and progress that defines a vision and key strategic outcomes required to achieve that vision. The city's intent is to pursue a singular vision which, when realized, offers its residents a proud heritage, a high quality of life, a prosperous future, and the enjoyment of residing in an attractive city; a great place to live, work and play. On May 5, 2015, the Steering Committee presented a copy of the City of Maricopa 2040 Vision and Strategic Plan to the City Council for adoption. The strategic plan also defines those areas of strategic importance and focus stated as Vision Elements, where critical resources should be spent – time, talent, and money – to reach the vision and answer the question, "What really is most important?" For each Vision Element, specific goals and strategies are proposed to aid the community and city in their pursuits to address the element toward achievement.

Map 2-12: City of Maricopa





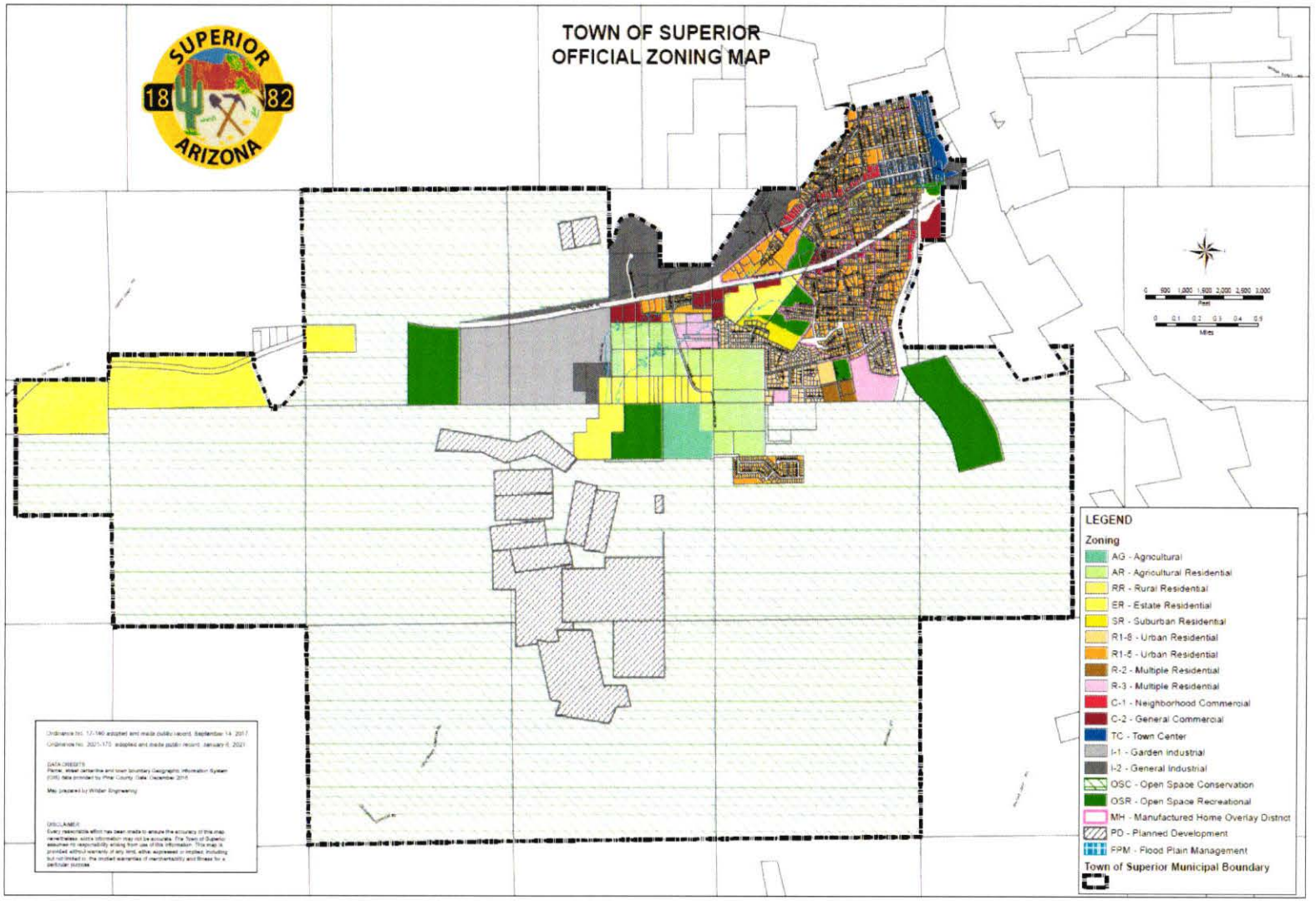
Map 2-13: City of Maricopa Land Use

2.2.9 Superior

The Town of Superior incorporated in 1976.

The Town of Superior is located in the Northeastern part of Pinal County, Arizona, and is situated at an elevation of 2,841 feet. The town covers approximately 1.94 square miles of formal boundaries and has 22.6 miles of total road surface. Superior has a transient working population with a base of 2,920 people as of the 2015, census. U.S Highway 60 and State Highway 177 intersect within the community. The Town of Superior is surrounded by high hills and small mountain ranges consisting primarily of private and forest lands. Therefore, Superior receives a lot of rain water runoff from these mountain areas during monsoon season. The primary watercourse impacting the town is Queen Creek.

Phoenix is approximately 63 miles to the west and Tucson is approximately 102 miles southward.



Map 2-14: Town of Superior Land Use

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SECTION 3: PLANNING PROCESS

3.1 Primary Points of Contact

Pinal County
Joshua Plumb
Civil Engineering Section Chief
Pinal Flood Control District

Apache Junction
Shane Kiesow
Public Works Manager
City of Apache Junction

Casa Grande
Chris Lawson
Streets Superintendent
City of Casa Grande

Coolidge
Mark Dillon
Fire Chief
City of Coolidge

Eloy
David Malewitz
City Manager
City of Eloy

Florence
Chris Salas
Public Works Director
Town of Florence

Kearny
Sharon Jakubowski-Wolz
Town Manager
Town of Kearny

Mammoth
John Schempf
Town Manager
Town of Mammoth

Maricopa
Eddie Rodriguez
Fire Marshal
City of Maricopa

Superior
Todd Pryor
Town Manager
Town of Superior

3.2 Planning Team and Activities

At the beginning of this planning process, Pinal County identified members for the Planning Team by initiating contact with and extending email invitations to all incorporated communities within the county limits. Other entities that were invited to participate included: Pinal Partnership, Arizona Public Service, Century Link, Banner Medical, Arizona Department of Environmental Quality, National Weather Service, Arizona Geological Survey, State Climatologist, Salt River Project, Arizona Department of Corrections, Cobre Valley Medical, Southwest Gas, Rural Metro, Fire Districts, AZ Water, Ak-Chin Indian Community, Gila River Indian Community, Hohokam Irrigation & Drainage, and San Carlos Apache Irrigation & Drainage. The participating members of the Planning Team are listed below, and returning members are in bold print.

Table 3-1: Planning Team

Name **Title**	**Agency/Dept/Org**	**Role**
Chris Lawson Streets Superintendent	City of Casa Grande	Represent Casa Grande in planning process.
Glenn Boothe **Emergency Manager**	Ak-Chin Indian Community	Plan awareness. Ak-Chin is not a participating jurisdiction in this Plan.
Steve Mondello **Emergency Management Coordinator**	City of Maricopa	Assisting in the overall coordination of the Plan update.
Erika Wilkerson Assistant Director	AZ Dept of Emergency & Military Affairs	Observe the planning process.
Alexandria D. Maese Mitigation Planner	AZ Dept of Emergency & Military Affairs	Management level support for planning effort

Table 3-1: Planning Team		
Name **Title**	**Agency/Dept/Org**	**Role**
Ken Drozd **Warning Coordinator**	NWS, Tucson	Provide weather related information.
Sharon Jakubowski-Wolz Town Manager	Town of Kearny	Represent Kearny in the planning process.
Todd Pryor Town Manager	Town of Superior	Represent Superior in the planning process.
Mark Dillon Fire Chief	City of Coolidge	Represent Coolidge in the planning process.
Chris Salas Public Works Director / Town Engineer	Town of Florence	Represent Florence in the planning process.
Shane Kiesow **Manager**	Apache Junction Public Works	Represent Apache Junction in the planning process.
Melissa Weimer City Manager's Office	Eloy	Represent Eloy in the planning process.
Dave Keen Fire Chief	City of Casa Grande Fire Dept	Represent Casa Grande in the planning process.
John Padilla **Emergency Mgmt Coordinator**	APS	Act as SME where needed.
Eddie Rodriguez **Deputy Fire Marshall**	Maricopa Fire	Represent Maricopa in the planning process.
Ken Piggott **Superintendent and Fire Chief**	Kearny Public Works and Fire Department	Represent Kearny in the planning process.
John Schempf City Manager	City of Mammoth	Represent the City of Mammoth in the planning process
Angela Sanchez	City of Mammoth	Represent the City of Mammoth in the planning process
Kelly Weddle **Chief**	Eloy Fire District	Represent Eloy Fire District in the planning process.
Erinanne M. Saffell, PhD Arizona State Climatologist	Arizona State University	Subject Matter Expert
F. Michael Conway Sr. Research Scientist	Arizona Geological Survey	Subject Matter Expert
Brian Gilbert Assistant Fire Chief	Rural Metro Fire Department	Represent Rural Metro Fire in the Planning Process
Joe LaFortune Emergency Manager	Town of Queen Creek	Plan awareness. Queen Creek is not a participating jurisdiction in this Plan
Bruce Harvey Emergency Manager	Gila River Indian Community	Plan awareness. Gila River is not a participating jurisdiction in this Plan
Wade Brannon Emergency Planner	Pinal Co Emergency Mgmt	Assisting in the overall coordination of the Plan update.
Benjamin Coker	Pinal Co Public Works	Providing GIS services for inclusion

Table 3-1: Planning Team		
Name Title	**Agency/Dept/Org**	**Role**
GIS Analyst		in the Plan.

The Planning Team met for the first time on July 22, 2021, to begin the planning process. The plan was reviewed and explained to familiarize the attendees with the document and discuss expectations. The Planning Team also reviewed current hazards to revise them during the update process. The team discussed their hazards and mitigation strategies for the second meeting on August 18, 2021. In meetings three and four, the Planning Team reviewed the capability assessment and developed new mitigation strategies, and set a schedule to review and update the plan for the next five years. For all four of these meetings, the Planning Team received assignments via email to facilitate the update process and assistance from DEMA. Additional meetings were also held at the local level between participants to complete the tasks via email and phone.

The planning process included coordination with agencies and organizations outside the participating jurisdiction's governance to obtain information and data for inclusion and provide more public exposure to the planning process. Information and data used in the plan were developed or provided by the Planning Team and other agencies or organizations. The team used their own or surrounding resources to obtain the information included. These resources include:

Table 3-2: Local Planning Resources		
Name Title	**Agency/Dept/Division**	**Jurisdiction**
Richard Mooney Asst Fire Chief	Superstition Fire & Medical District	Apache Junction
David Keen Fire Chief	Fire Dept.	Casa Grande
Mark McCrory Police Chief	Police Dept.	Casa Grande
Harry Grizzle Police Chief	Police Dept.	Coolidge
Matt Rencher Director/Engineer	Public Works Dept.	Coolidge
Christopher Vasquez Police Chief	Police Dept.	Eloy
Jim Walters Interim Fire Chief	Fire Department	Florence
Lisa Garcia Interim Town Mgr.	Town of Florence	Florence
Brad Pitassi Fire Chief	Fire Dept.	Maricopa
Jim Hughes Chief	Police Dept.	Maricopa
Eduardo Raudales City Engineer	Development Services	Maricopa
Kore Redden Interim Division Manager	Pinal Co Public Health	Pinal County
Matt Thomas	Pinal County Sheriff's	Pinal County

Table 3-2: Local Planning Resources		
Name Title	**Agency/Dept/Division**	**Jurisdiction**
Chief Deputy	Office	

3.3 Public and Stakeholder Involvement

Public involvement and input to the planning process was encouraged cooperatively among all the participating jurisdictions using several venues throughout the pre-draft planning process. The plan will remain continually on the county website.

The pre-draft public involvement strategy for the plan development included press releases, public notices, and newspaper articles. The 2022 Plan was posted to the county website and made available for review and comment. The local jurisdictions placed announcements on their websites linking the reader to the plan on the county website. The post-draft strategy included posting the draft plan to the county and participating jurisdictions website requesting public comment. The post draft was also released through press releases and public notices. All comments from the public was collected and incorporated into the Plan.

Table 3-3: Past Public and Stakeholder Involvement	
Jurisdiction	**Activity or Opportunity**
Pinal County	• Stakeholder Meetings • Plan shared on County website • Public Education and Awareness campaign, including brochures, meet and greets, and booths at the County Fair • Presentations of plan purpose, goals, and next steps at Board of Supervisors meeting • Presentation and adoption of the plan at Board of Supervisors meeting
Apache Junction	• Maintained city website containing the current Plan and contact information for those interested in contributing information or ideas to the planning process. • Published articles in local newspaper regarding hazard mitigation issues. • Actively participated with Pinal County Flood Control District, to target properties in high-risk areas. • Held inter-agency/jurisdictional meetings to better coordinate hazard mitigation initiatives, develop understandings, further identify stakeholder viewpoints and interests, and to continually improve the education and participatory process across jurisdictional boundaries.
Casa Grande	• Provided mitigation brochures to the public at community events. • Silent Witness Anti-Crime Night • Mayors State of the City Address
Coolidge	• Provided mitigation brochures to the public at community events: o The Mayor's State of the City Address o Calvin Coolidge Days o Coolidge Cotton Days
Eloy	• Updated the City of Eloy General Plan to include identification of risk and hazards in the community and plans to mitigate impacts on future development • Provided link to county plan on city website • Eloy Fire Department provides annual information on fire prevention and community risk reduction • Provide floodplain and related hazard mitigation information to property owners/developers in high risk areas

Table 3-3: Past Public and Stakeholder Involvement	
Jurisdiction	**Activity or Opportunity**
Florence	• Disseminate mitigation information to the public through community involvement with Fire and Police. • On duty crews from the Florence Fire Department will continue to deliver public safety information on such topics as: fire safety, water safety, and life safety, to schools, organized neighborhood meetings, church groups, daycare centers, and other organized community meetings. • Seek public input on Hazard Mitigation Plan utilizing city website.
Kearny	• Provided floodplain related hazard mitigation information to targeted properties in high-risk areas. • Provided information on the Town website.
Mammoth	The Mammoth Town Council holds public meeting to receive input from the residents of Mammoth. The town also has a Planning and Zoning and Parks and Recreation Boards to assist with planning and receive input • Published articles in local newspaper regarding the Plan. • Released periodic media statements related to mitigation activities and floodplain management updates. • Mayor and Council discuss and provide updates at local council meetings
Maricopa	• Brochures / flyers prepared and provided by DEMA were handed out by in the City booth at these events: Salsa Festival (April), July Fourth Celebration (July), and Founder's Day (October). • Fire and police (Safety Division) had a booth at these events and provided additional information for distribution
Superior	• Provided hazard and mitigation brochures at the Town Hall and Town Library. • Had a copy of the Plan available at the Town Hall. • Actively participated with Pinal County Flood Control District, to targeted properties in high risk areas.

3.4 Continued Public and Stakeholder Involvement

The following table summarizes activities for public involvement and dissemination of information that shall be pursued whenever possible and appropriate, throughout the coming 5-year planning period.

Table 3-4: Future Public and Stakeholder Involvement	
Jurisdiction	**Activity or Opportunity**
Pinal County	• Stakeholder Meetings • Plan shared on County website • Public Education and Awareness campaign, including brochures, meet and greets, and booths at the County Fair • Presentations of plan purpose, goals, and next steps at Board of Supervisors meeting • Presentation and adoption of the plan at Board of Supervisors meeting • Annual updates to the Board of Supervisors
Apache Junction	• Maintain a page on the City of Apache Junction website that will contain a copy of the current Plan and contact information for those interested in contributing information or ideas. • Publish articles in local newspaper regarding hazard mitigation issues. • Actively participated with Pinal County Flood Control District, to target properties in high-risk areas. • Hold inter-agency/jurisdictional meetings to coordinate hazard mitigation initiatives, further understandings, identify stakeholder viewpoints and interests, and to maintain the education and participatory processes across jurisdictional boundaries.

Table 3-4: Future Public and Stakeholder Involvement	
Jurisdiction	**Activity or Opportunity**
Casa Grande	• Maintains a page on the City of Casa Grande website that contains a copy of the current Plan and allows the submittal of citizen comments and staff response to citizen inquiries. This page is monitored and updated by the City's Planning Team Representative. • Provides news releases to local media/City website related to mitigation activities and floodplain management. • Annually provides floodplain related hazard and mitigation information, in coordination with Pinal County Flood Control District, to targeted properties in high risk areas. • Establishing and training Fire Department personnel for a Community Emergency Response Team (CERT) program. • Discusses the plan and other disaster preparedness related activities at various public meetings, events, Casa Grande business roundtable quarterly meetings and Mayor State of the City annual broadcasts
Coolidge	• Maintain a page on the City of Coolidge website that will contain a copy of the current Plan • Partner with local media outlets to release mitigation activities and floodplain management activities. • Establish a Community Emergency Response Team (CERT) program. • Discuss the plan and other disaster preparedness related activities at Coolidge Chamber of Commerce events
Eloy	• Discuss updates to plans and disseminate important emergency preparedness information within internal city working groups and provide outcomes to the public. • Maintain partnership and communication with the Eloy Fire District to ensure the community is receiving information related to hazard mitigation issues and processes for improvement. • Increase private partnerships for the planning and readiness activities for the community. • Annually provide floodplain related hazard and mitigation information in coordination with Pinal County Flood Control District, to targeted properties in high risk areas. • Continue to update and post mitigation information on City of Eloy website.
Florence	• Presented plan at Town Council meeting and advised newly elected officials periodically. • Plan is available on the Pinal County website.
Kearny	• Publish information to post on the Town website. • Provide news releases to local media. • Use the CERT program to distribute information regarding the Hazard Mitigation Plan. • Disseminate information at Council meetings and other public meetings.
Mammoth	• Publish mitigation information on the town website. • Provide news releases to local news media regarding mitigation activities and floodplain management. • Disseminate information at Town Council meetings and in public notices. • The public/stakeholder's will be able to attend Mammoth Town Council, Planning and Zoning and Parks and Recreation Boards public meetings to receive information and updates and to provide input.
Maricopa	• Press releases, website announcements regarding the MJHMP. • Distribute mitigation brochures at community events.
Superior	• Hold public meetings where input is encouraged from citizens and make announcements regarding updates to the Hazard Mitigation Plan. • Distribute public safety and mitigation brochures at community events and have distribution points at the Town Hall and Town Library. • Publish information on website.

3.5 Program Incorporation

Over the course of the planning process, plans, studies, reports, and information were obtained and reviewed for incorporation and/or reference purposes, they are:

Table 3-5: Resources Reviewed for Incorporation or Reference in this Plan	
Resource	**Description or Relevance to Plan**
U.S. Forest Service	Source for local wildfire data. Used in the risk assessment.
Arizona Department of Commerce	Reference for demographic and economic data for the county. Used for community descriptions
Arizona Department of Water Resources	Resource for data on drought conditions and statewide drought management (AzGDTF), and dam safety data. Used in risk assessment.
Arizona Geological Survey	Resource for earthquake, fissure, landslide/mudslide, subsidence, and other geological hazards. Used in the risk assessment.
Arizona Land Subsidence Group	Resource for fissure and subsidence data. Used in the risk assessment.
Arizona State Land Department	Source for statewide GIS coverage (ALRIS) and statewide wildfire hazard profile information (Division of Forestry). Used in the risk assessment.
Arizona Wildland Urban Interface Assessment	Source of wildfire hazard profile data and urban interface at risk communities. Used in the risk assessment.
Pinal Co Comprehensive Plan	Source for history, demographic, and development trend data for the unincorporated county.
Pinal Co Community Wildfire Protection Plan	Source of wildfire hazard profile data for hazard mapping and risk assessment
Pinal Co Capital Improvement Plan	Source for designated projects & assets needed to improve functionality of government, transportation needs, economic development through Public Works capital projects (includes infrastructure and flood control improvements)
Pinal Co Floodplain Management Plan	Source for determined projects, measures, studies, etc. related to floodplain management. Provides historical data as well as improvement plans, recommendations.
Pinal Co Transportation Plans	Source for historical data related to transportation and infrastructure as well as proposed improvements, ordinances, projects, etc., based on current needs and conditions.
Pinal Co Stormwater Management Plan	Source for historical data as well as overall plan for control, diversion and overall mitigation of stormwater and area drainage.
Pinal Co Zoning Ordinance	Source for laws related to zoning and community planning and development.
Apache Junction Chamber of Commerce - website	Source for history, demographic, and community description information for the city.
Apache Junction - website	Source for history, street infrastructure, and community description information for the city.
Apache Junction General Plan	Source of data for hazard mapping and formulating risk assessment.
Apache Junction Emergency Response and Recovery Plan	Used to assist in identifying hazard events for the community used in the risk assessment.
Apache Junction Stormwater Master Plan	Source for hazard information, flooding data, and historic event records used in the risk assessment.

Table 3-5: Resources Reviewed for Incorporation or Reference in this Plan	
Resource	**Description or Relevance to Plan**
Casa Grande General Plan	Source for history, demographic, and development trend data.
Coolidge General Plan	Source for history, demographic, and development trend data.
Coolidge Website	Source for history, demographic, codes, development trend data for the city, and other general information.
Eloy General Plan	Source for history, demographic, and development trend data.
Florence General Plan	Source for history, demographic, and development trend data.
Kearny General Plan	Source for history, demographic, and development trend data.
Maricopa 2040 Vision Plan	Source for history, demographic, and development trend data.
Superior General Plan	Source for history, demographic, and development trend data.

SECTION 4: RISK ASSESSMENT

4.1 Section Changes

This section introduces the newly added hazards of Earthquakes and Extreme Heat.

4.2 Hazard Identification

One of the principal elements of the hazard mitigation planning process is risk assessment. The risk assessment provides the foundation for the rest of the planning process, primarily the mitigation strategy. The risk assessment answers the fundamental questions of "what" can occur, "how often" it is likely to happen, and "how bad" the effects could be. The primary components of this risk assessment are categorized according to:

Hazard Identification

Hazard Profiling

Assessing Vulnerability to Hazard

For an inclusive risk assessment, the Planning Team used a multi-jurisdictional perspective to gather and develop information. Many of the hazardous events are likely to affect various jurisdictions in the county and are often not relegated to a single jurisdictional boundary. The vulnerability analysis results reflect vulnerability at an individual jurisdictional and countywide level. For most of the hazards, quantitative vulnerability was removed, and a qualitative vulnerability created by each of the jurisdictions for the hazards that they identified as priorities in their area.

For this plan, the planning team reassessed the identified hazards of the 2016 plan to determine if the risk still applies to the planning area. The review included an initial screening process to evaluate each of the listed hazards based on the following considerations:

- Experiential knowledge of the Planning Team with regard to the relative risk associated with the hazard.
- Past events (especially events that have occurred during the last plan cycle).
- The ability/desire to develop effective mitigation measures for the hazard

The culmination of the review process resulted in the confirmation of keeping the same hazards as the previous plan and adding two additional hazards listed below in bold. Therefore, the hazards identified for this Plan are:

- Dam Failure
- Drought
- **Earthquakes**
- **Extreme Heat**
- Fissure
- Flooding/Flash Flooding
- Levee Failure
- Severe Wind
- Subsidence
- Wildfires

Each jurisdiction evaluated and rated the hazards using the Calculated Priority Risk Index (CPRI) and met to discuss results amongst the jurisdictions after they had chosen hazards for their jurisdiction to address.

4.3 Vulnerability Analysis Methodology

The following sections summarize the methodologies used to perform the vulnerability analysis portion of the risk assessment. Individual jurisdictions discuss their vulnerably to chosen hazards in the appropriate section.

Calculated Priority Risk Index (CPRI) Evaluation

The first step in the vulnerability analysis (VA) is to assess the perceived overall risk for each of the plan hazards by assigning them risk ratings using the Calculated Priority Risk Index (CPRI). The CPRI value is obtained by assigning varying degrees of risk to four categories for each hazard, and then calculating an index value based on a weighting scheme. The table below summarizes the CPRI risk categories and provides guidance regarding the assignment of values and weighting factors for each category.

As an example, assume that the team is assessing the hazard of flooding, and has decided the following assignments best describe the flooding hazard for their community:

- Probability = Likely
- Magnitude/Severity = Critical
- Warning Time = 12 to 24 hours
- Duration = Less than 6 hours

The CPRI for the flooding hazard would then be:

CPRI = [(3*0.45) + (3*0.30) + (2*0.15) + (1*0.10)]

CPRI = 2.65 (maximum 4.00)

Table 4-1: Calculated Priority Risk Index (CPRI) Categories and Risk Levels

CPRI Category	Degree of Risk			Assigned Weighting Factor
	Level ID	Description	Index Value	
Probability	Unlikely	▪ Extremely rare with no documented history of occurrences or events. ▪ Annual probability of less than 0.001.	1	45%
	Possible	▪ Rare occurrences with at least one documented or anecdotal historic event. ▪ Annual probability that is between 0.01 and 0.001.	2	
	Likely	▪ Occasional occurrences with at least two or more documented historic events. ▪ Annual probability that is between 0.1 and 0.01.	3	
	Highly Likely	▪ Frequent events with a well-documented history of occurrence. ▪ Annual probability that is greater than 0.1.	4	
Magnitude/ Severity	Negligible	▪ Negligible property damages (less than 5% of critical and non-critical facilities and infrastructure). ▪ Injuries or illnesses are treatable with first aid and there are no deaths. ▪ Negligible quality of life lost. ▪ Shut down of critical facilities for less than 24 hours.	1	30%
	Limited	▪ Slight property damages (greater than 5% and less than 25% of critical and non-critical facilities and infrastructure). ▪ Injuries or illnesses do not result in permanent disability and there are no deaths. ▪ Moderate quality of life lost. ▪ Shut down of critical facilities for more than 1 day and less than 1 week.	2	

	Critical	▪ Moderate property damages (greater than 25% and less than 50% of critical and non-critical facilities and infrastructure). ▪ Injuries or illnesses result in permanent disability and at least one death. ▪ Shut down of critical facilities for more than 1 week and less than 1 month.	3	
	Catastrophic	▪ Severe property damages (greater than 50% of critical and non-critical facilities and infrastructure). ▪ Injuries or illnesses result in permanent disability and multiple deaths. ▪ Shut down of critical facilities for more than 1 month.	4	
Warning Time	Less than 6 hrs	Self explanatory.	4	15%
	6 to 12 hrs	Self explanatory.	3	
	12 to 24 hrs	Self explanatory.	2	
	More than 24 hrs	Self explanatory.	1	
Duration	Less than 6 hrs	Self explanatory.	1	10%
	Less than 24 hrs	Self explanatory.	2	
	Less than one wk	Self explanatory.	3	
	More than one wk	Self explanatory.	4	

Asset Inventory

The asset inventory establishes a baseline data-set for assessing the vulnerability of each jurisdiction's assets and is generally tabularized into ***critical*** and ***non-critical*** categories. ***Critical facilities and infrastructure*** are systems, structures and infrastructure within a community whose incapacity or destruction would:

- Have a debilitating impact on the defense or economic security of that community.
- Significantly hinder a community's ability to recover following a disaster.

The 2016 Plan used local jurisdiction institutional knowledge to represent the critical and non-critical facilities for Pinal County jurisdictions. For this Plan update the Planning Team determined they will continue to use local jurisdiction institutional knowledge and data provided by ERSI hosted on ArcGIS Online for the table below. It is noted that changes of ownerships have occurred but no change has occurred in the number of water Supply Systems county wide or jurisdiction specific.

Table 4-2: Critical and Non-Critical Facilities

Participating Jurisdiction	Critical Facilities and Infrastructure							
	Communications Infrastructure	Electrical Power Systems	Gas and Oil Facilities	Banking and Finance Institutions	Transportation Networks	Water Supply Systems	Government Services	Emergency Services
County-Wide Totals [b]	2852	210	55	56	470	79	90	130

Table 4-2: Critical and Non-Critical Facilities

Participating Jurisdiction	Critical Facilities and Infrastructure							
	Communications Infrastructure	Electrical Power Systems	Gas and Oil Facilities	Banking and Finance Institutions	Transportation Networks	Water Supply Systems	Government Services	Emergency Services
Apache Junction	155	17	0	8	4 [a]	10	5	11
Casa Grande	418	22	5	16	65	4	7	17
Coolidge	134	19	6	4	25	2	7	5
Eloy	72	14	2	2	35	25	9	6
Florence	136	15	3	4	21	9	44	11
Kearny	17	4	0	1	5	3	4	6
Mammoth	13	2	5	0	3	5	5	2
Maricopa	192	14	2	6	20	16	2	15
Superior	29	2	0	1	6	2	2	3
Unincorporated Pinal County	1670	93	31	12	285	3	5	53

It should also be noted that the facility counts in the table above do not represent a comprehensive inventory of all the category facilities that exist within the county. They do represent the facilities inventoried to-date by each jurisdiction and are considered to be a work-in-progress that may be expanded and augmented with each Plan cycle.

Loss Estimations

The Planning Team has determined they will continue to assess vulnerability as an overview summary of the hazard's impact on the community and its vulnerable structures, rather than in a quantitative manner. The Planning Team believes it is much more beneficial to express vulnerability in narrative form while taking into consideration the unique characteristics of their jurisdictions.

Risk Assessment Summary

The jurisdictional variability of risk associated with each hazard is demonstrated by the various CPRI and vulnerability information. Accordingly, each jurisdiction has varying levels of need regarding the hazards to be mitigated, and may not consider all of the hazards as posing a great risk to their communities. The table below summarizes the hazards selected for mitigation by each jurisdiction and will be the basis for each jurisdictions mitigation strategy.

Table 4-3: Hazards to be Mitigated

Jurisdiction	Flooding	Severe Wind	Extreme Heat	Drought	Wildfire	Earthquakes	Dam Failure	Subsidence	Fissure	Levee Failure
Unincorporated Pinal County	x	x	x	x	x	x	x	x	x	x
Apache Junction	x	x	x	x	x	x	x	x		
Casa Grande	x	x	x	x		x				x
Coolidge	x	x	x	x	x	x	x	x		
Eloy	x	x	x		x	x		x	x	
Florence	x	x	x		x	x	x			
Kearny	x	x	x	x	x	x	x			
Mammoth	x	x	x	x	x	x				
Maricopa	x	x	x	x		x	x	x		
Superior	x	x	x	x	x					

Hazard listed in order of most threatening as determined by the jurisdictions' CPRIs.

4.4 Hazard Risk Profiles

The following sections summarize the risk profiles of the hazards identified and include the following elements:

- **Description**
- **History**
- **Extent (of the hazard in the planning area)**
- **Probability of Future Events**
- **Vulnerability**
    - **CPRI Results**
    - **Jurisdictional Vulnerability Narrative**
- **Changes in Development in the Hazard Area**

4.4.1 Dam Failure

Description

The primary risk associated with dam failure in Pinal County is the inundation of downstream facilities and population by the resulting flood wave. Dams within or impacting the County can generally be divided into two groups: (1) storage reservoirs designed to permanently impound water, provide flood protection, and possibly generate power, and two (2) single purpose flood retarding structures (FRS) designed to attenuate or reduce flooding by impounding stormwater for relatively short durations of time during flood events. The majority of dams within the County are earthen FRS equipped with emergency spillways. The purpose of an emergency spillway is to provide a designed and protected outlet to convey runoff volumes exceeding the dam's storage capacity during extreme or back-to-back storm events. Dam failures may be caused by a variety of reasons including: seismic events, extreme wave action, leakage and piping, overtopping, material fatigue and spillway erosion.

History

There have not been any dam failure events within the last five years within the county. The following is a representative example from each participating jurisdiction.

Apache Junction – There has been no adverse impacts by this hazard event in past five years for the community.

Casa Grande – There have not been any dam failure incidents in the last five years.

Coolidge – There has been no history of a dam failure in Coolidge in the last five years.

Eloy – In the past five years, the City of Eloy has had no hazard events related to dam failure.

Florence – There has not been any documented dam failures in the last 5 years.

Kearny – Kearny has no history of dam failure.

Mammoth – No significant event within the last five years.

Maricopa – No documented significant recent hazard events in the last five years.

Superior – Town has no significant history or hazard events in the last five years of dam failure.

Unincorporated Pinal County – No significant events have occurred in the past five years.

Extent

The NID and ADWR databases provide useful information on the potential hazard posed by dams. Each dam in the NID is assigned one of the following three hazard potential classes based on the potential for loss of life and damage to property should the dam fail (listed in increasing severity): low, significant, or high. The hazard potential classification is based on an evaluation of the probable present and future incremental adverse consequences that would result from the release of water or stored contents due to failure or improper operation of the dam or appurtenances, regardless of the condition of the dam. The ADWR evaluation includes land-use zoning and development projected for the affected area over the 10-year period following the classification of the dam. It is important to note that the hazard potential classification is an assessment of the consequences of failure, but not an evaluation of the probability of failure or improper operation. The table below summarizes the hazard potential classifications and criteria for dams regulated by the State of Arizona.

Table 4-5: Downstream Hazard Potential Classes for State Regulated Dams		
Hazard Potential Classification	**Loss of Human Life**	**Economic, Environmental, Lifeline Losses**
Low	None expected	Low and generally limited to owner
Significant	None expected	Low to high
High	Probable. One or more expected	Low to high (but not necessary for this classification)
Note: The hazard potential classification is an assessment of consequences of failure, not of the probability of failure. Source: ADWR and NID 2009.		

The NID database includes dams that are either:

- High or Significant hazard potential class dams, or,
- Low hazard potential class dams that exceed 25 feet in height and 15 acre-feet storage, or,
- Low hazard potential class dams that exceed 50 acre-feet storage and 6 feet height.

There are 21 dams in Pinal County based on the two databases. Of the 21 dams, nine are under ADWR jurisdiction.

The magnitude of impacts due to dam failure are usually depicted by mapping the estimated downstream inundation limits based on an assessment of a combination of flow depth and velocity. These limits are typically a critical part of the EAP. For inundation resulting from dam failure, the following two classes of hazard risk are depicted:

High Hazard = Inundation limits due to dam failure

Low Hazard = All other areas outside the inundation limits

Probability of Future Events

The probability of future dam failure events discharges vary greatly with each dam and are directly influenced by the type and age of the dam, its operational purpose, storage capacity and height, downstream conditions, and many other factors. Two data sources publish hazard ratings for dams impacting Pinal County; The first is the Arizona Department of Water Resources (ADWR), and the second is the National Inventory of Dams (NID). Hazard ratings from each source are based on assessing the consequence of failure and/or dam safety considerations. They are not tied to the probability of occurrence.

ADWR has regulatory jurisdiction over the non-federal dams impacting the county and is responsible for regulating the safety of these dams, conducting field investigations, and participating in flood mitigation programs to minimize the risk for loss of life and property to the citizens of Arizona. ADWR jurisdictional dams are inspected regularly according to downstream hazard potential classification, which follows the NID classification system. High hazard dams are inspected annually, significant hazard dams every three years, and low hazard dams every five years. Via these inspections, ADWR identifies safety deficiencies requiring correction and assigns each dam one of six safety ratings. Examples of safety deficiencies include lack of an adequate emergency action plan, inability to safely pass the required Inflow Design Flood (IDF), embankment erosion, dam stability, etc.

Table 4-4: ADWR Safety Categories	
ADWR Safety Rating	**Definition**
No Deficiency	No safety deficiencies found.
Safety Deficiency	One or more conditions at the dam that impair or adversely affects the safe operation of the dam.

Table 4-4: ADWR Safety Categories	
ADWR Safety Rating	**Definition**
Unsafe Categories	
Category 1: Unsafe Dams with Elevated Risk of Failure	These dams have confirmed safety deficiencies for which there is concern they could fail during a 100-year or smaller flood event. There is an urgent need to repair or remove these dams.
Category 2: Unsafe Dams Requiring Rehabilitation or Removal	These dams have confirmed safety deficiencies and require either repair or removal. These dams are prioritized for repair or removal behind the Category 1 dams.
Category 3: Unsafe Dams with Uncertain Stability during Extreme Events (Requiring Study)	Concrete or masonry dams that have been reclassified to high hazard potential because of downstream development (i.e., hazard creep"). The necessary documentation demonstrating that the dams meet or exceed standard stability criteria for high hazard dams during extreme overtopping and seismic events is lacking. The dams are classified as unsafe pending the results of required studies. Upon completion of these studies, the dams are either removed from the list of unsafe dams or moved to Category 2 and prioritized for repair or removal.
Category 4: Unsafe Dams Pending Evaluation of Flood-Passing Capacity (Requiring Study)	In 1979, the U.S. Army Corps of Engineers established federal Guidelines for assessing the safe flood passing capacity of high hazard potential dams (CFR Vol. 44 No. 188). These guidelines established one-half of the "probable maximum flood" (PMF) as the minimum storm which must be safely passed without overtopping and subsequent failure of the dam. Dams unable to safely pass a storm of this size were classified as being in an "unsafe, non-emergency" condition. Prior studies for these earthen dams (mostly performed in the 1980's) predicted they could not safely pass one-half of the PMF. They were predicted to overtop and fail for flood events ranging from 30-46% of the PMF. Recent studies both statewide and nationwide have indicated that the science of PMF hydrology as practiced in the 1990's commonly overestimates the PMF for a given watershed. The ADWR is leading efforts on a statewide update of probably maximum precipitation (PMP) study scheduled for completion in 2011. These dams should be re-evaluated using updated methods to confirm their safety status. Upon completion of these evaluations, they are either removed from the list of unsafe dams or moved to Category 2 and prioritized for repair or removal.
Source: ADWR, 2021.	

The NID database contains information on approximately 77,000 dams in the 50 states and Puerto Rico, with approximately 30 characteristics reported for each dam, such as: name, owner, river, nearest community, length, height, average storage, max storage, hazard rating, Emergency Action Plan (EAP), latitude, and longitude.

Vulnerability

Table 4-6: CPRI Results for Dam Failure					
Jurisdiction	**Probability**	**Magnitude/ Severity**	**Warning Time**	**Duration**	**Rating**
Apache Junction	Possibly	Limited	< 6 hours	< 6 hours	2.20
Casa Grande	Unlikely	Negligible	< 6 hours	< 24 hours	1.55
Coolidge	Possibly	Limited	12 - 24 hours	< 24 hours	2.00
Eloy	Unlikely	Negligible	> 24 hours	< 6 hours	1.00
Florence	Possibly	Limited	12-24 hours	> 1 week	2.10
Kearny	Unlikely	Critical	< 6 hours	< 24 hours	2.15

Table 4-6: CPRI Results for Dam Failure					
Jurisdiction	**Probability**	**Magnitude/ Severity**	**Warning Time**	**Duration**	**Rating**
Mammoth	Unlikely	Negligible	> 24 hours	< 6 hours	1.00
Maricopa	Possibly	Critical	12-24 hours	< 24 hours	2.30
Superior	Unlikely	Negligible	> 24 hours	< 6 hours	1.00
Unincorporated Pinal Co	Unlikely	Catastrophic	< 6 hours	< 1 week	2.55
				County-wide average CPRI	1.78

The Planning Team has determined they will continue to assess vulnerability as an overview summary of the hazard's impact on the community and its vulnerable structures, rather than in a quantitative manner.

Apache Junction – The greatest vulnerability to the community is any emergency spillway flow from the Apache Junction Flood Retardant Structure (FRS). A worst possible inundation from an emergency spillway overflow could result in significant damage to critical public infrastructure (streets), residential and commercial property in the more densely populated northwestern portion of the city from Lost Dutchman to the Apache Trail and Meridian Drive.

Casa Grande – The susceptibility for harm or damage to dam failure is unlikely due to its location in proximity to any dams. There have not been any dam failure incidents in the last five years.

Coolidge – There is a possibility of Coolidge experiencing damage from a Calvin Coolidge Dam failure. Given the distance from the city there would be adequate time for notification. This could impact critical and non-critical facilities.

Eloy – Due to the unlikely possibility of dam failure in the City of Eloy, there is little to no vulnerability that would result harm or damage loss to the city's assets

Florence – The Town's sole dam, Magma Dam, was improved in the last 10 years. The Magma Flood Control District was asked to make changes to bring the dam up to current standards or decommission the dam. The improvements have since been completed. There are no expected direct impacts to on critical and non-critical facilities.

Kearny – As there is an unlikely chance of Kearny being affected by dam failure there is little chance of harm/damage loss to Kearny's assets.

Mammoth – Mammoth has very little vulnerability to dam failures. The Town is not aware of any dams that could present a hazard to the area.
Maricopa – Dam failure occurrence would flood and damage critical infrastructure to roads and access.

Superior – The impact of the dam failure could affect the town citizen's safety, but the Town has no such events occurred.

Unincorporated Pinal County – Based on the results from the assessments performed for the previous Plan, there are potentially $101 million in estimated losses related to dam failure inundation, $470 million in losses to HAZUS defined residential, commercial, and industrial facilities.

Within Pinal County, there are multiple dams which are classified as high hazard. A high hazard dam poses the greatest potential for downstream impacts should failure occur. A high hazard failure is expected to result in loss of life and may also cause significant economic losses, including damages to downstream property or critical infrastructure (e.g., washed out roads, bridges, and railroad tracks), environmental damage, or disruption and/or closure of business and industry. Electric generating facilities and transmission lines could also be damaged and affect life support systems in communities outside the immediate inundation zones. Injuries and fatalities may occur by way of debris, bodily injury, or

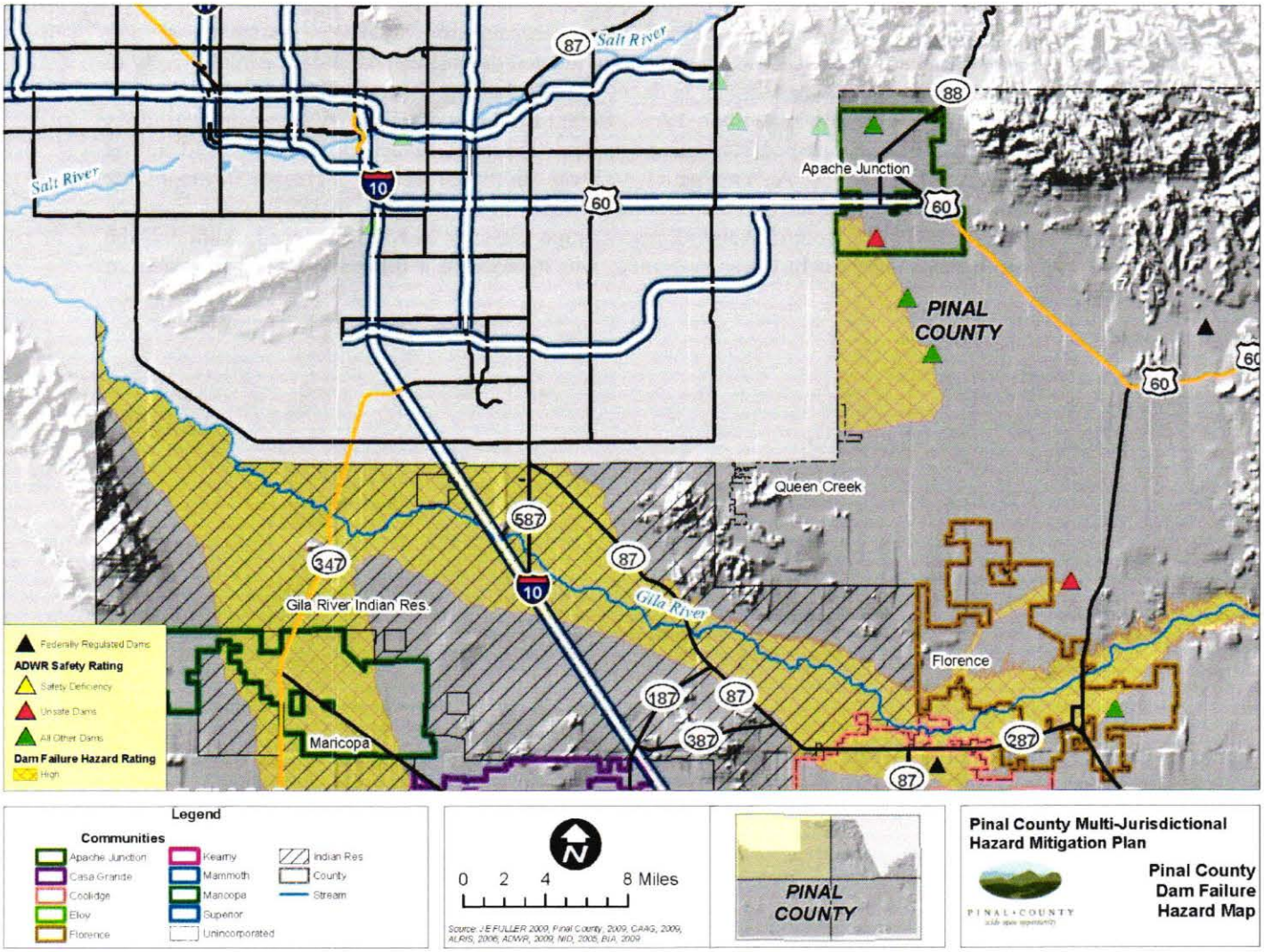
drowning. Standing water may also pose health concerns after the failure, as could the available water supply, and overall water quality. Although there have been no dam failures within Pinal County, there have been events which led dams in the County to be classified as unsafe.

After fissures were discovered in the vicinity of the Powerline and Vineyard structures, the Powerline FRS was classified as an Unsafe Dam with Elevated Risk of Failure by ADWR. The potential for dam failure from potential earth fissures through the embankments would cause breaching of the dam, and a major flooding event. To combat the fissures, an Interim Dam Safety Measure (IDSM) project was completed by the Maricopa County Flood Control District (MCFCD), consisting of three major elements to address the concerns associated with the Powerline FRS foundation. These elements were designed with a design life of 15 to 20 years. Following completion, MCFCD developed a more permanent solution. The solution consists of Powerline FRS being replaced with a channel approximately 3.5 miles in length. Meanwhile, the Vineyard Road FRS and Rittenhouse FRS will be raised and rehabilitated. As of February 24, 2021 the project had not progressed beyond the design phase and no project updates had been published by MCFCD. The three dams currently provide flood hazard protection from the 100-year rainfall event for the Central Arizona Project, 72 square miles of downstream property, and more than 150,000 persons within portions of both Pinal and Maricopa counties. MCFCD reports that "protection is also provided to structures such as the Central Arizona Project canal, Phoenix-Mesa Gateway Airport and the Loop 202 Santan Freeway."

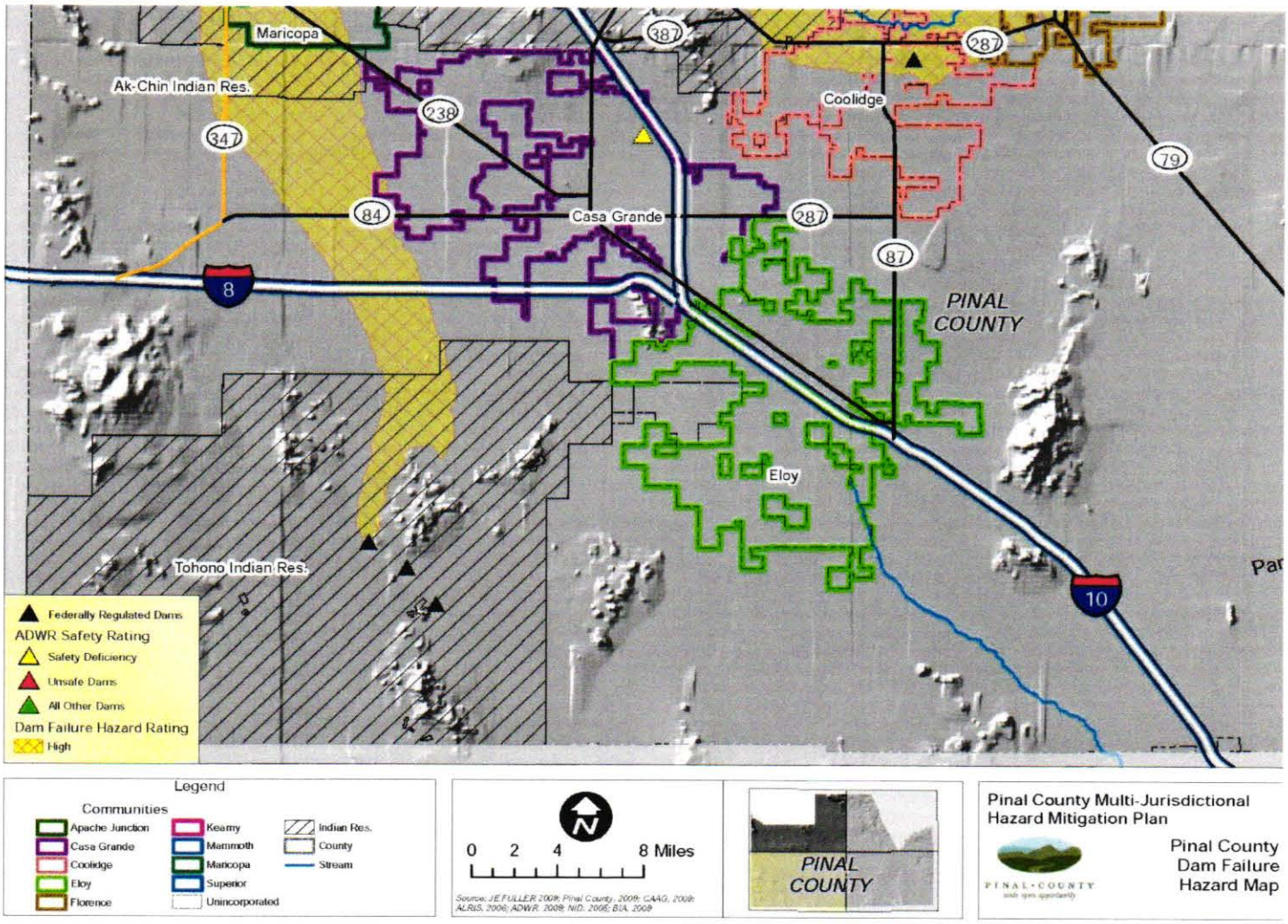
In 2008, the Magma FRS had a major test, to the point where evacuations were contemplated, and the EAP was initiated. Construction to repair and strengthen the dam began in 2011, went through two phases, and was completed in 2019. 1 Although residents and structures have gained additional protection, the Magma FRS remains a high hazard structure. The Amarillo Valley basins, named after adjacent roadways and located south of the City of Maricopa, are both below ground storage and above-ground embankments that intercept runoff from the upstream watershed. In the 1990's, these basins were originally designed for the 25-year flood event, and not believed to be intended to provide flood protection or flood mitigation for downstream properties or developments. Those downstream should not rely on these basins to provide adequate protection from flooding events, as the storage provided by these basins has negligible effect on the base flood event. Safety deficiencies were noted at the high hazard structures due to the presence of earth fissures, leading both the Maricopa Road Basin and Green Road Basin to be classified as unsafe. It is unlikely that any reasonable or cost-effective engineering solution is available to safely operate these two dam structures due to the presence of the earth fissures. Future modification may include lowering or breaching the structures so that height and volume limitations of jurisdictional status are not violated. Design and construction options are currently being discussed.

There are several other high hazard dams in the County, which in the extremely unlikely event of a failure, could cause significant damages. The Coolidge Dam is arguably the most notable dam which influences the County. A flood wave from a catastrophic failure of the dam would move rapidly along the Gila River and would be immediately life-threatening to the first residents located downstream, including the jurisdictions of Kearny and Florence. A failure of the Tat Momolikat Dam is also seen as extremely unlikely; however, a catastrophic failure of the dam would cause significant flooding in the City of Maricopa and have tremendous consequences in the unincorporated community of Stanfield. The Florence FRS Dam provides flood protection to the Town of Florence, State of Arizona correctional facilities, the Central Arizona Project, and agricultural land. The failure of a high hazard dam would have a substantial impact, as would any other high hazard dam in the unlikely event it was to fail. In addition to the high hazard dams, there are several "significant" dams as well, whereas a failure would be unlikely to result in loss of human life but may cause significant disruption or impact on lifeline facilities. Property losses would occur in a predominantly rural or agricultural area with a transient population but significant infrastructure.

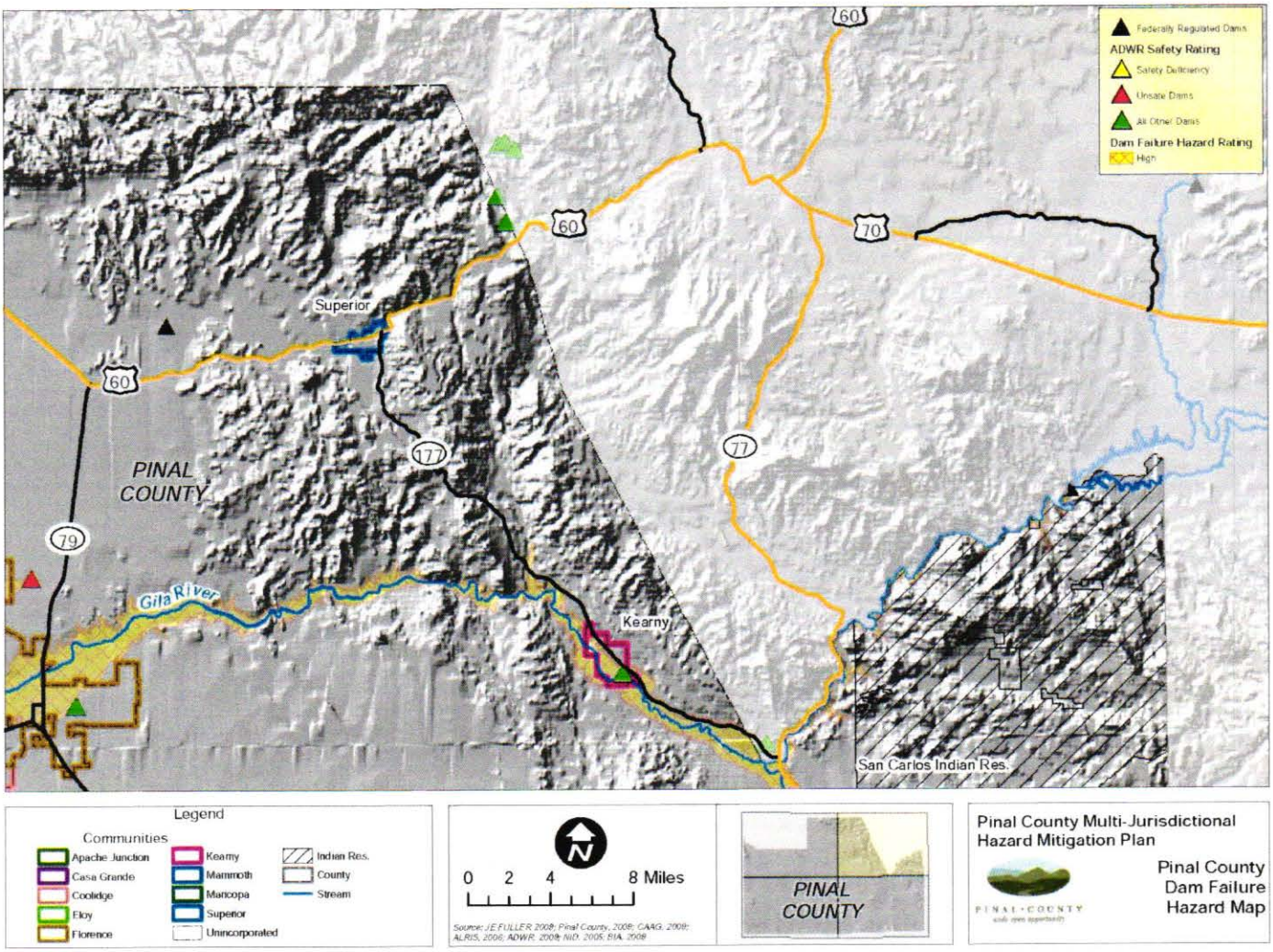
In addition to dam failure, it is also important to consider emergency spillway discharges when assessing risk (although not considered in the CPRI). Development located downstream of a dam is more likely to be impacted by an emergency spillway discharge than by a dam failure. The dynamics of the flood wave associated with an emergency spillway discharge are different from that of a dam failure. A dam failure is an uncontrolled release of water impounded behind a dam through a breach in the dam itself and is usually catastrophically destructive. An emergency spillway discharge usually increases in magnitude gradually, and then decreases gradually as the structure drains. As an example, in 1993, water from the Coolidge Dam was released in record levels because storage capacity had been reached. Although the dam did not fail, critical infrastructure was disrupted, which included a bridge failing upstream from Coolidge.



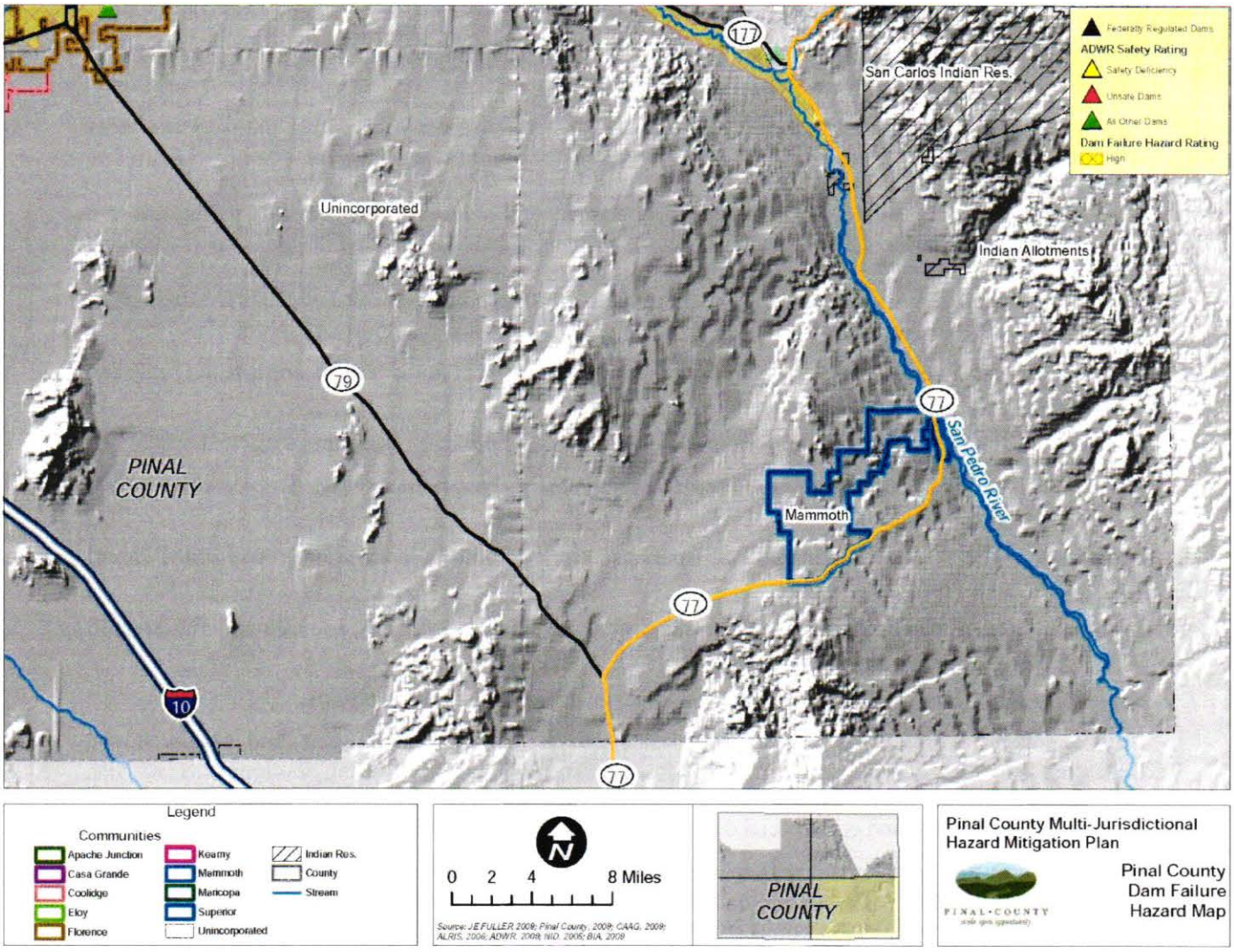
Map 4-1: Pinal County Dam Failure Hazard Area (1)



Map 4-2: Pinal County Dam Failure Hazard Area (2)



Map 4-3: Pinal County Dam Failure Hazard Area (3)



Map 4-4: Pinal County Dam Failure Hazard Area (4)

Changes in Development in the Hazard Area

With the anticipation of growth within the county, the participating jurisdictions were asked to describe how development within the hazard area has impacted them.

Apache Junction – Negligible changes or new development have occurred within the past five years within the susceptible areas of either the Apache Junction, Powerline, or Vineyard Road FRS structures community.
Casa Grande – Casa Grande has experienced commercial and industrial growth within the hazard area and a resurgence in residential construction; houses are mostly built within subdivisions that already had the infrastructure in place.
Coolidge – There has been steady growth in the area that comprises residential and commercial industries. Given the growth there would be a higher property loss and possibility of loss of life.

Eloy – In the last 5 years, there has been no changes in development in the hazard area affecting risk and vulnerability.

Florence – There have been additional homes built within the upper reach that is affected by the dam.

Kearny – Kearny has not had any significant developmental changes in the past five years that would increase risk/vulnerability.

Mammoth – The Town of Mammoth has experienced little to no development or growth in the hazard area over the past five years.

Maricopa – There has been an increase to residential development, the risk and vulnerability are still potential with improvements to the dam.

Superior – No new development has occurred in the town within the past five years.

Unincorporated Pinal County – The Powerline, Rittenhouse, Vineyard Road, and Magma Flood Regarding Structures have all seen significant downstream development. Housing developments, schools, and retail commercial development have replaced agricultural and vacant land. Further downstream, housing, transportation, and commercial development density has intensified.

Downstream of the Tat Momolikat Dam development has seen a steady increase in the unincorporated communities of Hidden Valley and Thunderbird Farms. These developments include several large master planned communities and single-family home construction on infill lots. The increased population places a greater number of people and values at risk.

Sources

National Oceanic and Atmospheric Administration, https://www.ncdc.noaa.gov/cag/county/time-series/AZ-021/pcp/ann/9/1895-2021

AZ Dept of Water Resources http://www.azwater.gov/AzDWR/SurfaceWater/DamSafety/default.htm

AZ Division of Emergency Management, *State of AZ Multi-Hazard Mitigation Plan*.

US Army Corps of Engineers, National Inventory of Dams, https://nid.usace.army.mil/

4.4.2 Drought

Description

Drought is a normal part of virtually every climate on the planet, including areas of high and low rainfall. It is different from normal aridity, which is a permanent characteristic of the climate in areas of low rainfall. Drought is the result of a natural decline in the expected precipitation over an extended period of time, typically one or more seasons in length. The severity of drought can be aggravated by other climatic factors, such as prolonged high winds and low relative humidity (FEMA, 1997).

Drought is a complex natural hazard which is reflected in the following four definitions commonly used to describe it:

- Meteorological – defined solely on the degree of dryness, expressed as a departure of actual precipitation from an expected average or normal amount based on monthly, seasonal, or annual time scales.
- Hydrological – related to the effects of precipitation shortfalls on stream flows and reservoir, lake, and groundwater levels.
- Agricultural – defined principally in terms of naturally occurring soil moisture deficiencies relative to water demands of plant life, usually arid crops.
- Socioeconomic – drought associates the supply and demand of economic goods or services with elements of meteorological, hydrologic, and agricultural drought. Socioeconomic drought occurs when the demand for water exceeds the supply as a result of weather-related supply shortfall. It may also be called a water management drought.

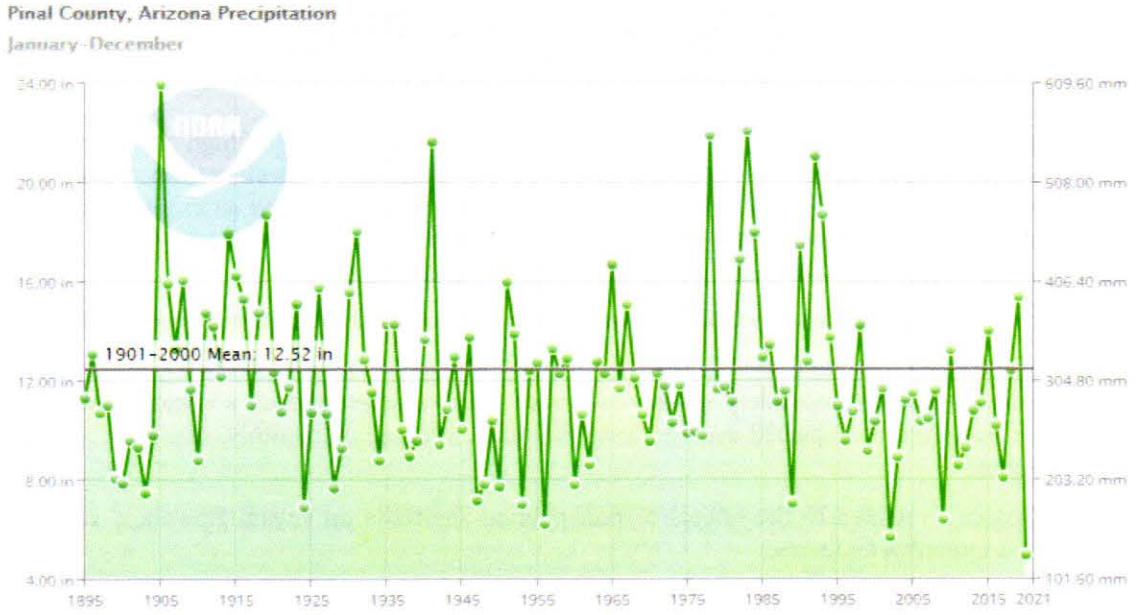
A drought's severity depends on numerous factors, including duration, intensity, and geographic extent as well as regional water supply demands by humans and vegetation. Due to its multi-dimensional nature, drought is difficult to define in exact terms and also poses difficulties in terms of comprehensive risk assessments.

Drought differs from other natural hazards in three ways. First, the onset and end of a drought are difficult to determine due to the slow accumulation and lingering effects of an event after its apparent end. Second, the lack of an exact and universally accepted definition adds to the confusion of its existence and severity. Third, in contrast with other natural hazards, the impact of drought is less obvious and may be spread over a larger geographic area. These characteristics have hindered the preparation of drought contingency or mitigation plans by many governments.

History

In 1999, the Governor of Arizona determined that the lack of precipitation had and would continue to have an adverse impact on the citizens of the State, and that a declaration of drought emergency was justified. As of 2021 this declaration in addition to the Drought Declaration for the State of Arizona (Executive Order 2007-10) are still in effect. Below is the most recent precipitation data from NCDC regarding average statewide precipitation variances from normal. Arizona has experienced many episodes of drought, and a period of prolonged drought occurred between 1849 to 1905. (Jacobs, 2003). Another prolonged drought occurred during the period of 1941 to 1965. The period from 1979-1993 appears to have been anomalously wet, while the rest of the historical records shows that dry conditions are most likely the normal condition for Arizona.

Since 1995, only 4 years have had above average annual precipitation. All other years since 1995 have received below average annual precipitation.



The following is a representative sample of drought events that have impacted the county:

Apache Junction – There has been no adverse impacts by this hazard event in past five years for the community.

Casa Grande – Casa Grande and all of Arizona have experienced drought conditions ranging from abnormally dry to exceptional drought within the last five years, with most of the years categorized as severe.

Coolidge – Coolidge has a long history of severe summer temperatures, warmer than average winter temperatures and much lower than average rainfall. This applies to not only national averages, but state averages as well. Arizona is currently in the 26th year of a long-term drought. The Coolidge Area experienced an abnormally severe drought in 1973-1974, with current conditions being reported by the Arizona State Climate Office as Coolidge being in Moderate Drought Conditions. Starting May 2019 and lasting through October 2019, Coolidge experienced minimal rainfall. The amounts were well below State and National predictions and prolonged the drought conditions into the 2020 monsoon season.

Eloy – In the past five years, the City of Eloy has had no hazard events related to drought.

Florence – The last 5 years are part of a continuing 26-year long drought within Arizona. There are no documented adverse impacts due to drought.

Kearny – Kearny has a history of moderate drought where plants are stressed; hillsides are unusually brown, and the lake and river are low during summer months.

Mammoth – No significant events within the last five years.

Maricopa – No documented significant recent hazard event in past five years.

Superior – April thru October 2019 Town had a few months of drought. The mining facility depends mainly on the water for its operation—the water used from the underground rives. Because of the significant use of the underground water, the wells are dried out. Moreover, The Landscape trees and shrubs along the US 60 Hwy have been impacted by the drought years. Many trees have died along the way; the irrigation doesn't provide enough water during the drought seasons. The wells lost the amount of water and dried out at the residential sites because of the drought event.

Unincorporated Pinal County – The U.S. Secretary of the Interior has declared a Tier 1 water shortage for Colorado River operations in 2022. The declaration reduces Arizona's share of the Colorado River water supply. The lion's share of the reduction will be borne by Pinal County agricultural users. The U.S. Secretary of Agriculture has designated Pinal County a primary natural disaster area due to severe drought, as reported in the U.S. Drought Monitor, in 2018, 2019, 2020, and 2021.

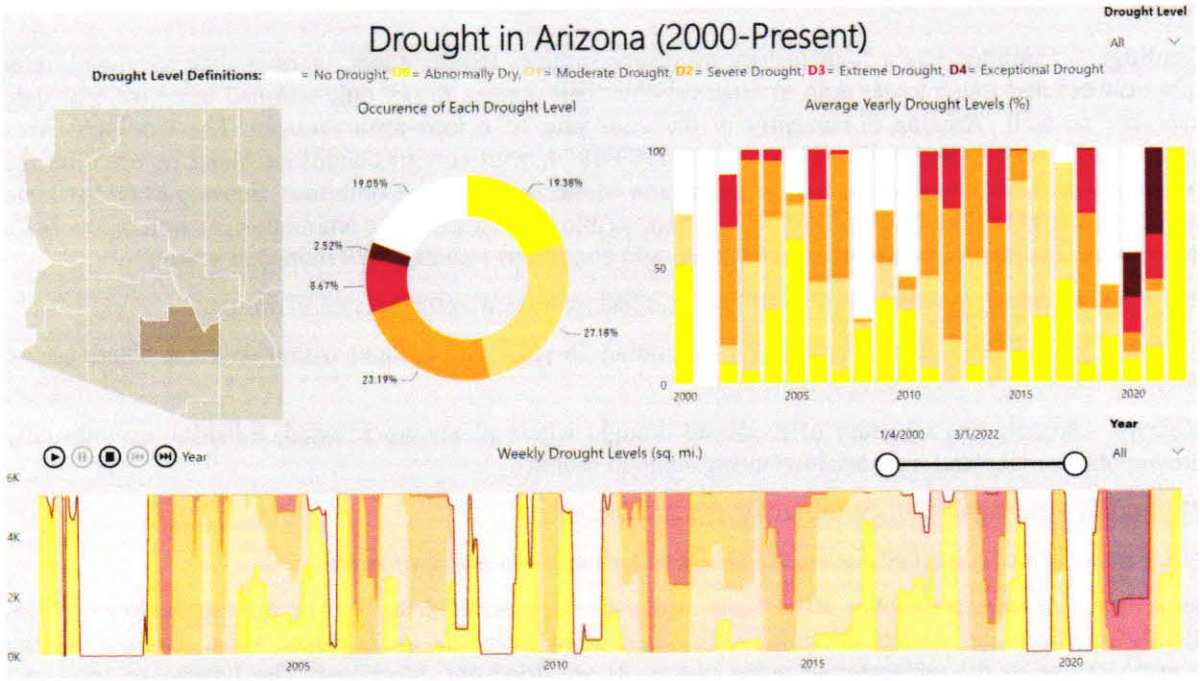
Extent (of the hazard in the planning area)

There is no commonly accepted return period or non-exceedance probability for defining the risk from drought (such as the 100-year or 1% annual chance of flood). The magnitude of drought is usually measured in time and the severity of the hydrologic deficit. The National Integrated Drought Information System (NIDS) Act of 2006 (Public Law 109-430) prescribes an interagency approach for drought monitoring, forecasting, and early warning[10]. The NIDIS maintains the U.S. Drought Portal[11], which is a centralized, web-based access point to several drought-related resources including the U.S. Drought Monitor (USDM) and the U.S. Seasonal Drought Outlook (USSDO). The USDM, shown in the figure below, is a weekly map depicting the status of drought and is developed and maintained by the National Drought Mitigation Center. The primary indicators for the figure below for the Western U.S. are the Palmer Hydrologic Drought Index and the 60-month Palmer Z-index. The Palmer Drought Severity Index (PSDI) is a commonly used index that measures the severity of drought for agriculture and water resource management. It is calculated from observed temperature and precipitation values and estimates soil moisture. However, the Palmer Index is not considered consistent enough to characterize the risk of

[10] National Integrated Drought Information System, 2016, *National Integrated Drought Information System Implementation Plan*, NOAA.

[11] NIDIS U.S. Drought Portal website is located at: https://www.drought.gov/drought/home

drought on a nationwide basis[12] and neither of the Palmer indices is well suited to the dry, mountainous western United States.

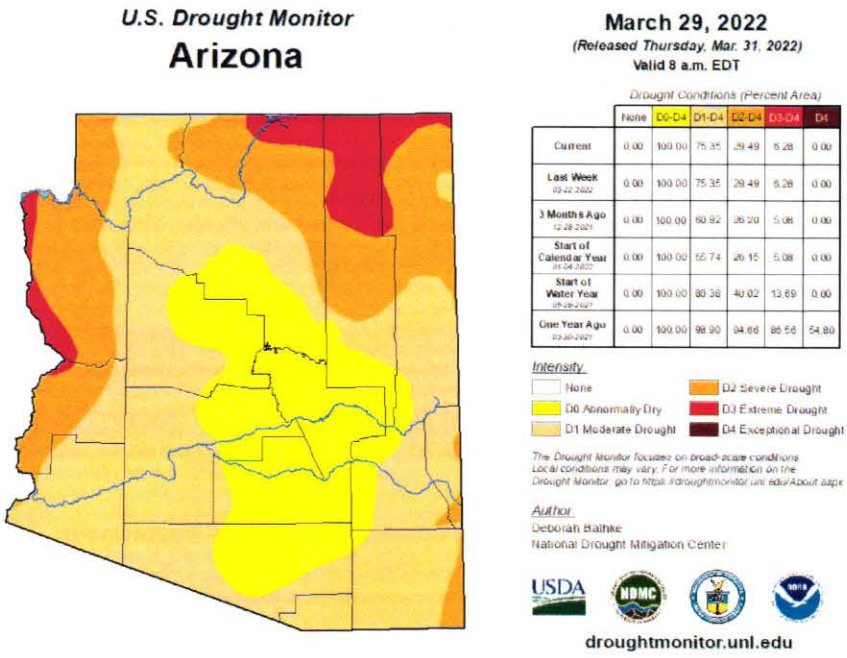


Probability of Future Events

Due to climate variability, there is a likelihood of continuously higher temperatures and below-normal precipitation, all aiding in drought conditions. The local vulnerability depends on duration, intensity, geographic extent, and regional water supply demands by humans and vegetation.

In 2003, Governor Janet Napolitano created the Arizona Drought Task Force (ADTF), led by ADWR, which developed a statewide drought plan. The plan includes criteria for determining both short and long-term drought status for each of the 15 major watersheds in the state using assessments that are based on precipitation and stream flow. The plan also provides the framework for an interagency group which reports to the governor on drought status, in addition to local drought impact groups in each county and the State Drought Monitoring Technical Committee. Twice a year this interagency group reports to the governor on the drought status and the potential need for drought declarations. The counties use the monthly drought status reports to implement drought actions within their drought plans. The State Drought Monitoring Technical Committee uses the Standardized Precipitation Index (SPI) for the short-term drought status and a combination of the SPI and streamflow for the long-term drought status. The figures below, present the most current short and long-term maps available for Arizona as of the writing of this plan

[12] Federal Emergency Management Agency, 1997, *Multi-Hazard Identification and Risk Assessment – A Cornerstone of the National Mitigation Strategy.*



The consensus of the Monitoring Technical Committee is that several years of above normal precipitation would be needed before the drought status is removed[13]. Due to ongoing drought conditions in the Colorado River watershed, the US Bureau of Reclamation in 2021 declared a Tier 1 shortage on the Colorado River beginning 2022. The shortage will impact CAP water supplies by reducing 512,000 acre-feet to Arizona's allocation of Colorado River water. The shortage declaration was not unexpected, and Arizona, the Basin states, and the federal government are continuing to work in re-consultation of the 2007 Operating Guidelines and other consultations to reduce the decline of Lake Powell and Lake Mead in light of a hotter and drier climate.

Vulnerability

Table 4-7: CPRI Results for Drought

Jurisdiction	Probability	Magnitude/ Severity	Warning Time	Duration	Rating
Apache Junction	Highly Likely	Negligible	> 24 hours	> 1 week	2.65
Casa Grande	Likely	Negligible	> 24 hours	> 1 week	2.20
Coolidge	Likely	Limited	> 24 hours	> 1 week	2.50
Eloy	Likely	Limited	> 24 hours	> 1 week	2.50
Florence	Possibly	Negligible	> 24 hours	> 1 week	1.75
Kearny	Likely	Negligible	> 24 hours	< 1 week	2.10
Mammoth	Likely	Limited	> 24 hours	> 1 week	2.50
Maricopa	Highly Likely	Critical	> 24 hours	< 1 week	3.25
Superior	Likely	Limited	> 24 hours	< 1 week	2.50
Unincorporated Pinal Co	Highly Likely	Limited	> 24 hours	> 1 week	2.95
				County-wide average CPRI	2.49

[13] AZ Department of Water Resources, 2021 https://new.azwater.gov/sites/default/files/media/JointCAPADWR-FactSheet-CoRiverShortage-2022.pdf

Drought vulnerability is primarily measured by its potential impact to certain sectors of the county economy and natural resources. Drought can be widespread and pervasive for several years.

The Planning Team has determined they will continue to assess vulnerability as an overview summary of the hazard's impact on the community and its vulnerable structures, rather than in a quantitative manner.

Apache Junction – Apache Junction depends on tourism that are related to the recreation activities of the four lakes, (e.g., Roosevelt, Apache, Canyon and Saguaro) northeast of the city on the Salt River. An extended drought (4-5 years) could have an adverse effect on these lakes which would result in a great economic impact on tourism dollars. Drought also adds to the increased threat of wildfire to city's growing wildfire urban interface (WUI).

Casa Grande – Dust storms brought on by or worsened by drought conditions impact the number of transportation accidents as the city boundaries are flush with the major transportation corridors.

Coolidge – The area's business sectors are primarily industrial and agriculture. These sectors can be impacted in many ways including economically due to the lack of water and transportation accidents that drought could affect.

Eloy – Eloy's industrial and agriculture industry would be affected the most in a drought event. Lack of available water and the disruption of transportation flow in and around Eloy would negatively impact the economics of these industries and the locality. Additionally, any significant drought event would have an adverse effect on the growing housing market in the area

Florence – Drought conditions can adversely affect wildfire potential occurrences and intensity creating a real problem to the already at-risk town.

Kearny – Like other jurisdictions, Kearny is at risk of wildfires, therefore the town can be impacted not only by the direct effects of drought, but it can also lead to the worsening of other hazards.

Mammoth – The Town of Mammoth has an extensive network of arroyos and seasonal washes in wildland urban interface areas. Extended drought will present an increased risk of wildfire as fuels dry and become more susceptible to fire. The town of Mammoth is also reliant on pumped ground water for domestic water. An extended drought may affect ground water levels and availability.

Maricopa – The City of Maricopa, like many regions of Arizona, has maintained a persistent drought. This could have an adverse effect to include occasional power outage and excessive heat issues. A power outage would affect the risk of thousands of residential homes without power to include a senior community to heat related.

Superior – Drought has caused the water levels from queen creek to be at an all-time low, leaving many aspects of Superior vulnerable. Most notably is the Town's large mining facility. The facility is mainly dependent on the queen creek water flow for its operations. The mine is a vital economic contributor as it employs many of the residents within Superior. If a prolonged drought season continues, it can cause a severe negative economic impact and stifle population growth and development. A deficit of water can also lead to wetlands habitats becoming unhabitable. Such habitats support a great variety of flora and fauna; the survival of all these life forms becomes problematic when there is a water deficit.

Unincorporated Pinal County – Agriculture is one of the main drivers of Pinal County's economy. Drought and resultant agricultural water shortages have led to a marked decrease in the number of acres engaged in productive farming. The

No standardized methodology exists for estimating losses due to drought and drought does not generally have a direct impact on critical and non-critical facilities and building stock. A direct correlation to loss of human life due to drought is improbable for Pinal County. Instead, drought vulnerability is primarily measured by its potential impact to certain sectors of the county economy and natural resources including:

- Crop and livestock agriculture
- Municipal and industrial water supply
- Recreation/tourism
- Wildlife and wildlife habitat

Sustained drought conditions will also have secondary impacts to other hazards such as fissures, flooding, dust storms, subsidence and wildfire. Extended drought may weaken and dry the grasses, shrubs, and trees of wildfire areas, making them more susceptible to ignition. Drought also tends to reduce the vegetative cover in watersheds, and hence decrease the interception of rainfall and increase the flooding hazard. Reduced vegetative cover in watersheds and on cultivated land provides an increased surface area for local dust storms. Subsidence and fissure conditions are aggravated when lean surface water supplies force the pumping of more groundwater to supply the demand without the benefit of recharge from normal rainfall.

Changes is Development in the Hazard Area

With the anticipation of growth within the county, the participating jurisdictions were asked to describe how development within the hazard area has impacted them.

Apache Junction – Residential building has continued, although slowly, within the WUI areas of the city during the past five years. This building has had only negligible impact to the risk/vulnerability being only a few structures.

Casa Grande – Casa Grande has experienced commercial and industrial growth within the hazard area and a resurgence in residential construction. Houses are mostly built within subdivisions that already have the infrastructure in place. Although with continued population growth, the increased water demand and drought conditions can impact the water supply.

Coolidge – With the residential growth and commercial growth a drought could impact water availability, electrical brown-outs or black outs due to higher than normal electrical demands.

Eloy – In the last 5 years, Eloy has experienced an increase in building permits resulting in reuse of current industrial and commercial properties, as well as more new construction of single-family housing.

Florence – There have been additional homes built within the Town limits that can be affected by drought.

Kearny – There have been no significant changes to the area to affect the risk/vulnerability.

Mammoth – The Town of Mammoth has experienced little to no development or growth in the hazard area over the past five years.

Maricopa – There have been no changes in development in the last five years.

Superior – There has been no changes in development in the hazard area.

Unincorporated Pinal County – Drought has led to a marked decrease in the number of acres in agricultural production. This has increased pressure by developers to convert this land to building sites. Thousands of acres have been taken out of production and left fallow as investment acreage or developed over the past five (5) years.

Agricultural and urban land uses are incompatible, leading to increased competition and conflict between agricultural users and developers. Agriculture is an essential industry that provides both valuable market goods and numerous nonmarket benefits to the community. The loss of farmland to development not only leads to the loss of these benefits, it also leads to an increase in losses to natural hazards, including many of those noted above.

Increased urbanization and development contribute to the heat island effect due to the loss of vegetation and increases in the built environment. It also increases flooding as run-off increases when arable land is paved over. Although data is not yet available, the increase in fallow land may have led to an increase in in the number of localized dust storms in former agricultural areas.

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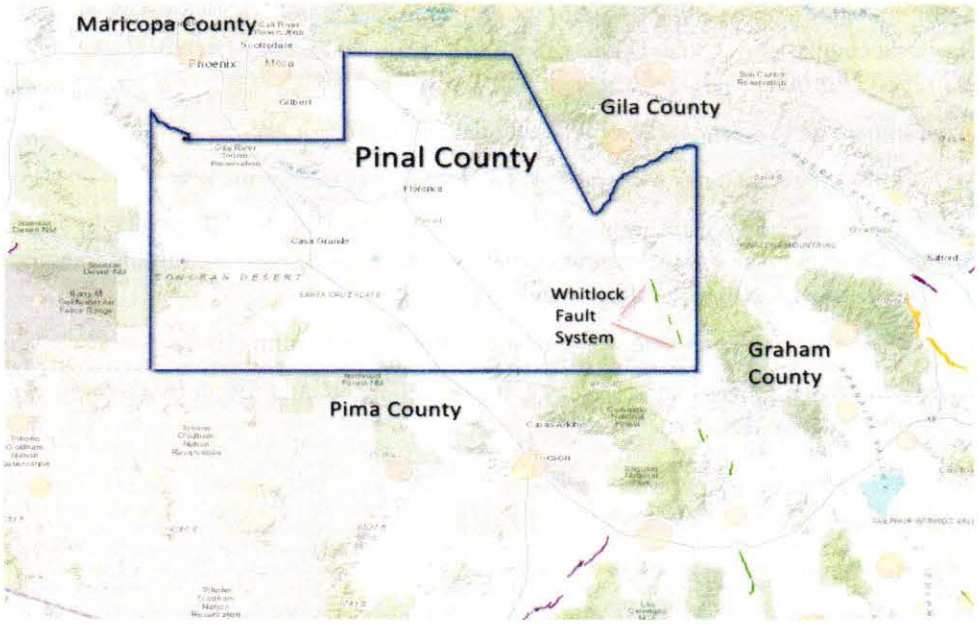
NIDIS U.S. Drought Portal http://www.drought.gov/portal/server.pt/community/drought.gov/202

4.4.3 Earthquake

Description



Outline of Pinal County showing historic earthquake epicenter (orange circles) and the Whitlock Fault System of southeastern-most Pinal County. The County is threatened by Quaternary faults of surrounding Arizona counties.

Moderate to large-magnitude earthquakes present a risk to life (injury or death), of substantial loss or damage to property, and environmental damage. Earthquakes occur when two blocks of earth slip along planes of weakness referred to as faults. The resulting seismic energy release can cause ground shaking that may produce cascading events – from landslides to collapsing buildings and broken water mains - that result in injury or death, damaged infrastructure, and environmental degradation.

Pinal County is situated in the Basin and Range Province of south-central Arizona that took shape in the Neogene. The landscape comprises rugged mountainous terrain, e.g., Picacho, Casa Grande, Sawtooth Mountains set in a sea of deep alluvial basins and ephemeral drainages. Mountain ranges pushed up out of the subsurface along normal faults. The only fault identified in Pinal County is the Whitlock Fault system situated in the west foothills of the Galiuro Mountains. Active Quaternary faults outcrop in bordering counties to the north (Maricopa and Gila Counties), east (Graham County), south (Pima County) and west (Maricopa County).

Rupture of mountain range faults of Arizona's Basin and Range Province is infrequent, nonetheless they do occur and are capable of moment magnitudes of moderate (Mm5) to large (Mm7+) earthquakes. New research using enhanced continuous GPS network identified anomalously high strain rate for southwestern Arizona (Broermann and others, 2021). The authors warned that this magnitude of strain could portend release in one or more rare large-magnitude earthquakes in the future.

History

The Arizona's Seismic Catalog contains more than 3,400 earthquake epicenters reported from 1852 to the present. There have been at least 52 temblors equal to or greater than magnitude 4.0; that includes five magnitude 6.0 or greater events, and ten magnitude 5.0 to 5.4 earthquakes. The Arizona Seismic Catalog reports 44 events that produced moderate (VI) to violent shaking (X) on MMI spectrum. Twenty-eight events were at VI level, five events at VII, nine events at VIII, and one event each at IX and X levels. Any

event at the VII level or above is likely to damage structures and threaten lives in communities proximal to the epicenter.

1887 Sonoran Earthquake Impact on Pinal County. Ground shaking from this large-magnitude earthquake would been felt throughout what is now Pinal County. DuBois and Smith extensive documentation of historic accounts shows that Dudleyville, Mammoth, Maricopa, Oracle, Picket Post Mountain, and Pinal all reported ground shaking congruent with MMI VII-VIII.

Examples of reports from impact of 1887 Great Sonoran Earthquake in Pinal County.

- Mammoth, Arizona. MMI estimate for Mammoth was VII (DuBois and Smith, 1987)
  - "Walls of buildings generally were pretty well shaken up. Roof of the saloon fell in some days after the shock. Surrounding mountains shook off a large amount of surplus hanging rocks, which were thrown to the base of the mountains."
- Oracle, Arizona. MMI estimate for Oracle was VII-VIII (DuBois and Smith, 1987)
  - "There were numerous slides and large quantities of rock and earth hurled to the base of the Santa Catalina Mountains."
- Picket Post Mountain – Superior, Arizona.
  - "Huge rocks rumbled down the N side of Picket Post Mtn."

Extent (of the hazard in the planning area)

Felt earthquakes are not as common in Arizona as they are in California where the San Andreas fault forms the boundary between the North American and Pacific tectonic plates. Nonetheless, Arizona's Broadband Seismic Network records roughly 50 to 100 in-state earthquakes annually. Most events are below the human threshold (~ Mw 2.5) of a felt event, but moderate magnitude earthquakes (Mw 4.0 and greater) occur with some frequency. (Mw) is a measure of the energy released by an earthquake and provides the basis for comparing earthquakes; all Mw4.0 earthquakes, for example, release the same amount of energy. With each increase in unit of magnitude, say from Mw5.0 to Mw6.0, there is a 32-fold increase in energy release; from Mw5.0 to Mw7.0, the total increase in magnitude is about 1000-fold (32 * 32) An increase in magnitude corresponds to an increase in the size of the area impacted, the duration of shaking, and the potential for damage.

Intensity is a measure of local ground shaking that directly impacts human society and is best characterized by the Modified Mercalli Scale (Table n). Proximity to the earthquake source, population density, building style(s), substrate, and environmental setting greatly influence the intensity of an earthquake. The Modified Mercalli Intensity Scale (MMI), enumerates in Roman numerals the 12 intensity steps. For instance, an MMI value of 3 is felt locally and may cause hanging objects to swing to and from; an MMI value of IX, on the other hand, is accompanied by violent shaking, general panic, and damage to masonry buildings and underground pipes.

Intensity	Shaking	Description/Damage
I	Not felt	Not felt except by a very few under especially favorable conditions.
II	Weak	Felt only by a few persons at rest,especially on upper floors of buildings.
III	Weak	Felt quite noticeably by persons indoors, especially on upper floors of buildings. Many people do not recognize it as an earthquake. Standing motor cars may rock slightly. Vibrations similar to the passing of a truck. Duration estimated.
IV	Light	Felt indoors by many, outdoors by few during the day. At night, some awakened. Dishes, windows, doors disturbed; walls make cracking sound. Sensation like heavy truck striking building. Standing motor cars rocked noticeably.
V	Moderate	Felt by nearly everyone; many awakened. Some dishes, windows broken. Unstable objects overturned. Pendulum clocks may stop.
VI	Strong	Felt by all, many frightened. Some heavy furniture moved; a few instances of fallen plaster. Damage slight.
VII	Very strong	Damage negligible in buildings of good design and construction; slight to moderate in well-built ordinary structures; considerable damage in poorly built or badly designed structures; some chimneys broken.
VIII	Severe	Damage slight in specially designed structures; considerable damage in ordinary substantial buildings with partial collapse. Damage great in poorly built structures. Fall of chimneys, factory stacks, columns, monuments, walls. Heavy furniture overturned.
IX	Violent	Damage considerable in specially designed structures; well-designed frame structures thrown out of plumb. Damage great in substantial buildings, with partial collapse. Buildings shifted off foundations.
X	Extreme	Some well-built wooden structures destroyed; most masonry and frame structures destroyed with foundations. Rails bent.

Modified Mercalli Intensity Scale. (Source, U.S. Geological Survey)

Probability of Future Events

The 2019 US National Seismic Hazard Model of the U.S. Geological Survey places Pinal County in the 4% to 19% probability area of potentially minor – MMI VI - between 2019 and 2119. It is unlikely that the USGS models incorporate the fresh strain data of the southern Basin and Range Province recently reported by Broermann and others (2021). These new data could potentially lead to an increase in the probability of MMI VI ground shaking in the next 100 years throughout southern Arizona, including Pinal County.

The probability of a temblor impacting Pinal County between 2021 and 2026 is low but is not zero. It is unlikely there would be any early warning of fault rupture, the exception would be smaller magnitude foreshocks followed by a larger magnitude main shock.

Vulnerability

Table 4-8: CPRI Results for Earthquake

Jurisdiction	Probability	Magnitude/ Severity	Warning Time	Duration	Rating
Apache Junction	Unlikely	Limited	< 6 hours	<1 week	2.06
Casa Grande	Unlikely	Limited	< 6 hours	<1 week	2.06
Coolidge	Unlikely	Limited	< 6 hours	<1 week	2.06
Eloy	Unlikely	Limited	< 6 hours	<1 week	2.06
Florence	Unlikely	Limited	< 6 hours	<1 week	2.06
Kearny	Unlikely	Limited	< 6 hours	<1 week	2.06
Mammoth	Unlikely	Limited	< 6 hours	<1 week	2.06
Maricopa	Unlikely	Limited	< 6 hours	<1 week	2.06
Superior	Unlikely	Limited	< 6 hours	<1 week	2.06
Unincorporated Pinal Co	Unlikely	Limited	< 6 hours	<1 week	2.06
				County-wide Average CPRI	2.06

Due to the irregular occurrence of earthquake events in and around the county, the jurisdictions chose to not mitigate the hazard. Nonetheless, a recognized and documented history of large earthquakes in the vicinity that have caused damage within the city.

The impact of moderate earthquakes – the most probable earthquake event to impact Pinal County - is frequently underestimated. According to Minson and others (2020), small to moderate earthquakes can produce markedly more shaking than expected, as a function of proximity to the event and the local substrate. In unprepared communities, this in turn can lead to more injuries and fatalities and produce outsized damage and destruction to property and infrastructure.

Building stock is a major risk factor for injuries/death resulting from ground shaking. Even low intensities of ground shaking can damage or collapse unreinforced masonry buildings of adobe, stone or unreinforced fire-brick or concrete block masonry buildings resulting in injuries or death that might not impact either wood-frame or engineered concrete-frame buildings (e.g., Yavapai County Multi-Jurisdictional Hazard Mitigation Plan).

Earthquake hazards threaten entire communities – urban and rural – in Pinal Counties. The risk is low and earthquakes in south central Arizona are best characterized as '*low-probability high-consequence*' events that occur infrequently and are largely unexpected. Those at greatest risk from earthquakes tend to be the most vulnerable in our communities. Individuals living in poorly built homes or unanchored trailers or on marginal lands in areas where utilities and infrastructure are old and poorly maintained are especially at risk (Table 1; courtesy of Yavapai County Multi-Jurisdictional Hazard Mitigation Plan 2018).

Table 1. At risk buildings, facilities and infrastructure of the built environment (modified from Yavapai County Multi-Jurisdictional Hazard Mitigation Plan 2018, p. 58).

- Older residential and commercial buildings and infrastructure constructed of unreinforced masonry (i.e., URM's) or any other construction materials having inadequate resistance to lateral forces of ground shaking.
- Older non-engineered residential and commercial buildings that have no lateral resistance and are vulnerable to fire following an earthquake.
- Buildings and lifeline systems sited in close proximity to an active fault system, or on poor soils that either enhance ground shaking or fail through permanent displacements (e.g., liquefaction and landslides).
- Schools and other buildings that have been built to low construction standards.
- Communication and control centers concentrated in one area.
- Hospital facilities insufficient for handling large number of casualties and injuries.
- Bridges, overhead crossings that have not been built to withstand lateral forces of earthquakes and are likely to collapse or be rendered unusable by ground shaking.
- Electrical, gas, and water supply lines that are likely to be knocked out of service by ground failure (i.e., liquefaction, lateral spreads, and landslides).

The U.S. Geological Survey's HAZUS modelling application provides standardized tools and data for estimating risk from earthquakes and other natural hazards (FEMA). At present, there are no HAZUS model runs for communities in Pinal County. Going forward we should build HAZUS models for the major cities and towns in Pinal County, e.g., Florence, Coolidge, Eloy, Oracle, Casa Grande and Apache Junction.

Changes is Development in the Hazard Area

The hazard area has experienced rapid industrial, commercial, and residential development over the past five years. The overall population has increased significantly. As have the number of buildings, transportation structures, and supporting infrastructure. The increased population and building stock have increased the jurisdiction's vulnerability to this low probability, high consequence event.

Economic development has not been limited to new construction. Older structures, many of them built using unreinforced masonry, have been remodeled for retail and light commercial use. The renovation of unreinforced masonry buildings of adobe, stone or unreinforced fire-brick or concrete block masonry buildings increases the jurisdiction's vulnerability to low intensity events, causing injuries or death that might not impact either wood-frame or engineered concrete-frame buildings.

Sources

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4.4.4 Extreme Heat

Description

Heatwave activity is on the rise in Arizona, and it is considered the fourth-fastest warming state in the country based on warming rates since 1970[14]. Arizona averages more than 50 dangerous heat days a year, the second-highest in the nation. By 2050, Arizona is projected to see almost 80 such days a year[15]. Extreme heat is the combination of very high temperatures and exceptionally humid conditions that exceed regionally based indices for perceived risk.

History

Extreme heat is a serious public health concern in Pinal County, leading to 60 heat-caused deaths and 120 heat-related deaths between 2010 and 2020. Heat-related illness was also responsible for 1,321 Pinal County emergency room visits or hospitalization between 2010 and 2016, averaging 189 per year. Across Arizona between the years 2008-2018, heat-related illness was responsible for:

- $136,000,000 in Emergency Room visit costs
- $308,000,000 for inpatient treatment, and
- $17.8 Billion in total costs and losses, including loss of life

Hospitalizations and Emergency Room visits typically increase sharply from mid to late June, peaking during the 3rd week of June. According to the National Weather Service, the seasonal increase in hospitalizations tracks closely with their first Extreme Heat Warning of the year.

Between 2008 and 2021, the National Weather Service issued heat warnings for an average of 14 days per year. The most significant number occurred in 2020, when heat warnings were issued on 48 days. The lowest number of heat warnings was in 2014, with only eight (8) warnings issued.

Extent

Climate change analysis predicts that the southwest will continue with increase in daily temperatures during all months in the year resulting in warmer winters and hotter summers[16]. In addition, the climate models also predict less rainfall or snowfall, which will cause water shortages for human consumption as well as generating electrical power[17].

Although extreme heat is often described as "a period of high heat and humidity with temperatures above 90 degrees for 2-3 days." The Center for Disease Control and the National Weather Service has identified several other risk factors contributing to excessive heat hazards. The NWS HeatRisk forecast recognizes these different factors and issues alerts based on:

1. How high and low temperatures and humidity are above average. Are the temperatures high enough to cause harm?
2. The time of year. Have people had time to acclimate to higher temperatures?
3. The duration of the extreme heat. How much-accumulated heat stress will there be?

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[14] https://statesatrisk.org/arizona/extreme-heat

[15] https://reportcard.statesatrisk.org/report-card/arizona/extreme_heat_grade

[16] Climate Change - Science of the American Southwest (U.S. National Park Service) (nps.gov) (https://www.nps.gov/subjects/swscience/climate-change.htm)

[17] Lake Mead level continues to drop, affecting power production - USA News Lab (https://usanewslab.com/us-news/las-vegas/lake-mead-level-continues-to-drop-affecting-power-production/)

The HeatRisk Alerts are numbered and colored-coded to reflect the severity of a heat event, as shown in the figure below:

Level 0 (Green): No elevated risk.	Level 1 (Yellow): Low Risk for those extremely sensitive to heat, especially those without effective cooling and/or adequate hydration.	Level 2 (Orange): Moderate Risk for sensitivity to heat, especially those without effective cooling and/or adequate hydration.	Level 3 (Red): High Risk for much of the population, especially heat sensitive and those without effective cooling and/or adequate hydration.	Leve 4 (Magenta): Very High Risk for entire population due to long-duration heat, with little to no relief overnight.

Figure 4.4.1

As with all other natural hazards, some members of the community experience more significant risks of illness or death due to excessive heat. At-risk groups include:

1. Children, who are less able to regulate their body temperature, spend more time outside and may not have the ability to recognize or protect themselves from the effects of heat.
2. Athletes who may overheat due to a combination of exposure, exertion, and heat-trapping protective gear.
3. Older Adults, who may be socially isolated, suffer from heart disease or take medication that increases their vulnerability to temperature extremes.
4. Pregnant women are at risk of preterm birth, low birth weight, fetal death, and infant mortality.
5. Emergency responders, like athletes, may overheat due to a combination of exposure, exertion, and heat-trapping protective gear.

The risks of excessive heat are exacerbated when a power outage occurs during a period of high heat. Air conditioners, which provide adequate cooling for much of the population, are no longer operational. Community members who do not have access to an effective cooling system may encounter high temperatures and, as a result, are more likely to suffer a heat-related illness.

Probability of Future Events

There are no recurrence or non-exceedance probabilities developed for extreme temperature events in Arizona or Pinal County. Table 4.4.2 shows the average temperatures, record highs, and record lows at the Casa Grande National Monument in Coolidge, AZ, during June, July, and August.

The mean maximum temperatures for these months are approximately 105°F. This number is well above the 90°F that may be described as "extreme." National Weather Service records do not show a year in which there were no heat warnings issued. Although often occurring on consecutive days, extreme temperatures generally do not exceed 6 hours in duration per day.

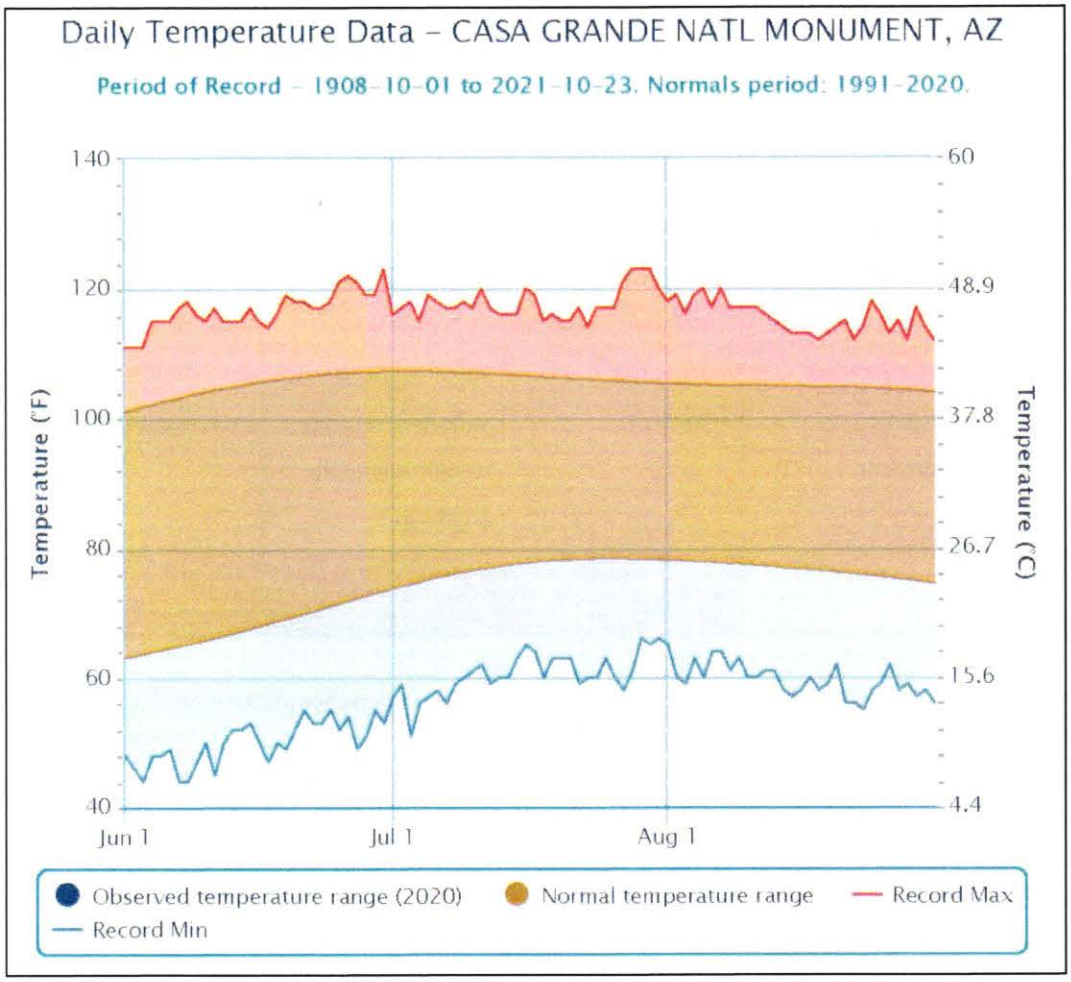


Figure 4.4.2

Vulnerability

Table 4-9: CPRI Results for Extreme Heat

Jurisdiction	Probability	Magnitude/ Severity	Warning Time	Duration	Rating
Apache Junction	Highly Likely	Critical	< 24 hours	> 6 hours	2.95
Casa Grande	Highly Likely	Critical	< 24 hours	> 6 hours	2.95
Coolidge	Highly Likely	Critical	< 24 hours	> 6 hours	2.95
Eloy	Highly Likely	Critical	< 24 hours	> 6 hours	2.95
Florence	Highly Likely	Critical	< 24 hours	> 6 hours	2.95
Kearny	Highly Likely	Limited	< 24 hours	> 6 hours	2.65
Mammoth	Highly Likely	Limited	< 24 hours	> 6 hours	2.65
Maricopa	Highly Likely	Critical	< 24 hours	> 6 hours	2.95
Superior	Highly Likely	Limited	< 24 hours	> 6 hours	2.65
Unincorporated Pinal Co	Highly Likely	Critical	< 24 hours	> 6 hours	2.95
				County-wide average CPRI =	**2.86**

Extreme heat events occur on a regular basis, typically in the summer months resulting in threats to public health and safety. Older adults, young children, and people who are sick, overweight or have an underlying health condition are more susceptible to heat-related illness. Additionally, some economic sectors are also affected by increasing high temperatures such as individuals employed in the energy and transportation industries. In extreme temperatures, air quality is also affected. Hot and sunny days can increase the production of ground-level ozone, a harmful pollutant that is the main component of smog, which can damage the respiratory system and is particularly harmful for those with asthma.

In recent years, temperatures in the summer months have been the warmest on record. Extreme heat, combined with less precipitation, and high wind days also increases the potential for major wildfires. Fluctuation in temperatures may also lead to higher uses of electricity, gas, or water that can lead to outages or interruptions in service. Pinal County covers an extensive geographic area with several different climate zones. Temperatures will vary across these zones by as much as 20 – 30°F. Temperatures reaching 110°F in Western Pinal County might only reach 90°F at the higher elevations in the eastern County.

The lower elevations in Western Pinal County will suffer from higher temperatures and a more significant number of extreme heat events during the year. These areas also have higher populations placing a greater number of people at risk. However, although average temperatures are lower, the higher elevations are not immune to extreme heat events. These areas also have aging utility infrastructure, increasing the likelihood of power outages during periods of peak demand. In addition, there is a high percentage of low-income households in eastern Pinal County, increasing the possibility of these homes not having access to an effective cooling system. Losses due to extreme heat primarily occur in the form of death and illness for people and animals as mentioned at the beginning of this section. Arizona Department of Health Services tracks data and monitors trends and other factors to determine if a statistical significance exists.

Changes in Development in the Hazard Area

The growth and development of master-planned communities on former agricultural land have increased the risk of higher temperatures due to the "Urban Heat Island" effect. The concrete, asphalt, and buildings in developed areas absorb heat during the day. The thermal mass of the built environment radiates the heat into the surrounding air, raising temperatures. The National Integrated Heat Health Information System reports that "highly developed urban areas can experience mid-afternoon temperatures that are 15°F to 20°F warmer than surrounding, vegetated areas." (NIHHIS). As these areas continue to grow, extreme temperatures are expected to increase in frequency and magnitude.

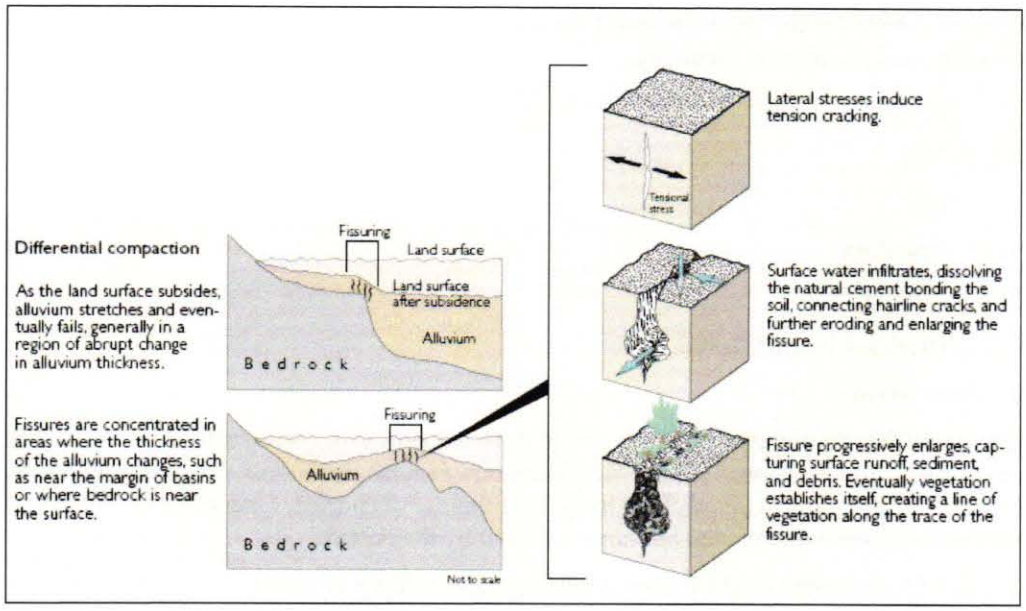
Sources

https://www.ready.gov/heat
https://www.nws.noaa.gov/directives/sym/pd01005015w012018curr.pdf
https://azdhs.gov/documents/preparedness/epidemiology-disease-control/extreme-weather/pubs/heat-related-mortality-year.pdf
https://nihhis.cpo.noaa.gov/Urban-Heat-Islands/Understand-Urban-Heat-Islands

4.4.5 Fissure

Description

Earth fissures are linear cracks, seams, or separations in the ground surface that extend from the groundwater table or bedrock, and are caused by tensional forces related to differential land subsidence. In many cases, fissures form as a direct result of subsidence caused by groundwater depletion. The surface expression of fissures ranges from less than a yard to several miles long and from less than an inch to tens of feet wide. The longest fissure in Pinal County and the state is near the community of Picacho and is over 10 miles long. Earth fissures occur at the edges of basins, usually parallel to mountain fronts, or above local bedrock highs in the subsurface, and typically cut across natural drainage patterns. Fissures can alter flood patterns, break buried pipes and lines, cause infrastructure to collapse, provide a direct conduit to the groundwater table for contaminants, and even pose a life safety hazard for both humans and animals.



Source: AZGS, 2010

History

In Arizona, fissures were first noted near Picacho in 1927. Initially, the heaviest use of groundwater was for agricultural irrigation use. More recently, however, exponential population growth has dramatically increased domestic demands. The risk posed by fissures is also rising as the population expands into the outlying basin edges and mountain front. The planning team decided they would each capture the number of documented fissure case histories for the last five years to reflect their vulnerability to the hazard.

Apache Junction – No significant hazard event occurred as a result of fissures within the past five years within the city.

Casa Grande – No fissure hazard event hast occurred in the last five years within Casa Grande.

Coolidge – There has been no history of fissure activity in Coolidge within the last five years.

Eloy – In the past five years, the City of Eloy has had no fissure related hazard events.

Florence – No fissure events have occurred in the last 5 years.

Kearny – There is no history of fissure in Kearny.

Mammoth – No significant fissure events have occurred within the last five years.

Maricopa – No documented significant fissure events in the last five years.

Superior – Although the dry years have cracked and fissured the cliffs in the surrounding area, no research has measured its effect on the land. No hazardous event has happened in the last five years involving fissures.

Unincorporated Pinal County – Although no significant events have occurred in the past five years, the Arizona Geological Survey reports that fissures remain active throughout the Pinal County Study areas.

Extent

The AZGS Earth Fissure Mapping Program locates and classifies earth fissures in Arizona. The fissures are classified according to their physical attributes. They are first characterized as continuous, discontinuous, or reported, unconfirmed. The fissures are further grouped into four (4) categories based

on the interior geometry of the sidewalls and floor of the fissure. The fissures are then described by noting the fissure's physical parameters including:

1. location,
2. width,
3. depth,
4. morphology,
5. vegetation,
6. vertical displacement, and
7. orientation

The AZGS states that "continuous fissures are manifested on the ground surface by an unbroken, and easily traced, surface expression." While "discontinuous fissures,[are] those [fissures] with a broken or non-continuous surface expression such as lines of potholes." Reported, Unconfirmed Fissures are earth fissures which have been documented but not confirmed by the AZGS.

The AZGS uses the following four (4) categories to group surveyed fissures:

1. Rounded edges with a flat bottom
2. Rounded edges with a crack bottom
3. sharp edges with a crack bottom, and
4. sharp edges with a flat bottom.

"Edges" refers to the top edges of the fissure. The bottom is the floor of the fissure. A flat bottom means that the bottom of the fissure can be seen from the edge. A crack bottom means that the bottom cannot be seen from the edge.

Probability of Future Events

There are no methods of quantifiably predicting the probability and magnitude of earth fissures. The locations of potential fissures or extension of existing fissures may be predictable in specific areas if enough information about the subsurface material properties and groundwater levels are available. It is a fair assurance that continued groundwater depletion will result in more fissures. The magnitude of existing and new fissures is dependent upon several variables including the depth to groundwater, type and depth of surficial material present, amount and rate of groundwater depletion, groundwater basin depth, depth to bedrock, volume and rate of runoff due to precipitation entering the fissure, and human intervention.

Vulnerability

Table 4-10: CPRI Results for Fissure

Jurisdiction	Probability	Magnitude/ Severity	Warning Time	Duration	Rating
Apache Junction	Possibly	Negligible	< 6 hours	< 1 week	2.10
Casa Grande	Possibly	Negligible	> 24 hours	> 1 week	1.75
Coolidge	Possibly	Negligible	> 24 hours	> 1 week	1.75
Eloy	Likely	Limited	> 24 hours	> 1 week	2.50
Florence	Unlikely	Negligible	> 24 hours	> 1 week	1.30
Kearny	Unlikely	Limited	> 24 hours	< 1 week	1.50
Mammoth	Unlikely	Negligible	> 24 hours	< 1 week	1.30
Maricopa	Possibly	Negligible	> 24 hours	< 1 week	1.65

Table 4-10: CPRI Results for Fissure					
Jurisdiction	**Probability**	**Magnitude/ Severity**	**Warning Time**	**Duration**	**Rating**
Superior	Unlikely	Negligible	> 24 hours	< 1 week	1.30
Unincorporated Pinal Co	Highly Likely	Limited	< 6 hours	< 1 week	3.30
				County-wide average CPRI =	**1.84**

The Planning Team has determined they will continue to assess vulnerability as an overview summary of the hazard's impact on the community and its vulnerable structures, rather than in a quantitative manner.

Apache Junction – In Apache Junction, the southwest corner of the city is most vulnerable to fissures, and is included in one AZGS fissure study area; the Apache Junction Study Area. This small section of the community, south of Baseline Avenue and west of Ironwood Drive, was mapped in April of 2008 and contains both continuous and discontinuous earth fissures. The greatest risk lies along the intersection of Baseline Avenue and Meridian Road, where a fissure crosses diagonally under the intersection, and west of Ironwood Drive north of Guadalupe Road where active fissures could threaten these critical transportation corridors and future development within the area.

Casa Grande – The city of Casa Grande is in the two AZGS fissure study areas; the Toltec Buttes Study Area, mapped in August 2008, and the Sacaton Butte Study Area, mapped in March 2011. The southeast corner of Casa Grande is also in the Toltec Buttes Study, where several fissures are along I-8 and the area that borders Eloy to the East. In addition,

In addition, a small portion of the northwest corner of Casa Grande was included in the Sacaton Butte Study; while there are no fissures noted within city limits, both continuous and discontinuous earth fissures were pointed out in the study area nearby. Although these fissures do not expose a large number of people to a high hazard area, the most recent applicable data for Casa Grande projected a total of $10,610,000 in potential economic impact due to building exposure in high hazard fissure zones.

Coolidge – The city of Coolidge is included in one AZGS fissure study area; the Picacho Peak and Friendly Corner Study Area, which was mapped in January 2016. The study area covers the southernmost areas of the community, and in reference to Coolidge, maps the approximate locations of unconfirmed earth fissures – with several being in close proximity to the City of Coolidge Municipal Airport. These fissures currently do not expose any population to a high hazard area. The most recent applicable data for Coolidge projected a total of $0 in potential economic impact due to building exposure in high hazard fissure zones.

Eloy – The city of Eloy is included in two AZGS fissure study areas (Toltec Buttes Study Area & Picacho Peak and Friendly Corner Study Area), and is in close proximity to others as well. In the Toltec Butte Study Area, several unconfirmed fissures are identified near the Toltec community and the northwestern limits of the city. Several noteworthy continuous and discontinuous fissures are noted south and southeast of the Casa Grande Mountains. In addition, far eastern sections of Eloy are included within the Picacho Peak and Friendly Corner Study Area, where a multitude of fissures are identified. However, most of these fissures lie to the east of AZ-87, outside of Eloy. The most recent applicable data for Eloy is estimated at $50 million in potential economic impact due to building exposure in high hazard fissure zones.

Florence – Florence is not included in any of the AZGS fissure study areas. The probability of fissures having an impact on the community is unlikely. The most recent applicable data for Florence projected a total of $0 in potential economic impact due to building exposure in high hazard fissure zones.

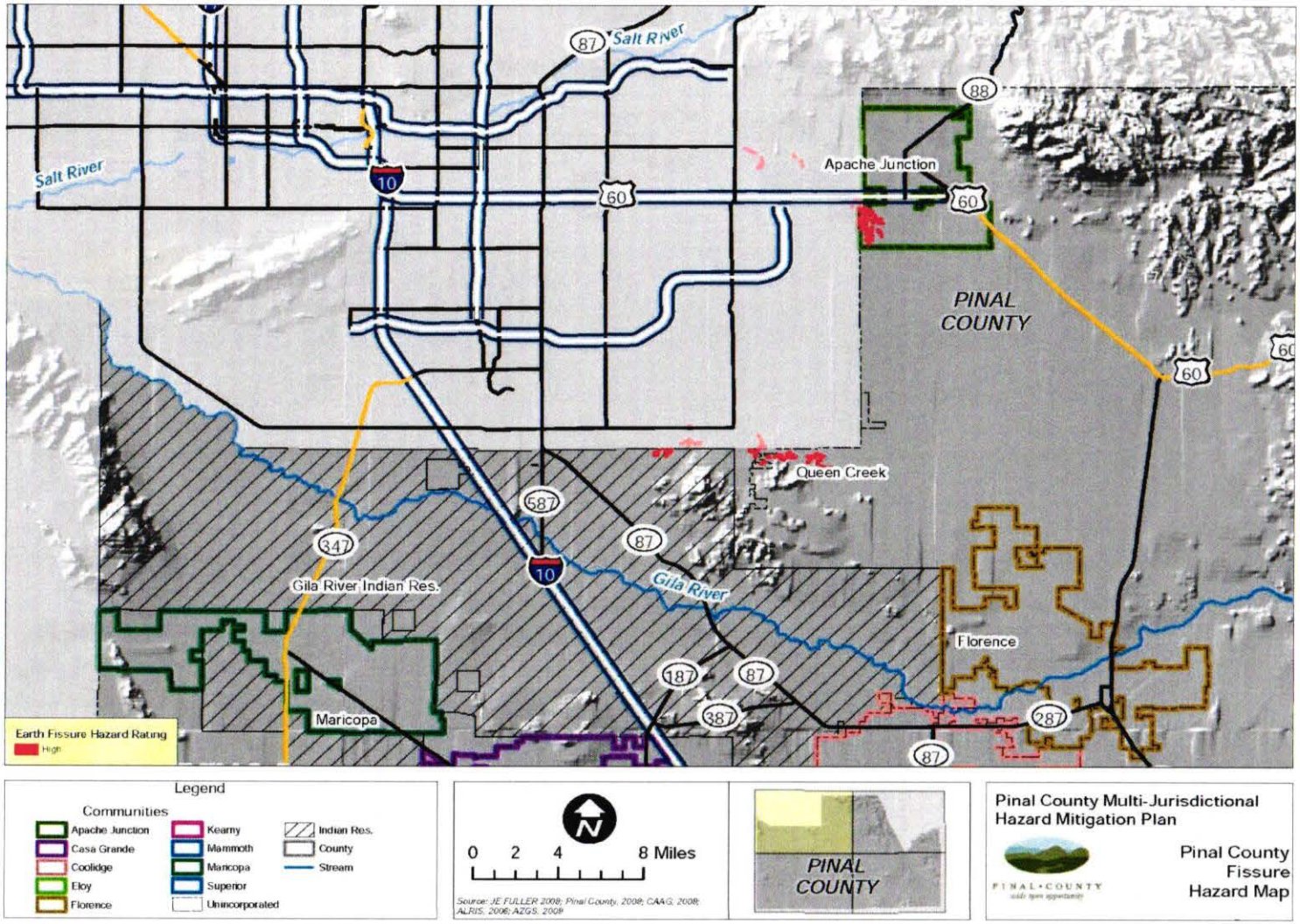
Kearny – Kearny is not included in any of the AZGS fissure study areas. The probability of fissures having an impact on the community is unlikely. The most recent applicable data for Kearny projected a total of $0 in potential economic impact due to building exposure in high hazard fissure zones.

Mammoth – Mammoth is not included in any of the AZGS fissure study areas. The probability of fissures having an impact on the community is unlikely. The most recent applicable data for Mammoth projected a total of $0 in potential economic impact due to building exposure in high hazard fissure zones.

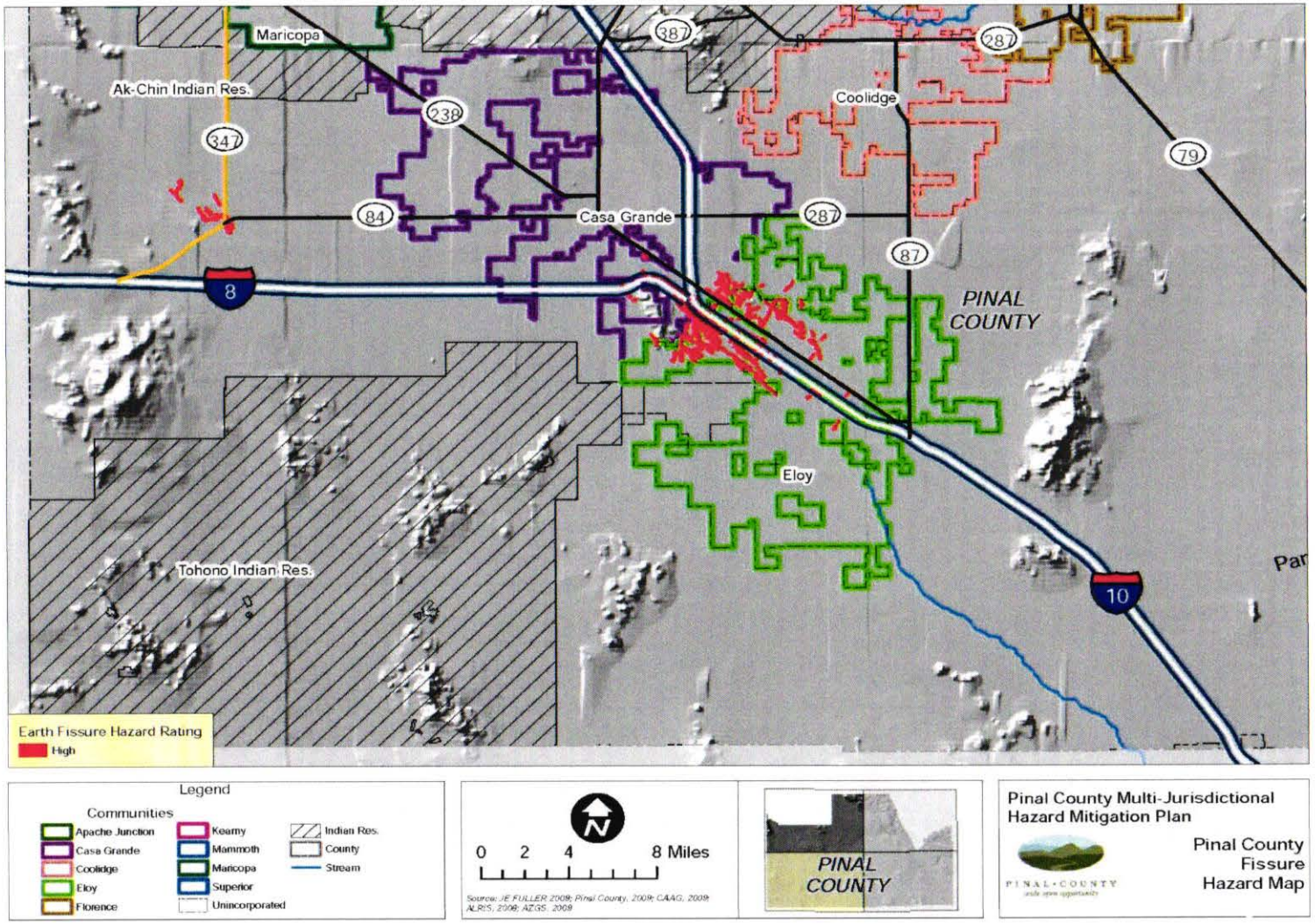
Maricopa – Fissures are not as prevalent in the Maricopa area; however, portions of the community are in two AZGS fissure study areas. Prepared by the AZGS in March 2011, the Sacaton Butte Study Area fissure map noted both continuous and discontinuous earth fissures adjacent to the southeastern limits of the city, near the Ak-Chin Regional Airport. In western Maricopa, the Heaton Study Area, mapped in February of 2009, noted both continuous and discontinuous earth fissures north of Arizona State Route 238, along with approximate locations of unconfirmed fissures. These fissures currently do not expose any population to a high hazard area. The most recent applicable data for Maricopa projected a total of $0 in potential economic impact due to building exposure in high hazard fissure zones. The risk of Fissures still exists to impact residential subdivisions to cause evacuation and relocation of residents.

Superior – The susceptibility of fissures impacting the community is unlikely as no buildings in the high hazard fissure zone have faced damages in the last five years.

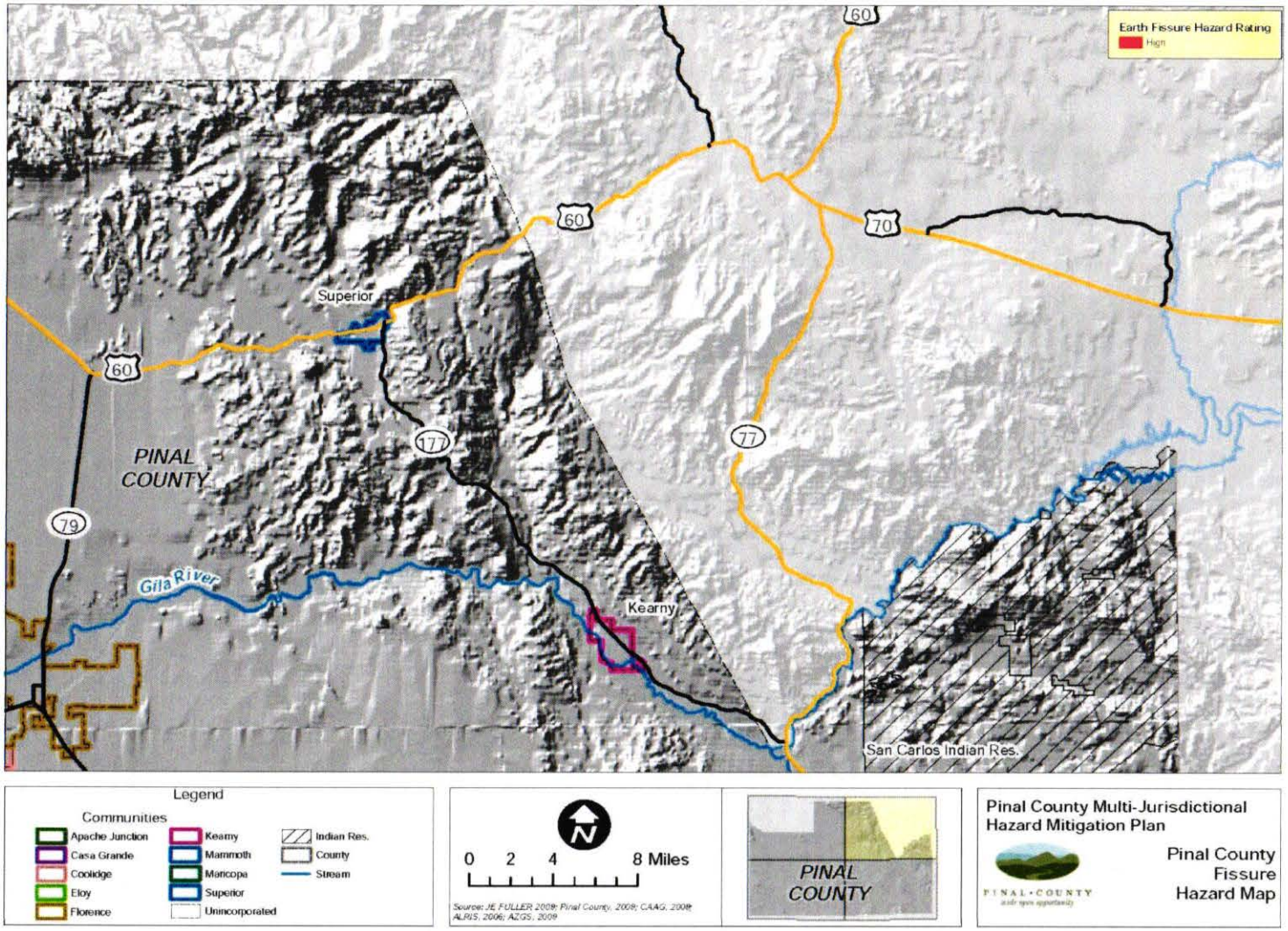
Unincorporated Pinal County – Several areas of unincorporated Pinal County are vulnerable to fissures. In the northern section of Pinal County, along the Maricopa County line, several fissures have been noted along Hunt Highway as part of the Chandler Heights Study Area. Fissures in this area, the Y-crack in particular, have presented several issues over the years. The Picacho Peak and Friendly Corner Study Area, located primarily among rural, unincorporated areas of the county, contains a significant number of noteworthy continuous and discontinuous fissures. Additional study areas impacting the unincorporated areas of the county include Tator Hills, Greene Wash, White Horse Pass, Santa Rosa Wash, and Pete's Corner. Although fissures are highly likely, the magnitude/severity observed in these areas is limited, primarily due to the rural geographical location, and thus a smaller number of people potentially affected.



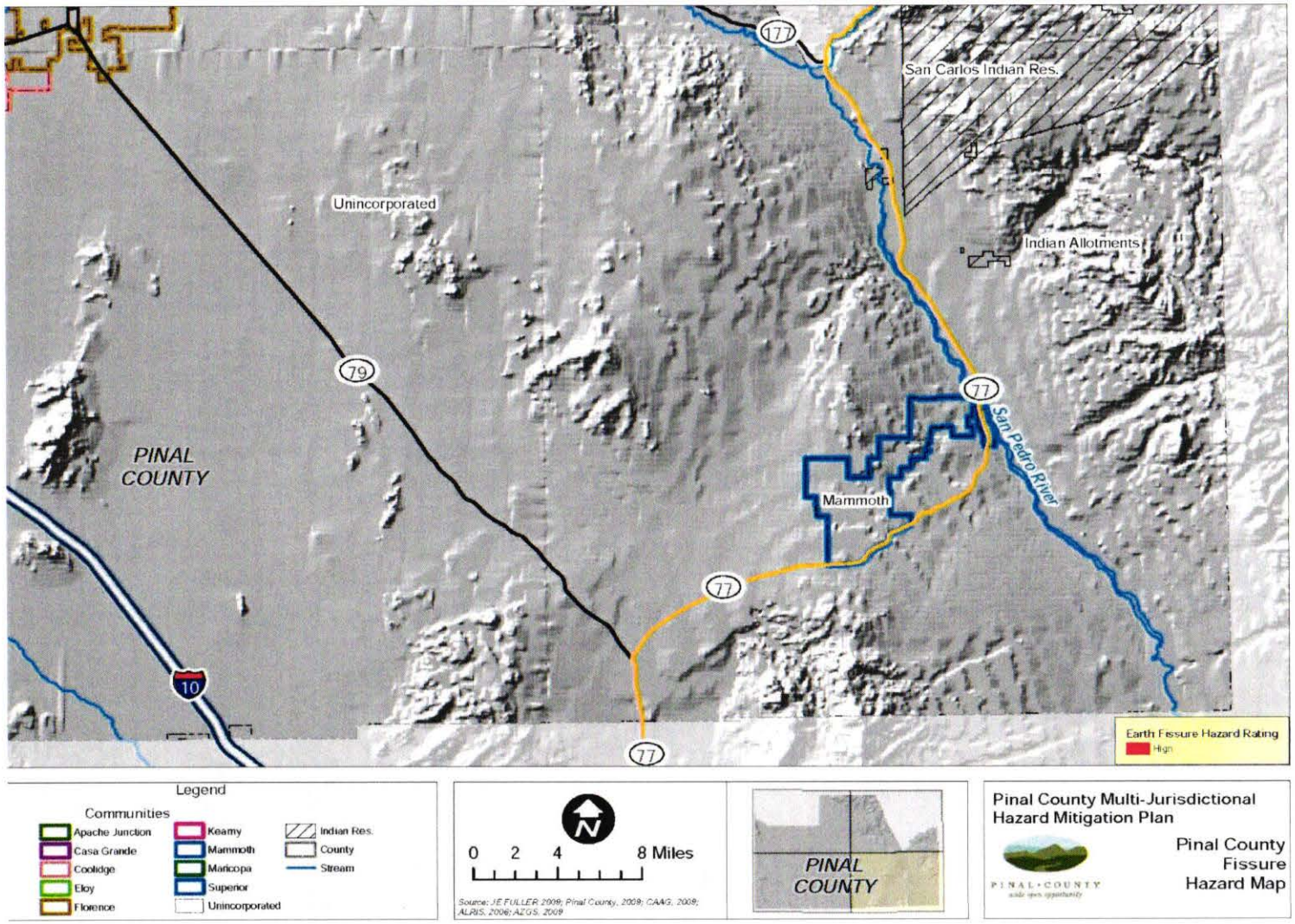
Map 4-11: Pinal County Fissure Hazard Area (1)



Map 4-12: Pinal County Fissure Hazard Area (2)



Map 4-13: Pinal County Fissure Hazard Area (3)



Map 4-14: Pinal County Fissure Hazard Area (4)

Changes is Development in the Hazard Area

With the anticipation of growth within the county, the participating jurisdictions were asked to describe how development within the hazard area has impacted them.

Apache Junction – No development has occurred in areas vulnerable to fissures within the past five years along with no threats observed by fissures to the transportation corridors.

Casa Grande – Casa Grande has experienced commercial and industrial growth within the hazard area and a resurgence in residential construction; houses are mostly built within subdivisions that already have the infrastructure in place. No development has occurred in the areas identified in either study.

Coolidge – The development in Coolidge has been concentrated south and west of the city, with little growth near the airport and the documented fissures. The growth consists of mainly residential to include single and multi-family units, as well as the addition of large-scale manufacturing facilities.

Eloy – In the last 5 years, Eloy has experienced an increase in building permits resulting in reuse of current industrial and commercial properties, as well as more construction of single-family housing located in the fissure hazard area.

Florence – No development has occurred in areas vulnerable to fissures within the past five years.

Kearny – There have been no significant changes to the area to affect the risk/vulnerability.

Mammoth – The Town of Mammoth has experienced little to no development or growth in the hazard area over the past five years.

Maricopa – No significant changes to affect fissures in the last five years.

Superior – Earth fissures and associated erosional gullies pose a hazard to people, property, and livestock. No such significant events have occurred within the five years in the Town—future development is planned to be evaluated for the potential impacts of the earth's fissures.

Unincorporated Pinal County – last five (5) years. In particular, the northern section of Pinal County, along the Maricopa County line; and in Central Pinal County have seen suburban and industrial development occur at a breakneck pace on previously undeveloped or agricultural land. This new development places more people and structures into areas of high fissure hazard. According to the Arizona Geological Survey, some of the more common damage associated with earth fissures includes:

- Cracked or collapsing roads
- Broken pipes & utility lines
- Damaged or breached canals
- Cracked foundation/separated walls
- Loss of agricultural land
- Livestock & wildlife injury or death
- Damaged well casing or wellhead
- Disrupted drainage
- Contaminated groundwater aquifer
- Sudden discharge of ponded water
- Human injury or death

Sources

AZ Division of Emergency Management, State of AZ Hazard Mitigation Plan.

AZ Geological Survey http://www.azgs.az.gov/EFC.shtml

AZ Land Subsidence Group, 2007. Land subsidence and earth fissures in Arizona: Research and informational needs for effective risk management, white paper
http://www.azgs.az.gov/Earth%20Fissures/CR-07-C.pdf

4.4.6 Flood / Flash Flood

Description

For this Plan, the hazard of flooding addressed in this section will pertain to floods that result from precipitation/runoff related events. Flooding due to dam or levee failures is addressed separately. The three seasonal atmospheric events that tend to trigger floods in Pinal County are:

- *Tropical Storm Remnants*: Some of the worst flooding tends to occur when the remnants of a hurricane that has been downgraded to a tropical storm or tropical depression enter the state. These events occur infrequently and mostly in the early autumn, and usually bring heavy and intense precipitation over large regions causing severe flooding.
- *Winter Rains*: Winter brings the threat of low intensity; but long duration rains covering large areas that cause extensive flooding and erosion, particularly when combined with snowmelt.
- *Summer Monsoons*: In mid to late summer the monsoon winds bring humid subtropical air into the state. Solar heating triggers afternoon and evening thunderstorms that can produce extremely intense, short duration bursts of rainfall. The thunderstorm rains are mostly translated into runoff and in some instances, the accumulation of runoff occurs very quickly resulting in a rapidly moving flood wave referred to as a flash flood. Flash floods tend to be localized and cause significant flooding of local watercourses.

Damaging floods in the county include riverine, sheet, alluvial fan, and local area flooding. Riverine flooding occurs along established watercourses when the bank full capacity of a watercourse is exceeded by storm runoff or snowmelt and the overbank areas become inundated. Sheet flooding occurs in regionally low areas with little topographic relief that generate floodplains over a mile wide, Alluvial fan flooding is generally located on piedmont areas near the base of local mountains, such as the Tortolita Fan, that are characterized by multiple, highly unstable flow paths that can rapidly change during flooding events. Local area flooding is often results from poorly designed or planned development wherein natural flow paths are altered, blocked or obliterated, and localized ponding and conveyance problems result. Erosion is also often associated with damages due to flooding.

History

Flooding is clearly a major hazard in Pinal County, resulting in over 17 presidential disaster declarations. There have also been several non-declared events of reported flooding incidents. The following historical incidents represent examples of major flooding that has affected the county:

Apache Junction – Multiple significant flash flood events within the past five years have occurred within the city: On July 23, 2017, August 23-24, 2018, September 23, 2019, and July 23, 2021. These events were characterized by occasional water rescues of stranded motorists/pedestrians, usual and numerous street closures due to flooding, frequent street damage (usually minor to moderate on rural outlying roads), significant and frequent road erosion repair and sediment removal, and occasional isolated damage, sometimes severe, to private property dwellings and businesses.

Casa Grande – On June 25, 2021, the City of Casa Grande Public Works employees worked at midnight and well into Monday to pump water out of the roadways along Cottonwood Lane between Peart and Arizola roads and between Arizola and Henness roads. The city closed those road sections to traffic at 6:50 a.m. Monday, forcing Vista Grande High School students to enter the school parking lot via Arizola Road on their first day of school for the year. Once public works employees reopened Cottonwood Lane between Peart and Arizola roads, crews would start pumping water from one retention basin at the high school to another to help clear water off Cottonwood Lane near Clements Road. The weekend storms dumped about 1.94 inches of rain at Casa Grande Municipal Airport, said Marvin Percha, a meteorologist with the National Weather Service. Some areas of Casa Grande got more than 2 inches.

Coolidge – Coolidge experiences mild to moderate flooding, mainly during the monsoon season. These events are usually located in low water crossings, low lying areas and washes. Monsoon seasons normally will cause localized flooding such as seen most recently in 2018 and 2021. Historically the major flooding events have occurred due to water being released from the Coolidge Dam causing flooding downstream as seen in September 1941, December 1965, December 1978 and January 1993. On July25, 2019, during the unseasonably wet monsoon season Coolidge experienced larger than average flooding with numerous incidents of water rescue and flood damage to residential structures.

Eloy – In the past five years, the City of Eloy has experienced significant flooding events that have resulted in loss of road access, property damage, and additional expenses for clean-up. In all cases, Eloy Police Department responds to calls and classifies events as hazardous. In some cases, the City of Eloy has applied for assistance through such organizations as DEMA to provide reimbursement expenses related to staff overtime.

Florence – There has not been any significant flood events in the last 5 years.

Kearny – Kearny has not had a flood since 1993. However, as the environment and weather patterns change, flood risks will increase.

Mammoth – No significant flood events have occurred within the last five years.

Maricopa – There have been no documented significant flood events within the last five years in Maricopa.

Superior – Flooding is one of the significant hazards in the Town of Superior. The Town is located about 2,600 feet in elevation to the National Tonto Forest. During the rainstorm, the water flows down fast and strong from the mountains and hills, creating immediate soil erosion in areas. Many times the rocks would be drugged by the stormwater into the culverts, ditches, and swales. The gravel driveways, dirt roads, asphalt milling surfaces erode during storm rains creating access issues.

Moreover, Few major traffic collectible streets cross the queen creek that gets flooded during the monsoon and winter rainstorm seasons. A few times a year, the Town has to shut down the street to avoid issues at the creek crossings; many times, roads are closed for up to 3 weeks. The flooded roads prevent people from getting to the hospital and hinder communities, schools, and emergency vehicles from responding to incidents. Per the Fire Marshal report and according to statistics, a house can burn down in thirteen minutes. Police and Ambulance delays can cause a death of a person who needs immediate help within three to four minutes. In non-flooding season, police, ambulance, and fire get to the incident within three to four minutes.

From February 15 to March 10, 2019, the creek flooded. The flooding caused two major collectible streets to close for up to 6 weeks due to a flooded creek.

On January 18, 2020, water washed out a vehicle when the driver tried to cross the flooded creek. Likely, no one was injured during the event. After four weeks, the public works department removed the car when the water was completely gone from the creek.

From March 13 to April 20, 2020, the queen creek crossings at Panther Drive and Stone Avenue were closed for four weeks.

On August 2021, the monsoon caused severe damages to our sewer pipe. The rocks washed into the open drainage system, causing the main sewer line to shut down.

From February to April 2020, the creek crossing was closed for up to 3 weeks due to flooding.

On July 25, 2021, the monsoon caused severe flooding throughout the Town, including the shutdown of the major streets at the creek crossing for 20 days leaving many residents to find other access across Town.

In September 2021, rainstorms caused 3-4 days of the shutdown of the creek crossings due to flooding. The shutdown caused traffic congestion in other streets, which led to delays in emergency response services and daily life activities for residents.

Unincorporated Pinal County – On October 1, 2018, the remnants of Hurricane Rosa brought heavy rains and localized flooding to Western Pinal County. The total amount of damages caused by the flooding was $538,169.95. The severest effects were seen in the unincorporated community of Thunderbird Farms due to flash flooding and high-water flows in the Vekol Wash. The unincorporated communities of Silverbell and Arizona City were also affected.

The flood waters also caused a failure of the Central Arizona Project Lateral located just west of the Vekol wash in as many as four (4) different locations. This contributed to the water flows in the already swollen Vekol wash and sent water North along Ralston Road, towards State Route 238.

A family crossing the normally dry Vekol Wash in two vehicles were endangered by a flash flood. The first vehicle began the crossing with less than four (4) inches of water running in the wash. As the second vehicle made its way across, it was struck by a "wall of water" which spun the vehicle around and left it facing up-stream. The occupants were able to escape the vehicle and get to the roof. When volunteer firefighters arrived, they found the family waiting on top of the vehicle for rescuers. However, as the firefighters were setting up for the rescue, a second wave hit the vehicle throwing the occupants away from the vehicle towards the edge of the wash. The occupants were able to grab onto brush near the shore which allowed the responders to reach them. The vehicle was swept downstream by the current. All of the family members were able to safely escape.

Successive seasonal storms in July and August 2021 caused an estimated 3,950,000 in public infrastructure damage due to flash flooding. Excessive water flows and saturated soil caused pavement failures, undermining of roadways, and the failure of multiple culverts. The resulting road closures led to some residents becoming isolated or having limited ingress and egress to their home.

Extent

The force of a flash flood can roll boulders, rip trees out of the ground, and destroy buildings and bridges. True to their name, flash floods occur suddenly – within a few minutes or hours. Rapidly rising water can reach heights of 30 feet or more, and to make matters worse, the same rains that produce flash floods can also trigger catastrophic mud slides[18]. The magnitude or strength of floods is measured in rainfall intensity, depth, and velocity. Within Pinal County, rainfall intensity above 1.5 inches per hour is the first warning system trigger at which dry washes flow bank to bank and may create flash floods or road closures. Overbank floods may occur when these rainfall intensity rates are sustained over several hours. Predetermined flow depth and velocity readings expressed as cubic feet per second from streamflow gages are then used to trigger additional warning and response.

Probability of Future Events

For the purposes of this Plan, the probability and magnitude of flood hazards in Pinal County jurisdictions are based on the 1% probability floodplains delineated on FEMA Flood Insurance Rate Maps (FIRMs), plus any provisional floodplain delineations used for in-house purposes by participating jurisdictions. FEMA has completed a map modification program to update the FIRMs for the county into a digital FIRM (DFIRM) format. DFIRM floodplain GIS base files were obtained from FEMA and are the basis for the flood hazard depictions in this Plan. Therefore, the vulnerability analysis results in this plan are likely conservative.

[18] https://www.livescience.com/6592-science-flash-floods.html

Two designations of flood hazard are used. Any "A" zone is designated as a HIGH hazard area. MEDIUM flood hazard areas are all "Shaded X" zones. All "A" zones (e.g. – A, A1-99, AE, AH, AO, etc.) represent areas with a one percent (1%) probability of being flooded at a depth of one-foot or greater in any given year. All "Shaded X" zones represent areas with a 0.2% probability of being flooded at a depth of one-foot or greater in any given year. These two storms are often referred to as the 100-year and 500-year storm, respectively.

Vulnerability

Table 4-11: CPRI Results for Flooding

Jurisdiction	Probability	Magnitude/ Severity	Warning Time	Duration	Rating
Apache Junction	Highly Likely	Critical	6-12 hours	< 24 hours	3.35
Casa Grande	Highly Likely	Limited	< 6 hours	< 24 hours	3.20
Coolidge	Likely	Limited	< 6 hours	< 24 hours	2.75
Eloy	Highly Likely	Limited	< 6 hours	> 24 hours	3.30
Florence	Likely	Limited	> 24 hours	< 1 week	2.40
Kearny	Likely	Critical	< 6 hours	< 24 hours	3.05
Mammoth	Highly Likely	Limited	< 6 hours	> 24 hours	3.30
Maricopa	Highly Likely	Critical	6-12 hours	> 1 week	3.55
Superior	Highly Likely	Critical	< 6 hours	> 1 hours	3.70
Unincorporated Pinal Co	Highly Likely	Limited	12-24 hours	< 1 week	3.00
				County-wide average CPRI =	**3.16**

The HAZUS info from the previous plan has not populated different information since the last plan update; therefore, the following information still pertains to this plan update.

For the previous Plan, the estimation of potential exposure to high and medium flood hazards was accomplished by intersecting the human and facility assets with the flood hazard limits depicted on this section's maps. Loss estimates to all facilities located within the high and medium flood hazard areas were made based on the loss estimation tables published by FEMA (FEMA, 2001). Most of the assets located within high hazard flood areas will be subject to three feet or less of flooding. It is assumed that all structural assets located within the high hazard areas will have a loss-to-exposure ratio of 0.20 (or 20%). A loss to exposure ratio of 0.05 (5%) is assumed for assets located in the medium hazard areas.

Based on the previous Plan's assessment, there is an estimated $37.9M and $2M in asset related losses for high and medium flood hazards, for all the participating jurisdictions in Pinal County. An additional $113.7 and $118.9M in high and medium flood losses to HAZUS defined residential, commercial, and industrial facilities is estimated for all participating county jurisdictions. Regarding human vulnerability, a total population of 18,918 people, or 5.03% of the total population, is potentially exposed to a high hazard flood event. A total population of 43,737 people, or 11.64% of the total population, is potentially exposed to a medium hazard flood event. Based on the historic record, multiple deaths and injuries are plausible and a substantial portion of the exposed population is subject to displacement depending on the event magnitude.

The Planning Team has determined they will continue to assess vulnerability as an overview summary of the hazard's impact on the community and its vulnerable structures, rather than in a quantitative manner.

Apache Junction – The City of Apache Junction is located on an alluvial fan at the base of the Superstition and Goldfield Mountains. The alluvial fan is characterized by the presence of many intermingling washes. Weekes Wash is the largest wash in the community and places the greatest number of residents at risk for flooding. Several homes are located within the 1-percent chance annual flood hazard area due to their proximity to the Weekes Wash. A significant portion of the city, particularly the

western parts of the community (west of Tomahawk Road), is located within the .2-percent chance annual flood hazard area. The city is subject to the effects of both summer flash flooding, and general winter storm flooding. A significant portion of the city is protected by three FRS structures (Apache Junction FRS, Powerline FRS and Vineyard Road FRS) to help reduce the flooding hazard within the community. However, due to limited protections for Weekes Wash and a large extent of homes, businesses, and infrastructure located within FEMA mapped flood hazard areas, potential magnitude/severity is rated as critical, as the impact to the community could be extensive.

Casa Grande – In the City of Casa Grande, lying to the north, along the North Branch of the Santa Cruz Wash, the area is subject to sheet flow flooding. Several residents in this area are subjected to either a 1-percent or .2-percent chance of annual flooding. In the southern portion of Casa Grande, inadequate drainage for run-off originating in or near the city results in localized ponding in many areas (e.g., Businesses located at the intersection of Florence Boulevard & N Cameron Street). The impact on the central business district could result in economic distress for the local economy. Due to the lack of well-defined stream channels, intense rainfall of short duration, 2 to 3 inches in less than an hour, creates severe drainage problems in the community. The drainage problem could result in closed roads and be a major disruption to transportation within the city. All streams in the vicinity of Casa Grande are ephemeral, occasionally flowing in response to large amounts of rainfall in short time intervals. Winter and summer precipitation falls as heavy rains from thunderstorms, whereas winter precipitation generally results from low-intensity storms lasting one to three days. The magnitude/severity of flooding in the city is limited as most of the community is outside of FEMA-identified at-risk areas.

Coolidge – Flooding in Coolidge is seen as limited, as the area at risk is not great in size, and the 1-percent flood-risk areas are restricted to agricultural areas. Several homes are located within the .2 percent annual flood-risk area, with the potential for more to be included in the future, as development continues in the FEMA mapped area of the community.

Eloy – Based on FEMA flood insurance rate maps, there are approximately 112 square miles of land in Eloy that lie within the 100-year floodplain area, this amount comprises approximately 21 percent of Eloy's entire planning area. The rivers and streams within the Planning Area are nearly always dry, but will provide a means for conveying water during rain or storm events. These water corridors may experience flooding during severe storm events. The greatest flood risk within the community lies to the south of the Casa Grande-Picacho Highway and the railroad tracks, as multiple homes are located within this 1-percent flood risk area, along with several properties in the industrial corridor. Flooding in this area could result in economic disruption, and many displaced residents. In addition, a large portion of land below I-10 is within a 100-year floodplain as well, however, this area is not seen as a particularly vulnerable section of the community as it is primarily agricultural land.

Florence – The major flooding risk present in Florence comes by way of the Gila River, which divides the town into northern and southern areas. A thin strip of the town runs across the Gila River floodplain; although little development has taken place in this strip, as it is mainly used for agricultural purposes, the concerns are enhanced due to the critical infrastructure buildings which are located within the flood risk area. The Pinal County Superior Court, Pinal County Sheriff's Office, Pinal County Jail, Florence Correctional Center, CCA Central AZ Detention Center, Florence Town Hall, and the Florence Fire Department are all situated within FEMA mapped flood hazard areas. In addition to the potential physical damages of critical facilities, and disruption of governmental operations, flooding can also cause significant transportation and evacuation issues (e.g., if water rises high enough on the Gila River, the bridge on AZ-79 could be shut down, leaving the town split). Although the existence of the Coolidge Dam considerably lessens the threat of flooding from large flood events, a threat still exists due to localized flooding, and the potential for flooding originating from events centered over the watershed downstream of Coolidge Dam. Assuming the reservoir to be at capacity, there are three types of events which would lead to severe flooding on the Gila River: (1) a widespread frontal type storm of large

magnitude and long duration, (2) a warm air mass moving in on a large snow accumulation, or (3) a frontal type storm falling on snow.

Kearny – In Kearny, the Gila River is the primary flood hazard. If flooding were to occur, the Kearny Airport and Kearny Golf Club would likely be impacted as they are located within the regulatory floodway. In addition, homes, and industry in the southwest corner of the community are also at risk (1-percent-annual-chance-floodplain), this area includes Industrial Drive, Beauford Road, and the northern section of Veterans Avenue. The railroad tracks running through the city keep the majority of Kearny separated from the potential rising waters of the Gila River, leaving the area east of the railroad tracks in an area of minimal risk (outside the 1-percent and .2 percent-annual-chance floodplains). Kearny is subject to flooding during almost any season of the year, while rainfall is the main cause of flooding.

Mammoth – In Mammoth, the San Pedro River, situated along the eastern edge of the community, poses the greatest flood risk. Homes and businesses on the east of South Main Street and east of Tiger Drive are located within 100 Year Flood Zones. In addition, a large section of the community, primarily the lower half is within a FEMA designated 500 Year Flood Zone. Major floods along the river usually occur during the fall months. In addition to the San Pedro River, flooding from the Tucson Wash affects a small portion of the northern part of the community. Several other un-named washes may cause shallow flooding, with average depths of less than one foot.

Maricopa – Within Maricopa, the Santa Cruz River system represents a significant flood hazard. Although many dikes and channels divert floodwater away from the community, most of these structures can convey only small recurrence interval flood events. They would be ineffective against a 1-percent chance or greater flood.

Heavy runoff and flooding of significant washes and tributaries running through the city may produce a moderate to high impact with high probability. The Vekol Wash and its tributaries represent a primary flooding source affecting the community. The Vekol Wash has a time of concentration in terms of hours; meanwhile, the Santa Cruz River system has a time of concentration of several days.

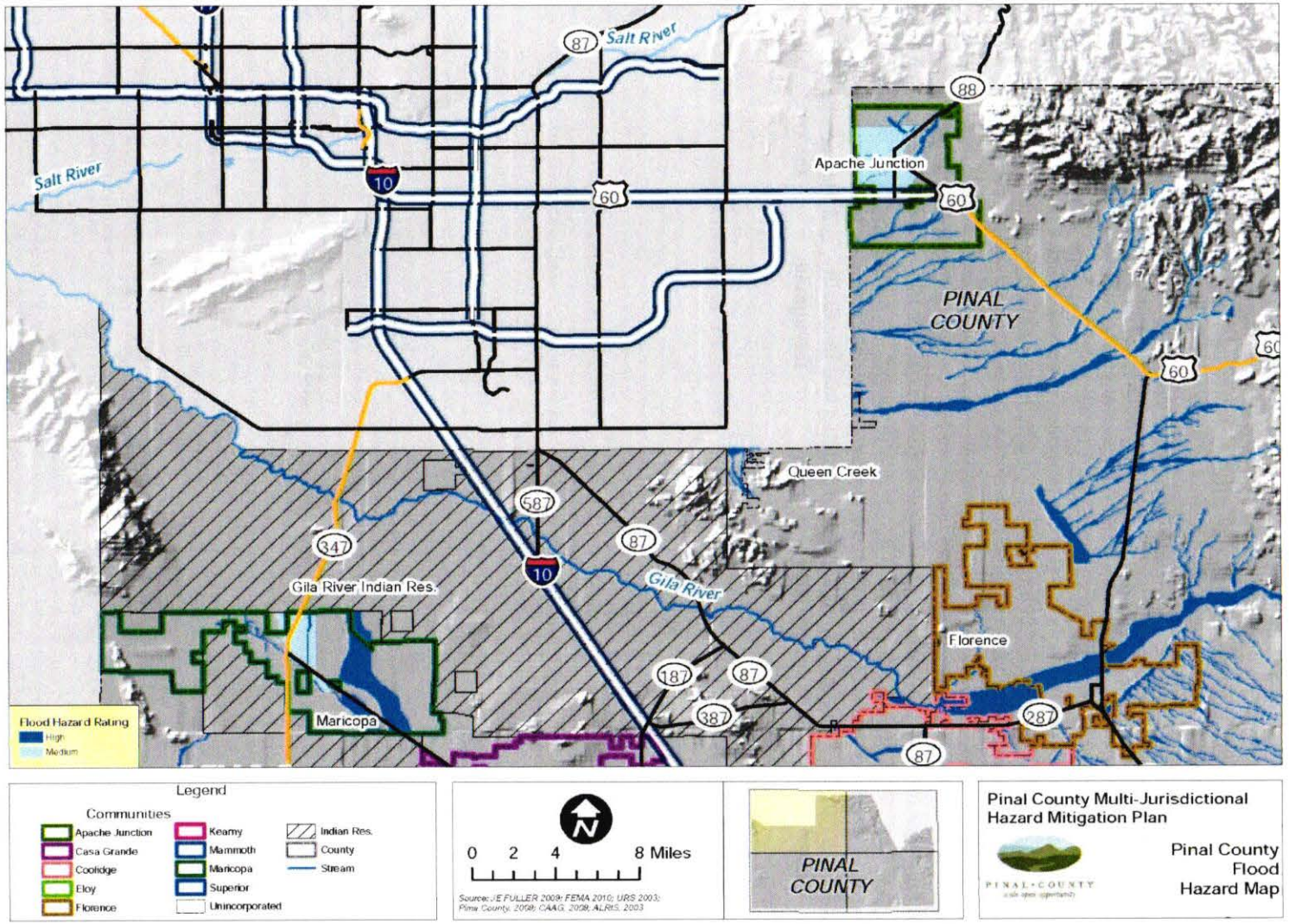
The community faces the greatest flood risk when heavy rainfalls at higher elevations (Tucson) flow into lower elevation rivers and washes, leading to Maricopa. Several homes, businesses, and churches within the city are in a 1-percent chance flood area, including key pieces of community infrastructure (e.g., US Post Office, Maricopa Fire Department administration offices, and sections of the Maricopa High School campus). In addition, a significant portion of Maricopa is within the .2-percent chance flood hazard area. Historically, flooding has impacted the arterial streets and roadways and has been the cause of emergency water rescue operations by the Maricopa Fire Department. Due to the number of homes and infrastructure identified in at-risk flooding zones by FEMA, the severity of a flood has a "critical" potential. The widespread flooding could cause significant disruption for the residents of Maricopa. The vulnerability did not cause any schools and businesses to close.

Superior – In Superior, Queen Creek, flowing south-westerly through the community, poses the most significant flood risk. Development within the floodplain is primarily residential. The major vulnerabilities include displaced residents and disruption to travel. Within the community, Mine Wash and School Wash are tributaries to Queen Creek and could also pose a flood risk to homes in the community. Flooding in the Town may occur at any time of the year, although summer thunderstorms will produce floods of the most significant magnitude. Due to the proximity of Mine Wash, School Wash, Cross Canyon Creek to Queen Creek and the town center, all four flooding sources would likely flood concurrently. Runoff within the Town would concentrate rapidly, peak, and recede in a matter of hours. Many homes are within the FEMA-mapped floodplain, leaving the community at risk from Queen Creek.

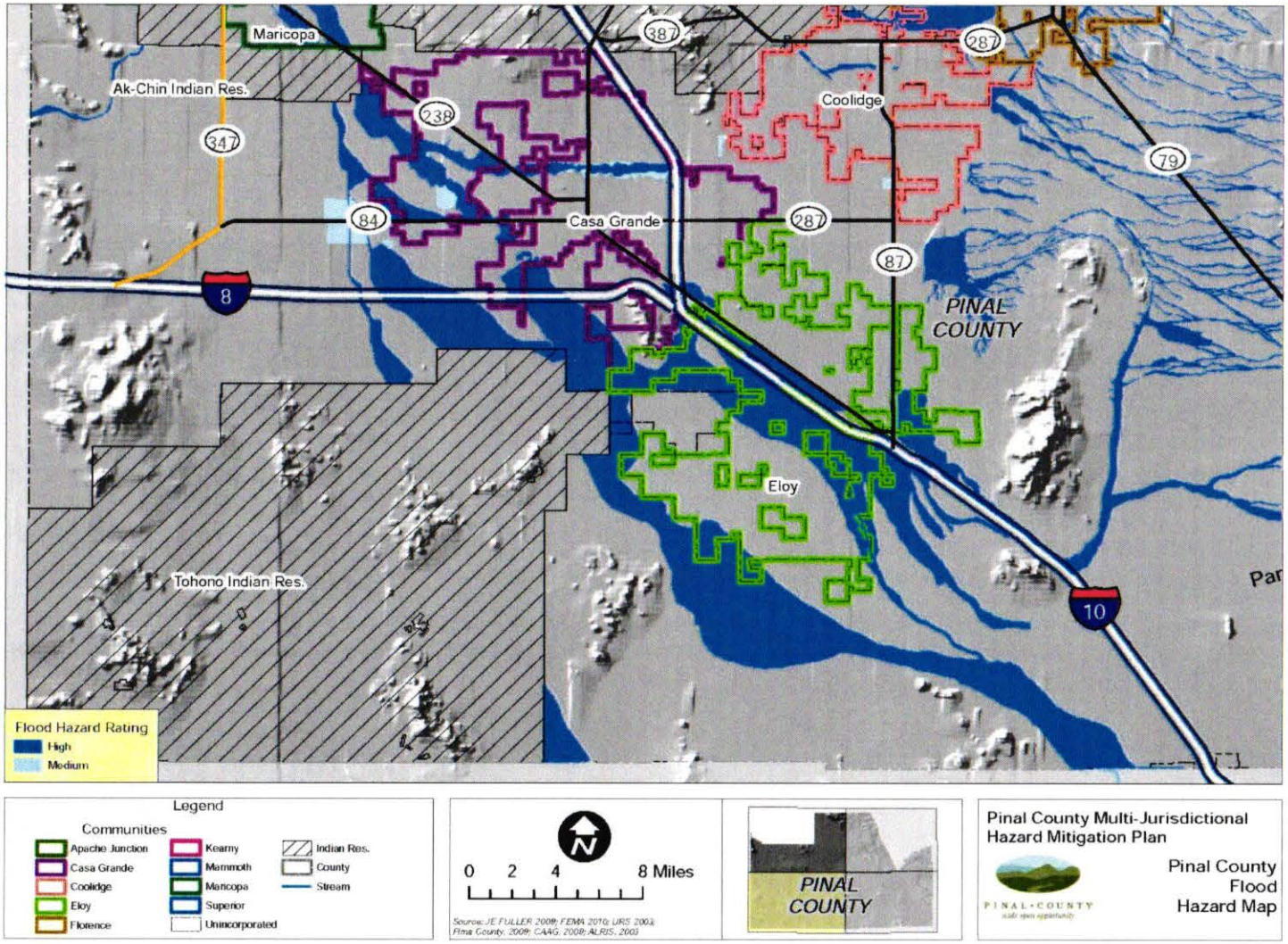
Every year, major collectible roads intersection with the creek are closed for up to 3 weeks due to road flooding. The flooding has impacted the Town with an extra cost of resolving the erosion issues at the high traffic intersection areas, where the soil is washed out by the stormwater and created deep swales

that slow down the traffic. The Town is constantly developing design plans to correct the problems of flooding, the lack of funds doesn't allow the Town to resolve the issues as quickly as they wish. The culvert Bridge at the creek crossing would solve the seasonal flood issues and release the burden for the community not getting immediate help from police, ambulance, and fire. The bridge would also resolve the delays of traffic, and mainly access to school.

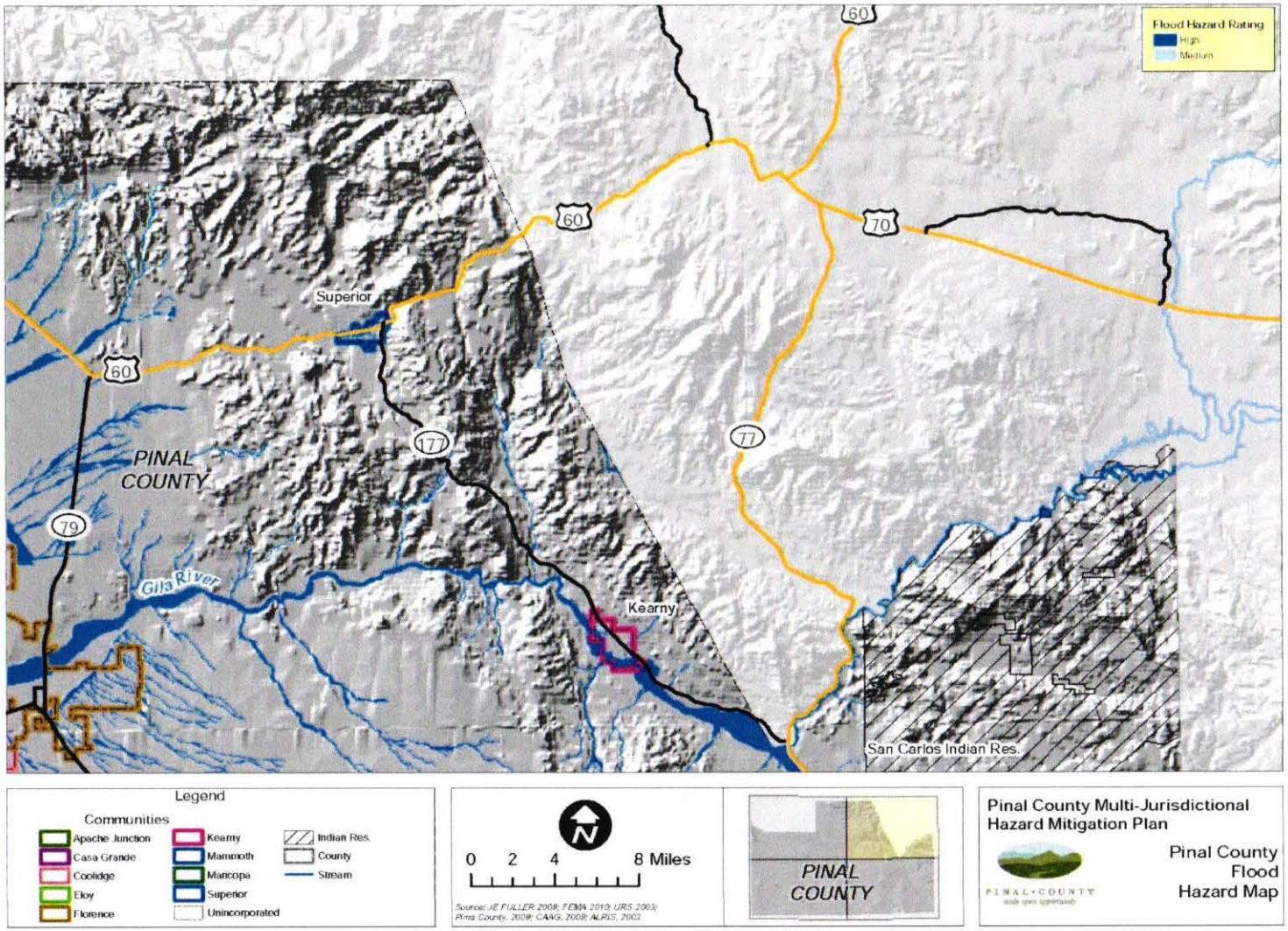
Unincorporated Pinal County – Within Pinal County, the three primary watercourses are the San Pedro River, the Gila River, and the Santa Cruz River system. The principal flood hazard results from overflow of major rivers during large flood events. This overflow results in the inundation of generally wide, flat floodplains, encompassing any residential, commercial, or agricultural development located within them. In addition, the region is subject to intense, short-duration rainfall, resulting in flash floods, which rise quickly, and cause high-velocity flood flows carrying large amounts of debris and sediment. Erosion of natural and newly-created earthen drainage channels adds to the potential hazard from flooding. Outside of the jurisdictions already discussed, several unincorporated areas of Pinal County are at risk for a potential damaging flood. For example, in San Manuel, a significant majority of the community is placed under the .2-percent annual flood chance by FEMA, a 500-year flood could result in widespread physical damages, economic disruption, and a large displacement of citizens. In Queen Valley, the Queen Creek poses the greatest flood risk, placing many homes within a FEMA mapped floodplain. It is also important to note, that although some areas may not be included within the FEMA 100-year or 500-year floodplain, that damaging, disruptive flooding in these areas may still occur. In addition, major flooding in one jurisdiction may have a county wide impact; road closures may affect several communities indirectly, displaced residents may look to other communities for lodging and hospitality, and the economic impacts could carry a ripple effect throughout the county.



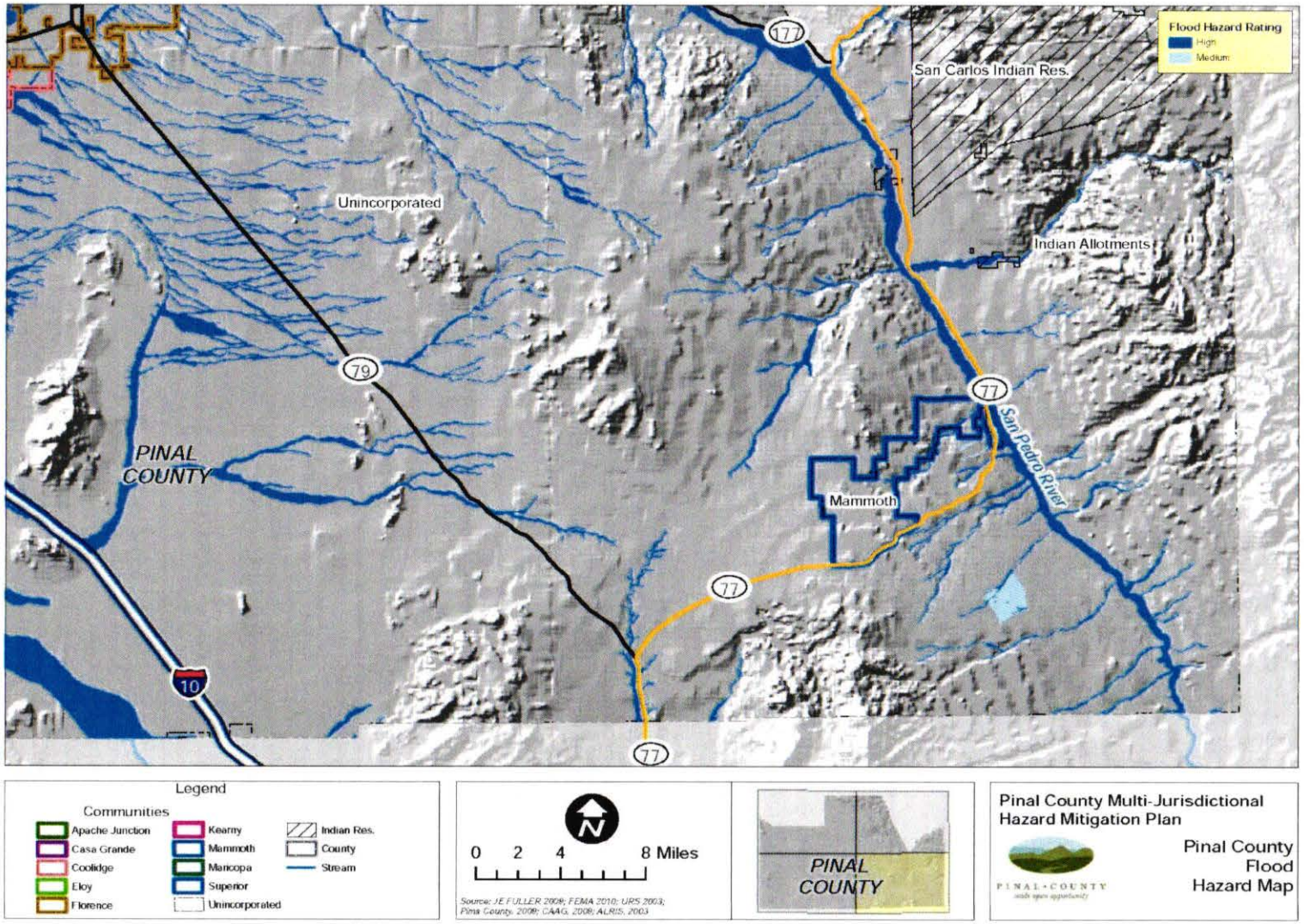
Map 4-15: Pinal County Flood Hazard Area (1)



Map 4-16: Pinal County Flood Hazard Area (2)



Map 4-17: Pinal County Flood Hazard Area (3)



Map 4-18: Pinal County Flood Hazard Area (4)

Repetitive Loss Properties

Repetitive Loss (RL) properties are NFIP-insured properties that, since 1978, have experienced multiple flood losses. FEMA tracks RL properties to identify Severe RL (SRL) properties. RL properties demonstrate a track record of repeated flooding for a certain location and are one element of the vulnerability analysis. These properties are also important to the NFIP, since structures that flood frequently put a strain on the National Flood Insurance Fund. Since the last plan update, the information on the number of Repetitive Loss Properties is not available for this plan update from FEMA due to privacy concerns.

Therefore, the information below may not represent the to date RL properties within the county. FEMA records do indicate a total of $289,850.12 was paid out in the associated building and contents value payments.

Table 4-12: RL Properties in Pinal County

Jurisdiction	No. of Properties	No. of Properties Mitigated	Total Payments
Casa Grande	1	1	$26,640
Unincorporated Pinal County	3	0	$137,510

Source: FEMA, 2014

Pinal County Flood Control District annually mails letters to all properties located in or near repetitive flood zone areas identified by the Arizona Department of Water Resources (ADWR). A copy of the letter is in Appendix B of this plan.

National Flood Insurance Program Participation

Participation in the NFIP is a key element of any community's local floodplain management and flood mitigation strategy. Pinal County and the incorporated jurisdictions participate in the NFIP. Joining the NFIP requires the adoption of a floodplain management ordinance that requires jurisdictions to follow established minimum standards set forth by FEMA and the State of Arizona, when developing in the floodplain. These standards require that all new buildings and substantial improvements to existing buildings will be protected from damage by the 100-year flood, and that new floodplain development will not aggravate existing flood problems or increase damage to other properties. As a participant in the NFIP, communities also benefit from having Flood Insurance Rate Maps (FIRM) that map identified flood hazard areas and can be used to assess flood hazard risk, regulate construction practices and set flood insurance rates. FIRMs are also an important source of information to educate residents, government officials and the private sector about the likelihood of flooding in their community.

Table 4-13: NFIP Statistics for Pinal County as of Feb 2022

Jurisdiction	Current Effective Map Date	Number of Policies	Amount of Coverage	Floodplain Management Role
Pinal County	5/16/19	341	$85,371,600	Provides floodplain management for the Unincorporated County, Coolidge, Eloy, Mammoth, Maricopa, and Superior.
Apache Junction	12/4/2007	45	$ 10,414,500	Provides in-house floodplain management.
Casa Grande	5/16/2019	66	$ 16,091,000	Provides in-house floodplain management.
Coolidge	12/4/2007	3	$ 735,000	Defers floodplain management responsibilities to Pinal County.

Table 4-13: NFIP Statistics for Pinal County as of Feb 2022				
Jurisdiction	Current Effective Map Date	Number of Policies	Amount of Coverage	Floodplain Management Role
Eloy	5/16/2019	17	$ 5,063,000	Defers floodplain management responsibilities to Pinal County.
Florence	12/4/2007	31	$ 9,603,600	Provides in-house floodplain management.
Kearny	12/4/2007	2	$ 350,000	Provides in-house floodplain management.
Mammoth	12/4/2007	4	$ 470,600	Defers floodplain management responsibilities to Pinal County.
Maricopa	06/16/2014	369	$99,765,500	Defers floodplain management responsibilities to Pinal County.
Superior	12/4/2007	7	$ 1,821,900	Defers floodplain management responsibilities to Pinal County.

Community Rating System

The Community Rating System (CRS) is a voluntary program for NFIP participating communities. The goals of the CRS are to reduce flood damages to insurable property, strengthen and support the insurance aspects of the NFIP, and encourage a comprehensive approach to floodplain management. The CRS has been developed to provide incentives in the form of premium discounts for communities to go beyond the minimum floodplain management requirements to develop extra measures to provide protection from flooding.

There are 10 CRS classes; Class 1 provides the most credit points and gives the greatest premium discount; Class 10 identifies a community that does not apply for the CRS, or does not obtain a minimum number of credit points and receives no discount. Activities recognized as measures for eliminating exposure to floods and worth CRS points are organized under four main categories: Public Information, Mapping and Regulation, Flood Damage Reduction, and Flood Preparedness. According to a report effective as of 2020, Casa Grande participates in the program and their class rating is 9, while Pinal County has a class rating of 6.

Changes is Development in the Hazard Area

For most Pinal County jurisdictions, adequate planning and regulatory tools are in place to regulate future development. Challenges with new growth will include the need for master drainage planning and additional floodplain delineations to identify and map the flood hazards within the growth areas where no mapping currently exists. The Pinal County Flood Control District will continue to be proactive and will work cooperatively with all jurisdictions to update and refine existing floodplain mapping as needed.

With the anticipation of growth within the county, the participating jurisdictions were asked to describe how development within the hazard area has impacted them

Apache Junction – Limited changes in development or new development has occurred within the city the past five years that would make for significant changes with its flooding vulnerabilities.

Casa Grande – Casa Grande has experienced commercial and industrial growth within the hazard area and a resurgence in residential construction; houses are mostly built within subdivisions that already have the infrastructure in place. None of the new development has occurred in any areas known to have flooding issues.

Coolidge – The area has added more senior living facilities which will provide a significant evacuation hazard if flooding occurs with these facilities. Numerous residential areas have taken over agricultural areas, but required flood basins are required to control the run off.

Eloy – Based on FEMA flood insurance rate maps, there are approximately 112 square miles of land in Eloy that lie within the 100-year floodplain area, this amount comprises approximately 21 percent of Eloy's entire planning area. The rivers and streams within the Planning Area are nearly always dry, but will provide a means for conveying water during rain or storm events. These water corridors may experience flooding during severe storm events. The greatest flood risk within the community lies to the south of the Casa Grande-Picacho Highway and the railroad tracks, as multiple homes are located within this 1-percent flood risk area, along with several properties in the industrial corridor. Flooding in this area could result in economic disruption, and many displaced residents. In addition, a large portion of land below I-10 is within a 100-year floodplain as well, however, this area is not seen as a particularly vulnerable section of the community as it is primarily agricultural land.

Florence – No additional development has occurred within the mapped floodplains.

Kearny – There have been no significant changes to the area to affect the risk/vulnerability.

Mammoth – The Town of Mammoth has experience little to no development or growth in the hazard area over the past five years.

Maricopa – No new residential homes or commercial businesses were built within the hazard area in the last five years. Improvements to wash infrastructure have occurred, the risk of flooding still exists to homes to mass evacuation and relocation.

Superior – The Town has been monitoring the flood issues at the crossing since 2019. Town collected the data of closed roads at the intersections, the flooded creek videos, and photos. Some development occurred within the last five years in the hazard area. New residential homes, remodel and reconstructed existing homes, an industrial area has been developed for the warehouses. The Town has been working on Developing a drainage master plan for the entire Town, performing basic remediation drainage channels to reduce the effects of flooding. Develop and adopt citywide water conservation standards.

Updating the flood maps to current data provides the Town with more opportunities to use available land that is not considered a flood zone.

Unincorporated Pinal County – Development in the Gila River and Santa Cruz river systems has led to an increase in the population and values at risk of loss from flooding. However, the vast majority of the development has been within master planned communities. These communities have robust storm water control systems and channelize the run-off during flash floods. This minimizes widespread physical damages, economic disruption, and a large displacement of citizens. It must also be noted that floodplain regulation also prevents these developments from placing structures within a FEMA mapped floodplain. Further, the floodplain regulation requires structures to be elevated to the regulatory flood elevation for single-lot development within a FEMA mapped floodplain, reducing the potential for flooding and flood-related losses.

Sources

AZ Division of Emergency Management, State of AZ Multi-Hazard Mitigation Plan.

FEMA, 2001, Understanding Your Risks; Identifying Hazards & Estimating Losses, Doc #386-2.

U.S. Dept of Commerce, National Climatic Data Center, Storm Events Database, http://www4.ncdc.noaa.gov/cgi-win/wwcgi.dll?wwevent~storms

U.S. Army Corps of Engineers, Los Angeles District, 1994, Flood Damage Report, State of AZ, Floods of 1993.

The Science of Flash Floods, https://www.livescience.com/6592-science-flash-floods.html

4.4.7 Levee Failure

Description

FEMA defines levees as man-made structures, usually earthen embankments that are designed and constructed in accordance with sound engineering practices to contain, control or divert the flow of water to provide protection from temporary flooding. National flood policy now recognizes the term "levee" to mean only those structures which were designed and constructed according to sound engineering practices, have up to date inspection records and current maintenance plans, and have been certified as to their technical soundness by a professional engineer. FEMA has classified all other structures that impound, divert, and/or otherwise impede the flow of runoff as "non-levee embankments". In Pinal County, these "non-levee embankments" might be comprised of features such as roadway and railway embankments, canals, irrigation ditches and drains, and agricultural dikes. Currently there is no state or Federal Levee Safety Program and no official state or federal levee inventory.

By design, levee and many non-levee embankments increase the conveyance capacity of a watercourse by artificially creating a deeper channel through embankments that extend above the natural overbank elevation. Upon failure, floodwaters will return to the natural overbank areas. FEMA urges communities to recognize that all areas downstream of levees and embankments are at some risk of flooding and there are no guarantees a levee or embankment will not fail or breach if a large quantity of water collects upstream.

Mechanisms for levee failure are similar to those for dam failure. Failure by overtopping could occur due to an inadequate design capacity, sediment deposition and vegetation growth in the channel, subsidence, and/or a runoff that exceeds the design recurrence interval of the levee. Failure by piping could be due to embankment cracking, fissures, animal boroughs, embankment settling, or vegetal root penetrations.

History

Levees (certified or not) have been used in Pinal County for over a hundred years to protect communities and agricultural assets from flooding, as well as to facilitate the delivery and removal of irrigation water. These levees range from simple earthen embankments pushed up by small equipment to large engineered embankments lining both sides of a watercourse. The structural integrity of levees with regard to flood protection and policy has been discussed at a national level since the early 1980s but was elevated to a high priority after the collapse and breach of New Orleans' levees after Hurricane Katrina in 2005.

There are no documented failures of certified levees within Pinal County. Non-levee embankment failures, however, occur on a regular basis and the risk posed by the thousands of uncertified embankments in the county's inventory is great. According to the Pinal County Flood Control District, recent failures have included documented breaches and piping failures, which have resulted in flooding of and damages to downstream agricultural fields, irrigation ditches, a correctional facility, and private residences.

The planning team was asked to document any incidents of levee failure that have occurred within the last five years:

Apache Junction – No significant levee hazard event occurred within the city in past five years.
Casa Grande – None known.

Coolidge – There is no history of levee failures in Coolidge within the last five years.

Eloy – In the past five years, the City of Eloy has had no hazard events related to levee failure.

Florence – There have not been any significant events that are related to levees.

Kearny – There is no history of levee failure in Kearny.

Mammoth – No significant levee failure events have occurred within the last five years.

Maricopa – No documented levee failure events have occurred within the last five years.

Superior – A levee breach is when part of the levee breaks away, leaving a large opening for water to flood the land protected by the levee. Often levees are armored or reinforced with rocks or concrete to prevent erosion and failure. The large natural rocks reinforce the levees on the Queen creek and protect the soil from erosion. There are no documented failures of levees within the Town have occurred within the last five years.

Unincorporated Pinal County – No FEMA certified levees have failed in the past five years. However, there have been multiple failures of non-certified embankments. In August, 2021, a non-certified embankment failed during heavy rainfall, contributing to flooding and infrastructure losses in and around the unincorporated community of Arizona City. It is difficult to estimate the losses directly attributable to the embankment failure due to the widespread flooding during the event.

Extent

Pinal County is protected by six (6) certified levee systems (USACE National Levee Database). These levees protect large portions of the County from seasonal flooding. None of the levies have been screened by USACE to rate levee performance and potential lost benefits.

FEMA and USACE have developed a levee screening tool that is used to describe levee performance and the extent of the hazard if the levee were to fail. The physical characteristics of a levee and the leveed area are measured. Then historical data or certain assumptions are used to estimate overtopping frequency. These results are used to develop a System Response Curve for the levee (Levees in Risk rating 2.0, FEMA, February 2022

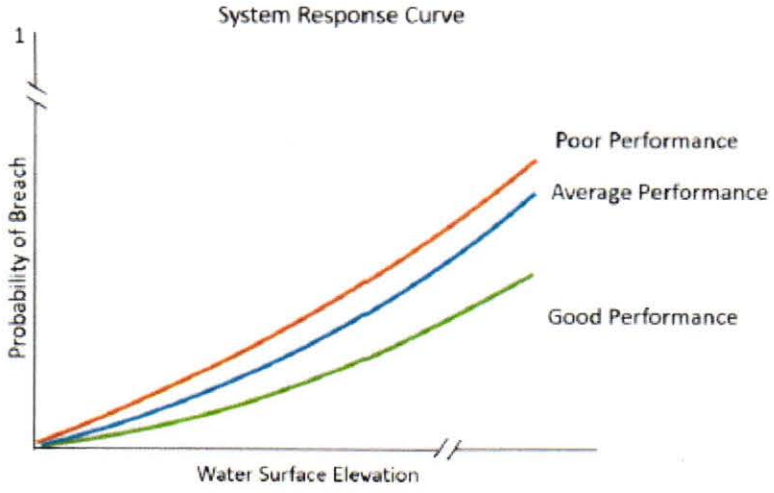


Figure 1Exemples of a system response curve with different evaluated levee performance.

Probability of Future Events

There are varied probability and magnitude criteria regarding levee failure due to variability in design, ownership and maintenance. For flood protection credit under the NFIP, FEMA has established certain deterministic design criteria based on the 1% (100-year) storm event and corresponding minimum freeboard requirements. Federally constructed levees are usually designed for larger, more infrequent events that equate to 250 to 500 year events plus freeboard. Recent recertification procedures proposed by U.S. Army Corps of Engineers, require that a certifiable levee have at least a 90% assurance of providing protection from overtopping by the 1% chance exceedance flood for all reaches of a levee system with a design freeboard height of at least three feet. For levees with less than three feet of design freeboard, the assurance is increased to 95%, and no certification will be made for levees with less than two feet of freeboard unless approved via a waiver. This assurance is only for containment (overtopping failure) and does not include probability of failure by any other mode (USACE, 2007). FEMA certified levees within Pinal County are designed to safely convey the 100-year event, with a minimum additional freeboard of 3 feet.

For this Plan, the Planning Team chose to map only the zones related directly to known certified levees and to assign a High hazard rating to these areas. The currently identified high hazard levee failure zones are indicated below (Map 4-19 through Map 4-22).

Vulnerability

Table 4-14: CPRI Results for Levee Failure

Jurisdiction	Probability	Magnitude/ Severity	Warning Time	Duration	Rating
Apache Junction	Unlikely	Limited	< 6 hours	< 6 hours	1.75
Casa Grande	Possibly	Limited	< 6 hours	< 24 hours	2.30
Coolidge	Possibly	Limited	6-12 hours	< 24 hours	2.15
Eloy	Unlikely	Negligible	< 6 hours	< 6 hours	1.45
Florence	Unlikely	Negligible	> 24 hours	< 1 week	1.20
Kearny	Unlikely	Limited	< 6 hours	< 1 week	1.95
Mammoth	Unlikely	Negligible	< 6 hours	< 6 hours	1.45
Maricopa	Unlikely	Critical	> 24 hours	< 6 hours	1.60
Superior	Unlikely	Negligible	< 6 hours	< 6 hours	1.45
Unincorporated Pinal Co	Possibly	Limited	< 6 hours	< 1 week	2.40
				County-wide average CPRI =	**1.77**

The Planning Team has determined they will continue to assess vulnerability as an overview summary of the hazard's impact on the community and its vulnerable structures, rather than in a quantitative manner.

Apache Junction – No levees exist within the city and the risk from non-levee structures are limited. Non-levee embankments with the city with some risk are related to roadway embankments or are part of a development's onsite stormwater retention/detention system.

Casa Grande – Casa Grande would be affected as identified in the high hazard levee failure zone maps. Along with these certified levees, numerous non-levee embankments pose a risk throughout the planning area, including roadways and railroad tracks, canals, irrigation ditches and drains, and agricultural dikes.

Coolidge – Coolidge has numerous canal systems that are in the city limits. The majority of these canals are concrete lined and not prone to spontaneous failures. There are a few that are soil based canals, but no issues have been noted with these canals.

Eloy – Due to the unlikely possibility of levee failure with in the City of Eloy, there is little to no vulnerability that would result harm or damage loss to the city's assets.

Florence – There are no certified levees within the Town limits.

Kearny – There is no history of levee failure in Kearny, and none is anticipated.

Mammoth – There are no documented levees in or near the Town of Mammoth.

Maricopa – A levee break could cause flooding to residential and commercial businesses to create evacuations and road access. A levee break could cause flooding to residentials and commercial business and cause evacuations and road access disruptions.

Superior – Areas with no surface protection are more prone to erosion. When floodwaters exceed the lowest crest of the levee system, or if high winds generate significant swells (a storm surge) in the river water to bring waves crashing over, it is called levee overtopping. Overtopping can lead to substantial landside erosion of the levee or even be the mechanism for complete breach.

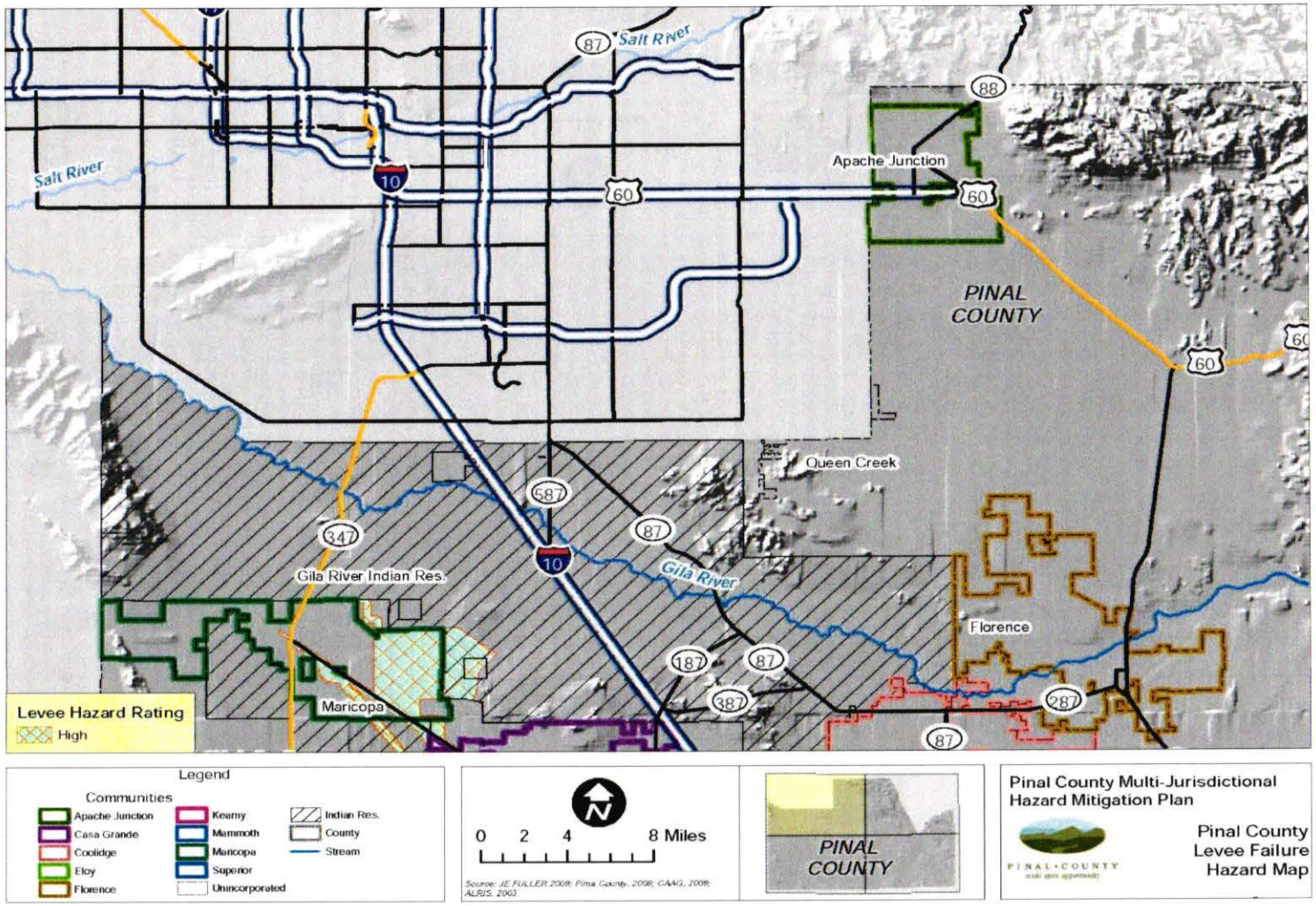
Unincorporated Pinal County – Levees and levee-type embankments are located throughout Pinal County, particularly in existing and former farmlands. Currently, the only FEMA certified levees are; the "Santa Rosa Levee" which is located along the west bank of the Santa Rosa Wash from the Union Pacific Railroad tracks to approximately the Bowlin Road alignment in the City of Maricopa, and the "Smith Farms Levee" located within the City of Maricopa, adjacent to White and Parker Road from north of Farrell Road to just north of Bowlin Road. Information available from FEMA indicates that the Santa Rosa Levee was breached during the flood events of 1957 and 1983. The west bank of the levee was reconstructed sometime after the 1983 flood event, while additional improvements were performed in 2004 in order to accredit the structure through FEMA. The City of Maricopa would be most heavily impacted if one or both certified levees were to fail, while Casa Grande would also be affected, as identified in the high hazard levee failure zone maps. As previously stated, along with these certified levees, there are numerous non-levee embankments that pose a risk throughout the planning area, such as roadways and railroad tracks, canals, irrigation ditches and drains, and agricultural dikes.

Floodplain areas behind these "non-levee embankments" are shown as if the levee simply does not exist. This is since it is generally difficult to characterize the effects these structures have on regional drainage, as they may fail during flooding events. The failure may occur after upstream water has collected behind the structure; this could lead to flooding which exceeds the pre-structure condition. As displayed in recently updated FIRMs, FEMA mapping standards are now including the worst-case scenario of both the non-levee embankment failing and the non-levee embankment remaining. Therefore, the risk associated with these non-engineered structures are represented in the Flooding profile of this plan.

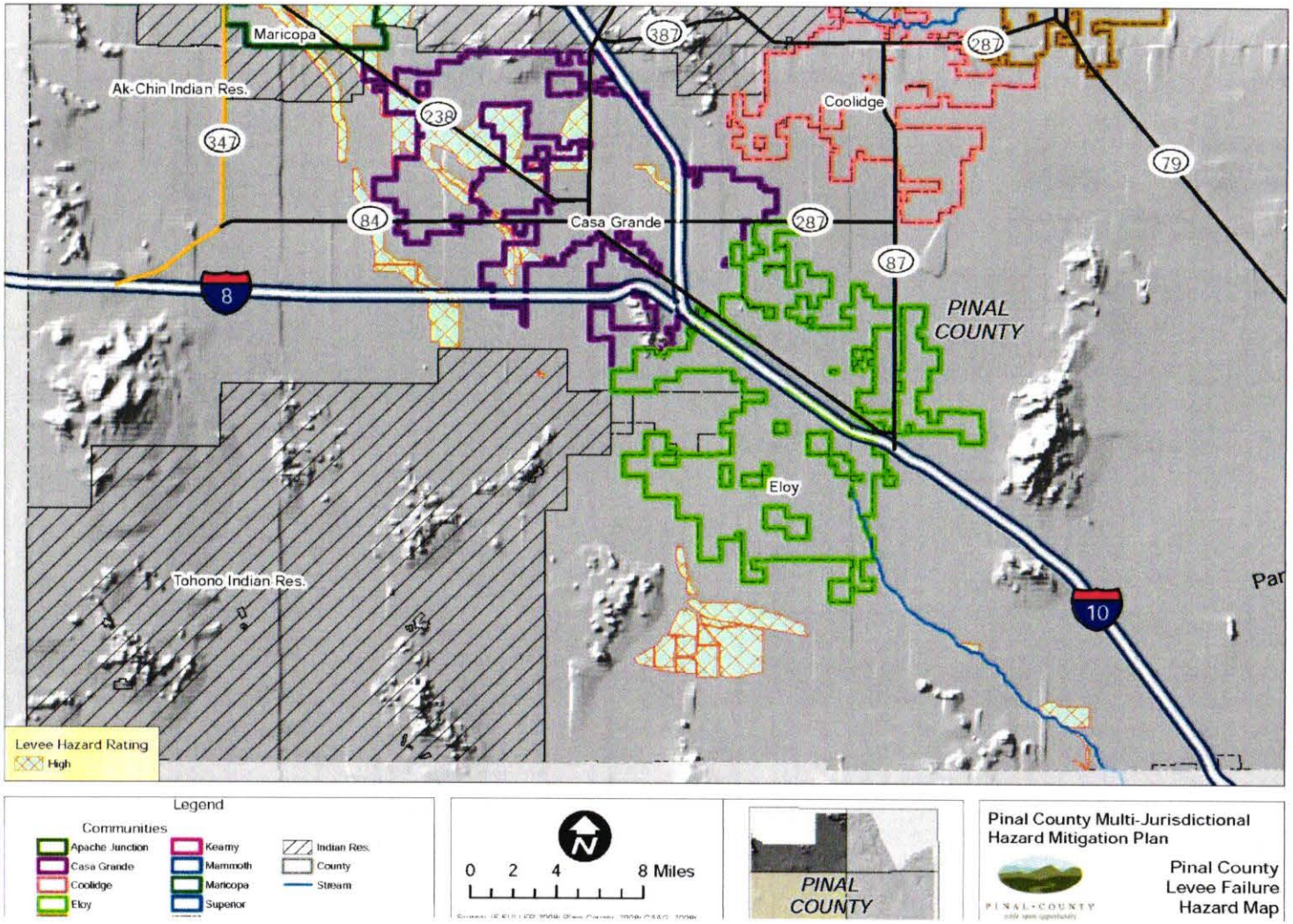
Based on the assessments performed for the previous Plan, there was determined to be an estimated $66.6 million in county-wide assets exposed to a high hazard levee failure. An additional $135.5 million in county-wide high hazard levee failure exposure of HAZUS defined residential, commercial, and industrial facilities is estimated. However, there are no commonly accepted methods for estimating potential levee related losses. Losses are difficult to predict as there are multiple variables which contribute to the potential for human and economic loss, such as; the size, speed, and timing at which a levee breach or failure occurs, volume of water impounded by the levee, size of the watershed, duration and size of the storm event, and downstream slope, vegetation, and soil characteristics. Physical impacts to be considered include property loss and damage, personal injury, and possible fatalities. It can also be expected that a large portion of the exposed population is subject to displacement depending on the event magnitude. Severity of the event will also dictate economic losses and degree of transportation disruption. Secondary effects of a breach or failure are similar to flood events, and could include moderate to severe erosion, flooded cropland, downstream sediment deposition and additional economic losses from downstream land-use restrictions.

In summary, levees have the potential to divert, concentrate, obstruct, or impound surface water runoff, and play a critical role in protecting communities, critical infrastructure, and valuable property. However, all areas downstream of levees and embankments are at some risk, as there is no guarantee a levee or

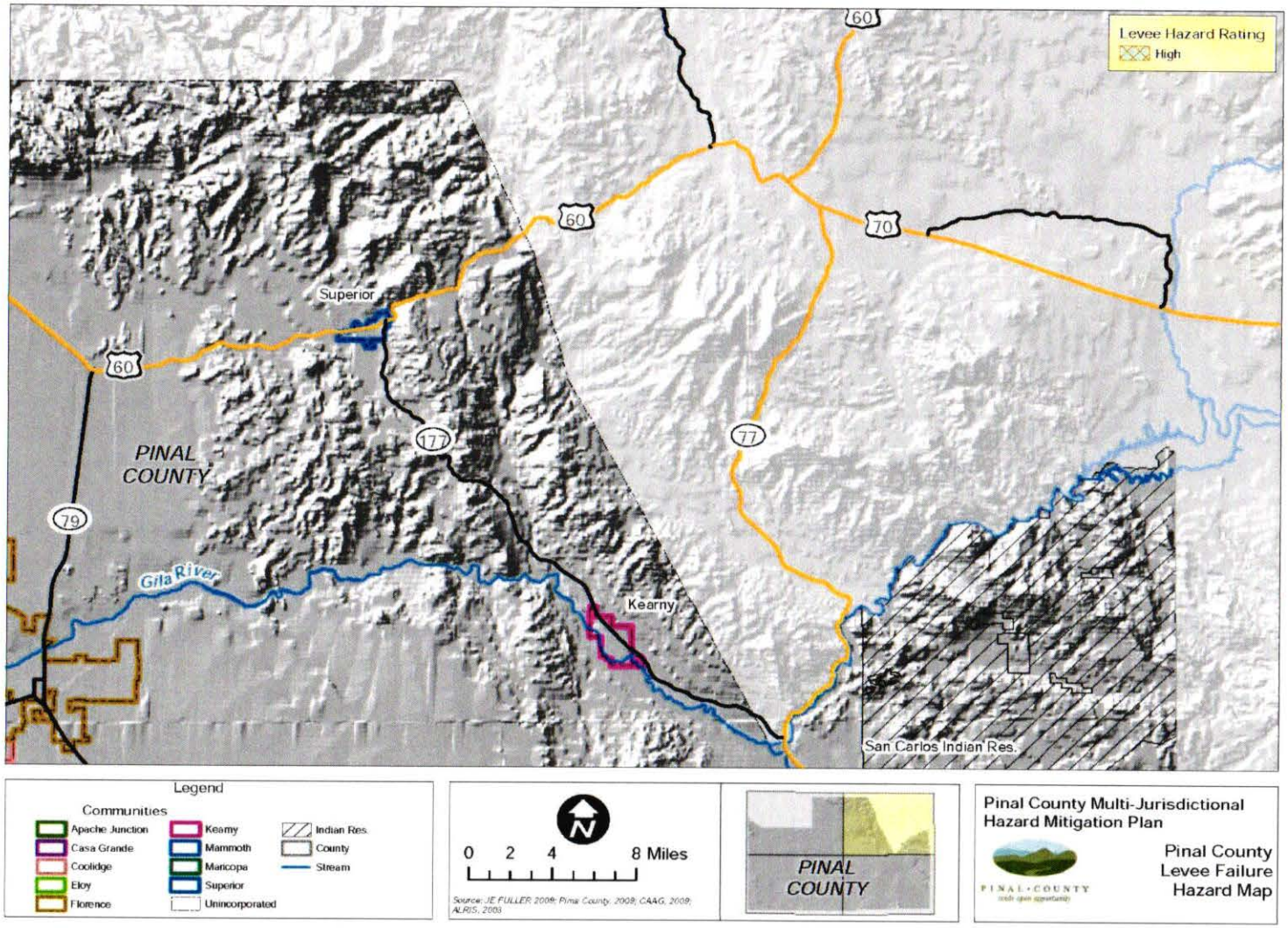
embankment will not fail or breach if a large quantity of water collects upstream. Residences and business that are located downstream of a levee or embankment, particularly if the structure was not designed and constructed to provide flood protection, should plan accordingly.



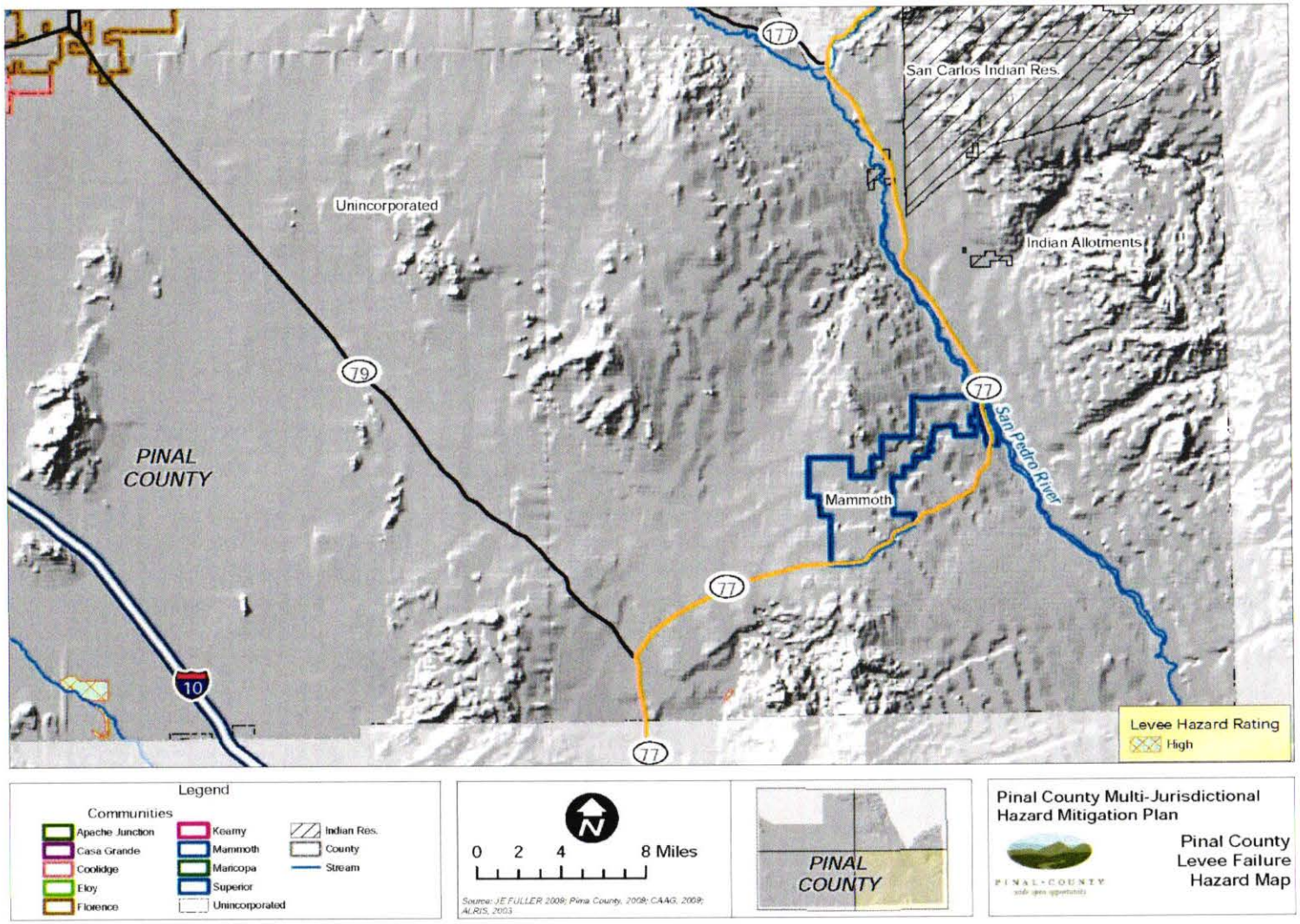
Map 4-19: Pinal County Levee Failure Hazard Area (1)



Map 4-20: Pinal County Levee Failure Hazard Area (2)



Map 4-21: Pinal County Levee Failure Hazard Area (3)



Map 4-22: Pinal County Levee Failure Hazard Area (4)

Changes is Development in the Hazard Area

With the anticipation of growth within the county, the participating jurisdictions were asked to describe how development within the hazard area has impacted them.

Apache Junction – Negligible changes or increase in development or roadway building have occurred in past five years.

Casa Grande – Casa Grande has experienced commercial and industrial growth within the hazard area and a resurgence in residential construction; houses are mostly built within subdivisions that already have the infrastructure in place. None of this new development has been done in areas identified as high hazard levee failure areas.

Coolidge – With the growth in the area more residential and commercial structures are being located near these canal levees. This increases the likelihood of property loss and loss of life due to the proximity.

Eloy – In the last 5 years, there has been no changes in development in the hazard area affecting risk and vulnerability.

Florence – There have been additional homes built within the Town limits that can be affected by drought.

Kearny – There have been no significant changes to the area to affect the risk/vulnerability.

Mammoth – The Town of Mammoth has experienced little to no development or growth in the hazard area over the past five years.

Maricopa – No new residential subdivisions have occurred within the last five years. The potential risk of flooding exists to cause evacuations and relocation to residents.

Superior – No development has occurred in the hazard area within the last five years.

Unincorporated Pinal County – Housing and commercial development have encroached on agricultural land where "non-levee embankments" were constructed by early farmers and landowners. The structures are not inspected, maintained, or often, even known or mapped. Failures are frequent and the downstream effects are often unknown, increasing the risk of private and public property damage.

Sources

AZ Division of Emergency Management, State of AZ Multi-Hazard Mitigation Plan.

FEMA, Understanding Your Risks; Identifying Hazards & Estimating Losses, Doc #386-2.

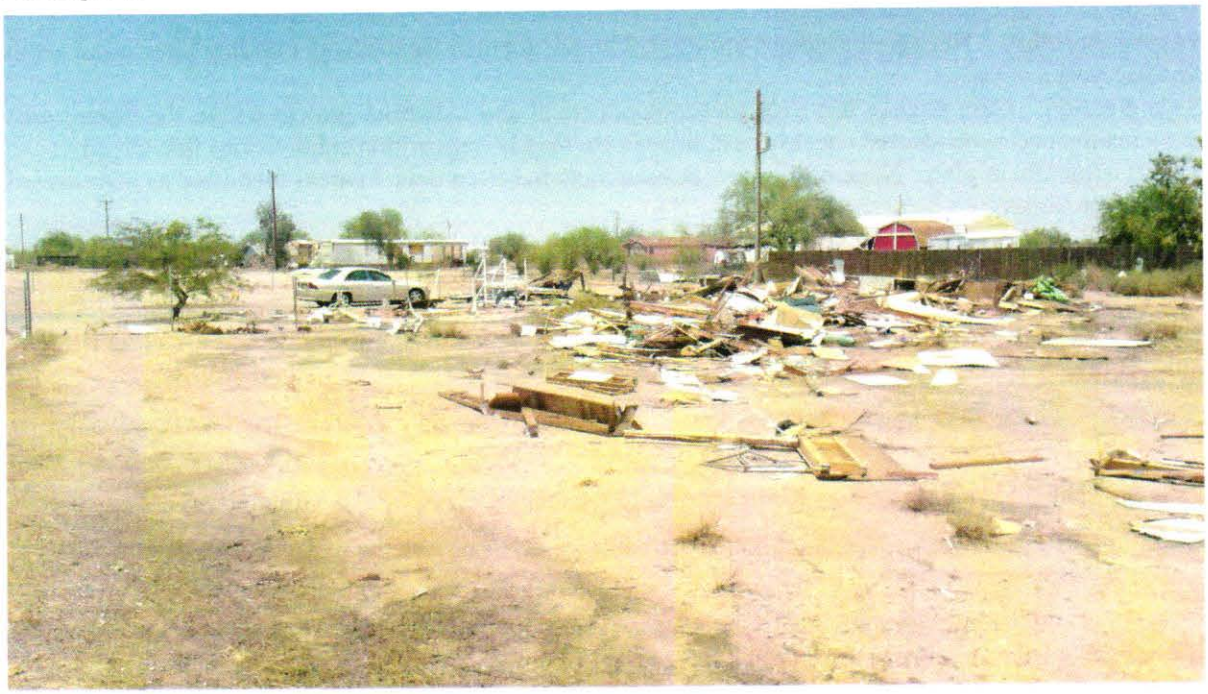
FEMA, http://www.fema.gov/plan/prevent/fhm/lv_intro.shtm#3

Pinal County, GIS files with levee failure hazard areas.

USACE, *Certification of Levee Systems for the National Flood Insurance Program (NFIP) – DRAFT*, ETL 1110-2-570.

4.4.8 Severe Wind

Description



The hazard of severe wind encompasses all climatic events that produce damaging winds. For Pinal County, severe winds usually result from either extreme pressure gradients that usually occur in the spring and early summer months, or from thunderstorms. Thunderstorms can occur year-round and are usually associated with cold fronts in the winter, monsoon activity in the summer, and tropical storms in the late summer or early fall.

Three types of damaging wind related features typically accompany a thunderstorm: downbursts, straight line winds, and infrequently tornadoes.

Downbursts are columns of air moving rapidly downward through a thunderstorm. When the air reaches the ground, it spreads out in all directions, creating horizontal wind gusts of 80 mph or higher. Downburst winds have been measured as high as 140 mph. Some of the air curls back upward with the potential to generate a new thunderstorm cell. Downbursts are called macrobursts when the diameter is greater than 2.5 miles, and microbursts when the diameter is 2.5 miles or less. They can be either dry or wet downbursts, where the wet downburst contains precipitation that continues all the way down to the ground, while the precipitation in a dry downburst evaporates on the way to the ground, decreasing the air temperature and increasing the air speed. In a microburst the wind speeds are highest near the location where the downdraft reached the surface, and are reduced as they move outward due to the friction of objects at the surface. Typical damage from downbursts includes uprooted trees, downed power lines, mobile homes knocked off their foundations, block walls and fences blown down, and porches and awnings blown off homes.

Straight line winds are developed similar to downbursts, but are usually sustained for greater periods as a thunderstorms reaches the mature stage, traveling parallel to the ground surface at speeds of 75 mph or higher. These winds are frequently responsible for generating dust storms and sand storms, reducing visibility and creating hazardous driving conditions.

A tornado is a rapidly rotating funnel (or vortex) of air that extends toward the ground from a cumulonimbus cloud. Most funnel clouds do not touch the ground, but when the lower tip of the funnel cloud touches the earth, it becomes a tornado and can cause extensive damage. For Pinal County, tornadoes are the least common severe wind to accompany a thunderstorm.

History

Severe wind events occur on a significantly more frequent basis throughout the county, but do not always have reported damages associated with every event. The planning team was asked to document any incidents of severe wind that have occurred within the last five years:

Apache Junction – Monsoon weather events within the past five years have created adverse impacts for the community due to severe winds. One such monsoon-related wind event occurred on July 9, 2018, which resulted in widespread light to moderate damage to private dwellings and critical public infrastructure (traffic signals, street lights, and street signs).

Casa Grande – Casa Grande has had numerous storms that have produced damaging winds; according to the NWS, 17 severe weather events have occurred. Most of these storms are during the monsoon season. These storms usually produce severe wind, heavy rainfall, and flash flooding along with powerful dust storms.

Coolidge – Coolidge has a history of severe wind events due to its geographical location. These events normally occur during monsoon season, but can occur year round. The recent monsoon seasons of 2018, 2019 and 2021 proved to be exceptionally damaging seasons to city infrastructure that included downed trees, power lines and numerous accounts of roof and other structural damage. On July 10, 2021 Coolidge experienced a severe wind event that resulted in numerous downed trees, power lines and damage to residential structures.

Eloy – In the past five years, the City of Eloy has had few events related to severe wind. Only two relatable events, monsoon season and dust storms, produce excessive wind gusts resulting in downed power lines and poor driving conditions. In both cases, Eloy Police Department responds to calls and classifies these events as hazardous. Several microbursts have occurred with one destroying a business on September 16, 2019.

Florence – During the highly active monsoon season, wind gusts can develop quickly and with a relatively flat landscape, gain intensity as it spreads through the area. With little protection, communications towers, above ground transmission lines and trees in the area can be blown down affecting several critical infrastructures.

The Emergency services of the Town rely upon 2 100' communications towers to support handheld radio transmission and alerting of emergencies to the providers. A microwave link exists between the towers to enhance the transmission and provide continuity. A significant wind gust in 8/2016 altered the path of the link and required manual re-setting to have communications restored. On 2 occasions, 9/2015 and 6/2021 communication towers have been struck by lightning causing damage to critical equipment that required repair and replacements.

Around the Core and Historic area of the Town, most homes and businesses are serviced by above ground electric transmission lines. Servicing 2 retirement communities to the north of the Core, wind gusts have compromised the wires and interrupted electrical service in the areas. Retirement communities present many medical devices that require constant power to support those individuals that rely on them. In 8/2020 a Severe Windstorm compromised the power at the Caliente Retirement Community. Florence Fire Department assisted a resident who did not have a portable oxygen tank and loaned one until the power was restored.

Kearny – Kearny has historically had severe windstorms during monsoon season. The most recent wind event was on the 28th of August 2021. Windspeed registered between 60mph to 80mph causing both electric and phone power outages. Telephone pole damages caused loss of phone lines for several weeks.

Mammoth – No significant events within the last five years.

Maricopa – Over the last few years, increased wind and monsoon events have affected residential and commercial structures. On July 10, 2021, a severe thunderstorm with strong winds hit the city of Maricopa to causing damage to rooftops, down trees, and power lines. Power outages occurred in most of the town. Electrical District-3 restored power within two days.

Superior – The monsoon season of 2021 brought severe thunderstorms generating winds up to 73 mph in the Town of Superior. Similar windstorms happened in the past five years during the monsoon season and throughout the wintertime. Severe winds cause fences to fall, older constructions and traffic signs post to collapse every year. The Town has many manufactured older homes, susceptible to damage from the high winds and tornados. Town has reported significant events in 2017, November of 2019, and August 2021.

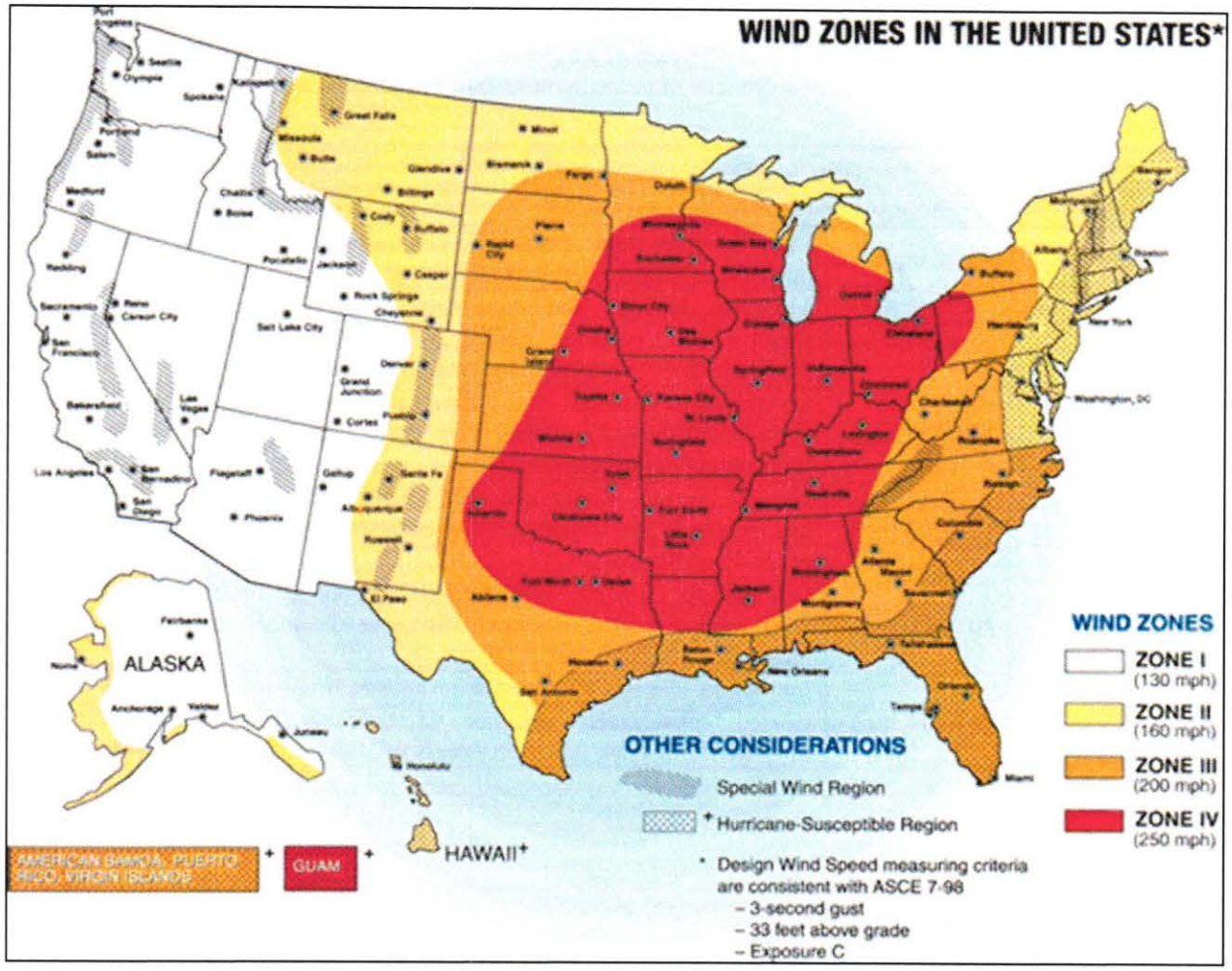
The severe winds knocked down some of the old roof structures from residential abandoned houses, and a historical Theater building collapsed in March 2017.
The winter storm winds caused damages to a few older residential buildings by damaging fences and roofs. Also, on Main Street, the historical Building roof partially collapsed due to winds and rainstorms in February 2019. Next, many of the street signs collapsed due to severe winds during January-March of 2019.
On August 2021, many of the roofs and walls of the abandoned buildings collapsed due to severe wind storms. Throughout that month, several street signs were damaged or irreparable.

Unincorporated Pinal County – On August 03, 2018 the City of Eloy experienced a microburst during a seasonal monsoon storm. The severe wind damaged or destroyed multiple homes. Although impactful to the homeowners, there were no deaths associated with the event and total damages did not rise to a level that required state or federal assistance.

Extent

High winds, often accompanying severe thunderstorms, can cause significant property damage, threaten public safety, and have adverse economic impacts from business closures and power loss. Windstorms in the planning area are rarely life threatening, but do disrupt daily activities, cause damage to buildings, and structures, and increase the potential for other hazards, such as wildfire. Strong thunderstorm winds can start a dust storm. Dust storms usually arrive suddenly in the form of an advancing wall of dust and debris which may be miles long and several thousand feet high. They strike with little warning and can drastically reduce visibility making driving conditions hazardous. Dust storms usually last only a few minutes and the blinding, choking dust can quickly reduce visibility causing accidents that may involve chain collisions, creating massive pileups.

Wind zone map shows how the frequency and strength of extreme windstorms vary across the United States. Pinal County is entirely located in Zone 1, as illustrated in the figure below. Wind speeds in Zone I, where the risk of extreme windstorms is lowest, can be as high as 130 miles per hour.



Source: Federal Emergency Management Agency. Double Jeopardy: Building Codes May Underestimate Risks Due to Multiple Hazards.

Probability of Future Events

Most severe wind events are associated with thunderstorms as previously mentioned. The probability of a severe thunderstorm occurring with high velocity winds increases as the average duration and number of thunderstorm events increases.

The NWS issues a severe thunderstorm watch when conditions are favorable for the development of severe thunderstorms. The local NWS office considers a thunderstorm severe if it produces hail at least 3/4-inch in diameter, wind of 58 mph or higher, or tornadoes. When a watch is issued for a region, residents are encouraged to continue normal activities but should remain alert for signs of approaching storms, and continue to listen for weather forecasts and statements from the local NWS office. When a severe thunderstorm has been detected by weather radar or one has been reported by trained storm spotters, the local NWS office will issue a severe thunderstorm warning. A severe thunderstorm warning is an urgent message to the affected counties that a severe thunderstorm is imminent. The warning time

provided by a severe thunderstorm watch may be on the order of hours, while a severe thunderstorm warning typically provides an hour or less warning time.

Based on historic record, the probability of tornados occurring in Pinal County is limited. Tornado damage severity is measured by the Fujita Tornado Scale, which assigns a numerical value of 0 to 5 based on wind speeds with the letter F preceding the number (e.g., FO, F1, F2). Most tornadoes last less than 30 minutes, but some last for over an hour. The path of a tornado can range from a few hundred feet to miles. The width of a tornado may range from tens of yards to more than a quarter of a mile.

Table 4-15: Fujita Tornado Scale

Category	Wind Speed	Description of Damage
F0	40-72 mph	Light damage. Some damage to chimneys; break branches off trees; push over shallow-rooted trees; damage to sign boards.
F1	73-112 mph	Moderate damage. The lower limit is the beginning of hurricane speed. Roof surfaces peeled off; mobile homes pushed off foundations or overturned; moving autos pushed off roads.
F2	113-157 mph	Considerable damage. Roofs torn off frame houses; mobile homes demolished; boxcars pushed over; large trees snapped or uprooted; light-object missiles generated.
F3	158-206 mph	Severe damage. Roofs and some walls torn off well constructed houses; trains overturned; most trees in forest uprooted; cars lifted off ground and thrown.
F4	207-260 mph	Devastating damage. Well-constructed houses leveled; structures with weak foundations blown off some distance; cars thrown and large missiles generated.
F5	261-318 mph	Incredible damage. Strong frame houses lifted off foundations and carried considerable distance to disintegrate; automobile-sized missiles fly through the air in excess of 100-yards; trees debarked.

Source: FEMA, 1997.

Vulnerability

Table 4-16: CPRI Results for Severe Wind

Jurisdiction	Probability	Magnitude/ Severity	Warning Time	Duration	Rating
Apache Junction	Highly Likely	Critical	< 6 hours	< 24 hours	3.50
Casa Grande	Highly Likely	Critical	< 6 hours	< 6 hours	3.40
Coolidge	Highly Likely	Critical	< 6 hours	< 6 hours	3.40
Eloy	Highly Likely	Critical	< 6 hours	< 6 hours	3.40
Florence	Highly Likely	Critical	< 6 hours	< 6 hours	3.40
Kearny	Likely	Limited	< 6 hours	< 1 week	1.95
Mammoth	Likely	Limited	< 6 hours	< 6 hours	2.65
Maricopa	Likely	Limited	6-12 hours	< 6 hours	2.50
Superior	High Likely	Limited	< 6 hours	< 6 hours	3.10
Unincorporated Pinal Co	Highly Likely	Limited	6-12 hours	< 6 hours	2.95
				County-wide average CPRI =	**3.02**

The following information from the last plan update have remained the same and is applicable to this plan update.

The entire County is assumed to be equally exposed to the damage risks associated with severe winds. Typically, incidents are fairly localized and damages associated with individual events are relatively small. Based on the historic record, it is feasible to expect average annual county-wide losses of $1.0 to $1.5 million. It is difficult to estimate losses for individual jurisdictions within the County due to the lack of concrete data.

Most of the county's vulnerability to severe winds typically occurs during thunderstorms and other types of intense rainfall events. Thunderstorms can bring in high winds, create funnel clouds, and microbursts. Resulting damages from winds are typically reflected through downed trees and branches, roof's, traffic signals, and power lines. Private property owners may not report wind impacts, making it difficult to estimate community losses. Post storm clean-up on public property, generally falls under a normal/routine activity unless there was significant damages or costs associated with a particular event. Severe wind events are often associated with wildfires, with wind driven wildfires being more unpredictable and cause a more severe rate of spread, leading to additional impacts.

The Planning Team has determined they will continue to assess vulnerability as an overview summary of the hazard's impact on the community and its vulnerable structures, rather than in a quantitative manner.

Apache Junction – The town has a high number of manufactured homes as well as older home which are more susceptible to damage from wind events.

Casa Grande – Similar to the potential effects of drought, transportation issues are of concern in this area due to its proximity to the major transportation corridors.

Coolidge – Coolidge has critical infrastructure in the form of large electrical generating plants. There are also numerous mobile home parks that house permanent and seasonal residents that would be impacted.

Eloy – Transportation issues are of concern in this area due to its close proximity to the major transportation corridors.

Florence – Wind events are of particular concern, as Florence is the County seat and has a large number of critical facilities, infrastructure, and services that could be potentially damaged. Damage or destruction of these systems could have a serious effect of the entire county.

Kearny – Many older and manufactured homes in this area are highly susceptible to property damage due to wind events.

Mammoth – Mammoth experiences seasonal severe winds during both summer and winter storms. The areas depressed socio-economic status and aging building stock increase the towns vulnerability to damage due to severe wind events.

Maricopa – Severe wind events can cause an economic loss to Maricopa's large agricultural crops and commercial businesses. It can also affect residential roofs, trees and cause critical power outages.

Superior – Due to the elevated geographic area, many older homes are on the hillsides. These homes are highly susceptible to damages from wind events. The damages cost the Town on average $5000 a week not including the material costs and most damage repairs to residential communities are paid by the residents. During the monsoon season and winter storms, the public works department repairs several collapsed traffic posts throughout the Town.

There are also potential health hazard impacts due to mine chemicals and tailings for the citizens and tourists residing near those areas.

Unincorporated Pinal County –

All areas of Unincorporated County are exposed to the damage risks associated with severe winds. Typically, incidents are fairly localized and damages associated with individual events are relatively small. Particularly at risk are rural, socioeconomically disadvantaged areas with higher numbers of older manufactured homes and travel trailers repurposed to be a permanent resident. These structures may not need tie-down requirements for manufactured homes, placing the structure and the residents at greater risk.

Severe wind conditions may also place certain transportation corridors at risk of experiencing decreased visibility due to locally dense blowing dust causing reduced visibility. The brown-out conditions caused by the blowing dust can lead to severe, multi-vehicle traffic incidents and closed interstates.

Changes is Development in the Hazard Area

With the anticipation of growth within the county, the participating jurisdictions were asked to describe how development within the hazard area has impacted them.

Apache Junction – No change in risk due to only negligible changes or additions in development occurring within past five years.

Casa Grande – Casa Grande has experienced commercial and industrial growth within the hazard area and a resurgence in residential construction; houses are mostly built within subdivisions that already have the infrastructure in place. All new development is susceptible to the severe wind during Summer and Winter Storms.

Coolidge – Numerous new solar facilities, electrical generating stations and an increase in the residential building sector will be affected. The recent increase in residential single and multi-family units has increased the number of structures that could sustain damage during these events. In addition, high value manufacturing/industrial facilities are at risk due to the height of the facility and the potential damage of the infrastructure that is associated with their individual processes.

Eloy – In the last 5 years, there has been no changes in development in the hazard area affecting risk and vulnerability.

Florence – There have been additional homes built within the Town limits that can be affected by severe wind.

Kearny – Kearny's residential capacity is at an all-time high with very few single-family home vacancies. Given any significant windstorms, there is higher risk/vulnerability of more families being without phone or electrical power for any significant amount of time.

Mammoth – The Town of Mammoth has experienced little to no development or growth in the hazard area over the past five years.

Maricopa – In the last five years, there has been an increase in new subdivision homes and commercial development within the hazard area. Since the new development is within the area, residents could be vulnerable to power outages if a significant severe wind event swept through.

Superior – No developments have occurred in last five years within the hazard area.

Unincorporated Pinal County – Rapid growth and development in the hazard areas have increased the number of values at risk. It has also increased the number of vehicles traveling along the I-10 corridor and other highways affected by severe dust storms.

Sources

AZ Division of Emergency Management, State of AZ All Hazard Mitigation Plan.

AZ Division of Emergency Management, State of AZ Multi-Hazard Mitigation Plan.

Changnon, Jr. S., *Climatology of Thunder Events in the Conterminous U.S., Part I: Temporal Aspects* and *Part II: Spatial Aspects*, Journal of Climate, Vol. 1, No. 4, pp. 389-405.

U.S. Dept of Commerce, National Climatic Data Center, Storm Events Database, http://www4.ncdc.noaa.gov/cgi-win/wwcgi.dll?wwevent~storms

4.4.9 Subsidence

Description

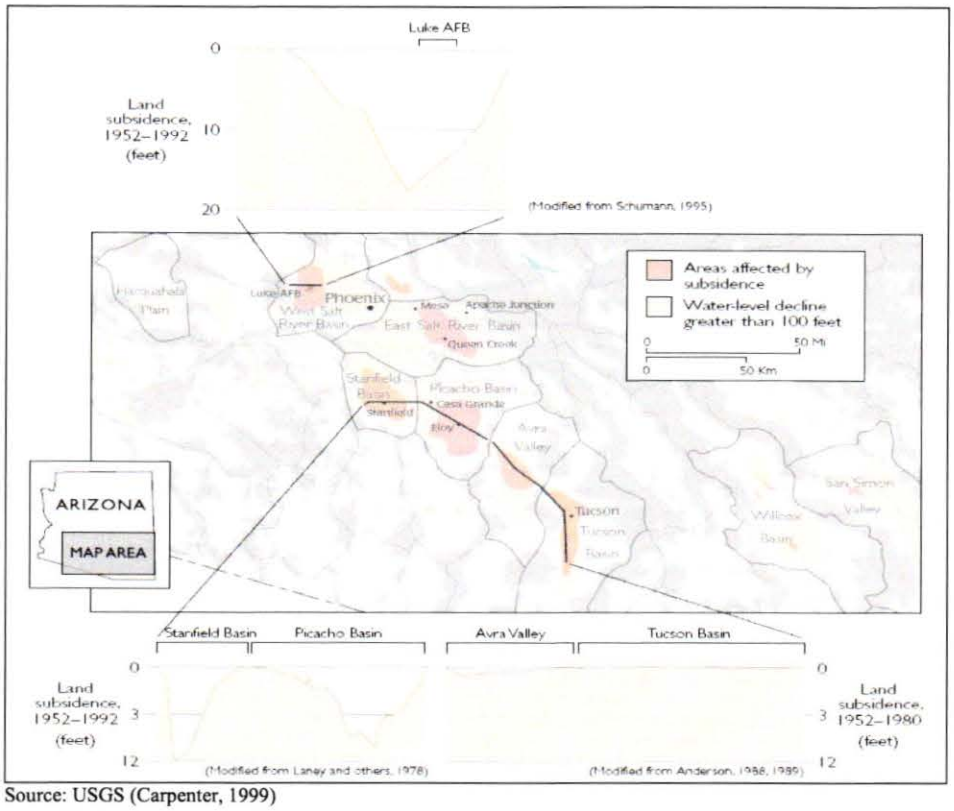
Subsidence occurs when the original land surface elevation drops due to changes in the subsurface. Causes of subsidence include, but are not limited to, removal of fluids (water, oil, gas, etc.), mine collapse, and hydro compaction. Of these causes, hydro compaction and mine collapse tend to be localized events, while fluid removal may occur either locally or regionally. The main cause for subsidence in Pinal County is excessive groundwater withdrawal, wherein the volume of water withdrawn exceeds the natural recharge. Once an area has subsided, it is likely the ground elevation will not rise again due to consolidation of the soils, even if the pumped groundwater is replaced.

Subsidence causes regional drainage patterns to change. Impacts include unexpected flooding, storm drain backwater, reversal of channel and sewer system drainage patterns, and damages to infrastructure both in the subsurface (water, sewer, electric lines, well casings, etc.) and surface (roads, canals, drainages, surveyed benchmarks, etc.) and subsidence also causes fissures.

Land-use areas that are predominantly agricultural tend to experience the most intense subsidence due to groundwater based irrigation practices. Subsidence is not, however, restricted to only rural areas since exponential population growth also places great demands on groundwater.

History

Active subsidence has been occurring in certain areas of Pinal County for over 60 years and is primarily due to groundwater overdraft. By 1980 ground-water levels had declined at least 100 feet county-wide and between 300 and 500 feet in some areas (Carpenter, 1999). The following illustrates profile estimates of ground subsidence in several south-central Arizona locations.



Source: USGS (Carpenter, 1999)

These groundwater declines have resulted in the following:

- Queen Creek – by 1977, an area of almost 230 square miles had subsided more than three feet (Carpenter, 1999).
- Eloy – by 1977, nearly 625 square miles had subsided around Eloy, where as much as 12.5 feet of subsidence was measured (Carpenter, 1999).
- Stanfield – by 1977, another 425 square miles had subsided around Stanfield, with a maximum subsidence of 11.8 feet (Carpenter, 1999).
- US 60 Superstition Freeway – ADOT performed surveys over an eight year period between 1975 and 1983 to measure subsidence of the freeway through a 12 mile stretch centered at around Meridian Road. In that time, the freeway grades lowered as much as 2.5 feet. (AMEC, 2006).

There are no documented damages directly attributable to subsidence in Pinal County. The following represent the jurisdictional history.

Apache Junction – No significant hazard events related to subsidence occurred in past five years within the city.

Casa Grande – Unknown.

Coolidge – There has not been a significant history of subsidence in the Coolidge area.

Eloy – In the past five years, the City of Eloy has had no hazard events related to subsidence.

Florence – There have not been any significant events that are related to subsidence.

Kearny – There is no history of subsidence in Kearny, and none is anticipated.

Mammoth – No significant events within the last five years.

Maricopa – No documented significant subsidence hazards in the last five years.

Superior – No significant events of subsidence have occurred in the last five years.

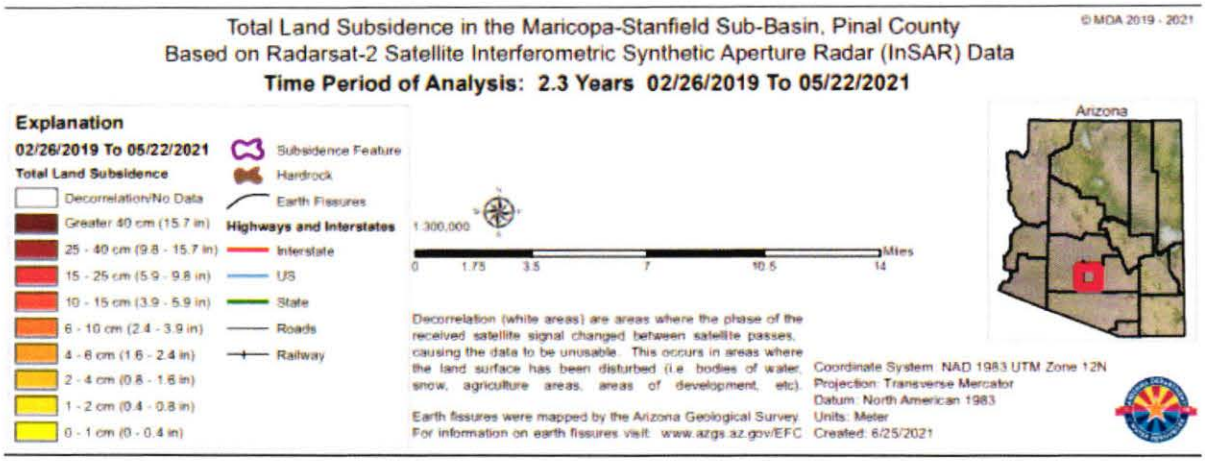
Unincorporated Pinal County – No significant events have occurred in the past five years.

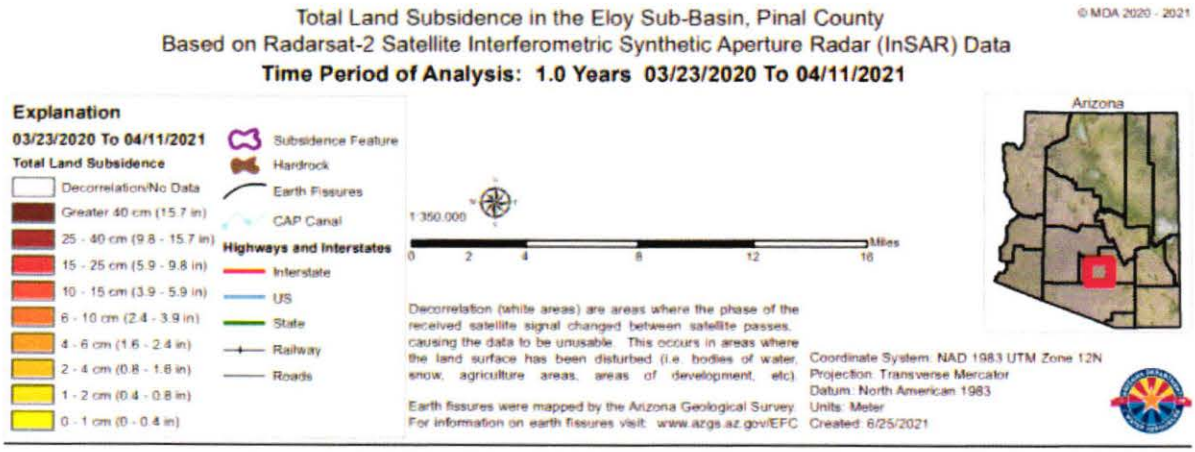
Extent

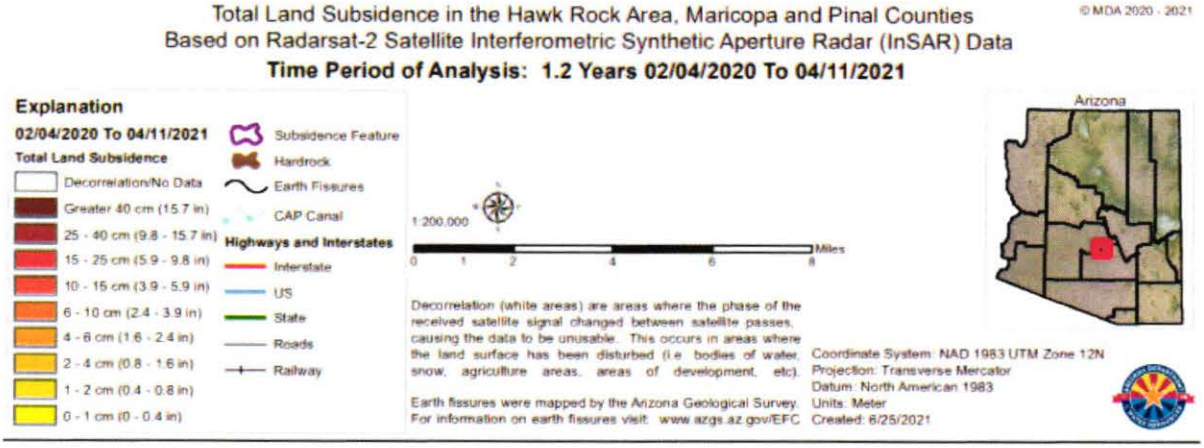
The severity of land subsidence has no generally established measure, except that it can be described in terms of the rate of change in ground elevation relative to sea level. Land subsidence occurs slowly and continuously over time or on abrupt occasions, as in the case of sudden formation of sinkholes.

ADWR is the State agency responsible for identifying and monitoring active land subsidence areas around the State[19]. ADWR has identified numerous subsidence features around the state and continues to monitor the extent and rates of these features on an annual basis (ADWR, 2009). In Pinal County, ADWR monitors 3 geographical areas using Interferometric Synthetic Aperture Radar (InSAR); Maricopa-Stanfield, Picacho-Eloy, and Hawk Rock land subsidence. The following, showcase the land subsidence rates for the three geographical areas mentioned beforehand.

[19] https://new.azwater.gov/hydrology/field-services/groundwater-and-land-subsidence-info.







ADWR has been using InSAR since 2002 to determine the spatial extent, deformation rates, and time-series history of more than sixteen land subsidence features within the Phoenix, Pinal and Tucson Active Management Areas (AMAs), and several groundwater basins outside Active Management Areas in Maricopa, La Paz, and Cochise Counties.

The Planning Team reviewed and chose to use the zones currently being monitored by ADWR to depict the subsidence hazard for the County[20]. Areas defined by ADWR as active subsidence areas were mapped as high hazard zones and all other areas were assigned a low hazard.

Probability of Future Events

There are no statistical probability estimates for subsidence. The magnitude of land subsidence has been detected over the years using surveying techniques such as differential leveling and high accuracy Global Positioning System (GPS) surveying. In the early 1990's, scientists began to use a satellite based technology called Synthetic Aperture Radar (SAR) and interferometric processing (InSAR) to detect land surface elevation changes. InSAR has been developed into a highly reliable land subsidence monitoring technique that has been utilized by ADWR since 2002.

Vulnerability

Table 4-17: CPRI Results for Subsidence

Jurisdiction	Probability	Magnitude/ Severity	Warning Time	Duration	Rating
Apache Junction	Possibly	Limited	> 24 hours	> 1 week	2.05
Casa Grande	Possibly	Negligible	> 24 hours	> 1 week	1.75
Coolidge	Possibly	Limited	12-24 hours	> 1 week	2.20
Eloy	Likely	Limited	> 24 hours	> 1 week	2.50
Florence	Unlikely	Negligible	> 24 hours	> 1 week	1.30
Kearny	Unlikely	Negligible	> 24 hours	> 1 week	1.30
Mammoth	Unlikely	Negligible	> 24 hours	< 6 hours	1.00
Maricopa	Possibly	Limited	< 6 hours	> 1 week	2.40
Superior	Unlikely	Negligible	> 24 hours	< 6 hours	1.45
Unincorporated Pinal Co	Highly Likely	Negligible	> 24 hours	> 1 week	2.65
				County-wide average CPRI =	**1.86**

The Planning Team has determined they will continue to assess vulnerability as an overview summary of the hazard's impact on the community and its vulnerable structures rather than quantitatively.

Apache Junction – Active subsidence has been occurring within undeveloped areas in the southwest region of the city including developed areas on the border with Pinal County.

Casa Grande – Casa Grande has some subsidence hazard areas located on the Western side of the city and small areas to the East, but the majority is outside of subsidence hazard areas.

Coolidge – With the residential and commercial growth in the area along with critical infrastructure in the area, subsidence poses an economic and loss of life risk in Coolidge.

Eloy – Eloy is similar to many other localities within Pinal County with aquifers located throughout the city limits. As the need for water continues to be a priority the vulnerability from subsidence will remain a likely probability. Increased demand for water will affect the longevity of the aquifers, as well as their structural capabilities from aquifer depletion. Any subsidence event, depending on location, could result in destruction of pipelines, roads, canals, and homes within Eloy.

Florence – A small portion of the Town is located within the Picacho – Eloy subsidence area.

Kearny – There is no history of subsidence in Kearny, and none is anticipated.

[20] https://new.azwater.gov/hydrology/e-library

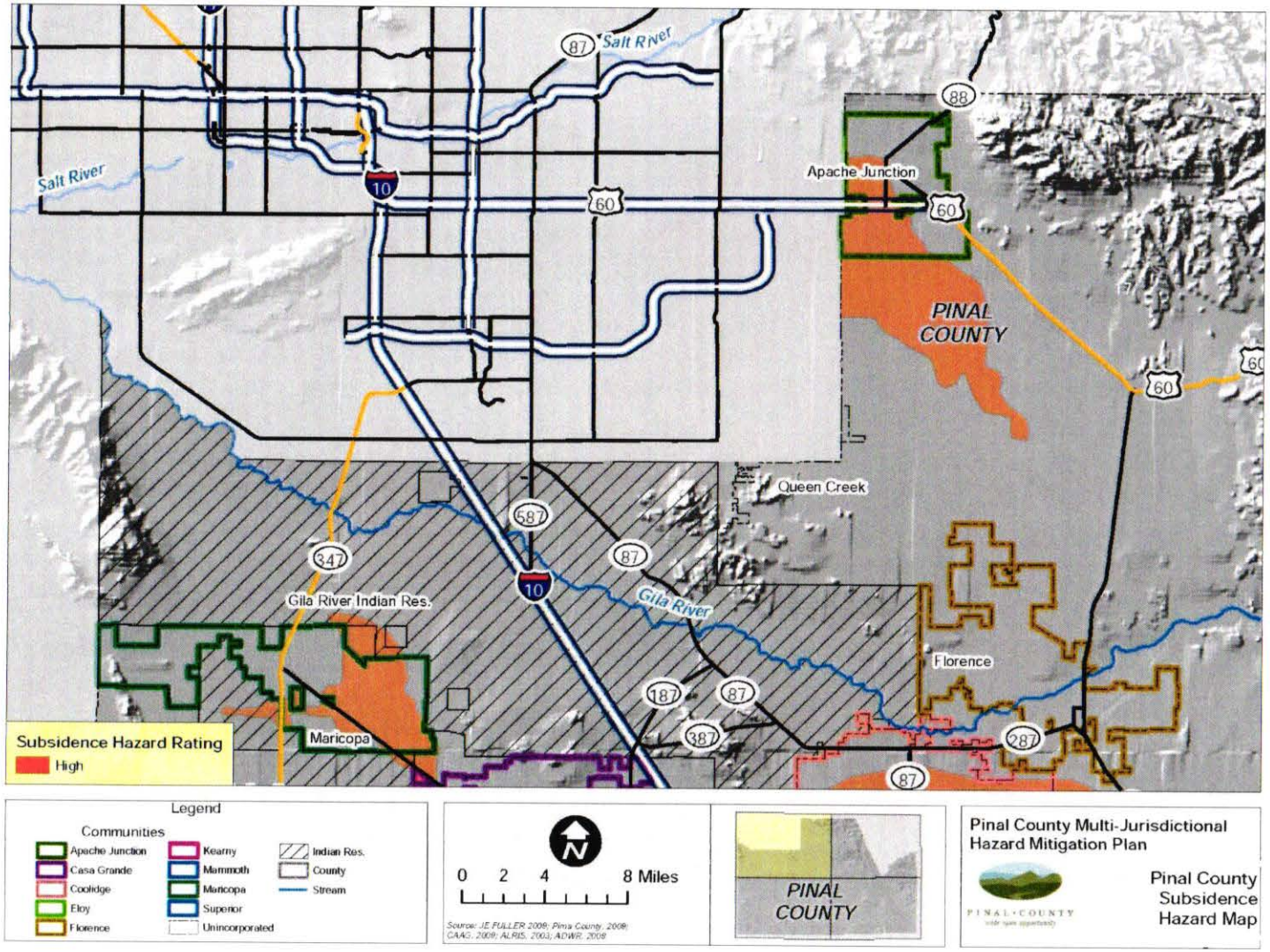
Mammoth – Mammoth is not in an area affected by subsidence. The probability of subsidence having an impact on the community is unlikely.

Maricopa – The possible risk would create evacuation to subdivision and residential loss to residents.

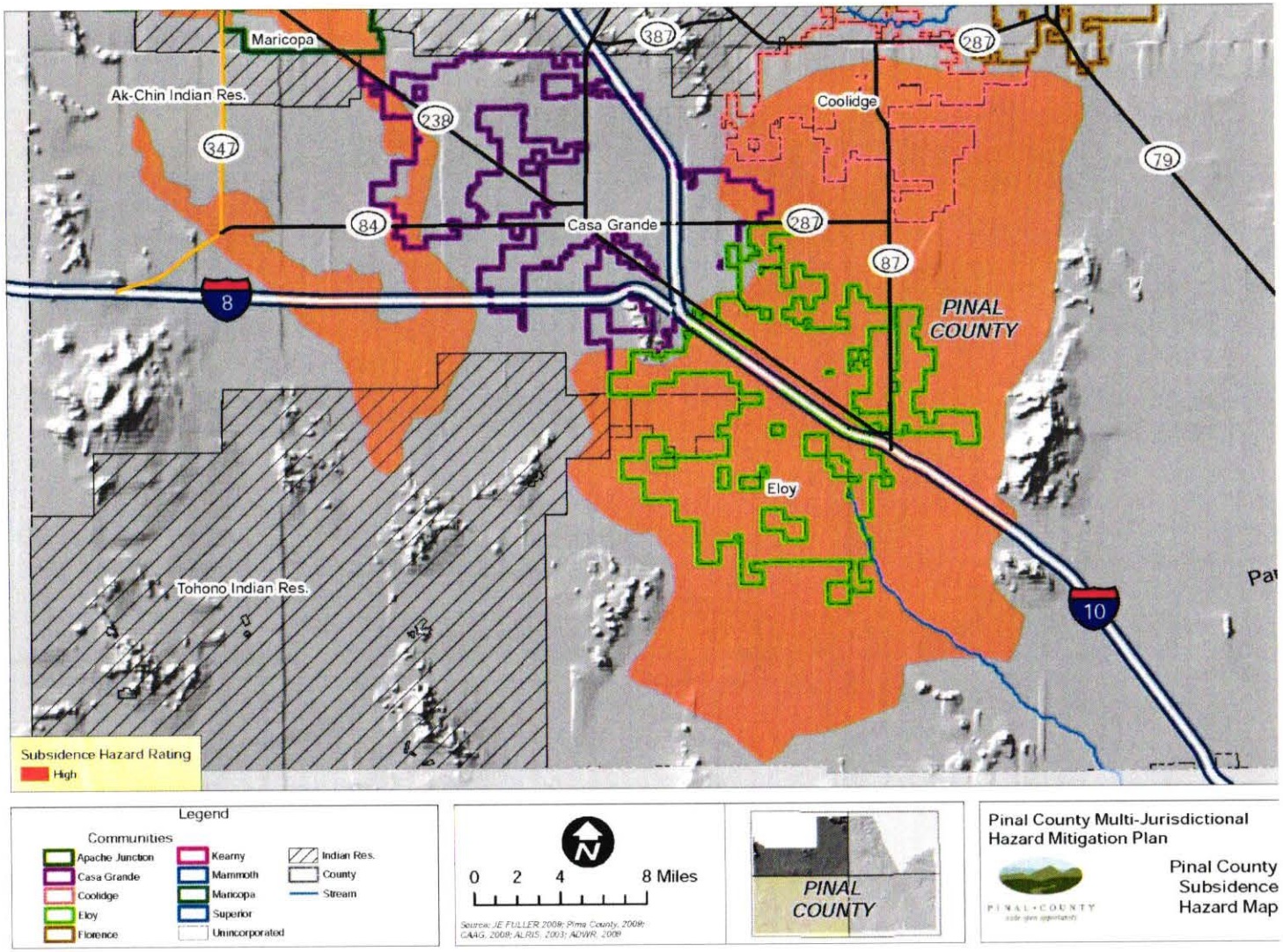
Superior – The Town has a good chance of the Groundwater overdraft and mining tales causing the subsidence within the town limits. The mining uses underground water, which causes loss of the water in Queen Creek. Queen Creek lost up to 70% of its water for the last decades due to the mining facilities, per Environmental impact and Wastewater study Report 2019.

Unincorporated Pinal County – Vulnerability to subsidence has increased due to on-going industrial, commercial, and residential development in the high hazard areas of Northern and Central Pinal County. Risk may also be affected by drought conditions and changing agricultural water usage patterns in these areas. Drought and reductions in the availability of CAP water for agricultural users may force changes to usage patterns. It is not known how the grower's adaptations to drought conditions, through the adoption of techniques like drip irrigation, will affect the conditions that cause subsidence. Overall hazard will also be affected by changes in the amount of groundwater pumped and banked by agricultural growers and new development.

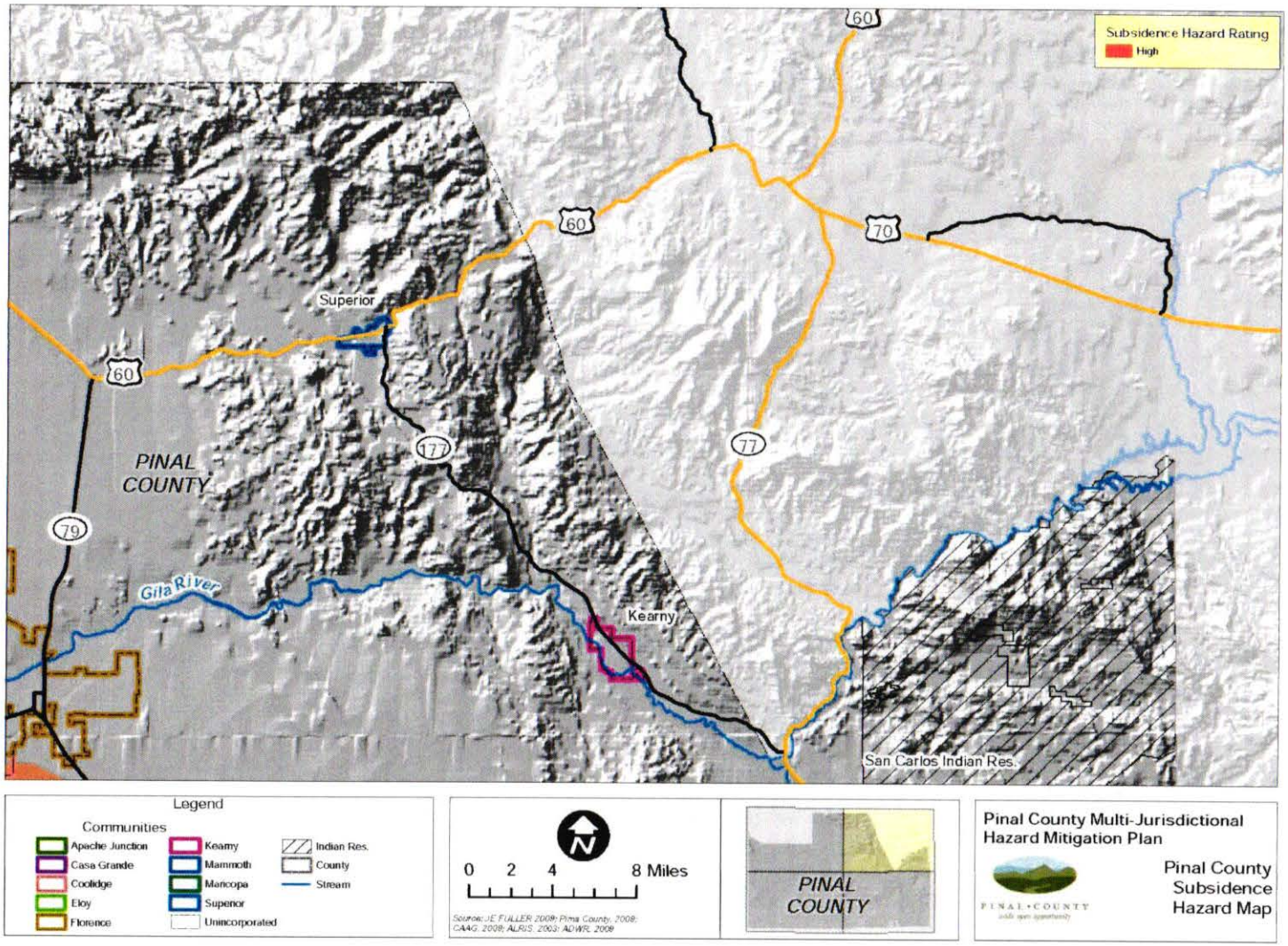
It is unlikely that death and injury might be the direct result of subsidence, however secondary impacts related to fissures may pose the risk. Several communities are located within a high hazard area, with subsidence, buildings normally sink uniformly with the ground, and are undamaged in the process. Damage is more likely to be observed when differential subsidence occurs. Differential subsidence is when adjacent areas subside at different rates; this may cause damage to buildings by lowering one side of a building more than another. Longer facilities are most often impacted by this, such as canals and pipeline which cross all, or a large part of a subsidence feature. Canals, aqueducts, sewers, and drains may all be affected, as these are all built with very precise slopes, which allow the liquid to flow effectively. Subsidence, however, may cause changes in the slope and cause liquids to flow too slowly, too fast, or not at all, which may cause ponding, overflowing, or overloading of checkpoints. Other critical infrastructure such as gas lines and roads may also be damaged by subsidence, which has the potential to cause major disruptions for citizens. Although the rate of subsidence has generally been reduced through a shift from groundwater to alternate sources, the areas affected by land subsidence and the problems encountered may expand in the future if groundwater is withdrawn at unsustainable levels.


Salt River
Salt River
Apache Junction
PINAL COUNTY
Queen Creek
Gila River Indian Res.
Gila River
Florence
Maricopa
Subsidence Hazard Rating
High
Legend
Communities
Apache Junction
Casa Grande
Coolidge
Eloy
Florence
Kearny
Mammoth
Maricopa
Superior
Unincorporated
Indian Res.
County
Stream
0 2 4 8 Miles
PINAL COUNTY
Pinal County Multi-Jurisdictional Hazard Mitigation Plan
Pinal County Subsidence Hazard Map

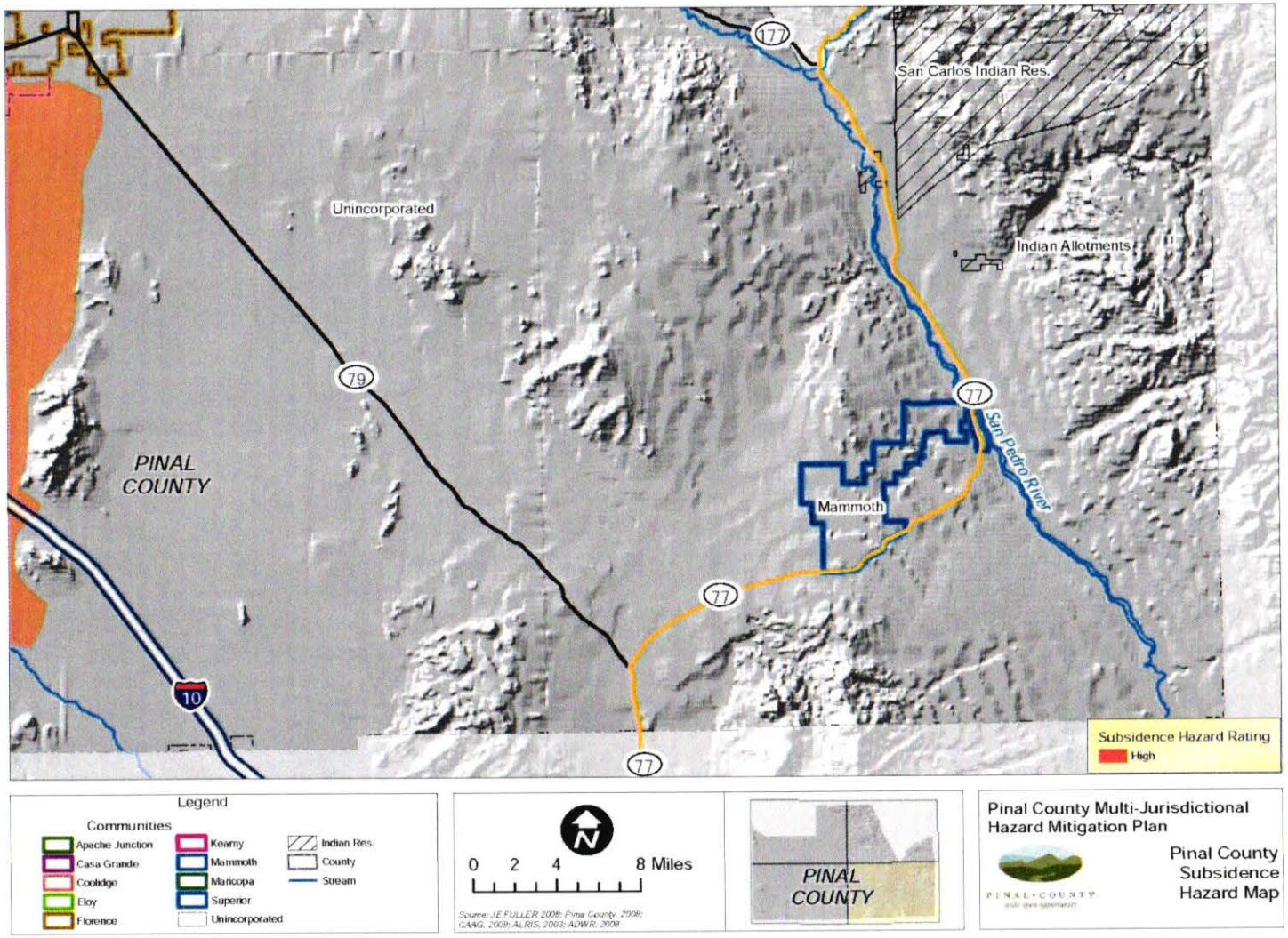
Map 4-23: Pinal County Subsidence Hazard Area (1)



Map 4-24: Pinal County Subsidence Hazard Area (2)



Map 4-25: Pinal County Subsidence Hazard Area (3)



Map 4-26: Pinal County Subsidence Hazard Area (4)

Changes is Development in the Hazard Area

As ADWR continues its mapping and tracking programs, more data will become available for use in regulating future development. Public awareness of the hazard is a key element to any effective mitigation measure, as well as the need to slow the depletion of groundwater sources. New regional drainage features and structures should always refer to the maps in this plan, or those found through ADWR, to determine the need for special design considerations that address subsidence.

The participating jurisdictions were asked to describe how development within the hazard area has impacted them.

Apache Junction – No development in the affected areas of the city have occurred during the past five years.

Casa Grande – Casa Grande has experienced commercial and industrial growth within the hazard area and a resurgence in residential construction; houses are mostly built within subdivisions that already have the infrastructure in place. Subsidence has not affected new development.

Coolidge – Numerous electrical and solar power generating stations are located and planned in the area which increases a significant fiscal loss in this industry. Residential growth occurring in the city is putting a strain on the compaction and soil in the area.

Eloy – Over the past five years, Eloy has experienced an increase in growth primarily in the industrial sector. As new housing and industry has entered the market, Eloy continues to prioritize monitoring of new development and the demands on water supply.

Florence – There have been additional homes built within the Town limits that can be affected by subsidence.

Kearny – There have been no significant changes to the area to affect the risk/vulnerability.

Mammoth – The Town of Mammoth has experienced little to no development or growth in the hazard area over the past five years.

Maricopa – In the last five years, there has been an increase in new residential homes within the hazard area. Since the new homes are within the area, residents could be more likely to be evacuated in the event of subsidence.

Superior – No significant events of subsidence have occurred in the last five years.

Unincorporated Pinal County – Unincorporated Pinal County has experienced commercial and industrial growth in the hazard area within the past 5 years. Growth has primarily occurred on former agriculture land increasing the hazards presented by subsidence, however no significant events have occurred in the past five years.

Sources

AMEC Earth & Environmental, Inc., Earth Fissure Risk Zone Investigation Report, Powerline and Vineyard Flood Retarding Structures, Pinal County, AZ

AZ Dept of Water Resources, http://www.azwater.gov/DWR/Content/Find_by_Program/Hydrology/land-subsidence-in-arizona.htm

AZ Division of Emergency Management, State of AZ Multi-Hazard Mitigation Plan.

AZ Geological Survey, Land Subsidence and Earth Fissures in Arizona

AZ Land Subsidence Group. Land subsidence and earth fissures in AZ: Research and informational needs for effective risk management, white paper, Tempe, AZ. http://www.azgs.az.gov/Earth%20Fissures/CR-07-C.pdf

Carpenter, M.C., Land subsidence in the United States, South-Central Arizona: Earth fissures and subsidence complicate development of desert water resources, [Galloway, D., Jones, D.R., and Ingebritson, S.E., editors], USGS Circular 1182.

Understanding Your Risks; Identifying Hazards and Estimating Losses, FEMA Document No. 386-2.

4.4.10 Wildfire

Description

A wildfire is an uncontrolled fire spreading through wildland vegetative fuels and/or urban interface areas where fuels may include structures. They often begin unnoticed, spread quickly, and are usually signaled by dense smoke that may fill the area for miles around. Wildfires can be human-caused through acts such as arson or campfires, or can be caused by natural events such as lightning. If not promptly controlled, wildfires may grow into an emergency or disaster. Even small fires can threaten lives, resources, and destroy improved properties.

The indirect effects of wildfires can also be catastrophic. In addition to stripping the land of vegetation and destroying forest resources and personal property, large, intense fires can harm the soil, waterways and the land itself. Soil exposed to intense heat may temporarily lose its capability to absorb moisture and support life. Exposed soils in denuded watersheds erode quickly and are easily transported to rivers and streams thereby enhancing flood potential, harming aquatic life and degrading water quality. Lands stripped of vegetation are also subject to increased landslide hazards.

History

Wildfires have a prominent history in Pinal County. The declared disaster and historic hazard data summarized in this section does not adequately reflect the true cost of a wildfire. This is particularly the case with the cost of wildfire suppression efforts to prevent structure and human loss. Accordingly, the following list of incidents provides a representative sample of moderate and major wildfire events that have impacted the County:

Apache Junction – Significant wildfire events have occurred within the city within the past five years and in surrounding areas. Most notable fire within the city was the Lost Dutchman Fire on May 7, 2020, that consumed 221 acres and resulted in the evacuation of nearby residential properties. A neighboring fire outside the city, the Superstition Fire which began on August 20, 2020, now presents the city with additional flooding hazard from its burn scar.

Casa Grande – No significant wildfire events have occurred within the city in the last five years.

Coolidge – There is a significant history of wildfires in the Coolidge area. Even though these fires are locally situated and rarely spread outside of the city limits, these events occur on a yearly basis. This is due to low humidity conditions, low geographic location, and high wind/high temperature conditions. With numerous small wildfires occurring in the past mainly limited to light prairie grass and desert fuel types. May 30, 2019 and July 7, 2019 two large fires were recorded in the area, being named LaPalma Fire and Picacho Lake Fire. These fires were still contained to a relatively small geographical area but showed the danger from this hazard is still present.

Eloy – In the past five years, the City of Eloy has experienced few hazard events related to wildfire. On April 29, 2020 a four-acre fire was responded to along Interstate 10 at Mile Post 200. Ground fuels burning with a wind event causing rapid fire growth. Impact to vegetation, wildlife, and Interstate traffic due to heavy smoke.

Florence – The Town of Florence has not had a campaign fire threaten the residents of the area within the last 10 years. With a major highway, State Route 79, running through the municipal borders, many roadside fires have been contained. From 2019 until November of 2021, the department responded to 19 roadside fires. With a 24/7 fully staffed professional Fire Department, rapid response to roadside incidents that are typical in this setting, stop the spread of these incidents.

With many natural and man-made fire breaks the threat of spread from a fire advancing into the population areas of the Town is likely but rapid response and resource management will allow control of

the incident. With a municipal water system and fire hydrant access throughout the major population areas, fire apparatus can quickly fill up and provide a constant flow of water to fire fighting resources.

Over the last decade the State of Arizona has seen significant increases in the amount and severity of wildfires. The Pinal County area of the state has seen significant increases over the last 5 years. The Florence Fire Department recently (2020) became active in the State Wildland response contract. Committing to deploying a Type 6 wildland engine to support operations and initial attack in the Pinal County region, our local response has benefitted. With fully trained and equipped personnel, the response to local wildfires has significantly changed. Becoming part of the statewide response and supporting response to local emergencies, resources are not as sparse in Pinal County.

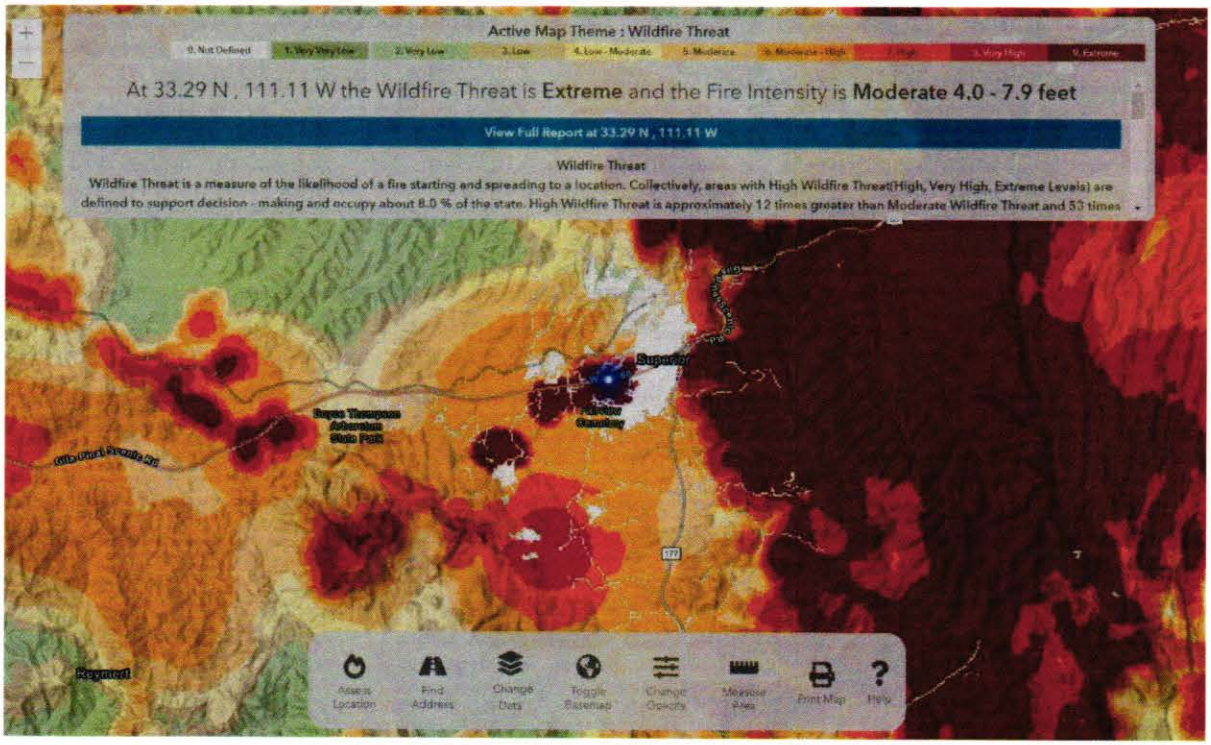
Kearny – There is extensive history of wildfires surrounding Kearny, which has high temperatures sue to its low elevation and low relative humidity, conditions that work against firefighting efforts.

- The Woodbury Fire: Began on June 8, 2019, five miles northwest of Superior, AZ. Over its duration, the fire traveled through the Superstition Wilderness area of the Tonto National Forest, tracking to the northeast toward Theodore Roosevelt Lake.
- The Tilbury Fire: On June 14, 2019, a fire was reported near Kearny, AZ. Quick action by the Kearny Volunteer Fire Department prevented damage to nearby structures.
- The Simmons Fire on May 26, 2021, located four miles north of Kearny burned 40 acres.
- The Telegraph Fire: Started on June 4, 2021, in Superior. As of July 3, 2021, the fire had been 100% contained.

Mammoth – There have been no significant incidents directly affecting the town of Mammoth within the previous five years. However, in April 2021 the Margo Fire destroyed 30 homes in the San Pedro River Valley, less than 15 miles from the Town. The Town itself provided shelter to fire evacuees.

Maricopa – No documented wildfires have occurred within Maricopa in the last five years.

Superior – The Arizona Department of Forestry and Fire Management Fire Risk Report placed the Town of Superior in the highest fire risk Category with the Score - 6.74 in Arizona. The High-Risk range is 4.0-9.0. Additionally, the Fire Risk report document is attached to this report as Exhibit "A."



Superior is at the highest risk for wildfires. The riparian corridor of the queen creek and conjunction of the woodland and mixed desert shrubs create the highest incidences of ignition of the fires.

On June 6 to 29, 2021, the Telegraph fires caused damage within the town limits threatening homes and Superior Arboretum. The fire also caused highway closures and a negative economic impact on the Town. The business and tourist attraction places were closed for four weeks. Town citizens were ordered to stand by for the evacuation, and evacuation orders were placed for the south part of the Town for two weeks.

Due to significant rainfalls in August - October 2021, there is a high chance of wildfires in the coming summer season. After approximately four weeks of heavy rains, the surrounding area and mountains quickly became green with the new grass and plants growing. All that dry grass and plants, including invasive species, are the serious concern of the future fires.

Unincorporated Pinal County – The unincorporated town of Dudleyville has seen two large wildland fires since 2017. On July 7, 2017, the Roach Fire was reported. The 1400 acre fire went on to destroy 14 structures, including 3 homes and cause the evacuation of about 100 people. On Apr 8, 2021, the Margo fire started in the Gila River wash near Dudleyville. Approximately 200 people were evacuated from Dudleyville due to high fire activity, smoke, and unsafe conditions. Ultimately the 1,148 acre fire destroyed 12 homes and as many as 30 structures in the community.

On June 5, 2020, the Bighorn Fire was reported on the Santa Catalina Mountains in Pima County. Due to the steep terrain and difficult conditions, the fire burned over 180,000 acres in both Pima and Pinal Counties and forced the evacuations of several mountain communities.

On June 4, 2021, the Telegraph Fire was reported. The fire would be the largest fire in the U.S. for a time. By the time the fire was contained on Jul 3, 2021, the fire had consumed 51 structures and 180,757 acres across two counties. In Pinal County, the residents of Top-of-the-World were evacuated and the Town of Superior was threatened. Access to areas of Pinal County was also cut off by the closures of State Route 77, State Route 177, and U.S. 60.

On June 6, 2021, residents in Top-of-the-World and the Oaks Mobile Home and RV Park were ordered to evacuate.[3] Later that same day, all Miami residents west of the Miami town limits were ordered to evacuate.[4] On June 14, 2021, residents of El Capitan, Arizona were ordered to evacuate.[5]

These fires have also increased the risk of post-fire flooding in and around these fires. The loss of vegetation allows rainfall runoff to erode the soil and cause flooding. The sediment and debris will flow downstream, damaging roads and other public infrastructure.

Extent

Statewide wildfire season usually begins in May and lasts through July. Although the season has begun earlier in the last few years, a trend that is expected to increase with drier winters[21]. The scale and complexity of any wildfire will determine the extent of the hazard. The complexity of a wildfire is measured by a number of variables including the terrain, fire weather, and values at risk. The rugged terrain, extreme heat, and extensive wildland urban interface quickly lead to large, complex wildfires in the eastern, mountainous areas of the county.

One way to measure the severity of a fire is through flame length, it is directly related to Fire Intensity and is commonly used as a direct visual indication of Fire Intensity. There are seven categories for the Flame Length shown on the legend below[22].

Flame Length Level			Assess Group
0	Snow/Ice, Water, Barren, Urban or Agriculture		
1	Very Low	Less than 2 feet	Very Low
2	Low	2 - 3.9 feet	Low
3	Moderate	4 - 7.9 feet	Moderate
4	High	8 - 11.9 feet	High
5	Very High	12 - 19.9 feet	Very High
6	Very, Very High	20 - 29.9 feet	Extreme
7	Extreme	≥ 30 feet	

Interpretation of flame length:

- 0-3.9 ft: People can work near the flames create a Lean, Clean and Green Zone at least 30 feet from structures.
- 4-7.9 ft: Fires are too intense to work at the front of the flame. Mechanical equipment needed to support fire suppression efforts. Fire embers travel moderate distances. Create a Reduced Fuel Zone for an additional 70 feet.
- 8-11.9 ft: Due to the fire intensity, tree torching and spotting, control efforts are difficult. Create a Reduced Fuel Zone for an additional 70 feet.
- 12+ ft: Major fire movement likely with tree crowning and long-range spotting. Create a Reduced Fuel Zone for an additional 70 feet.

Pinal County Community Wildfire Protection Plan (CWPP) conducted a wildfire risk analysis to identify areas of low, moderate and high wildfire risk. Detailed results of this analysis can be found on the Pinal

[21] https://www.azmirror.com/2021/06/28/years-of-raging-arizona-wildfires-bring-focus-onto-climate-change-drought/

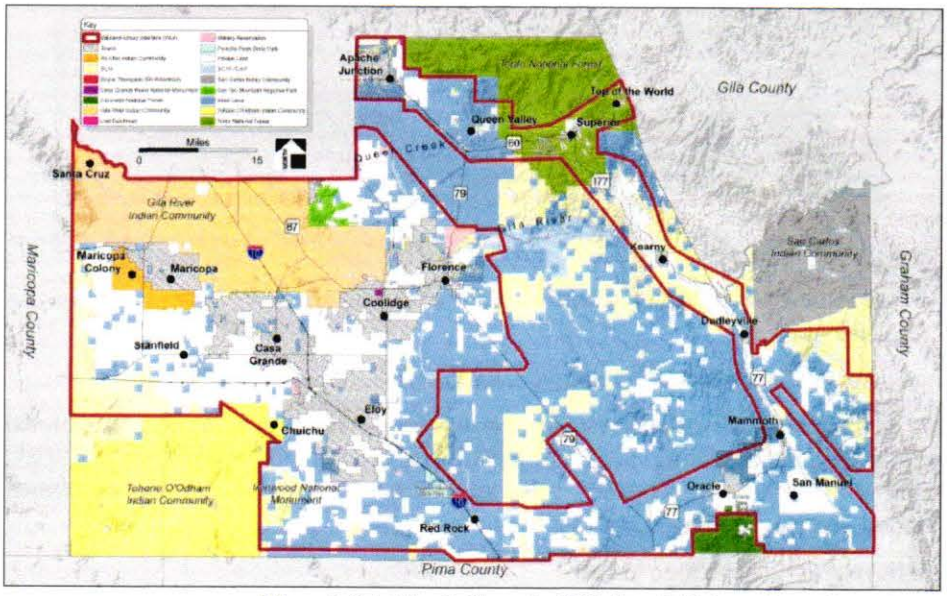
[22] https://apps.azgeo.az.gov/azwrap/AssessmentReport.html?lat=32.69139082743503&lon=-111.50757667880572

county's emergency management website. The 2018 Pinal County CWPP was developed as a collaborative effort between representatives of local governments, fire departments and districts, Arizona Department of Forestry and Fire Management (ADFFM), Bureau of Land Management (BLM) Gila District, Coronado National Forest (CNF), and Tonto National Forest (TNF), who collectively formed the Core Planning Team (Core Team).

Probability of Future Events

Wildfire incidents for Pinal County are influenced by numerous factors including vegetation densities, previous burn history, hydrologic conditions, climatic conditions such as temperature, humidity, and wind, ignition source (human or natural), topographic aspect and slope, and remoteness of area. Two sources were used to map the wildfire risk for Pinal County. The first is the data developed for the Pinal County Community Wildfire Protection Plan (PCCWPP) (LSDI, 2018). The second is a statewide coverage developed by the State of Arizona as a part of the 2003/04 AZ Wildland Urban Interface Assessment (AWUIA) project (Fisher, 2004).

Pinal County and participating jurisdictions have updated the community wildfire protection plan developed in 2009. The objective of the plan was to help local governments, fire departments and districts, and residents identify at-risk public and private lands to better protect those lands from severe wildfire threat. Elements identified in the PCCWPP include delineation of the wildland urban interface (WUI) areas, mapping of vegetative fuels and topographical slope and aspect elements impacting wildfire risk, and mapping of wildfire risk zones that include consideration for the built environment.



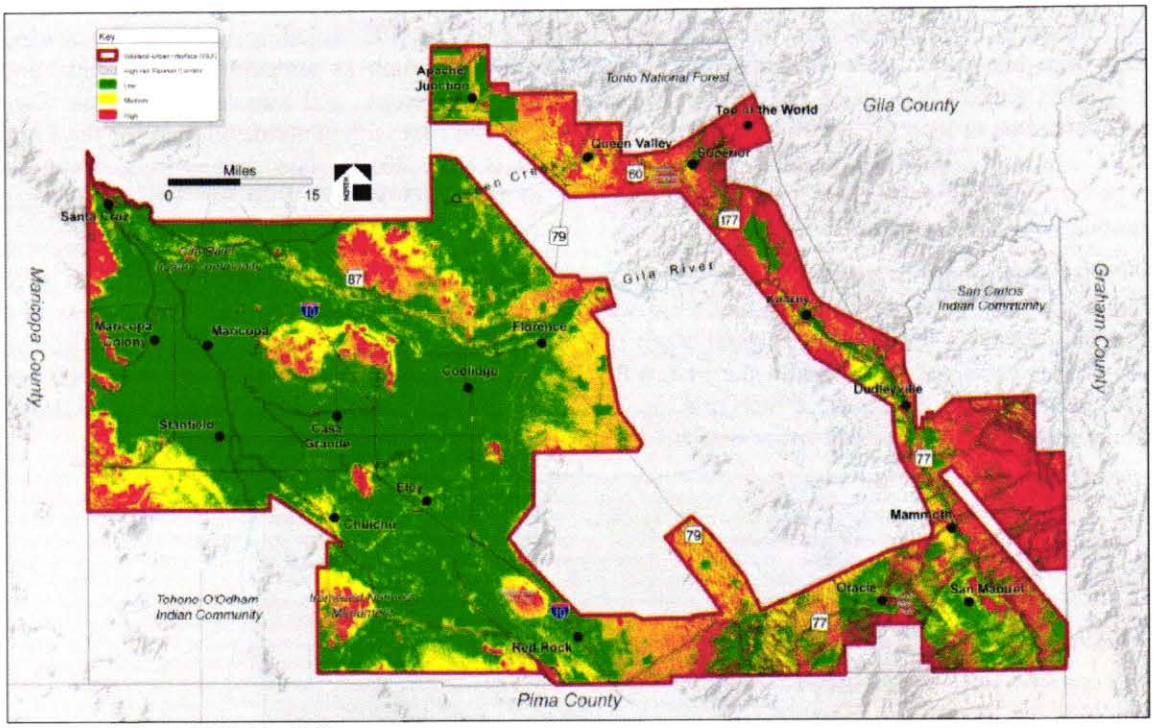
Map 4-27: Pinal County Wildland Urban Interface Area

The PCCWPP also identified two models of wildland fuel hazards to represent a typical year of rainfall and an extraordinarily heavy rainfall year to present a range of wildland fuel hazards across the County. Each model divided the fuel hazard into three categories; high, medium and low. The Planning Team chose to use the extraordinary rainfall fuel hazard model.

In 2004, the State of Arizona prepared the AWUIA to analyze wildfire risk at a statewide basis, using a common spatial model. The model results were used for validation of those communities listed in the federal register as WUI, and for further identification other communities possibly at risk. The AWUIA approach used four main data layers:

- TOPO – aspect and slope derived from 30 meter Digital Elevation Model data from USGS.

- RISK – historical fire density using point data from fire record years 1986–1996 from all wildland agencies.
- HAZARD – fuels, natural fire regimes and condition class.
- HOUSE – houses and/or structures



Source: Pinal County CWPP, May 2009

Map 4-28: Extraordinary Rainfall Year Fuel Hazards

A value rating in the range of 1-15 was assigned for all layers to represent the level of risk.

Two separate results were developed. The first coverage used an applied weighting scheme that combined each of the four data layers to develop a ranking model for identifying WUI communities at greatest risk. The second coverage, referred to as the "Land Hazard", also applied a weighting scheme that combined only the topo, risk, and hazard layers, as follows:

Land Hazard = (hazard*70%)+(risk*20%)+(topo*10%)

Weighing percentages were determined through discussion with the Arizona Interagency Coordinating Group. The "Land Hazard" layer produced from this model is based on a 250-meter raster grid (some data originated at 1,000-meter). The resultant raster values range from 1-15 and were classified into three groups to depict wildfire hazard without the influence of structures: high (values of 10-15), medium (values of 7-9), and low (values of 1-6).

The following table is an excerpt from the PCCWPP that summarized the WUI risk for all communities within Pinal County.

Community[a]	WUI risk	Fire department/ district	Community	WUI risk	Fire department/ district
Dudleyville	Moderate	Dudleyville Fire District	Apache Junction	Low	Apache Junction Fire District
Kearny	High	Kearny Fire Department	Queen Creek	Low	Queen Creek Fire Department
Oracle	High	Oracle Fire District	Eloy	Low	Eloy Fire District
Santa Cruz	Moderate	Gila River Indian Community Fire Department	Superior	High	Superior Fire Department
Maricopa Colony	Low	Ak-Chin Indian Community Fire Department	San Manuel	Low	San Manuel Fire District
Top of the World	High	None	Casa Grande	Low	Casa Grande Fire Department
Florence	Moderate	Florence Fire Department	Mammoth	Low	Mammoth Fire District
Coolidge	Low	Coolidge Fire Department	Maricopa	Low	Maricopa Fire Department
Queen Valley	High	Queen Valley Fire District	Stanfield	Low	Stanfield Fire District
Arizona City	Low	Arizona City Fire District	Oracle Junction/Saddlebrook	Moderate	Golder Ranch Fire District
Avra Valley	Low	Avra Valley Fire District	Galiuro Mountains	Low	None
Thunderbird Farms	Low	Thunderbird Fire District	Chuichu	Moderate	Tohono O'odham Nation Fire Department
Picacho	Low	None			

[a]Dudleyville listed as low, Kearny listed as moderate, Oracle listed as high, Santa Cruz listed as moderate, Maricopa Colony listed as low, and Top of the World listed as high on the 2007 *Arizona Communities at Risk Matrix* (http://www.azsf.az.gov).

Vulnerability

Table 4-18: CPRI Results for Wildfire

Jurisdiction	Probability	Magnitude/ Severity	Warning Time	Duration	Rating
Apache Junction	Likely	Limited	< 6 hours	< 24 hours	2.75
Casa Grande	Possibly	Negligible	6-12 hours	< 24 hours	1.85
Coolidge	Likely	Limited	< 6 hours	< 24 hours	2.75
Eloy	Likely	Limited	< 6 hours	< 24 hours	2.75
Florence	Likely	Limited	6-12 hours	< 24 hours	2.60
Kearny	Highly Likely	Limited	< 6 hours	< 1 week	3.30
Mammoth	Highly Likely	Limited	< 6 hours	< 1 week	3.30
Maricopa	Likely	Negligible	> 24 hours	< 6 hours	1.90
Superior	Highly Likely	Limited	< 6 hours	< 1 week	3.30
Unincorporated Pinal Co	Highly Likely	Limited	< 6 hours	> 1 week	3.40
				County-wide average CPRI =	**2.79**

In Pinal County, wildfires pose the greatest danger in the eastern region of the County, where the fuels are more supportive of extreme fires, but are a threat throughout the planning area. The wildfire hazard has the potential to destroy buildings, cause damage to vital infrastructure, and result in the loss of life, agricultural land, and animals. Depending on the parameters and size of the fire, a wildfire can have a significant economic impact, such as disruption to industries and supply chains, and the closure of vital transportation networks. According to the PCCWPP, a total of 458,479 acres are in areas with a high wildfire risk. From the most recent applicable data available, $93,000, and $5.6 million in asset related losses are estimated for high and medium wildfire hazards, for all the planning area.

The most exposed population are those living within WUI zones. Other populations to consider include children, the elderly, or those with breathing conditions who may be exposed to high levels of smoke. Also, important to consider long term care facilities or other skilled care facilities because of the potential

for increased evacuation times. Typically, deaths and injuries not related to firefighting activities are rare. However, it is feasible to assume that at least one death and/or injury may be plausible. There is also a high probability of population displacement during a wildfire event, especially in the urban wildland interface areas.

It is duly noted that the loss and exposure numbers listed above represent a comprehensive evaluation of the County as a whole. It is unlikely that a wildfire would occur that would impact all of the high and medium wildfire hazard areas at the same time.

The Planning Team has determined they will continue to assess vulnerability as an overview summary of the hazard's impact on the community and its vulnerable structures rather than quantitatively.

Apache Junction – In the Apache Junction WUI, the areas at highest risk for wildfires occur primarily along the slopes of the Superstition Mountains in the eastern portion of the WUI, and the Goldfield Mountains in the northern portion of the WUI. As with other communities, vulnerability of homes and businesses increases as the distance of the property to wildfire prone areas decreases. Vegetation associations within the Apache Junction area range from desert scrub types on the desert floor to mixed desert shrub associations in the mountain foothills. During years of extraordinary rainfall, these areas of the WUI require greater attention as they present a heightened risk. Additionally, there is an overall elevated risk from the density of developed areas in proximity to high-risk wildland fuels.

Casa Grande – The majority of the Casa Grande WUI is classified as low wildfire risk. There are several large dry riparian areas in the WUI. The immediate surrounding areas, such as the Santa Rosa Wash, Greene Wash, and the Casa Grande canal downstream of the Picacho Reservoir, are considered areas of high wildfire concern. The relatively flat landscape comprises desert scrub-shrub vegetative communities, which dominate the landscape and are not conducive to intensive wildfire due to noncontiguous aerial or ground fuels. However, during extreme rainfall years, abundant annual and invasive grasses can create areas of increased risk within the foothills of the Sacaton and Casa Grande Mountains, in addition to the dry riparian habitat areas mentioned earlier.

Coolidge – The majority of the Coolidge WUI is classified as low risk of wildfire. The immediate area surrounding the WUI is largely open land, with most of the land being used for agricultural purposes. The relatively flat landscape is composed of desert scrub-shrub vegetative communities, which dominate the landscape and are not conducive to intensive wildfire due to noncontiguous aerial or ground fuels. During extreme rainfall years, abundant annual and invasive grasses can create areas of increased risk.

Eloy – The Eloy WUI, located within the Santa Cruz Flat, is composed of desert scrub-shrub vegetative communities, which dominate the landscape and are not conducive to intensive wildfire due to noncontiguous aerial or ground fuels. The City of Eloy and immediate surrounding area has a history of low numbers of wildfire ignitions, in addition, fires are usually quickly extinguished due to the low fuel loads. Areas of highest wildfire risk are located to the east of the city, within the foothills of the northern extension of the Picacho Mountains and in the riparian habitats within the Picacho Reservoir and its associated canals and drainages. The northern extension of the Picacho Mountains is classified as moderate risk based on prior wildfire ignitions. Transportation issues are of concern in this area due to its close proximity to the major transportation corridors.

Florence – The Florence WUI is located within the relatively flat lowlands of the Gila River Valley. The vegetation ranges from desert scrub-shrub communities, which dominate the landscape and are not conducive to intensive wildfire due to noncontiguous aerial or ground fuels, to upland Sonoran desert shrub communities, which during extreme rainfall years can produce abundant light fuels from invasive annual and perennial grasses. In extreme rainfall years, significant ground fuels are produced within the bajadas of the western slopes of the Tortilla Mountains and the ascending slopes north of the community to the Mineral Mountain and White Canyon Wilderness area, which create areas of high risk to wildfire.

Although Florence has a high population density within its WUI, due to the low number of wildfire ignitions and an overall low wildfire risk, the overall wildfire risk rating is moderate.

Kearny – In Kearny, the areas at highest risk for wildfires are along both sides of the Gila River riparian corridor in areas on ascending slope in conjunction with woodland vegetation associations. The Gila River riparian corridor, which has the highest incidences of ignition, with its associated side channels and drainages, are considered areas of elevated risk from wildfire. Vegetation associations at highest risk for wildfire consist primarily of riparian, woodland, and mixed desert scrub. Businesses and homes south and west of the railroad tracks face the greatest risk, as this area primarily contains the greatest fuel load.

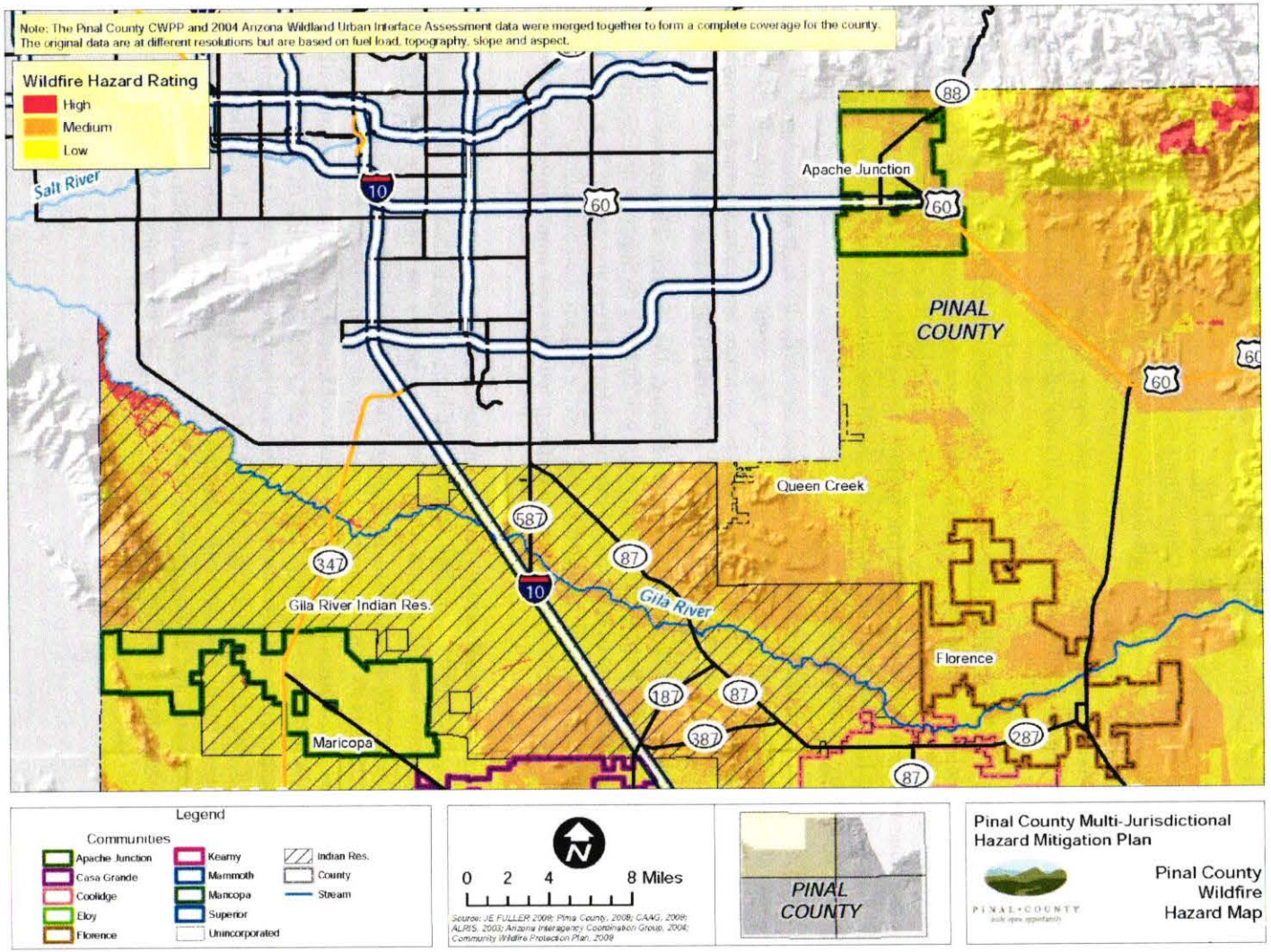
Mammoth – In Mammoth, the areas at highest risk for wildfires occur primarily along the San Pedro River riparian corridor and in upland areas with ascending slope to the east of the riparian corridor. The San Pedro River riparian corridor, with associated side channels and drainages within the community, are considered of elevated risk from wildfire. Vegetation associations at highest risk consist primarily of riparian, woodland, and mixed desert scrub. The town has some critical communication towers that if damaged by wildfires will disrupt communication through most of County, making wildfire a heightened risk.

Maricopa – Maricopa is a low desert valley composed of desert scrub-shrub vegetation, which dominates the landscape and is not conducive to intensive wildfire due to noncontiguous aerial or ground fuels. In extreme rainfall years, significant ground fuels were produced within the Sacaton Mountains' foothills, east of Maricopa. Due to low wildfire risk and a low ignition history. Most fires are usually extinguished in their initial stages, being less than one acre in the area; therefore, damages are likely to be negligible—vulnerability risk to residential communities.

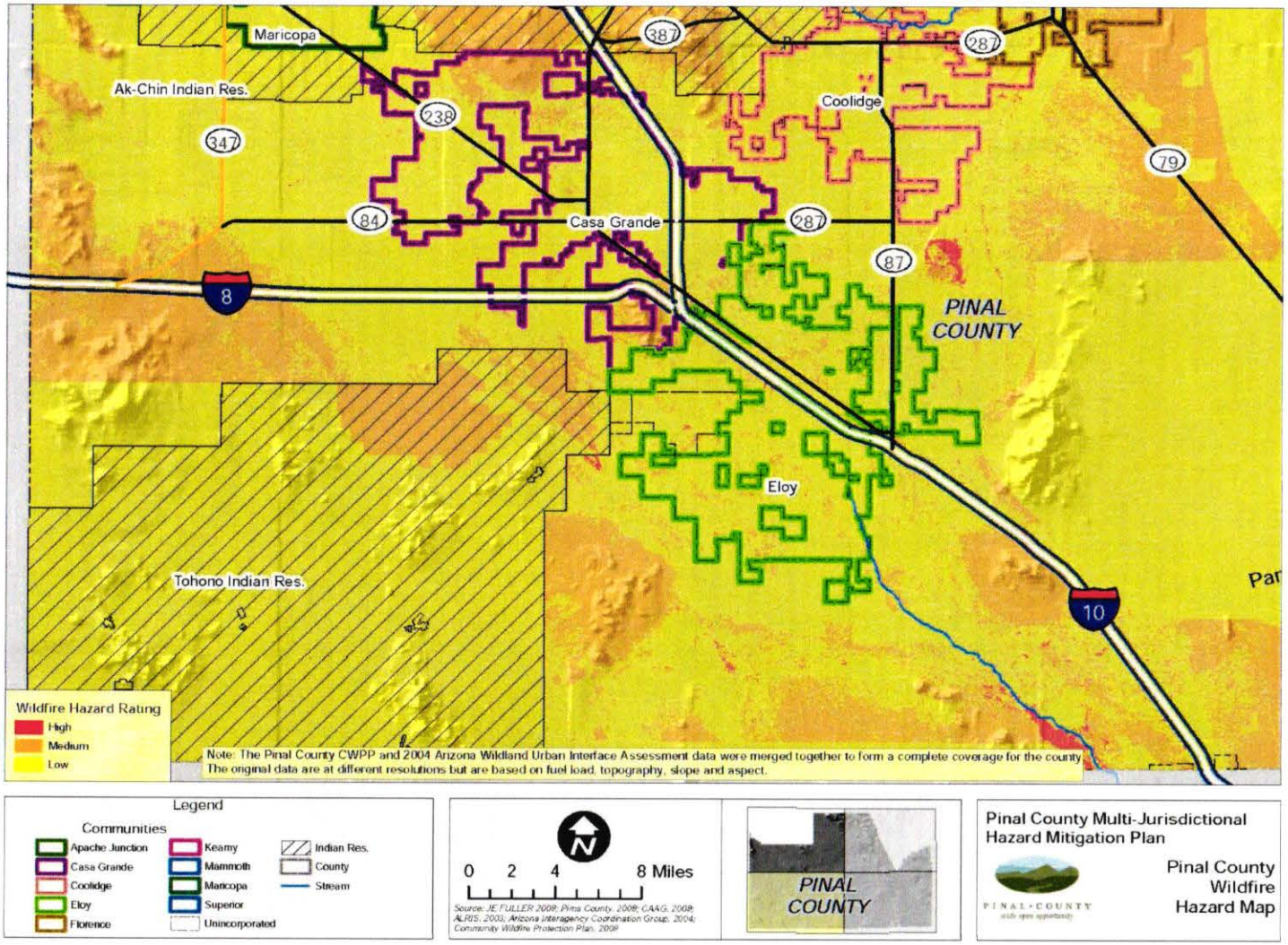
Superior – Superior and the surrounding area is composed primarily of high wildfire risk vegetation. Vegetative associations range from desert scrub types on the desert floor to mixed desert shrub associations in the mountain foothills. Significant threats to structure and infrastructure are within and adjacent to the community, and several large wildfires have occurred within those areas.

During years of extraordinary rainfall and its ignition history, the Boyce Thompson Southwestern Arboretum east and north along US 60 presents an increased wildfire risk to Superior and requires greater attention. Focus areas primarily consist of the west of Panther (Mary) Drive and east of Ray Road, as fires started in these non-residential parts could spread into and heavily impact the community. The Town has a critical communication tower that, if damaged by wildfires, will disrupt communication through the Town limits.

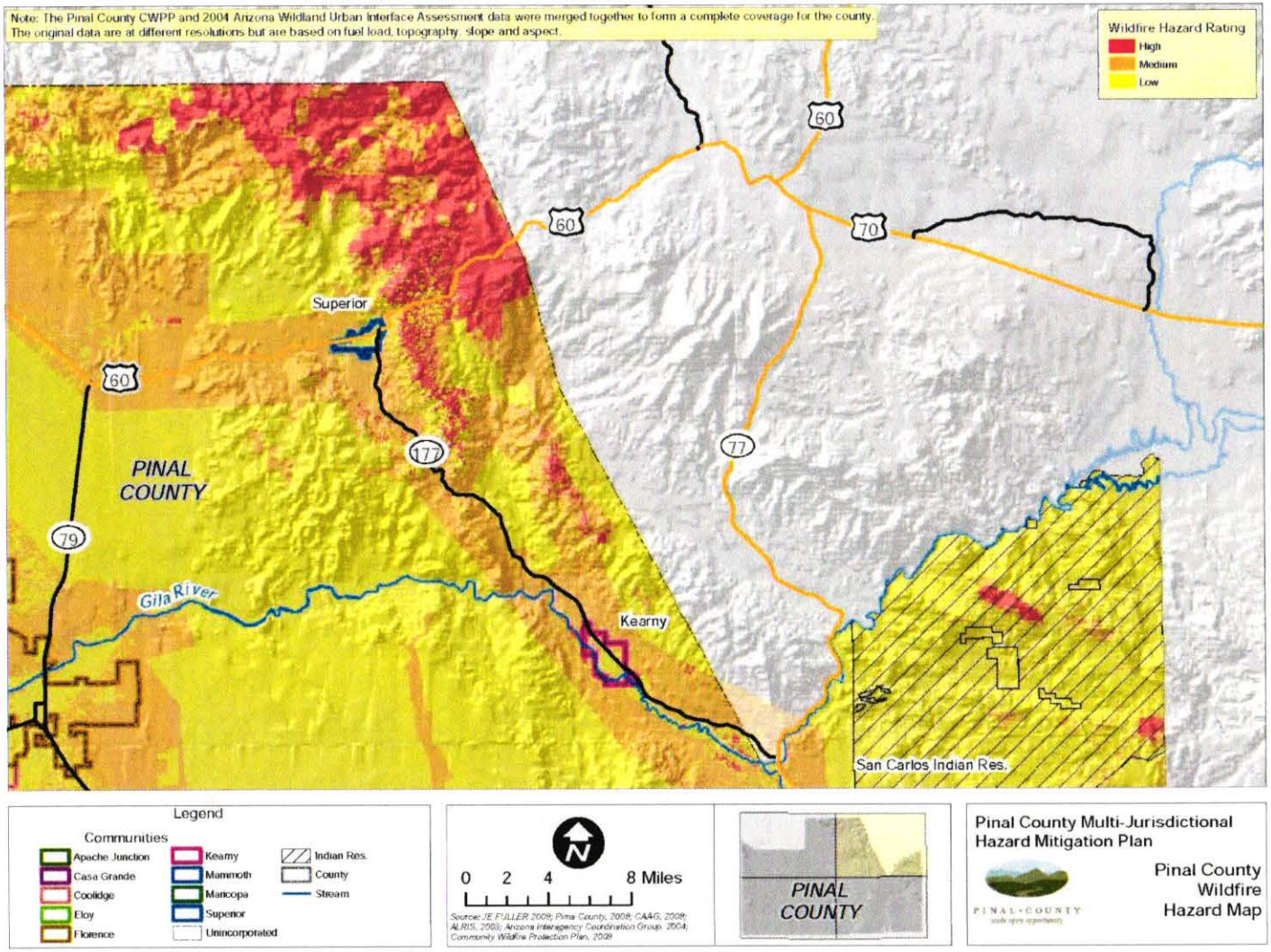
Unincorporated Pinal Co – Several unincorporated communities of the County face heightened risk of wildfires due to their geographic locations. In San Manuel, the highest risk is located primarily along the San Pedro River riparian corridor and in upland areas. Wildfires in this area could create concerns for response resources and community evacuation. In Queen Valley, vegetation varies from desert scrub types on the desert floor to mixed desert shrub and woodlands in the foothills of the Superstition Mountains. Due to hillsides near homes having a high density of brush growth, there are areas classified as high risk. In Top of the World, there is high wildfire risk due to the combination of volatile vegetative associations occurring in conjunction with southerly exposures of increasing steep slopes. In addition, the community is not within a fire district and therefore has an ISO rating of 10. In Oracle, due to the proximity to high vegetative fuels and structure density, the southern and eastern portions of the community are at the greatest risk for damaging wildfires. To account for the wildfire risk, Oracle has taken the initiative to be designated as a FireWise community, and the community has written, mapped, and coordinated community evacuation procedures.



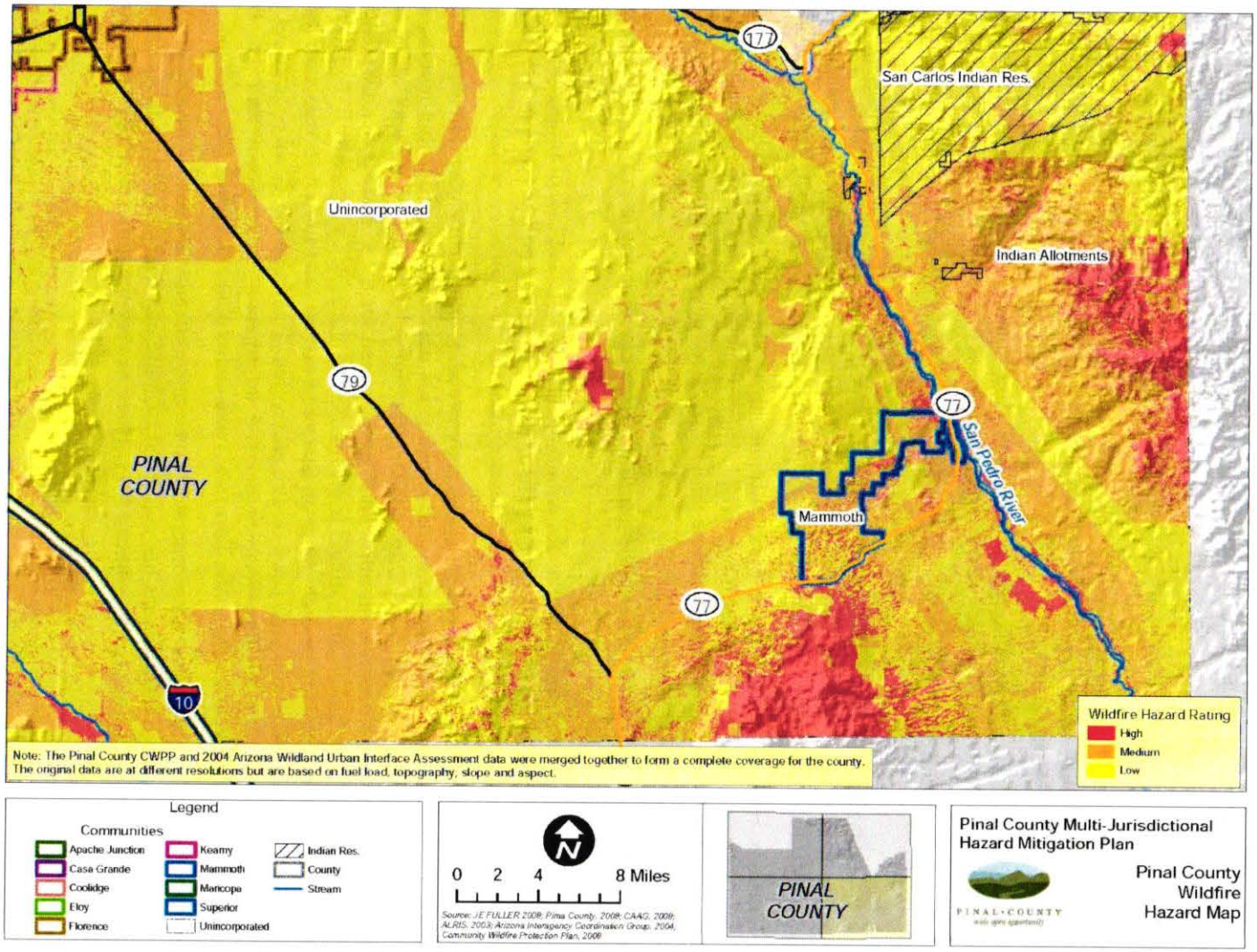
Map 4-29: Pinal County Wildfire Hazard Map (1)



Map 4-30: Pinal County Wildfire Hazard Area (2)



Map 4-31: Pinal County Wildfire Hazard Area (3)



Map 4-32: Pinal County Wildfire Hazard Area (4)

Changes is Development in the Hazard Area

By its very definition, the WUI represents the fringe of urban development as it intersects with the natural environment. As previously discussed, wildfire risks are significant for a sizeable portion of the county. Any future development will only increase the WUI areas and expand the potential exposure of structures to wildfire hazards. The PCCWPP addresses mitigation opportunities for expanding WUI areas and provides recommended guidelines for safe building and land-use practices in wildfire hazard areas.

Growth in Pinal County has significantly increased the population and infrastructure exposed to wildfires. The participating jurisdictions were asked to describe how development within the hazard area has impacted them.

Apache Junction – Slight increase in risk as more residential dwelling have been built within the WUI these past five years.

Casa Grande – Casa Grande has experienced commercial and industrial growth within the hazard area and a resurgence in residential construction; houses are mostly built within subdivisions that already have the infrastructure in place.

Coolidge – With the transition of agriculture land to residential and commercial uses the risk of wildfires are decreasing slightly, but the loss of property in fiscal terms and loss of life risk is increasing.

Eloy – In the last 5 years, there has been no changes in development in the hazard area affecting risk and vulnerability.

Florence – Development and annexations have increased the risk of loss to wildfire. However, new all new development must meet modern building codes and engineering standards, decreasing the overall hazard. Air quality issues secondary to wildland fires continue to present risks to vulnerable populations.

Kearny – Kearny's residential capacity is at an all-time high with very few single-family home vacancies. Although the most recent fires did not directly impact any structures in the town of Kearny, the town was on a "set" status at one point in time which means residents were required to prepare to evacuate should the fire change course.

Mammoth – The Town of Mammoth has experienced little to no development or growth in the hazard area over the past five years.

Maricopa – New development of residential homes within the hazard area is at risk of property loss due to wildfires. In the event of a wildfire, residents are also at risk of breathing poor air quality, which can cause a range of health issues, including respiratory and cardiovascular problems.

Superior – While the Town has had few residential and commercial development changes in the past five years, the population is growing fast. New industrial construction development, residential houses, and remodeling/ reconstruction of existing houses bring higher risks and vulnerability of all types of hazards that the Town must consider and resolve on time. The Town applied for the Forest service USDA Fire protection funds to provide the buffer zone around town limits. The funds will also assist in conducting roadside vegetation thinning, moving, and chipping on State and private land to reduce vulnerability to the effects of wildfire. It will also train volunteers on fire prevention. To ensure the Town is aware of the risks, it will continue to display the Fire Wise Model and information at the Town Hall and Fire Department and regularly add information to the Town's website concerning emergency preparedness.

Unincorporated Pinal County – The unincorporated community of Saddlebrook, a master planned retirement community near high hazard areas has continued its build out. The community faces hazards from fire, smoke, and limited access due to wildland fires. There has been minimal development in other high hazard areas.

Sources

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Fisher, M., AZ Wildland Urban Interface Assessment, prepared for the AZ Interagency Coordination Group.
http://www.azsf.az.gov/UserFiles/PDF/Arizona%20Wildland%20Urban%20Interface%20Assessment%2005MAR04.pdf

Logan Simpson Design, Inc., *Pinal County Community Wildfire Protection Plan*

National Wildfire Coordination Group, Historical ICS 209 reports http://fam.nwcg.gov/fam-web/hist_209/report_list_209

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SECTION 5: MITIGATION STRATEGY

The mitigation strategy discusses the actions that will reduce or possibly remove the community's exposure to hazard risks. The primary components of the mitigation strategy are categorized into the following:

Goals and Objectives

Capability Assessment

Mitigation Strategy

5.1 Hazard Mitigation Goals

The 2016 Plan goal and objectives were reviewed and it was determined by the Planning Team that there were no adjustments necessary, therefore they remain as follows:

Goal: Reduce or eliminate the risk to people and property from natural hazards.

Objective 1: Reduce or eliminate risks that threaten life and property within Pinal County.

Objective 2: Reduce risk to critical facilities and infrastructure from impacts of hazards within Pinal County.

Objective 3: Promote hazard mitigation throughout Pinal County.

Objective 4: Increase public awareness of hazards and risks within Pinal County.

5.2 Capability Assessment

A capability assessment determines the resources a jurisdiction has to identify, evaluate, and enhance the capacity of local resources to mitigate the effects of hazards. This section discusses a jurisdiction's resources to reduce the impacts of identified hazards and enhance them to improve future mitigation efforts. A thoughtful review of jurisdictional capabilities will assist in determining gaps that could limit existing or proposed mitigation measures or potentially aggravate a jurisdiction's vulnerability to an identified hazard. Additionally, a capability assessment can detail current successful mitigation actions that continue to receive support.

The capability assessment is comprised of several components:

- Planning Capability

  The planning capability assessment provides a general overview of the key plans, programs, or policies. This information helps identify opportunities to address existing planning gaps and provides an opportunity to review areas that mitigation measures can be utilized with existing plans.

- Codes & Regulations Capability

  The regulatory capability assessment provides an overview of codes and ordinances that address hazard mitigation activities.

- Fiscal Capability

  The financial capability assessment assesses the resources a jurisdiction has access to or can use to fund and implement mitigation actions.

- Administrative & Technical Staff Capability

The administrative and technical staff capability assessment summarizes each jurisdiction's capacity for mitigation planning and implementing specific mitigation actions. It also refers to the ability to access and coordinate these resources effectively.

- National Flood Insurance Program (NFIP) Participation

  The NFIP contains specific regulatory measures that enable government officials to determine where and how growth occurs relative to flood hazards. Participation in the NFIP is voluntary for local governments, but FEMA promotes the program as a basic first step for implementing and sustaining an effective flood hazard mitigation program and is a crucial indicator for measuring local capability as part of this assessment. For a county or municipality to participate in the NFIP, they must adopt a local flood damage prevention ordinance that requires jurisdictions to follow established minimum building standards in the floodplain. The jurisdictions in Pinal County participate in the NFIP and will continue to maintain NFIP compliance, and in some instances go above and beyond stated requirements.

The planning team chose to keep the format of the tables summarizing the administrative, technical, and fiscal capabilities. Each jurisdiction listed their legal and regulatory capabilities by summarizing and identifying the codes, ordinances, plans, and studies/reports used by the jurisdiction, as well as identify the appropriate agency/department with responsibility for maintaining and updating those documents. Each jurisdiction was asked to update its tables and pare down any unnecessary information. Additionally, each jurisdiction will continually seek opportunities for involvement in other planning, policy development, or ordinance development that could be beneficial to improving and implementing mitigation actions.

Community Rating System (CRS)

An additional indicator of floodplain management capability is active participation in the CRS. The CRS is an incentive-based program that encourages communities to undertake defined flood mitigation activities that go beyond the minimum requirements of the NFIP. CRS mitigation activities are assigned a point value. As a community earns points and reaches identified thresholds, they can apply for an improved CRS class which are tied to flood insurance premium reductions.

Table 5-1: CRS Date for Pinal County

Jurisdiction	Policies in Force	Total Coverage	Total Written Premiums	CRS Class
Pinal County	369	$ 91,396,200	$ 226,428	6
Apache Junction	49	$ 11,867,900	$ 39,530	
Casa Grande	63	$ 14,142,700	$ 47,226	8
Coolidge	2	$ 385,000	$ 699	
Eloy	19	$ 5,498,600	$ 20,233	
Florence	32	$ 10,429,000	$ 14,410	
Kearny	1	$ 210,000	$ 361	
Mammoth	4	$ 759,100	$ 5,659	
Maricopa	340	$ 92,831,000	$ 232,038	
Queen Creek	7	$ 2,105,000	$ 4,968	
Superior	4	$ 942,800	$ 3,902	

Table 5-1: CRS Date for Pinal County				
Jurisdiction	**Policies in Force**	**Total Coverage**	**Total Written Premiums**	**CRS Class**
FEMA https://nfipservices.floodsmart.gov//reports-flood-insurance-data, data as of 2/28/2021 CRS data source https://www.fema.gov/floodplain-management/community-rating-system, data as of 10/1/2020				

5.2.1 Unincorporated Pinal County Capability Assessment

Table 5-2: Unincorporated Pinal County Capability Assessment		
Plans, Programs, & Policies		
Community Rating System program	Purpose	A voluntary incentive program that recognizes and encourages community floodplain management activities that exceed the minimum NFIP requirements. CRS participants are offered flood insurance premium rates at a discount to reflect the community actions meeting the goals of the CRS.
	Responsible Agency	Pinal County Flood Control District
	Hazards	Dam Failure, flood/flash flood, levee failure
	Effect on Mitigation Efforts	Medium. The program requires outreach and education, as well as enhanced regulation over flood prone areas.
	Opportunities for Enhancement	The recent re-rating improved Pinal County's CRS rating to Class 6. However, by reviewing the CRS Program requirements for a Class 5 rating, additional opportunities for improvement may be found and incorporated into the County's flood control and risk reduction efforts.
Firewise Community Certification	Purpose	Encourages homeowners to take responsibility for preparing and protecting their homes and property from the risk of loss from a wildfire.
	Responsible Agency	Pinal County Office of Emergency Management
	Hazards	Wildfire
	Effect on Mitigation Efforts	High, the program provides information and resources to property owners that allow them to take simple steps that will protect their property, leveraging the efforts of county employees and volunteers to cost effectively protect a large number of properties.
	Opportunities for Enhancement	Target property owners in high-risk areas for public awareness and homeowner outreach efforts to inform them about the steps that they can take to reduce their vulnerability to wildfire.
StormReady Program	Purpose	Encourages homeowners to take responsibility for preparing and protecting their homes and property from the risk of loss from a wildfire.
	Responsible Agency	Pinal County Office of Emergency Management
	Hazards	Wildfire
	Effect on Mitigation Efforts	High, the program provides information and resources to property owners that allow them to take simple steps that will protect their property, leveraging the efforts of county employees and volunteers to cost effectively protect a large number of

		properties.
	Opportunities for Enhancement	Establish a public outreach campaign to promote the importance of readiness and preparation for severe storms and recruits severe weather reports.
Capital Improvements Plan	Purpose	A management tool used by the county board of supervisors to coordinate the location, timing, and financing of capital improvements over a 5-year horizon. The C.I.P. is updated annually.
	Responsible Agency	Board of Supervisors
	Hazards	All
	Effect on Mitigation Efforts	High, Allows for spending across multiple fiscal years on facilities, flood control, and transportation projects related to hazard mitigation.
	Opportunities for Enhancement	Add requirements for projects to incorporate hazard mitigation into the project plan.
Community Wildfire Protection Plan	Purpose	Identifies and prioritizes areas at risk and areas for hazardous fuel reduction treatments. It also recommends the types and methods of treatment.
	Responsible Agency	Pinal County Office of Emergency Management
	Hazards	Wildfire
	Effect on Mitigation Efforts	Low, understanding the areas at-risk and the fuel reduction treatment recommendations are highly technical and are not easily adaptable to planners and county officials.
	Opportunities for Enhancement	Update the plan annually. Increased integration of plan into invasive species reduction efforts. Addition of sample task orders into plan. Integration of recent wildfire data and fire behavior into plan. Inclusion of visually pleasing and biologically sound fuel treatment methods.
Comprehensive Land Use Plan	Purpose	The Pinal County Comprehensive Plan is a statement of policy and an expression of the county's vision. The plan is a tool to help guide and shape the county's future growth. The intent of the Comprehensive Plan is to achieve a sustainable future for Pinal County. A new Comprehensive Plan was adopted by the Pinal County Board of Supervisors on November 20, 2019.
	Responsible Agency	Pinal County Community Development
	Hazards	All
	Effect on Mitigation Efforts	Medium. The plan is not a regulatory document, but as per A.R.S. §11-806, it is developed to conserve the natural resources of the county; ensure efficient expenditure of public funds; and promote the health, safety, convenience, and general welfare of the public.
	Opportunities for Enhancement	The integration of hazard mitigation and community resilience goals into the plan can

		increase the likelihood that future development will meet these goals.
Continuity of Operations Plan	Purpose	Assists in ensuring that essential government services are provided or quickly reestablished to the public when the County is affected by an emergency or disaster.
	Responsible Agency	Pinal County Office of Emergency Management
	Hazards	All
	Effect on Mitigation Efforts	High, the provision of essential government services is critical to effective emergency and disaster response and recovery efforts.
	Opportunities for Enhancement	Greater adoption of Department COOPs by County Departments and Agencies Development of a Continuity of Government Plan.
Strategic Plan	Purpose	Provides comprehensive long-term goals and objectives and outlines the approach for achieving those goals and objectives.
	Responsible Agency	Board of Supervisors
	Hazards	All
	Effect on Mitigation Efforts	Medium. The plan coordinates employee and agency efforts towards common goals, including resilience and sustainability.
	Opportunities for Enhancement	Incorporating hazard mitigation and community resilience goals and objectives into Pinal County's Strategic Plan would prompt County officials to prioritize and emphasize hazard mitigation efforts and initiatives in new and on-going projects and processes.
Emergency Operations Plan	Purpose	Outlines responsibility, means and methods by which resources are deployed during and following an emergency or disaster.
	Responsible Agency	Pinal County Office of Emergency Management
	Hazards	All
	Effect on Mitigation Efforts	High, the plan ensures that the county will initiate an immediate, coordinated, and effective emergency response, with sufficient resources, to save lives and property.
	Opportunities for Enhancement	Institute annual seminars to ensure department commitments Develop annual revision process to incorporate changing hazards and lessons learned.
Floodplain Management Plan	Purpose	An overall strategy of programs, projects, and measures aimed at reducing the adverse impacts of flood hazards on the community. The Plan identifies and addresses the flood hazard impacts and provides mitigation measures to help protect properties and their occupants.
	Responsible Agency	Pinal County Flood Control District
	Hazards	Dam failure, flood/flash flood, levee failure
	Effect on Mitigation Efforts	High. The plan guides the County's efforts in identifying flood prone areas, as well as development measures to ensure safety to residents.

	Opportunities for Enhancement	Continue to update and refine area studies to better understand flooding sources and potential hazards. Adjust the five-year and multi-year CIP to plan for projects to address enhanced understanding of flooding sources.
Drainage Master Plan	Purpose	Addresses flooding associated with stormwater runoff. The stormwater management plan is typically focused on design and construction measures that are intended to reduce the impact of more frequently occurring minor urban flooding.
	Responsible Agency	Pinal County Community Development
	Hazards	Dam failure, flood/flash flood, levee failure
	Effect on Mitigation Efforts	High. The plan addresses high-frequency events and can identify areas where smaller, developer-driven projects can provide significant benefit.
	Opportunities for Enhancement	Continue the program of updating Area Drainage Master Plans and implement the recommendations from those plans through regulation or capital projects.
Multi-year training and exercise program	Purpose	An outline of multi-agency, multi-disciplinary emergency response training and exercises aimed at testing the emergency response plan and identifying capability gaps within the community.
	Responsible Agency	Pinal County Office of Emergency Management
	Hazards	All
	Effect on Mitigation Efforts	High, the plan
	Opportunities for Enhancement	Greater incorporation of elected officials and department executives into exercises. Faster inclusion of lessons learned into trainings and exercises. Adding PSAP personnel to exercises.
Codes & Regulations		
2018 ICC Building Codes	Purpose	Regulates construction standards. They consider the type, frequency, and intensity of hazards present in the region.
	Responsible Agency	Pinal County Community Development
	Hazards	All
	Effect on Mitigation Efforts	High, Structures built to applicable building codes are inherently resistant to many hazards.
	Opportunities for Enhancement	Regularly update the Building Codes, according to the ICC revision cycle.
Floodplain Ordinance	Purpose	Minimize the extent of floods by preventing obstructions that inhibit water flow and increase flood height and damage. Prevent and minimize loss of life, injuries, and property damage in flood hazard areas. Promote the public health, safety, and welfare of citizens in flood hazard areas.
	Responsible Agency	Pinal County Flood Control District
	Hazards	Dam failure, flood/flash flood, levee failure

	Effect on Mitigation Efforts	Manage planned growth. Adopt and enforce local ordinances that regulate uses in flood hazard areas. Grant permits for use in flood hazard areas that are consistent with the ordinance.
	Opportunities for Enhancement	The Floodplain Ordinance is a living document that is updated and enhanced to correspond to changing state and federal regulations as well as changes in flood science.
Site Plan Review Requirements	Purpose	Used to evaluate proposed development prior to construction. An illustration of the proposed work, including its location, exact dimensions, existing and proposed buildings, and many other elements are often included.
	Responsible Agency	Pinal County Community Development
	Hazards	All
	Effect on Mitigation Efforts	High. Site plan reviews allows regulators to ensure that developments incorporate mitigation principles into the design and reduce risk.
	Opportunities for Enhancement	Regularly review and update site plan requirements to address evolving hazards and risks in the community.
Subdivision Ordinance	Purpose	An opportunity to account for natural hazards prior to the development of land as they formulate regulations when the land is subdivided.
	Responsible Agency	Pinal County Community Development
	Hazards	All
	Effect on Mitigation Efforts	High, Subdivision design that incorporates mitigation principles can reduce the exposure of future development to hazard events.
	Opportunities for Enhancement	Regularly review and update subdivision requirements to address evolving hazards and risks in the community.
Zoning Ordinance	Purpose	Used to dictate the type of land use and to set minimum specifications for use such as lot size, building height and setbacks, and density of population.
	Responsible Agency	Pinal County Community Development
	Hazards	All, Zoning ordinances can incorporate mitigation principles into the permitted types of land use.
	Effect on Mitigation Efforts	High. Land use regulations that incorporate mitigation principles can reduce the exposure of future development to hazard events.
	Opportunities for Enhancement	Regularly review and update zoning requirements to address evolving hazards and risks in the community.
Engineering Design Standards	Purpose	Establishes engineering standards for public infrastructure such as roads and bridges.
	Responsible Agency	Pinal County Community Development
	Hazards	All

	Effect on Mitigation Efforts	High. Engineering design standards allow regulators to ensure that developments incorporate mitigation principles into public infrastructure design and reduce risk.
	Opportunities for Enhancement	Regularly review and update engineering design requirements to address evolving engineering standards and hazards in the community.
Fiscal Capability		
Capital Improvements Project Funding	Purpose	Allows for spending across multiple fiscal years on facilities, flood control, and transportation projects related to hazard mitigation.
	Responsible Agency	Board of Supervisors
	Hazards	All
	Effect on Mitigation Efforts	Allows the County to implement cost-effective mitigation measures when developing capital improvement projects.
Community Development Block Grant	Purpose	Utilized to address community needs, including construction/renovation/improvement of infrastructure projects and community facilities such as senior, health/social services centers; expansion of public services for low-income persons; creation of new jobs; and affordable housing reconstruction/rehabilitation projects programs.
	Responsible Agency	Board of Supervisors
	Hazards	All
	Effect on Mitigation Efforts	Provides a funding source for mitigation projects that will address needs in traditionally underserved communities.
Debt through General Obligation Bonds	Purpose	Issued with the belief that the County will be able to repay its debt obligation through taxation or revenue from projects. General obligation bonds can be used to generate funds for mitigation projects.
	Responsible Agency	Board of Supervisors
	Hazards	All
	Effect on Mitigation Efforts	High, Allows the County to incur debt in order to develop mitigation projects.
Levy Taxes	Purpose	Allows the jurisdiction to tax its population base
	Responsible Agency	Board of Supervisors
	Hazards	All
	Effect on Mitigation Efforts	High. A primary source of operating revenue for the County, allows the County to fund mitigation projects and personnel.
Incur debt through special tax bonds	Purpose	Issued with the belief that the County will be able to repay its debt obligation through either excise taxes or special assessment taxes. Special tax bonds can be used to generate funds for specific mitigation projects or special tax districts.
	Responsible Agency	Board of Supervisors

	Hazards	All
	Effect on Mitigation Efforts	High, Allows the County to incur debt in order to develop mitigation projects
Impact fees for homebuyers or new developments/homes	Purpose	Development Impact Fees are pursuant to Arizona Revised Statutes 11-1102, and are adopted for the purpose of promoting health, safety and general welfare of the residents of Pinal County.
	Responsible Agency	Pinal County Community Development
	Hazards	All
	Effect on Mitigation Efforts	High, Impact fees provide a source of revenue to fund mitigation projects serving new developments.
Highway User Revenue Fund	Purpose	The primary source of revenues available to the County for road construction, improvements, maintenance, and other related expenses to the roads the County is responsible for.
	Responsible Agency	Pinal County Public Works
	Hazards	All
	Effect on Mitigation Efforts	High, the revenue allows the county to make road improvements and bridge projects that reduce roadway flooding and allow all weather emergency access to residents.
Administrative & Technical Staff Capability		
Building Official		The county administrator of building and construction codes, engineering calculation supervision, permits, facilities management, and accepted construction procedures. They may also inspect structures to ensure compliance with the plans and check workmanship and code compliance.
Planner		Identifies community needs and develop short- and long-term solutions to improve and revitalize communities and areas
Emergency Manager		The emergency management office is responsible for the mitigation, preparedness, response, and recovery operations that deal with both natural and human- caused disaster events.
County Engineer		Administers, implements, and enforces the standards for design of roads, bridges, and other infrastructure, and ensures the designs meet the standards for safe and intelligent growth, as well as environmental requirements.
Floodplain Administrator		Administers and enforces the floodplain management regulations to ensure the county and county-dependence agencies are meeting the minimum requirements of participation in the NFIP. By County Code, the County Engineer serves as the Floodplain Administrator.
Grant Writer		Gathers documentation and fulfills the requirements of various funding opportunities to formally seek funding on behalf of the County.

Local Emergency Planning Committee	Attempts to identify and catalogue potential chemical hazards, identify available resources, mitigate chemical hazards when feasible, and write hazardous materials emergency response plans.
GIS Analyst	Uses Geospatial data to create county maps, including flood plain, fire hazard, drought, and other mitigation maps
Planning Department:	Provides management and oversight of development through the application of codes, ordinances, building regulations and public input
Public Works Official	Provides management and oversight of infrastructure projects such as public buildings, transport infrastructure, public spaces, public services, and other physical assets and facilities.
Surveyor	Gathers geospatial data and re-establishes property boundaries after a disaster

5.2.2 Apache Junction Capability Assessment

Table 5-3: Apache Junction Capability Assessment		
Plans, Programs, & Policies		
Capital Improvement Plans	Purpose	CIP identifies the City of Apache Junction's short to mid-range plans for capital projects and equipment purchases providing planning assistance for projects' execution, prioritization, financial planning, budgeting, and scheduling. City's CIP plans are usually updated annually covering a period of 5 years.
	Responsible Agency	Apache Junction Public Works
	Hazards	Dam Failure, Drought, Flooding, Levee Failure, Severe Wind
	Effect on Mitigation Efforts	High; CIP significantly impacts community's built and natural environment.
	Opportunities for Enhancement	Updating more frequently and ensuring other planning elements/studies are included along with public input.
General Plan	Purpose	Planning document comprising the City of Apache Junction's planning policies expressive to the community's goals and aspirations to guide future growth and development. Plan is inclusive to land use, environmental planning, parks and recreation/open space, neighborhood revitalization/housing, downtown/economic development, transportation/circulation, and water resources.
	Responsible Agency	Apache Junction Development Services Department
	Hazards	Drought, Fissure, Flooding, Severe Wind, Subsidence, Wildfires
	Effect on Mitigation Efforts	High; significant to community's built and natural environment.
	Opportunities for Enhancement	Timely updates and amendments to manage escalation in development and heightened hazards to the community such as drought.

Stormwater Master Plan	Purpose	Plan summarizes existing drainage problems and the existing and future conditions hydrology with recommendations for stormwater drainage improvements for CIP planning and budgeting.
	Responsible Agency	Apache Junction Public Works
	Hazards	Dam Failure, Drought, Flooding, Levee Failure
	Effect on Mitigation Efforts	High; planning document used in city's CIP planning efforts covering significant projects with potential mitigation impacts for drought, flooding, dam and levee failures.
	Opportunities for Enhancement	Update being current plan version is dated 2002 with many projects being completed.
Active Transportation Plan	Purpose	Plan serves as the primary tool for deployment and integration of connected, comfortable facilities for bicyclists, pedestrians, equestrians and other non-motorized modes within Apache Junction.
	Responsible Agency	Apache Junction Development Services and Public Works departments
	Hazards	Dam Failure, Drought, Flooding, Wildfires
	Effect on Mitigation Efforts	Medium; plan incorporates elements for the uses and improvements of trails within open spaces. Opportunities exist with these improvements to also incorporate hazard mitigation projects.
	Opportunities for Enhancement	Timely updates and amendments to manage community's increasing development and increases in hazards such as drought, flooding and wildfire.
Community Wildfire Protection Plan	Purpose	Plan is designed to support the efforts of local land managers to identify and mitigate hazards to private property, community infrastructure, and ecosystem health from wildfire in the wildland-urban interface.
	Responsible Agency	Multijurisdictional with Pinal County
	Hazards	Drought, Wildfire
	Effect on Mitigation Efforts	High; plan delineates high risk areas and includes variety of mitigation measures and strategies.
	Opportunities for Enhancement	Routinely update to manage increases in development and subsequent exposure with on-going drought conditions and wildfire hazards.
Economic Development Plan (DRIS)	Purpose	The Downtown Redevelopment and Implementation Strategy ("DRIS") was created to present a framework for creating a downtown that is vibrant and reflects the heritage of the community as it evolves into a 21st century city.
	Responsible Agency	Apache Junction Economic Department
	Hazards	Drought, Flooding, Levee Failure
	Effect on Mitigation Efforts	Medium; addresses flood hazard areas located within city's primary business district.
	Opportunities for Enhancement	Update to manage increases in development and subsequent hazards with on-going drought conditions.

Emergency Operations Plan	Purpose	City's Emergency Response and Recovery Plan.
	Responsible Agency	Apache Junction Office of Emergency Management
	Hazards	All hazards
	Effect on Mitigation Efforts	High; plan addresses operational policies and responsibilities of the city with mitigation efforts in response to emergency events.
	Opportunities for Enhancement	City is currently operating primarily its 2006 edition with only a couple segments of the plan updated. Opportunity is to finish full update.
Codes & Regulations		
Floodplain Management Ordinance	Purpose	To minimize public and private losses due to flooding and enable our residents to participate in NFIP, receive federal disaster assistance, obtain flood insurance, and reduce the cost of flood insurance.
	Responsible Agency	Apache Junction Public Works
	Hazards	Flooding and Levee Failure
	Effect on Mitigation Efforts	High; direct impacts on flooding exposure.
	Opportunities for Enhancement	Routine review and revision as needed.
Stormwater Pollution Prevention Ordinance	Purpose	Identifies activities and conditions that could cause stormwater pollution and related mitigation measures to be taken.
	Responsible Agency	Apache Junction Public Works
	Hazards	Flooding and Levee Failure
	Effect on Mitigation Efforts	Medium; mitigation measures of ordinance has a part in addressing pollutants that cause obstructions to drainage channels/facilities causing more severe flooding situations.
	Opportunities for Enhancement	Update ordinance to provide city updated tool to help community's mitigation of exposure to flash flooding hazards.
City Code – Building, Electric and Fire Codes	Purpose	Sets clear expectations of the standards that buildings should meet helping ensure construction quality and specifications for fire and life safety norms.
	Responsible Agency	Apache Junction Development Services Department
	Hazards	All hazards
	Effect on Mitigation Efforts	High; important measures to harden buildings for all hazards.
	Opportunities for Enhancement	Routine updates to meet increases in development and exposure with on-going natural hazards.
City Code – Land Development Code	Purpose	Guides community's development from permissible land uses to building densities, locations, setbacks and public improvements.
	Responsible Agency	Apache Junction Development Services Department
	Hazards	All hazards
	Effect on Mitigation Efforts	High; direct impact to development to mitigate exposures.

	Opportunities for Enhancement	Routine updates to meet increases in development, changes in communities vision and exposures with on-going natural hazards.
Zoning Ordinance	Purpose	Incorporates design standards, site development regulations and engineering regulations including flood plain regulations for new developments.
	Responsible Agency	Apache Junction Development Services Department
	Hazards	All hazards
	Effect on Mitigation Efforts	High; significant influence on planning of all new development.
	Opportunities for Enhancement	Routine updates to meet increases in development, changes in communities vision and exposures with on-going natural hazards.
Fiscal Capability		
General Fund	Purpose	Revenues accruing to the City from State shared revenues, local sales taxes, fees and interest earnings.
	Responsible Agency	Apache Junction City Manager Office
	Hazards	Drought, Severe Wind, Wildfires
	Effect on Mitigation Efforts	High; most discretionary monies the city possess to fund projects where other monies do not exist.
Highway User Revenue Fund	Purpose	Federal and State gas tax revenues.
	Responsible Agency	Apache Junction Public Works Department
	Hazards	Fissure, Flooding, Levee Failure, Subsidence
	Effect on Mitigation Efforts	High; significant source of revenue for the city's maintenance and improvement of its streets and related drainage facilities.
Transportation Development Fee	Purpose	Fee connected to new development for the improvement or expansion of public transportation infrastructure.
	Responsible Agency	Apache Junction Public Works Department
	Hazards	Fissure, Flooding, Levee Failure, Subsidence
	Effect on Mitigation Efforts	High; source of revenue to improve and build new roads and related drainage facilities.
Parks & Recreation Development Fee Block Grant	Purpose	Fee connected to new development for the improvement or expansion of public parks and recreation facilities.
	Responsible Agency	Apache Junction Parks & Recreation Department
	Hazards	Drought, Flooding, Severe Wind, Wildfires
	Effect on Mitigation Efforts	High; source of revenue to improve or create new drainage facilities or buffering zones that double as parks recreational space.
Community Development	Purpose	Program that provides annual grants on a formula basis to develop viable urban communities by providing decent housing, economic opportunities and a suitable living

Block Grant		environment, principally for low- and moderate-income persons.
	Responsible Agency	Apache Junction Development Services Department
	Hazards	Flooding, Levee Failure
	Effect on Mitigation Efforts	Medium; in eligible areas often used for street improvements that address flooding problems.
Surface Transportation Block Grant	Purpose	Program that provides funding that may be used to preserve and improve the conditions and performance of public roads, bridges, transit and pedestrian and bicycle infrastructure projects.
	Responsible Agency	Apache Junction Development Services Department
	Hazards	Flooding, Levee Failure
	Effect on Mitigation Efforts	Medium; funds often used for street improvements that also address flooding problems.
Pinal County Flood Control Grant	Purpose	Program funded through a secondary property tax paid by county property owners that has been used to target specific flooding problem areas by the construction of drainage facilities including regional flood water detention systems.
	Responsible Agency	Upon any award: Apache Junction Public Works Department
	Hazards	Flooding, Levee Failure
	Effect on Mitigation Efforts	High; important fund for larger flood mitigation projects.
Special Sales Tax or User Tax	Purpose	Local consumption tax imposed on the sale of goods and services or on the users of the specific facility or service.
	Responsible Agency	Apache Junction City Manager Office/ Apache Junction Public Works Department
	Hazards	All Hazards
	Effect on Mitigation Efforts	Medium; could be used as a dedicated source of funds for hazard mitigation projects.
Special Assessment Tax	Purpose	Local surtax levied on property owners to pay for specific local infrastructure project.
	Responsible Agency	Apache Junction City Manager Office/ Apache Junction Public Works Department
	Hazards	All Hazards
	Effect on Mitigation Efforts	Medium; could be used as a dedicated source of funds for specific hazard mitigation project(s) for specific areas.
General Obligation Bonds	Purpose	Municipal bond backed by City's credit and taxing ability to repay its debt obligation.
	Responsible Agency	Apache Junction City Manager Office/ Apache Junction Public Works Department
	Hazards	All Hazards
	Effect on Mitigation Efforts	Medium; could be used as a dedicated source of funds for specific hazard mitigation projects.
Administrative & Technical Staff Capability		
Mutual Aid Agreements		Agreements currently in place with various community/county agencies including the Superstition Fire & Medical District. City is a signatory to the AZ Mutual Aid Compact.

Multi-Jurisdictional Emergency Management Committee	City convenes a multi-jurisdictional Emergency Management Committee quarterly.
Apache Junction City Council	City's governing board responsible for developing and approving the City's zoning ordinance, land use plans, General Plan, and other ordinances/regulations.
City Engineer	Serves as the City's Floodplain Administrator.
Principal Engineer	Conducts plan/development reviews and completions along with technical reviews.
Building & Safety Manager	Instrumental in participating in the development and implementation of goals, policies and priorities for building permits and building inspections.
Assistant City Manager	Serves as City's Office of Emergency Management Director.
Public Works Manager	Leads Public Works Department's emergency operations and serves as City's Emergency Operations Center ("EOC") Coordinator.
Planning Manager	Important role in the direction and supervising the programs and operations of the Planning Division within the Development Services Department.
Principal Planner	Important role in managing and evaluating complex planning/development projects.
GIS Coordinator	Coordinates GIS activities including emergency management GIS needs. Leads GIS support during EOC activations.
Public Information Officer	Coordinates public information during emergency events. Manages joint information systems and center during EOC activations
Grants and Community Development Administrator	Provides technical assistance in the development, submittal and administration of grant applications related to hazard mitigation measures.

5.2.3 Casa Grande Capability Assessment

Table 5-4: Casa Grande Capability Assessment		
Plans, Programs, & Policies		
Capital Improvement Program	Purpose	To build and maintain appropriate infrastructure to ensure the needs of residents are served.
	Responsible Agency	All City Departments
	Hazards	Flooding, Severe Wind, Drought
	Effect on Mitigation Efforts	CIP Projects have been identified to mitigate potential hazards
	Opportunities for Enhancement	Plans and or strategies have been identified to address flooding and drought issues within areas of the City.
2030 Casa Grande General Plan	Purpose	Long term framework for future growth.
	Responsible Agency	Planning and Zoning, City Manager, Mayor & Council
	Hazards	Flood, Drought, Fissure,
	Effect on Mitigation Efforts	Land use, environmental planning, natural resource conservation, safety planning

	Opportunities for Enhancement	Updated every 10 years
Casa Grande Emergency Response and Recovery Plan	Purpose	Designed as the foundation for disaster response and recovery operations for the departments and offices of the city.
	Responsible Agency	Mayor and Council, office of emergency management, all city departments
	Hazards	All
	Effect on Mitigation Efforts	The direct impact of mitigation efforts is a result of the ability to follow an established plan and maintaining the ability to be flexible during emergency events.
	Opportunities for Enhancement	The plan should be reviewed annually and revised as needed.
Drainage Masterplan	Purpose	The over-all purpose of this report is to document data collection for the Casa Grande area and to document existing conditions flooding issues throughout the Casa Grande planning area. Additionally, the City of Casa Grande drainage regulations were compared to several other relevant agencies.
	Responsible Agency	PW/Engineering Division
	Hazards	Flood
	Effect on Mitigation Efforts	Identify areas of concern for future development and land use as well as Capital projects
	Opportunities for Enhancement	Future mitigation efforts could be improved by having the study done more frequently than it has been done in the past. With the growth that is being experienced now drainage infrastructure improvements are being built now that will change drainage conditions from what the current plan shows.
Transportation Plan	Purpose	Planning and analysis of future transportation needs as well as a regional transportation plan.
	Responsible Agency	PW/Engineering Division
	Hazards	Flood
	Effect on Mitigation Efforts	Identification of travel corridors identifying bridge and other drainage needs
	Opportunities for Enhancement	Opportunities for enhancement are minimal as corridors and drainage structures have been identified in 3 separate transportation plans that are currently in use for development and long-range planning. Update as needed.
Regional Trail Masterplan	Purpose	Development of plans that result in the preservation of open space, construction of parks, and development of a high-quality trail system.
	Responsible Agency	Community Services
	Hazards	Flood, Drought
	Effect on Mitigation Efforts	Recreational development of flood prone lands emphasizing on flood control improvements
	Opportunities for Enhancement	The current plan needs to be improved and modified to accommodate future planned area developments that were not part of the current study.

Community Services Master Plan	Purpose	To provide a guiding plan for the community services department through extensive needs assessment, community input process, citizen survey and comprehensive evaluation of all existing aspects of community services.
	Responsible Agency	Community Services
	Hazards	Flood, Drought
	Effect on Mitigation Efforts	Recreational development of flood prone lands emphasizing on flood control improvements.
	Opportunities for Enhancement	As the community continues to experience rapid growth, opportunities for improvement for mitigating hazards will be achieved by updating the current plan.
Codes & Regulations		
Building Codes	Purpose	To provide minimum standards to protect the public health, safety, and general welfare as they relate to the construction and occupancy of buildings and structures.
	Responsible Agency	Planning and Development
	Hazards	Fire, Earthquakes, wind, other extreme events
	Effect on Mitigation Efforts	Ensure structural integrity and safety
	Opportunities for Enhancement	Review and update existing building codes to reflect the most current regulations.
Site Plan Review Ordinance	Purpose	Ensure the proposed development plan follows the provisions of this Ordinance.
	Responsible Agency	Planning and Development
	Hazards	Drought, Flood
	Effect on Mitigation Efforts	Ensure 100-year water supply, identification of floodplain zone
	Opportunities for Enhancement	Review and update existing ordinance to reflect the most current regulations
Flood Damage Prevention Ordinance	Purpose	Protect human life and health, minimize public money for costly flood control projects, minimize business interruptions, minimize damage, participate and maintain eligibility for flood insurance and disaster relief.
	Responsible Agency	City Manager
	Hazards	Flood
	Effect on Mitigation Efforts	Promote public health, safety, and general welfare, and to minimize public and private losses due to flood conditions in specific areas.
	Opportunities for Enhancement	Review and update existing ordinance to reflect the most current regulations.
Stormwater Management and Drainage Ordinance	Purpose	Accommodation of historic and developed flows. Proper and adequate provision shall be made for disposal or retention of stormwater; this shall apply equally to development of properties and streets.
	Responsible Agency	PW/Engineering Division
	Hazards	Flood
	Effect on Mitigation Efforts	Flows generated by new development to be adequately retained, offsite flows to be

		properly transmitted across the development site, Existing major watercourses shall be maintained and dedicated as drainage ways.
	Opportunities for Enhancement	Review and update existing ordinance to reflect the most current regulations.
Fiscal Capability		
Capital Improvement Project Fund	Purpose	To build and maintain appropriate infrastructure to ensure the needs of residents are served
	Responsible Agency	All Departments
	Hazards	Flooding, Severe Wind, Drought
	Effect on Mitigation Efforts	CIP Projects have been identified to mitigate potential hazards
Community Development Block Grant Funding	Purpose	Construction or renovation of various infrastructure projects such as water, wastewater and solid waste facilities, streets, and flood control projects; construction or improvements of a range of community facilities
	Responsible Agency	All Departments
	Hazards	Flood
	Effect on Mitigation Efforts	Identify flood control projects and make improvements as needed.
Development Impact Fees	Purpose	Used for water, sewer, streets, parks, and public safety facilities when there is a capital improvement program in place.
	Responsible Agency	All Departments
	Hazards	All
	Effect on Mitigation Efforts	Identification of Capital projects to mitigate potential hazards
Administrative & Technical Staff Capability		
Community Planner		Land use planning can be used as a hazard mitigation tool to reduce vulnerability and simultaneously promote economic growth, ensure natural resource protection, or encourage livability initiatives.
Engineer		Setting of design and safety standards, and the actual design and construction of infrastructure used to prevent damage and losses caused by hazards.
Emergency Manager		Helps the community anticipate hazards and vulnerability, and undertake measures to deal with disasters more effectively (e.g., mitigate, prepare for, respond to and recover from them.
Building Official		Enforce building codes within their jurisdiction to ensure structural integrity and safety for structures built within the city.
Floodplain Manager		Minimize public and private losses due to flooding; and to enable its residents to participate in the National Flood Insurance Program (NFIP), receive federal disaster assistance, obtain

	flood insurance, and reduce the cost of flood insurance.
GIS Coordinator	Flood Mapping, Flood Zones, Hazard identification, modeling, analyzing spatial data, and displaying community vulnerability.
Grant Writer	Provide funding for eligible mitigation measures that reduce disaster losses.
Planning and Zoning Commission	An advisory group to the municipal governing body on issues and policies related to planning, land use regulation, and community development.
Community Facilities Districts	Allows the financing of the installation, operation, and maintenance of public improvements such as roads, water and wastewater facilities, flood control and drainage projects that benefit a specified area.

5.2.4 Coolidge Capability Assessment

Table 5-5: Coolidge Capability Assessment		
Plans, Programs, & Policies		
Community Wildfire Protection	Purpose	Identifies and prioritizes areas for hazardous fuel reduction treatments and recommends the types and methods of treatment.
	Responsible Agency	Coolidge Fire
	Hazards	Wildfire
	Effect on Mitigation Efforts	Medium. A CWPP may address issues such as wildfire response, hazard mitigation, community preparedness, or structure protection.
	Opportunities for Enhancement	Coordinate with State and County agencies to implement a more comprehensive Wildland Urban Interface program for the community.
Floodplain Management Plan	Purpose	An overall strategy of programs, projects, and measures aimed at reducing the adverse impacts of flood hazards on the community.
	Responsible Agency	Public Works, Fire, Growth Development
	Hazards	Flooding
	Effect on Mitigation Efforts	Medium. The Plan identifies and addresses the flood hazard impacts and provides mitigation measures to help protect properties and their occupants.
	Opportunities for Enhancement	Implement, Evaluate and Review Floodplain requirements yearly. This allows city planners to adjust requirements as the community grows and the population increases.
Codes & Regulations		
Zoning Ordinances	Purpose	Used to dictate the type of land use and to set minimum specifications for use such as lot size, building height and setbacks, and density of population.
	Responsible Agency	Pinal County Community Development

	Hazards	All, Zoning ordinances can incorporate mitigation principles into the permitted types of land use
	Effect on Mitigation Efforts	High. Land use regulations that incorporate mitigation principles can reduce the exposure of future development to hazard events.
	Opportunities for Enhancement	Regularly review and update zoning requirements to address evolving hazards and risks in the community
Subdivision Ordinances	Purpose	An opportunity to account for natural hazards prior to the development of land as they formulate regulations when the land is subdivided.
	Responsible Agency	Pinal County Community Development
	Hazards	All
	Effect on Mitigation Efforts	High, Subdivision design that incorporates mitigation principles can reduce the exposure of future development to hazard events.
	Opportunities for Enhancement	Regularly review and update subdivision requirements to address evolving hazards and risks in the community
Fiscal Capability		
Hazard Fuels Mitigation Grants	Purpose	Reduce Hazardous Fuels and Restore Fire-adapted Ecosystems, Improve Prevention and Education in the Interface, and Community Wildfire Protection Planning.
	Responsible Agency	Fire
	Hazards	Large amounts of farming waste that is burned after harvest season, lack of solid waste dumping sites designed to be used by residential population.
	Effect on Mitigation Efforts	Provides funding for equipment and manpower to assist with mitigation efforts for large scale burning and controlled burning equipment at solid waste dumping facilities.
Floodplain Management	Purpose	To protect the health and safety of Coolidge residents and minimize the impact the private and public loss due to floods.
	Responsible Agency	Pinal County
	Hazards	Private and residential flooding due to monsoon and seasonal rains.
	Effect on Mitigation Efforts	Program is funded through various fees collected by Pinal County through elevation certificates. Flood Insurance is required if business or residence is located in special flood hazard area (SFHA).
Administrative & Technical Staff Capability		
Code Enforcement/ Building Official		Ensures compliance to current codes and regulations as set forth by the City of Coolidge, Pinal County and the State of Arizona
Fire Department		Emergency Response, hazard mitigation and assisting with recovery for any affected business or residence

Planning and Zoning Commission	The Planning and Zoning Commission is responsible for approving the City's zoning ordinance, land use plan, Master Plan, and subdivision regulations. This commission is also charged with any re-planning, improvement, and reconstruction of neighborhood and public use buildings.
City Engineer	Responsible for ensuring existing and new developments building plans comply with current codes and regulations recognized by the City of Coolidge. Ensures that current mitigation efforts, i.e…retention ponds and sold waste sites meet the needs of the community
Public Works	Provide personnel to assist in mitigation, response and recovery efforts before, during and after any hazard incident

5.2.5 Eloy Capability Assessment

Table 5-6: Eloy Capability Assessment		
Plans, Programs, & Policies		
Capital Improvement	Purpose	Guides the schedule of spending on public improvements.
	Responsible Agency	Finance
	Hazards	All
	Effect on Mitigation Efforts	Guides future development away from identified hazard areas and addresses problems within hazard areas.
	Opportunities for Enhancement	Update capital improvement plan; obligate money to address site-specific hazards.
Community Wildfire Protection	Purpose	Identifies and prioritizes areas for hazardous fuel reduction treatments and recommends the types and methods of treatment.
	Responsible Agency	Community Development
	Hazards	All
	Effect on Mitigation Efforts	Addresses hazard mitigation, wildfire response, community preparedness and/or structure protection.
	Opportunities for Enhancement	Update community wildfire protection plan to address any newly-identified hazards.
Economic Development	Purpose	Provides a comprehensive overview of the economy and sets policy direction for economic growth.
	Responsible Agency	Community Development
	Hazards	All
	Effect on Mitigation Efforts	Identifies strategies, program, and projects to improve the local economy.
	Opportunities for Enhancement	Review the economic plan, solicit resident input, and update as needed.
Emergency	Purpose	Outlines responsibility, means, and months by which resources are deployed in emergency

Operations		or disaster situations.
	Responsible Agency	City Manager's Office
	Hazards	All
	Effect on Mitigation Efforts	Addresses emergency/disaster situations in a timely manner and provides situational guidance.
	Opportunities for Enhancement	Training city personnel on emergency procedures.
Codes & Regulations		
Building Codes	Purpose	Regulates construction standards, considering type, frequency, and intensity of hazards.
	Responsible Agency	Community Development
	Hazards	Winds, floods, earthquakes.
	Effect on Mitigation Efforts	Structures built to code are inherently resistant to many hazards.
	Opportunities for Enhancement	Update building code as needed to ensure compliance with ordinances.
Floodplain Ordinances	Purpose	Manages planned growth, regulates uses in flood hazard areas, grants permits for use in flood hazard areas consistent with the ordinance.
	Responsible Agency	Community Development
	Hazards	Floods
	Effect on Mitigation Efforts	Minimize the extent of floods; prevent and minimize loss of life, injuries, damage; promote public health, safety and welfare of residents in flood hazard zones.
	Opportunities for Enhancement	Review and update as needed to address potential flood zones.
Site Plan Review Requirements	Purpose	Evaluates proposed development prior to construction.
	Responsible Agency	Community Development
	Hazards	All
	Effect on Mitigation Efforts	Enables analysis of potential hazards and any effects by specifying the proposed work, including the location, dimensions, existing and proposed buildings, etc.
	Opportunities for Enhancement	Review regularly and update as needed.
Subdivision Ordinances	Purpose	Formulating regulations when land is subdivided.
	Responsible Agency	Community Development
	Hazards	All
	Effect on Mitigation Efforts	Accounts for hazards prior to land development.
	Opportunities for Enhancement	Proactively address potential hazards affecting development of land.
Zoning Ordinances	Purpose	Dictates land use and sets minimum specifications for use such as lot size and setbacks.
	Responsible Agency	Community Development
	Hazards	All
	Effect on Mitigation Efforts	Zoning ordinances account for any relevant hazards.

	Opportunities for Enhancement	Periodic review of zoning ordinances.
Fiscal Capability		
Capital Improvements Project Funding	Purpose	Allows for spending on identified capital projects and for equipment purchases related to mitigation projects.
	Responsible Agency	Finance
	Hazards	All
	Effect on Mitigation Efforts	Enables spending of funds on hazard mitigation projects.
Community Development Block Grants	Purpose	Used to address community needs: construction/renovation/improvement of infrastructure projects and community facilities, affordable housing reconstruction/rehabilitation projects.
	Responsible Agency	Finance
	Hazards	All
	Effect on Mitigation Efforts	Ensures rehabbed houses have remedied any hazard issues.
Debt through General Obligation Bonds	Purpose	Used to generate funds for mitigation projects.
	Responsible Agency	Eloy City Council
	Hazards	All
	Effect on Mitigation Efforts	Provides funding for hazard mitigation projects.
Levy Taxes	Purpose	Allows City of Eloy to tax its population base.
	Responsible Agency	Eloy City Council
	Hazards	All
	Effect on Mitigation Efforts	Provides funding for hazard mitigation projects.
Withhold Spending in Hazardous Areas	Purpose	To withhold funding for activities or actions in area(s) known to be prone to specific hazards.
	Responsible Agency	Finance
	Hazards	All
	Effect on Mitigation Efforts	Ensures activities/actions are not conducted in hazardous areas.
Administrative & Technical Staff Capability		
Building Official		Administers building and construction codes, inspects structures to ensure code compliance and check workmanship.
Planner		Identifies community needs and develops short and long-term solutions to improve and revitalize the area.
Engineer		Designs infrastructure, ensuring adherence to budgetary and environmental requirements; oversee projects.
Grant Writer		Gathers documentation and fulfills the requirements of funding opportunities to formally seek funding for the City.

Mapping GIS Specialist	Uses GIS data to create county maps, including floodplain fire hazard, drought and/or other mitigation maps.
Public Works Official	Provides management and oversight of infrastructure projects such as public buildings, transport infrastructure.
Police Dept.	Establishes protocols and training in order to coordinate emergency safety measures in response to a hazard event.
Fire District	Establishes protocols and training in order to coordinate emergency safety measures in response to a hazard event.

5.2.6 Florence Capability Assessment

Table 5-7: Florence Capability Assessment		
Plans, Programs, & Policies		
Capital Improvement	Purpose	Guides the schedule of spending on public improvements.
	Responsible Agency	Finance
	Hazards	All
	Effect on Mitigation Efforts	Guides future development away from identified hazard areas and addresses problems within hazard areas.
	Opportunities for Enhancement	Update capital improvement plan; obligate money to address site-specific hazards.
Community Wildfire Protection	Purpose	Identifies and prioritizes areas for hazardous fuel reduction treatments and recommends the types and methods of treatment.
	Responsible Agency	Fire Department
	Hazards	Wildfire
	Effect on Mitigation Efforts	Addresses hazard mitigation, wildfire response, community preparedness and/or structure protection.
	Opportunities for Enhancement	Update community wildfire protection plan to address any newly-identified hazards.
Emergency Operations Plan	Purpose	Outlines responsibility, means, and months by which resources are deployed in emergency or disaster situations.
	Responsible Agency	Fire Department
	Hazards	All
	Effect on Mitigation Efforts	Addresses emergency/disaster situations in a timely manner and provides situational guidance.
	Opportunities for Enhancement	Training Town personnel on emergency procedures.
Community Rating System	Purpose	The purpose is to recognize and encourage community floodplain management activities
	Responsible Agency	Public Works

	Hazards	Flood
	Effect on Mitigation Efforts	Incentivize community actions to meet CRS goals.
	Opportunities for Enhancement	Increase public education and outreach.
Codes & Regulations		
Building Code	Purpose	Regulates construction standards, considering type, frequency, and intensity of hazards.
	Responsible Agency	Community Development
	Hazards	All
	Effect on Mitigation Efforts	Structures built to code are inherently resistant to many hazards.
	Opportunities for Enhancement	Update building code as needed to ensure compliance with ordinances.
Floodplain Ordinance	Purpose	Manages planned growth, regulates uses in flood hazard areas, grants permits for use in flood hazard areas consistent with the ordinance.
	Responsible Agency	Public Works
	Hazards	Floods
	Effect on Mitigation Efforts	Minimize the extent of floods; prevent and minimize loss of life, injuries, damage; promote public health, safety and welfare of residents in flood hazard zones.
	Opportunities for Enhancement	Review and update as needed to address potential flood zones.
Site Plan Review Requirements	Purpose	Evaluates proposed development prior to construction.
	Responsible Agency	Community Development
	Hazards	All
	Effect on Mitigation Efforts	Enables analysis of potential hazards and any effects by specifying the proposed work, including the location, dimensions, existing and proposed buildings, etc.
	Opportunities for Enhancement	Review regularly and update as needed.
Subdivision Ordinance	Purpose	Formulating regulations when land is subdivided.
	Responsible Agency	Community Development
	Hazards	All
	Effect on Mitigation Efforts	Accounts for hazards prior to land development.
	Opportunities for Enhancement	Proactively address potential hazards affecting development of land.
Zoning Ordinance	Purpose	Dictates land use and sets minimum specifications for use such as lot size and setbacks.
	Responsible Agency	Community Development
	Hazards	All
	Effect on Mitigation Efforts	Zoning ordinances account for any relevant hazards.
	Opportunities for Enhancement	Periodic review of zoning ordinances.
Wildfire Ordinance	Purpose	To reduce the risk of structure loss to wildfire.
	Responsible Agency	Fire Department

	Hazards	Wildfire
	Effect on Mitigation Efforts	Reduces risk by incorporating wildfire defense principles in subdivision design, defensible space, and fire-resistant structural safeguards.
	Opportunities for Enhancement	Support defensible space through fuels management programs.
Fiscal Capability		
Capital Improvements Project Funding	Purpose	Allows for spending on identified capital projects and for equipment purchases related to mitigation projects.
	Responsible Agency	Finance
	Hazards	All
	Effect on Mitigation Efforts	Enables spending of funds on hazard mitigation projects.
Community Development Block Grants	Purpose	Used to address community needs: construction/renovation/improvement of infrastructure projects and community facilities, affordable housing reconstruction/rehabilitation projects.
	Responsible Agency	Finance
	Hazards	All
	Effect on Mitigation Efforts	Ensures rehabbed houses have remedied any hazard issues.
Debt through General Obligation Bonds	Purpose	Used to generate funds for mitigation projects.
	Responsible Agency	Florence Town Council
	Hazards	All
	Effect on Mitigation Efforts	Provides funding for hazard mitigation projects.
Levy Taxes	Purpose	Allows Town of Florence to tax its population base.
	Responsible Agency	Florence Town Council
	Hazards	All
	Effect on Mitigation Efforts	Provides funding for hazard mitigation projects.
Withhold Spending in Hazardous Areas	Purpose	To withhold funding for activities or actions in area(s) known to be prone to specific hazards.
	Responsible Agency	Finance
	Hazards	All
	Effect on Mitigation Efforts	Ensures activities/actions are not conducted in hazardous areas.
Administrative & Technical Staff Capability		
Building Official		Administers building and construction codes, inspects structures to ensure code compliance and check workmanship.
Planner		Identifies community needs and develops short and long-term solutions to improve and revitalize the area.

Emergency Manager	Responsible for the mitigation, preparedness, response, and recovery operations that deal with both natural and human- caused disaster events.
Engineer	Designs infrastructure, ensuring adherence to budgetary and environmental requirements; oversee projects.
Floodplain Manager	Ensures the Town is meeting the minimum requirements of participation in the NFIP, and often is tasked with applying for funding or grants.
Grant Writer	Gathers documentation and fulfills the requirements of funding opportunities to formally seek funding for the Town.
Mapping GIS Specialist	Uses GIS data to create county maps, including floodplain fire hazard, drought and/or other mitigation maps.
Planning Department	Provides management and oversight of development through the application of codes, ordinances, building regulations and public input.
Public Works Official	Provides management and oversight of infrastructure projects such as public buildings, transport infrastructure.

5.2.7 Kearny Capability Assessment

Table 5-8: Kearny Capability Assessment		
Plans, Programs, & Policies		
Emergency Response and Recovery Plan	Purpose	The Town of Kearny Emergency Response and Recovery Plan (KERRP) predetermines, to the extent possible, operational policies and responsibilities of Town departments and cooperating government, private, and volunteer agencies for responding to and recovering from major natural or man-made emergencies.
	Responsible Agency	Town Mayor and Council: provide authority for policy changes required by component organizations responding to the emergency. Town Manager, Fire Chief, Police Chief, Director of Public Works, Kearny Incident Command Chief
	Hazards	All
	Effect on Mitigation Efforts	This plan applies to major emergencies which may occur within the incorporated areas of Kearny. It may be used in conjunction with Emergency Response plans of other jurisdictions.
	Opportunities for Enhancement	Response by town, county, and state agencies to lifesaving and life protecting requirements under this plan has precedence over other town, county, and state response activities, except where national security implications are determined to be of a higher priority. Support from agencies will be provided to the extent that it does not conflict with other

		emergency missions that an agency is required to perform.
Community Wildfire Protection	Purpose	To identify at-risk lands to better protect those lands from severe wildfire threat.
	Responsible Agency	Fire Chief, Town Manager Department of Forestry and Fire Management
	Hazards	Fire
	Effect on Mitigation Efforts	To help identify potentially new recommendations in the types and methods for treatment and management necessary to mitigate the potential for catastrophic wildland fire.
	Opportunities for Enhancement	Identify wildland vegetative fuel hazards, consideration of aspect and local topography, historical fire occurrence, and wildfire ignition history with the comparison of average and extreme rainfall years.
Capital Improvements Plan	Purpose	To identify capital improvement projects, identify and forecast funding sources, prioritize improvements based on funding available, and estimate a timeline for completion of individual improvements.
	Responsible Agency	Town Administration and Town Council
	Hazards	Flood, Fire, Wind
	Effect on Mitigation Efforts	Mitigate risk of natural disasters and promote community resilience.
	Opportunities for Enhancement	This plan needs to be updated since the current version is from 2017.
Comprehensive/Master Plan	Purpose	Tool and blueprint for guiding the Town's future growth and development.
	Responsible Agency	Town Administration and Town Council
	Hazards	Flood, Fire, Wind, Natural Disasters
	Effect on Mitigation Efforts	Shows how the Town will grow and conserve its resources.
	Opportunities for Enhancement	Identify hazards that may affect future grown and development of the Town.
Codes & Regulations		
Town Code (Chapter 17)	Purpose	To promote the public health, safety, and general welfare, and to minimize public and private losses due to flood conditions in specific areas by provisions designed to: protect human life and health; minimize expenditure of public money for costly flood control projects; minimize the need for rescue and relief efforts associated with flooding and generally undertaken at the expense of the general public; minimize prolonged business interruptions; minimize damage to public facilities and utilities such as water and gas mains, electric, telephone and sewer lines, streets and bridges located in areas of special flood hazard; help maintain a stable tax base by providing for the second use and development of areas of special flood hazard so as to minimize future flood blight areas; Insure that potential buyers

		are notified that property is in an area of special flood hazard; insure that those who occupy the areas of special flood hazard assume responsibility for their actions; maintain eligibility for state disaster relief.
	Responsible Agency	Town of Kearny
	Hazards	Flood
	Effect on Mitigation Efforts	Effective, the code and ordinance provide methods and provisions to restrict or prohibit uses which are dangerous to health safety, and property due to water or erosion hazards, or which result in damaging increases in erosion or flood heights or velocities.
	Opportunities for Enhancement	The code is sufficient for mitigation purposes.
Ordinance (16-203)	Purpose	To promote the public health, safety, and general welfare, and to minimize public and private losses due to flood conditions in specific areas by provisions designed to: protect human life an health; minimize expenditure of public money for costly flood control projects; minimize the need for rescue and relief efforts associated with flooding and generally undertaken at the expense of the general public; minimize prolonged business interruption; minimize damage to public facilities and utilities such as water and gas mains, electric, telephone and sewer lines, and streets and bridges located in areas of special flood hazards; help maintain a stable tax base by providing for the sound use and development of areas of special flood hazards so as to minimize blight areas caused by flooding; notify potential buyers that property is in an area of special flood hazard; notify those who occupy the areas of special flood hazard that they assume responsibility for their actions; participate in a d maintain eligibility for flood insurance and disaster relief.
	Responsible Agency	Town of Kearny
	Hazards	Flood
	Effect on Mitigation Efforts	Effective, the code and ordinance provide methods and provisions to restrict or prohibit uses which are dangerous to health safety, and property due to water or erosion hazards, or which result in damaging increases in erosion or flood heights or velocities.
	Opportunities for Enhancement	The ordinance is sufficient for mitigation purposes.
Fiscal Capability		
Community Development Block Grants	Purpose	Financially, the Town has the ability to incur debt through tax and bond obligations and to levy taxes for specific purposes.
	Responsible Agency	Town Administration and Town Council
	Hazards	All

	Effect on Mitigation Efforts	The additional revenues enhance future mitigation efforts by providing extra resources for the town to implement some of the actions and projects identified as priorities for the town.
Administrative & Technical Staff Capability		
Town Manager		The Town Manager is instrumental in updating hazard mitigation plans and its implementation.
Grant Writer		The Grant Writer is instrumental in obtaining funding to apply towards projects that mitigate hazards and disasters.
Town Engineer (Consultant)		The Town Engineer would be the only qualified resource with knowledge of land development and land management practices having an understanding of natural and/or human-caused hazards to mitigate any potential disasters.

5.2.8 Mammoth Capability Assessment

Table 5-9: Mammoth Capability Assessment		
Plans, Programs, & Policies		
Community Wildfire Protection Plan	Purpose	Identifies and prioritizes areas for hazardous fuel reduction treatments and recommends the types and methods of treatment.
	Responsible Agency	Mammoth Volunteer Fire Department
	Hazards	Wildfire
	Effect on Mitigation Efforts	Addresses hazard mitigation, wildfire response, community preparedness and/or structure protection.
	Opportunities for Enhancement	Participate in annual updates to address new and continuing issues and projects
Emergency Operations Plan	Purpose	Outlines responsibility, means, and months by which resources are deployed in emergency or disaster situations.
	Responsible Agency	Town Manager
	Hazards	All
	Effect on Mitigation Efforts	Addresses emergency/disaster situations in a timely manner and provides situational guidance.
	Opportunities for Enhancement	The Plan was last updated in 2007, begin an annual or biannual revision process to meet new and emerging challenges.
Community Rating System	Purpose	The purpose is to recognize and encourage community floodplain management activities within the town.
	Responsible Agency	Public Works
	Hazards	Flood

	Effect on Mitigation Efforts	Incentivize community actions to meet CRS goals.
	Opportunities for Enhancement	Increase public education and outreach.
Codes & Regulations		
Building Codes	Purpose	Regulates construction standards, considering type, frequency, and intensity of hazards.
	Responsible Agency	Community Development
	Hazards	All
	Effect on Mitigation Efforts	Structures built to code are inherently resistant to many hazards.
	Opportunities for Enhancement	Update building code as needed to ensure compliance with ordinances.
Floodplain Ordinances	Purpose	Manages planned growth, regulates uses in flood hazard areas, grants permits for use in flood hazard areas consistent with the ordinance.
	Responsible Agency	Planning & Zoning
	Hazards	Floods
	Effect on Mitigation Efforts	Minimize the extent of floods; prevent and minimize loss of life, injuries, damage; promote public health, safety and welfare of residents in flood hazard zones.
	Opportunities for Enhancement	Review and update as needed to address potential flood zones.
Site Plan Review Requirements	Purpose	Evaluates proposed development prior to construction.
	Responsible Agency	Planning and Zoning
	Hazards	All
	Effect on Mitigation Efforts	Enables analysis of potential hazards and any effects by specifying the proposed work, including the location, dimensions, existing and proposed buildings, etc.
	Opportunities for Enhancement	Review regularly and update as needed.
Zoning Ordinances	Purpose	Dictates land use and sets minimum specifications for use such as lot size and setbacks.
	Responsible Agency	Community Development
	Hazards	All
	Effect on Mitigation Efforts	Zoning ordinances account for any relevant hazards.
	Opportunities for Enhancement	Periodic review of zoning ordinances.
Fiscal Capability		
Community Development Block Grants	Purpose	Used to address community needs: construction/renovation/improvement of infrastructure projects and community facilities, affordable housing reconstruction/rehabilitation projects.
	Responsible Agency	Finance
	Hazards	All
	Effect on Mitigation Efforts	Ensures rehabbed houses have remedied any hazard issues.
Debt through	Purpose	Used to generate funds for mitigation projects.

General Obligation Bonds	Responsible Agency	Town Council
	Hazards	All
	Effect on Mitigation Efforts	Provides funding for hazard mitigation projects.
Levy Taxes	Purpose	Allows Town of Florence to tax its population base.
	Responsible Agency	Florence Town Council
	Hazards	All
	Effect on Mitigation Efforts	Provides funding for hazard mitigation projects.
Withhold Spending in Hazardous Areas	Purpose	To withhold funding for activities or actions in area(s) known to be prone to specific hazards.
	Responsible Agency	Finance
	Hazards	All
	Effect on Mitigation Efforts	Ensures activities/actions are not conducted in hazardous areas.
Administrative & Technical Staff Capability		
Emergency Manager		Responsible for the mitigation, preparedness, response, and recovery operations that deal with both natural and human- caused disaster events. Filled by the Town Manager
Floodplain Manager		Ensures the Town is meeting the minimum requirements of participation in the NFIP. Filled by Pinal County Flood Control District
Grant Writer		Gathers documentation and fulfills the requirements of funding opportunities to formally seek funding for the Town.
Public Works Official		Provides management and oversight of infrastructure projects such as public buildings, transport infrastructure.

5.2.9 Maricopa Capability Assessment

Table 5-10: Maricopa Capability Assessment		
Plans, Programs, & Policies		
Capital Improvements Plan	Purpose	Guides the scheduling of spending on public improvements and can serve as a mechanism for guiding future development away from identified hazard areas.
	Responsible Agency	Office of Engineering & CIP Development
	Hazards	All
	Effect on Mitigation Efforts	Each project can incorporate sensible actions to reduce or eliminate future hazards. The Plan can also address existing problems within hazard areas. For example, a jurisdiction might program resources to address site-specific drainage problems.
	Opportunities for Enhancement	Planning and designing mitigations into all Capital Improvement Projects.

Community Wildfire Protection Plan	Purpose	Identifies and prioritizes areas for hazardous fuel reduction treatments and recommends the types and methods of treatment.
	Responsible Agency	City of Maricopa Fire/Medical Department
	Hazards	Wildfire
	Effect on Mitigation Efforts	Moderate - City of Maricopa is not in a high threat area for wildfire. However, the City is boarded by rural and agricultural communities that has wildfires every wildlife season. The department responds to fires on the boarder of the community that impact the City with smoke and occasional road closures.
	Opportunities for Enhancement	There is an opportunity to work with the two sovereign nations on the City boards and develop a mitigation program with the Bureau of Indian Affairs (BIA) Branch of Wildfire Management. This includes additional fire training for the department members, enhanced mutual-aid, and a fuels reduction program of the grass, brush, and flashy fuel types near the roadways.
Comprehensive/ Land Use Plan	Purpose	The jurisdiction's overall vision and guide to decision making, and generally contains information on demographics, land use, transportation, and facilities.
	Responsible Agency	Development Services
	Hazards	All
	Effect on Mitigation Efforts	As a comprehensive plan is broad in scope the integration of hazard mitigation measures can enhance the likelihood of achieving risk reduction goals.
	Opportunities for Enhancement	Adding mitigation measures to all improvements within the Comprehensive Land Use Plan.
Economic Development Plan	Purpose	Provides a comprehensive overview of the current status of Maricopa's economy, sets policy direction for economic growth, and identifies strategies, programs, and projects to improve the economy. Emphasis is placed on the attraction of new businesses and the retention of existing businesses.
	Responsible Agency	Economic Development
	Hazards	All
	Effect on Mitigation Efforts	To achieve risk reduction and vulnerability.
	Opportunities for Enhancement	These efforts will keep more jobs within the City of Maricopa, thereby reducing the number of commuters into Phoenix.
Floodplain Management Plan	Purpose	An overall strategy of programs, projects, and measures aimed at reducing the adverse impacts of flood hazards on the community.
	Responsible Agency	Engineering and Pinal County Floodplain Administrator
	Hazards	Flood
	Effect on Mitigation Efforts	The Plan identifies and addresses the flood hazard impacts and provides mitigation

		measures to help protect properties and their occupants.
	Opportunities for Enhancement	Stay current with FEMA flood zones and remapping of areas that have been analyzed using Flow2D models showing a different floodplain hazard than the one shown on current FEMA's FIRMS. Enhanced access and socialization (newspapers, mail letters or/and local webpage) to inform and help the community to identify and understand which areas are at risk from flooding and be able to take action (acquire flood insurance, use higher finished floor elevations for future construction or expansion of their properties, build drainage facilities).
Stormwater Management Plan	Purpose	Addresses flooding associated with stormwater runoff.
	Responsible Agency	Office of Engineering & CIP Development
	Hazards	Flood
	Effect on Mitigation Efforts	The stormwater management plan is typically focused on design and construction measures that are intended to reduce the impact of more frequently occurring minor urban flooding.
	Opportunities for Enhancement	The city is actively seeking to hire a storm manager and flood plain manager to coordinate and administrate the areas prone to flood and control developments based on drainage studies and regional plans to route storm water.
Transportation Plan	Purpose	The framework of the future transportation system as population, development, technology, and other factors impact a community.
	Responsible Agency	Office of Engineering & CIP Development
	Hazards	All
	Effect on Mitigation Efforts	Strategic plan to enhance vehicular, pedestrian trails, and bicycle trails.
	Opportunities for Enhancement	Area growth assumptions and detailed demographics projections to identify the areas where floods have the potential to close existing or future roads limiting access to communities. Propose all weather crossings (bridge, box culvert) at strategic locations to ensure proper access during flood or other emergencies. Identify future emergency routes and include the required infrastructure on the transportation plan.
Codes & Regulations		
Building Code	Purpose	Regulates construction standards. They consider the type, frequency, and intensity of hazards present in the region.
	Responsible Agency	Development Services Department
	Hazards	All
	Effect on Mitigation Efforts	Structures built to applicable building codes are inherently resistant to many hazards such as strong winds, floods, and earthquakes.
	Opportunities for Enhancement	The international Code Council (ICC) holds Public Comment Hearings. Public and

		ICC members are encouraged to attend the event to suggest any code development and inform their actions of submitting code changes during voting and adoption.
Floodplain Ordinance	Purpose	Floodplain ordinances are used to minimized the extent of floods by preventing obstructions that inhibit water flow and increase flood height and damage, prevent and minimize loss of life, injuries, and property damage in flood hazard areas; promote the public health, safety, and welfare of citizens in flood hazard areas.
	Responsible Agency	Office of Engineering & CIP Development and Pinal County Floodplain Administrator
	Hazards	Flood
	Effect on Mitigation Efforts	Manage planned growth; adopt and enforce local ordinances that regulate uses in flood hazard areas; grant permits for use in flood hazard areas that are consistent with the ordinance.
	Opportunities for Enhancement	Restrict or prohibit uses which are dangerous to health, safety and property due to water or erosion hazards and protect property, facilities vulnerable to increased damages due to flooding; control, filling, grading, dredging, and other development which may cause increase flood damage; prevent or regulate construction of obstructions which will unnaturally divert or flood waters or increase flood hazards in other areas; protect the integrity of the floodplains by making it necessary to regulate development within city boundaries that could the delineated floodplains; require a floodplain Use of Permit of Clearance for development within watercourse or contributing watershed that has flows greater than 200 cubic feet per second during a 100-year flood event, unless drainage clearance has been issued.
Site Plan Review Requirements	Purpose	Used to evaluate proposed development prior to construction.
	Responsible Agency	Office of Engineering & CIP Development
	Hazards	All
	Effect on Mitigation Efforts	An illustration of the proposed work, including its location, exact dimensions, existing and proposed buildings, and many other elements are often included.
	Opportunities for Enhancement	Used to evaluate proposed development prior to construction.
Zoning Ordinance	Purpose	Used to dictate the type of land use and to set minimum specifications for use such as lot size, building height and setbacks, and density of population.
	Responsible Agency	Development Services Department
	Hazards	All
	Effect on Mitigation Efforts	Regulates new residential and commercial structures.
	Opportunities for Enhancement	Staying current on zoning code regulation.

Fiscal Capability		
Capital Improvements Project Funding	Purpose	Allows for spending on identified capital projects and for equipment purchases (in this context) related to mitigation projects.
	Responsible Agency	Office of Engineering & CIP Development
	Hazards	All
	Effect on Mitigation Efforts	Reduce the risk and future vulnerability
Community Development Block Grant	Purpose	Utilized to address community needs, including construction/renovation/improvement of infrastructure projects.
	Responsible Agency	Development Services Department
	Hazards	All
	Effect on Mitigation Efforts	Available funding to identify and reduce the risk and needs.
Debt through General Obligation Bonds	Purpose	General obligation bonds can be used to generate funds for mitigation projects. Voter authorized bond capacity would be required prior to utilization.
	Responsible Agency	Finance Department
	Hazards	All
	Effect on Mitigation Efforts	Allows funding for mitigation projects, addresses community needs, including construction/renovation/improvement of infrastructure projects.
Levy Taxes	Purpose	Allows the city to tax its population base. Voter approval for primary property tax to be utilized for hazard mitigation would be required prior to levy.
	Responsible Agency	Finance Department
	Hazards	All
	Effect on Mitigation Efforts	Allows funding for mitigation projects
Withhold Spending in Hazard Prone Areas	Purpose	The ability of the city to not provide funding for activities or actions in an area that is known to be prone to specific hazards.
	Responsible Agency	City Manager's Office
	Hazards	All
	Effect on Mitigation Efforts	Withhold funding and not allow construction.
Administrative & Technical Staff Capability		
Building Official		Inspects structures to ensure compliance with the plans and check workmanship and code compliance.
Planner		Identifies community needs and develop short- and long-term solutions.
Emergency Manager/Coordinator		Responsible for the mitigation, preparedness, response, and recovery operations that

	deal with both natural and human- caused disaster events.
Engineer	Oversees city infrastructure to ensure they adhere to budgetary and environmental requirements.
Floodplain Manager/Administrator	Ensures the city is meeting the minimum requirements of participation in the NFIP.
Mapping/GIS Specialist	Uses GIS data to create city maps, including flood plain, fire hazard, drought, and other mitigation maps.
Planning Department	Provides management and development through city codes, ordinances, building regulations and public input.
Public Works Official	Provides management and infrastructure projects to city public buildings, transport infrastructure, public spaces, public services, and other physical assets and facilities.

5.2.10 Superior Capability Assessment

Table 5-11: Superior Capability Assessment		
Plans, Programs, & Policies		
2019 Superior Hotel Feasibility Study	Purpose	The population growth, to set a direction a meet program challenges of the next decade
	Responsible Agency	Town Manager/ Consultants
	Hazards	All
	Effect on Mitigation Efforts	Medium; The study provided that Town requires a New Hotel with at least 150 rooms. The results from the study identified the need for a hotel to protect people from hazardous events.
	Opportunities for Enhancement	New Hotel will provide strategies for expanding the tourism opportunities and the temporary staging during flood or fire events.
2020-2022 Replace and Rebuild the WWTP	Purpose	To Rebuild/ Modify the Waste Water Treatment Plant
	Responsible Agency	Engineering Consultants
	Hazards	All
	Effect on Mitigation Efforts	Medium. The new system would help eliminate future hazardous water contamination situations and sewage brakes.
	Opportunities for Enhancement	The design engineers produced plans and planned to re-construct a new sewer collection system and Waste Water Plant. The Town has applied for USDA Rural Development Grants to fund the construction.
2022 Flood control & stormwater management	Purpose	To determine projects, comprehensive data historical, current, and future predictions based on a study; mitigation of stormwater, and area drainage.
	Responsible Agency	Pinal County Flood Control management/ Town engineer
	Hazards	Fire/ Flood

plan	Effect on Mitigation Efforts	Medium. It would be assisted in regulating building codes within flood-prone areas.
	Opportunities for Enhancement	Develop a drainage master plan for the entire Town; perform basic remediation drainage channels to reduce the effects of flooding. Develop and adopt citywide water conservation standards. Updating the flood maps to current data provides the Town with more opportunities to use available land that is not considered a flood zone.
Community Wildfire Protection Plan	Purpose	To promote and protect the health, peace, safety, comfort, convenience, and general welfare of the residents; to minimize public and private losses due to fire.
	Responsible Agency	Town manager/ Public Works/ Fire Chief/ Police Chief
	Hazards	Fire/ Flood
	Effect on Mitigation Efforts	Medium. The 2021 fires around the town limits encouraged the management to prepare the buffer zone around the Town to protect from future fires. Add information to the Town's website on a regular basis concerning emergency preparedness.
	Opportunities for Enhancement	To improve future mitigation actions Town needs to provide a buffer zone around town limits. Conduct roadside thining and moving as well as general thining and chipping on State and private land to reduce vulnerability to the effects of wildfire. Fire prevention training of the volunteers. Continue to display the Fire Wise Model and information at the Town Hall and Fire Department.
Codes & Regulations		
2020 Zoning ordinances	Purpose	Enforce zoning and building codes through the current site plan, subdivision, and building permit review process to reduce the effect of drought, flood, severe wind, and other hazards on new and/or remodeled buildings and infrastructure.
	Responsible Agency	Planning & Zoning/ Public Safety and Building Safety Department
	Hazards	All
	Effect on Mitigation Efforts	Medium
	Opportunities for Enhancement	Continue working with the public on educating of the revised town and zoning codes and regulations, also on the adoption of new IBC Codes. Continue enforcing adopted codes and ordinances. Continue to utilize social media outreach regarding hazard mitigation projects.
2020 Town of Superior Codes	Purpose	Enforce zoning and building codes through the current site plan, subdivision, and building permit review process to reduce the effect of drought, flood, severe wind, and other hazards on new and/or remodeled buildings and infrastructure.
	Responsible Agency	Planning & Zoning/ Public Safety and Building Safety Department.
	Hazards	All
	Effect on Mitigation Efforts	Medium

	Opportunities for Enhancement	Continue working with the public on educating of the revised town and zoning codes and regulations, also on the adoption of new IBC Codes. Continue enforcing adopted codes and ordinances. Continue to utilize social media outreach regarding hazard mitigation projects.
International Building Code 2018 International Residential Code 2018 International Energy Conservation Code 2018 International Fire Code 2018 International Fuel Gas Code 2018 International Mechanical Code 2018 International Plumbing Code 2018 International Swimming Pool and Spa Code 2018 International Property Maintenance	Purpose	Continue to enforce zoning and building codes through the current site plan, subdivision, and building permit review process to reduce the effect of drought, flood, severe wind, and other hazards on new and/or remodeled buildings and infrastructure.
	Responsible Agency	Planning & Zoning/ Public Safety and Building Safety Department.
	Hazards	Flood, Fire, Wind, Drought
	Effect on Mitigation Efforts	Medium
	Opportunities for Enhancement	Continue working with the public on educating of the revised town and zoning codes and regulations, also on the adoption of new IBC Codes. Continue enforcing adopted codes and ordinances. Continue to utilize social media outreach regarding hazard mitigation projects.

Code 2018 National Electrical Code 2017		
Fiscal Capability		
Community Development Block Grants	Purpose	Utilized to address community needs, including construction/renovation/improvement of infrastructure projects and community facilities such as senior, health/social services centers; expansion of public services for low-income persons; and affordable housing reconstruction/rehabilitation projects programs.
	Responsible Agency	Town Manager; Code Enforcement; Fire Marshall
	Hazards	Wildfire
	Effect on Mitigation Efforts	Medium
2018-2021 Comprehensive Economic Development Study	Purpose	To promote and protect the health, peace, safety, comfort, convenience, and general welfare of the residents;
	Responsible Agency	Town Manager/ Consultants
	Hazards	All
	Effect on Mitigation Efforts	Medium
2020 Superior Tourism Strategy	Purpose	To promote tourism attraction to the Town and surrounding land.
	Responsible Agency	Town Manager/ Consultants
	Hazards	All
	Effect on Mitigation Efforts	Medium
Building Abatements	Purpose	Cleanup the Town from dilapidated/abandoned structures
	Responsible Agency	Town Manager/ Code Enforcement/ Fire Marshal
	Hazards	All
	Effect on Mitigation Efforts	Medium
Administrative & Technical Staff Capability		
Town Manager Todd Pryor		Responsible for the financial resources/ funds/ grants. Coordinating & regulating staff.
Building Inspector Adam Session		Responsible for the IBC code enforcement
Fire Marshal Dallas Lane		Responsible for the fire training, IFC 2018 Code Enforcement for Industrial, commercial, and residential buildings
Police Chief Frank Alanis		Responsible for the public safety and training

Planning & Zoning Department Lana Clark	Responsible for the Town utility plan, Roads, zoning codes, and regulations for Industrial, commercial, and residential zones.
CAD/ GIS specialist Lana Clark	Provide services for grading & drainage plans, site plans, utility plans and profiles, existing maps, and future developments of streets and subdivisions.
Code Enforcement	Responsible for enforcing the Town Codes and The Zoning Ordinances
Engineering Consultants	Responsible for writing Grants and WWTP design & Construction
Public Works Department	Responsible for providing Town with daily tasks, street repairs, parks and landscape, utilities, minor constructions

5.2.11 National Flood Insurance Program Participation and Compliance

Each of the participating jurisdictions performed an overall assessment of their participation in the NFIP program by responding to the following questions:

Question 1: Describe your jurisdiction's current floodplain management / regulation process for construction of new or substantially improved development within your jurisdiction.

Question 2: Describe the status and/or validity of the current floodplain hazard mapping for your jurisdiction.

Question 3: Describe any community assistance activities (e.g. – help with obtaining Elevation Certificates, flood hazard identification assistance, flood insurance acquisition guidance, public involvement activities, etc.)

Question 4: Describe identified needs in your floodplain management program. This could include things like updating the floodplain management code/regulation, establishing written review procedures, modifying or adding flood hazard area mapping, etc.

Responses were provided by all jurisdictions regardless of their participation status in the NFIP program. Table 5-12 through Table 5-21 summarizes the responses provided by each of the currently participating jurisdictions.

5-12: NFIP Assessment Responses for Unincorporated Pinal County
Q1: Describe your jurisdiction's current floodplain management/regulation process for construction of new or substantially improved development within your jurisdiction.
The County's floodplain regulations are contained in the "Pinal County Floodplain Management Ordinance" adopted on April 10, 2019. Regulatory floodplains are mapped on the town's GIS system and any new construction in a regulatory floodplain or along a regulatory flow line (wash or overland flow) requires a Floodplain Use Permit, reviewed and approved by Pinal County Flood Control staff. Developments submitted through the electronic plan review are reviewed by Flood Control staff to determine whether or not all or a portion of the property is within a regulatory floodplain or flow line. Once a development is identified as meeting either of those criteria, the applicant is notified of the need to submit for a Floodplain Use Permit, and the project is reviewed to ensure it complies with the County Ordinance as it relates to the NFIP and the County's participation in the Community Rating System (CRS).
Q2: Describe the status and/or validity of the current floodplain hazard mapping for your jurisdiction.
Updated Countywide Federal Insurance Rate Map (FIRM) Panels became effective on December 4, 2007, with some panels receiving updates in 2014 and 2019. Currently, these maps, in addition to Letters of Map Change, may be used to determine if a particular piece of property is in a 100-year floodplain. In addition, where new studies are underway, the data for which will create a more restrictive floodplain, the County treats that as the best available data and regulates developments to that revised data.
Q3: Describe any community assistance activities (e.g. – help with obtaining Elevation Certificates, flood hazard identification assistance, flood insurance acquisition guidance, public involvement activities, etc.).
The Pinal County Flood Control District routinely engages in outreach as part of the ongoing effort to educate and inform citizens about flooding and flood protection. The County prepares and mails out an annual newsletter to residents within the Special Flood Hazard Area in advance of Arizona's monsoon season. The newsletter provides useful information to residents regarding flood preparedness, County

and Federal regulations, and permitting procedures. The County also prepares mailers/letters to residences in certain parts of Pinal County for targeted outreach and messaging.

In addition, the County provides flood zone determinations and Base Flood Elevation determinations, copies of Elevation Certificates (where available) and guidance on flood insurance requirements.

The County also routinely holds public information meetings for regional studies and flood mitigation projects, inviting residents to provide information or feedback that will enhance the efficacy of the projects.

Q4: Describe identified needs in your floodplain management program. This could include things like updating the floodplain management code/regulation, establishing written review procedures, modifying, or adding flood hazard area mapping, etc.

The Pinal County Flood Control District routinely conducts studies to better identify and understand flooding sources and potential hazards within the County. Where the study results justify it, this can result in map changes to the Special Food Hazard Area or locally determined floodplains. County-wide and regional studies are ongoing, as funding becomes available. These proactive steps help reduce the risk of loss of life and livestock within the flood-prone areas in the County.

In addition, the County updates its Floodplain Management Plan annually, as part of the annual CRS recertification.

5-13: NFIP Assessment Responses for Apache Junction

Q1: Describe your jurisdiction's current floodplain management/regulation process for construction of new or substantially improved development within your jurisdiction.

The City's floodplain regulations are contained in Apache Junction City Code, Volume II Land Development Code, Chapter 5 "Floodplain Management and Stormwater Regulations", Article 5-1: "Floodplain Management", which is from ADWR's Base Model Ordinance. Nearly all the city's regulatory floodplain areas are contained within private properties, and natural washes and manmade channels within Special Flood Hazard Areas are conveyed through these private properties.

City-owned/maintained washes and detention basins are further restricted against development. Any future transfers of such properties will include wording in recorded Warranty Deeds preventing changes in floodplain uses.

The City has a vegetation maintenance/control program, and annually allocates funds to remove non-native, invasive, and channel-obstructing vegetation as part of its "Invasive Plant Management Plan" from selected watercourses and other city-owned property.

Regulatory floodplains/floodways are mapped on the City's GIS system. Private development reviews verify that no infringement occurs within the floodplain (or that infringement is appropriately mitigated within that project per FEMA floodplain development requirements).

When a development is submitted through the Electronic Plan Review to Development Services staff, and all or some portion of the property is in the SFHA, it is tagged for review by the City Floodplain Administrator in addition to standard building safety reviews. Floodplain development requirements for both new construction and substantial improvement to existing or damaged structures are listed during the review process and are required to be met by the owner/developer.

Q2: Describe the status and/or validity of the current floodplain hazard mapping for your jurisdiction.

The effective date of the current Federal Insurance Rate Map (FIRM) Panels is December 4, 2007. Currently, these maps, in addition to Letters of Map Change (LOMC) are used to determine if a particular piece of property lies wholly or partially within a 100-year floodplain.

A citywide FEMA floodplain restudy is underway and tentatively planned to be effective 2023. The purpose of this restudy is to provide current, more accurate floodplain boundary mapping and to determine Base Flood Elevations in existing Zone A floodplains without BFEs.

Until the new floodplain delineations become effective, City staff has been using the draft mapping as "Best Available Data" for floodplain mapping purposes. This is being done with permission from FEMA. Utilizing the draft mapping as Best Available Data will help property owners avoid any unnecessary issues when the new mapping becomes effective.

Q3: Describe any community assistance activities (e.g. – help with obtaining Elevation Certificates, flood hazard identification assistance, flood insurance acquisition guidance, public involvement activities, etc.).

The City is currently partnering with Pinal County Flood Control District for the design and construction of a series of large regional retention basin along Weekes Wash north of Lost Dutchman Boulevard. The purpose of these basins is flood mitigation, sediment management, and transportation risk reductions, with a downstream benefited area of ±2.5 square miles. In conjunction with this effort, the City has also prepared a Notice of Intention with AZDEMA for applying for Hazard Mitigation Grant Program (HMGP) 4524 funds for assistance with this regional detention facility.

City staff works with developers who are proposing to develop in floodplain impacted properties. This effort includes education to owners and developers to assist them in developing floodplain impacted parcels.

As part of the FEMA floodplain restudy currently underway, public meetings will be planned. Not only will the new floodplain mapping be introduced, but this will also be an opportunity to educate the public on flood hazard areas, and rules and regulations for development activities within the flood hazard areas. This floodplain restudy will also develop a strategies and timelines to notify property owners affected by the new FIRM mapping (i.e., properties that are being added to the 100-year floodplain, and properties that will no longer be in the 100-year floodplain).

Q4: Describe identified needs in your floodplain management program. This could include things like updating the floodplain management code/regulation, establishing written review procedures, modifying, or adding flood hazard area mapping, etc.

The City is in need of updating its floodplain ordinance. An upcoming CAV conducted by ADWR in the first quarter of 2022 will identify areas of the current ordinance needing updates due to changes in Federal floodplain policies.

City staff has also recently been transitioning to new permitting software for development design review and construction. This transition has included procedures to track floodplain reviews.

The City also has a need to update its "Stormwater Master Plan - 2002" which identifies storm water flows at multiple concentration points throughout the city. This plan also identifies larger flood mitigating and stormwater control projects that can be further pursued as funding sources are identified.

In 2016 the City completed a FEMA Flood Risk Report that provides non-regulatory information to help local officials, floodplain managers, planners, emergency managers, and others better understand their flood risk, take steps to mitigate those risks, and communicate those risks to citizens and local businesses. The 2016 FRR was prepared with the involvement of a variety of citizens, city staff,

councilmembers, commission members, Pinal County staff, ADWR staff, and FEMA and its consulting staff. This report can also be used to further identify potential flood mitigating projects to reduce the risk of loss of life and property within the city.

Table 5-14: NFIP Assessment Responses for Casa Grande
Q1: Describe your jurisdiction's current floodplain management/regulation process for construction of new or substantially improved development within your jurisdiction.
The city's floodplain regulations are contained in City Code Chapter 15.40 "Flood Damage Prevention", The special flood hazard areas regulated by this chapter have been identified by the Federal Emergency Management Agency (FEMA) in a scientific and engineering report entitled, "The Flood Insurance Study for the Pinal County, Arizona, and Incorporated Areas," dated June 16, 2014, with accompanying flood insurance rate maps, dated December 4, 2007, and all subsequent amendments and/or revisions thereto, which is adopted by reference and declared to be a part of this chapter. The flood insurance study is on file at the city development center office, 510 East Florence Boulevard, Casa Grande, Arizona. When a new development is submitted within the SFHA the floodplain administrator is authorized to delegate authority to other officials in the city to take such actions or grant or deny permits in accordance with this ordinance.
Q2: Describe the status and/or validity of the current floodplain hazard mapping for your jurisdiction.
The special flood hazard areas have been identified by the Federal Emergency Management Agency (FEMA) in a scientific and engineering report entitled, "The Flood Insurance Study for the Pinal County, Arizona, and Incorporated Areas," dated June 16, 2014, with accompanying flood insurance rate maps, dated December 4, 2007. The maps are up to date and valid within Casa Grande's GIS system.
Q3: Describe any community assistance activities (e.g. – help with obtaining Elevation Certificates, flood hazard identification assistance, flood insurance acquisition guidance, public involvement activities, etc.).
City staff provides information to property owners regarding flood zone determination, floodproofing method, SFHA development regulation and the NFIP requirements. In addition, in cases citizen have site -specific issues concerning neighbor's activities which change drainage patterns affecting their property, city staff evaluates the situation and determines if any city codes have been violated or provide advice and recommendations to make their property less prone to flooding, without impacting neighboring properties.
Q4: Describe identified needs in your floodplain management program. This could include things like updating the floodplain management code/regulation, establishing written review procedures, modifying, or adding flood hazard area mapping, etc.
City needs to re-study the flood zone 'A' in our floodplain management program to provide a base flood elevation (BFE). Concerning the floodplain management code/regulation, our Special Flood Hazard Area Regulations underwent an extensive revision in 2019. We incorporated all of the comments we received from ADWR staff into final version of the ordinance that was adopted by our City Council.

Table 5-15: NFIP Assessment Responses for Coolidge
Q1: Describe your jurisdiction's current floodplain management/regulation process for construction of new or substantially improved development within your jurisdiction.
Pinal County is the City's floodplain Administrator. Floodplain regulations are contained in the "Pinal County Floodplain Management Ordinance" adopted on April 10, 2019. Regulatory floodplains are mapped on the County's GIS system and any new construction in a regulatory floodplain or along a regulatory flow line (wash or overland flow) requires a Floodplain Use Permit, reviewed and approved

by the Pinal County Flood Control District.

Developments submitted through the electronic plan review are reviewed to determine whether or not all or a portion of the property is within a regulatory floodplain or flow line. Once a development is identified as meeting either of those criteria, the applicant is notified of the need to submit for a Floodplain Use Permit, and the project is reviewed to ensure it complies with the Floodplain Ordinance as it relates to the NFIP and the City's participation in the Community Rating System (CRS).

Q2: Describe the status and/or validity of the current floodplain hazard mapping for your jurisdiction.

Updated Countywide Federal Insurance Rate Map (FIRM) Panels became effective on December 4, 2007, with some panels receiving updates in 2014 and 2019. Currently, these maps, in addition to Letters of Map Change, may be used to determine if a particular piece of property is in a 100-year floodplain. In addition, where new studies are underway, the data for which will create a more restrictive floodplain, the County treats that as the best available data and regulates developments to that revised data.

Q3: Describe any community assistance activities (e.g. – help with obtaining Elevation Certificates, flood hazard identification assistance, flood insurance acquisition guidance, public involvement activities, etc.).

The City of Coolidge coordinates with the Pinal County Flood Control District to routinely engage in outreach as part of the ongoing effort to educate and inform citizens about flooding and flood protection. The County prepares and mails out an annual newsletter to residents within the Special Flood Hazard Area in advance of Arizona's monsoon season. The newsletter provides useful information to residents regarding flood preparedness, County and Federal regulations, and permitting procedures. The County also prepares mailers/letters to residences in certain parts of Pinal County for targeted outreach and messaging.

In addition, the County provides flood zone determinations and Base Flood Elevation determinations, copies of Elevation Certificates (where available) and guidance on flood insurance requirements.

The County also routinely holds public information meetings for regional studies and flood mitigation projects, inviting residents to provide information or feedback that will enhance the efficacy of the projects.

Q4: Describe identified needs in your floodplain management program. This could include things like updating the floodplain management code/regulation, establishing written review procedures, modifying, or adding flood hazard area mapping, etc.

The City of Coolidge coordinates with the Pinal County Flood Control District who routinely conducts studies to better identify and understand flooding sources and potential hazards within the County. Where the study results justify it, this can result in map changes to the Special Food Hazard Area or locally determined floodplains. County-wide and regional studies are ongoing, as funding becomes available. These proactive steps help reduce the risk of loss of life and livestock within the flood-prone areas in the County.

In addition, the County updates its Floodplain Management Plan annually, as part of the annual CRS recertification.

Table 5-16: NFIP Assessment Responses for Eloy

Q1: Describe your jurisdiction's current floodplain management/regulation process for construction of new or substantially improved development within your jurisdiction.

Pinal County is the City of Eloy's floodplain Administrator. Floodplain regulations are contained in the "Pinal County Floodplain Management Ordinance" adopted on April 10, 2019. Regulatory floodplains are mapped on the County's GIS system and any new construction in a regulatory floodplain or along a regulatory flow line (wash or overland flow) requires a Floodplain Use Permit, reviewed and approved by the Pinal County Flood Control District.

Developments submitted through the electronic plan review are reviewed to determine whether or not all or a portion of the property is within a regulatory floodplain or flow line. Once a development is identified as meeting either of those criteria, the applicant is notified of the need to submit for a Floodplain Use Permit, and the project is reviewed to ensure it complies with the Floodplain Ordinance as it relates to the NFIP and the City's participation in the Community Rating System (CRS).

Q2: Describe the status and/or validity of the current floodplain hazard mapping for your jurisdiction.

Updated Countywide Federal Insurance Rate Map (FIRM) Panels became effective on December 4, 2007, with some panels receiving updates in 2014 and 2019. Currently, these maps, in addition to Letters of Map Change, may be used to determine if a particular piece of property is in a 100-year floodplain. In addition, where new studies are underway, the data for which will create a more restrictive floodplain, the County treats that as the best available data and regulates developments to that revised data.

Q3: Describe any community assistance activities (e.g. – help with obtaining Elevation Certificates, flood hazard identification assistance, flood insurance acquisition guidance, public involvement activities, etc.).

The City of Eloy coordinates with the Pinal County Flood Control District to routinely engage in outreach as part of the ongoing effort to educate and inform citizens about flooding and flood protection. The County prepares and mails out an annual newsletter to residents within the Special Flood Hazard Area in advance of Arizona's monsoon season. The newsletter provides useful information to residents regarding flood preparedness, County and Federal regulations, and permitting procedures. The County also prepares mailers/letters to residences in certain parts of Pinal County for targeted outreach and messaging.

In addition, the County provides flood zone determinations and Base Flood Elevation determinations, copies of Elevation Certificates (where available) and guidance on flood insurance requirements.

The County also routinely holds public information meetings for regional studies and flood mitigation projects, inviting residents to provide information or feedback that will enhance the efficacy of the projects.

Q4: Describe identified needs in your floodplain management program. This could include things like updating the floodplain management code/regulation, establishing written review procedures, modifying, or adding flood hazard area mapping, etc.

The City of Eloy coordinates with the Pinal County Flood Control District who routinely conducts studies to better identify and understand flooding sources and potential hazards within the County. Where the study results justify it, this can result in map changes to the Special Food Hazard Area or locally determined floodplains. County-wide and regional studies are ongoing, as funding becomes available. These proactive steps help reduce the risk of loss of life and livestock within the flood-prone areas in the County.

In addition, the County updates its Floodplain Management Plan annually, as part of the annual CRS recertification.

Table 5-17: NFIP Assessment Responses for Unincorporated Florence
Q1: Describe your jurisdiction's current floodplain management/regulation process for construction of new or substantially improved development within your jurisdiction.
Any new construction in a regulatory floodplain or along a regulatory flow line (wash or overland flow) requires a Floodplain Use Permit, reviewed and approved by the Town of Florence Engineering staff. Developments submitted through the electronic plan review are reviewed by Engineering staff to determine whether or not all or a portion of the property is within a regulatory floodplain or flow line. Once a development is identified as meeting either of those criteria, the applicant is notified of the need to submit for a Floodplain Use Permit, and the project is reviewed to ensure it complies with the Town Ordinance as it relates to the NFIP and the Town's participation in the Community Rating System (CRS).
Q2: Describe the status and/or validity of the current floodplain hazard mapping for your jurisdiction.
Updated Countywide Federal Insurance Rate Map (FIRM) Panels became effective on December 4, 2007, with some panels receiving updates in 2014 and 2019. Currently, these maps, in addition to Letters of Map Change, may be used to determine if a particular piece of property is in a 100-year floodplain. In addition, where new studies are underway, the data for which will create a more restrictive floodplain, the County treats that as the best available data and regulates developments to that revised data.
Q3: Describe any community assistance activities (e.g. – help with obtaining Elevation Certificates, flood hazard identification assistance, flood insurance acquisition guidance, public involvement activities, etc.).
The Town of Florence coordinates with the Pinal County Flood Control District to routinely engage in outreach as part of the ongoing effort to educate and inform citizens about flooding and flood protection. The County prepares and mails out an annual newsletter to residents within the Special Flood Hazard Area in advance of Arizona's monsoon season. The newsletter provides useful information to residents regarding flood preparedness, County and Federal regulations, and permitting procedures. The County also prepares mailers/letters to residences in certain parts of Pinal County for targeted outreach and messaging. In addition, the County provides flood zone determinations and Base Flood Elevation determinations, copies of Elevation Certificates (where available) and guidance on flood insurance requirements. The County also routinely holds public information meetings for regional studies and flood mitigation projects, inviting residents to provide information or feedback that will enhance the efficacy of the projects.
Q4: Describe identified needs in your floodplain management program. This could include things like updating the floodplain management code/regulation, establishing written review procedures, modifying, or adding flood hazard area mapping, etc.
The Town of Florence coordinates with the Pinal County Flood Control District who routinely conducts studies to better identify and understand flooding sources and potential hazards within the County. Where the study results justify it, this can result in map changes to the Special Food Hazard Area or locally determined floodplains. County-wide and regional studies are ongoing, as funding becomes available. These proactive steps help reduce the risk of loss of life and livestock within the flood-prone areas in the County. In addition, the County updates its Floodplain Management Plan annually, as part of the annual CRS recertification.

Table 5-18: NFIP Assessment Responses for Kearny
Q1: Describe your jurisdiction's current floodplain management/regulation process for construction of new or substantially improved development within your jurisdiction.
The town's floodplain regulations are contained in Town Code Chapter 17 "Flood Damage Prevention", Town Ordinance 16-203 and the Kearny Multi-Hazard Mitigation Plan. Development in the Town of Kearny has remained fairly static over the past twenty years and is predominantly tied to the economic health of the copper mining industry. The Town experiences slight increases in tourism due to the popularity of Off Highway Vehicles (OHV) and the abundant trails and riding opportunities that surround the area. The Town also has an 11-acre lake with 12 campsites. There is also the Mescal Mountains OHV area which also has 12 campsites. According to the Town's General Plan, four areas have been identified for future growth and management. Table 4-16 summarizes each growth area and the potential challenges posed by the hazards identified in this plan.
Q2: Describe the status and/or validity of the current floodplain hazard mapping for your jurisdiction.
The depiction and severity of flood hazard for Kearny and Pinal County is primarily based on the 100-year floodplains delineated on Federal Emergency Management Agency (FEMA) Flood Insurance Rate Maps (FIRM). Two designations of flood hazard are used, with "high" hazard areas being any "A" zone and "medium" flood hazard being either a "B" or "Shaded X" zones. All "A" zones (i.e. – A, A1- 99, AE, AH, AO, etc.) represent areas with a one percent (1%) probability of being flooded at a depth of one-foot or greater in any given year. All "B" or "Shaded X" zones represent areas with a 0.2 percent (0.2%) probability of being flooded at a depth of one foot or greater in any given year. These two storms are often referred to as the 100-year and 500-year storm, respectively. Figure 4-1 presents a map of Kearny with the FEMA delineated 100-year and 500-year flood limits shown. Other flood hazard areas may exist but have not been officially identified as of the date of this plan.
Q3: Describe any community assistance activities (e.g. – help with obtaining Elevation Certificates, flood hazard identification assistance, flood insurance acquisition guidance, public involvement activities, etc.).
Kearny does not, currently, have any community assistance activities.
Q4: Describe identified needs in your floodplain management program. This could include things like updating the floodplain management code/regulation, establishing written review procedures, modifying, or adding flood hazard area mapping, etc.
Kearny needs to identify who manages its flood warning system which has not been functional for over 20 years. The Town should probably review its flood management plan and obtain updated flood mapping charts.

Table 5-19: NFIP Assessment Responses for Mammoth
Q1: Describe your jurisdiction's current floodplain management/regulation process for construction of new or substantially improved development within your jurisdiction.
Pinal County is the Town of Mammoth's floodplain Administrator. Floodplain regulations are contained in the "Pinal County Floodplain Management Ordinance" adopted on April 10, 2019. Regulatory floodplains are mapped on the County's GIS system and any new construction in a regulatory floodplain or along a regulatory flow line (wash or overland flow) requires a Floodplain Use Permit, reviewed and approved by the Pinal County Flood Control District. Developments submitted through the electronic plan review are reviewed to determine whether or not all or a portion of the property is within a regulatory floodplain or flow line. Once a development is

identified as meeting either of those criteria, the applicant is notified of the need to submit for a Floodplain Use Permit, and the project is reviewed to ensure it complies with the Floodplain Ordinance as it relates to the NFIP and the Town's participation in the Community Rating System (CRS).
Q2: Describe the status and/or validity of the current floodplain hazard mapping for your jurisdiction.
Updated Countywide Federal Insurance Rate Map (FIRM) Panels became effective on December 4, 2007, with some panels receiving updates in 2014 and 2019. Currently, these maps, in addition to Letters of Map Change, may be used to determine if a particular piece of property is in a 100-year floodplain. In addition, where new studies are underway, the data for which will create a more restrictive floodplain, the County treats that as the best available data and regulates developments to that revised data.
Q3: Describe any community assistance activities (e.g. – help with obtaining Elevation Certificates, flood hazard identification assistance, flood insurance acquisition guidance, public involvement activities, etc.).
The Town of Mammoth coordinates with the Pinal County Flood Control District to routinely engage in outreach as part of the ongoing effort to educate and inform citizens about flooding and flood protection. The County prepares and mails out an annual newsletter to residents within the Special Flood Hazard Area in advance of Arizona's monsoon season. The newsletter provides useful information to residents regarding flood preparedness, County, and Federal regulations, and permitting procedures. The County also prepares mailers/letters to residences in certain parts of Pinal County for targeted outreach and messaging. In addition, the County provides flood zone determinations and Base Flood Elevation determinations, copies of Elevation Certificates (where available) and guidance on flood insurance requirements. The County also routinely holds public information meetings for regional studies and flood mitigation projects, inviting residents to provide information or feedback that will enhance the efficacy of the projects.
Q4: Describe identified needs in your floodplain management program. This could include things like updating the floodplain management code/regulation, establishing written review procedures, modifying, or adding flood hazard area mapping, etc.
The Town of Mammoth coordinates with the Pinal County Flood Control District who routinely conducts studies to better identify and understand flooding sources and potential hazards within the County. Where the study results justify it, this can result in map changes to the Special Food Hazard Area or locally determined floodplains. County-wide and regional studies are ongoing, as funding becomes available. These proactive steps help reduce the risk of loss of life and livestock within the flood-prone areas in the County. In addition, the County updates its Floodplain Management Plan annually, as part of the annual CRS recertification.

Table 5-20: NFIP Assessment Responses for Maricopa
Q1: Describe your jurisdiction's current floodplain management/regulation process for construction of new or substantially improved development within your jurisdiction.
Applications are submitted digitally through the City of Maricopa. Applicants that need to comply with regulations when building on a special flood hazard area are sent to Pinal County Floodplain Administrator. Documentation reviewed and approved by the County is reviewed, approved and stored by the City of Maricopa prior approval of permits.
Q2: Describe the status and/or validity of the current floodplain hazard mapping for your

jurisdiction.
The City's FIRMS are up to date with latest FEMA's approved LOMRs.
Q3: Describe any community assistance activities (e.g. – help with obtaining Elevation Certificates, flood hazard identification assistance, flood insurance acquisition guidance, public involvement activities, etc.).
The City notifies by mail and local newspapers when changes to their flood zone occurs. All buildings that are in a special flood area require elevation certificate. A Certificate of Occupancy is only provided after the elevation certificate is available and approved by floodplain administrator. The city also provides information by phone/email or webpage about the latest FIRM to potential land buyers.
Q4: Describe identified needs in your floodplain management program. This could include things like updating the floodplain management code/regulation, establishing written review procedures, modifying, or adding flood hazard area mapping, etc.
There is a need for a floodplain manager that works for the City of Maricopa in addition to current floodplain manager (Pinal County) that specializes in providing information to residents and developers.

Table 5-21: NFIP Assessment Responses for Superior
Q1: Describe your jurisdiction's current floodplain management/regulation process for construction of new or substantially improved development within your jurisdiction.
Pinal County Floodplain regulations apply to the Town of Superior. The Town doesn't have its own department. Also, some towns' floodplain regulations are contained in Town Code Article 12-5 and zoning ordinances. Nearly all the Town's regulatory floodplain areas are contained within town-owned or residential properties and/or are within a platted (or granted) Drainage Easement on other properties. Town-owned washes are further restricted against development by the flood zone's Pinal County Flood management regulations. The Town has an extensive vegetation maintenance/control program and annually allocates funds to remove non-native, invasive and channel-obstructing vegetation in its "Queen Creek Trail program." Regulatory floodplains are mapped on the Town's GIS system. Private development reviews verify that no infringement occurs within the floodplain (or that infringement is appropriately mitigated within that project).
Q2: Describe the status and/or validity of the current floodplain hazard mapping for your jurisdiction.
Revised to reflect LOMR, the FEMA map was provided to the Town in 2021 and became effective by August 05, 2021. The map helped to revise the queen creek flood zone boundaries. The provided map eliminated some of the previous flood zones; this helps residents develop areas that are no longer in the flood zone.
Q3: Describe any community assistance activities (e.g. – help with obtaining Elevation Certificates, flood hazard identification assistance, flood insurance acquisition guidance, public involvement activities, etc.).
Citizen groups focused on emergency preparedness, environmental protection program. The Town shares the information with the public through community websites with Fire and Police. National insurance flyers, any data provided to citizens. The engineering department shows and discusses the latest flood mapping website with property owners to determine the flood elevations for their properties. The Pinal County Enforcement Section could teach the Town how to better enforce and regulate the existing ordinances. Presently working on how we can provide elevation certificate. Reflecting back on the last 5 years, there no meetings to notify citizens of the FEMA map, but we are currently working on a timeline to establish these meetings.
Q4: Describe identified needs in your floodplain management program. This could include things like updating the floodplain management code/regulation, establishing written review

procedures, modifying, or adding flood hazard area mapping, etc.
The Town needs to update the floodplain management code/regulation. The Town needs an Area Drainage Master Studies (ADMS), primarily done by the Flood Control District of Pinal County, areas subject to development activities identified with current or future flood hazard zones. These will help reduce the risk of loss of life and livestock within the flood-prone areas in the Town. The floodplain management code can reduce the flood zone area. Moreover, the map has to be reader-friendly; we want to make sure readers understand the map.

5.3 Mitigation Measures

Mitigation measures are activities that when implemented, will have the effect of reducing the community's exposure and risk to the particular hazard or hazards being mitigated.

The process for defining the list of mitigation measures for the Plan was accomplished by performing an assessment of the measures specified in the 2016 Plan. A new list of measures for the Plan was developed by combining the carry forward results from the assessment with new measures. Details of the process and the results are summarized in the following sections.

Previous Mitigation Measures Assessment

The measures from the 2016 Plan were reviewed and assessed by their respective jurisdiction. Measures with a disposition classification of "Keep" or "Revise" were carried forward to become part of the measure list for this Plan update. All measures identified for deletion were removed and are not included in this Plan. The results of the assessment of the 2016 Plan's actions and projects can be found in this Plan's Appendix.

Current Mitigation Measures

Each jurisdiction developed/identified new measures using the goals and objectives, results of the vulnerability analysis and capability assessment, and the planning team's institutional knowledge of hazard mitigation needs in the community. For each measure, the following elements were identified:

- **Description**
- **Hazard(s) Mitigated**
- **Estimated Cost**
- **Anticipated Completion Date**
- **Primary Agency for Implementation**
- **Potential Funding Source(s)**
- **Priority Ranking** – each measure was assigned a priority ranking of either "High", "Medium", or "Low". The assignments were subjectively made using a simple process that assessed how well the measure satisfied the following considerations:
    - A favorable benefit versus cost evaluation, wherein the perceived direct and indirect benefits outweighed the project cost.
    - A direct beneficial impact on the ability to protect life and/or property from natural hazards.
    - A mitigation solution with a long-term effectiveness

Table 5-1: Mitigation Strategy for Unincorporated Pinal County

Priority Ranking	Description	Hazard(s) Mitigated	Estimated Cost	Anticipated Completion Date	Project Lead	Potential Funding Source(s)
Low	Research landscaping alternatives for use in reducing wind velocity in high-risk areas of the county (e.g. tree lines)	Severe Wind	Staff Time	2027	Pinal County Community Development	Pinal County General Fund
High	McClellan Wash Watercourse Master Plan. Multi-phase planning, design, and construction project to address regional flooding	Flood	$50M	Ongoing (multi-phase effort).	PCFCD	Grants and Improvement Districts
Medium	Russell Road Industrial Area. Multi-phase planning, design, and construction to address flooding in the area of Russell Road, Peters & Nall, and Maricopa-Casa Grande Highway	Flood	$2M	FY27	PCFCD	Grants and Flood Control District Levy
Medium	Roberts/Thompson Channel. Flood control channel along Roberts Road in Santan Valley	Flood	$2.5M	FY24	PCFCD	Flood Control District Levy
High	Welton Wash Flood Control Improvements. Improvements to Welton Wash in Dudleyville, to mitigate regional flooding concerns	Flood	$4.5M	FY25	PCFCD	Grants and Flood Control District Levy
High	Dirtwater Springs Basin. Flood control basin in Apache Junction to mitigate regional flooding	Flood	$5M	FY26	PCFCD	Local agency contribution and Flood Control District Levy
Medium	Val Vista Channel Rehabilitation. Improvement and rehabilitation of the channel along Val Vista Road from Trekkel Rd to Pinal Ave	Flood	$1M	FY27	PCFCD	Flood Control District Levy
Medium	Hidden Valley Drainage Channel Assessment. Identification and solutions to existing flood issues in Hidden Valley area	Flood	$1.5M	Ongoing	PCFCD	Flood Control District Levy
High	San Tan Valley Area Drainage Master Plan. Development of area-wide master plan	Flood	$500,000	FY23	PCFCD	Flood Control District Levy

Table 5-1: Mitigation Strategy for Unincorporated Pinal County

Priority Ranking	Description	Hazard(s) Mitigated	Estimated Cost	Anticipated Completion Date	Project Lead	Potential Funding Source(s)
High	Middle Magma Channel Watershed Plan. Multi-phase planning, design, and construction project to address regional flooding	Flood	$10M	FY28	PCFCD	Grants with contribution from Flood Control District Levy
Medium	Mammoth Street Drainage Mitigation. Multi-phase design, and construction project to address regional flooding in Mammoth	Flood	$1M	FY28	PCFCD	Flood Control District Levy
Medium	Houston Avenue Channel. Design and construction of a drainage channel parallel to Houston Ave to tie in to the Meridian Road channel.	Flood	$1M	FY25	PCFCD	Flood Control District Levy
High	Empire at Pegasus Channel. Channel connecting the discharge from the future San Tan Groves Channel to the Sonoqui Channel.	Flood	$1.25M	FY26	PCFCD	Flood Control District Levy
High	Arizona City Flood Mitigation. Localized solutions for flood prone areas in Arizona City.	Flood	$1.5M	FY26	PCFCD	Flood Control District Levy
High	Eloy Industrial Park Drainage. Partnership with the City of Eloy to mitigate flooding in the City's industrial area	Flood	$250,000	Ongoing	PCFCD	Local agency contribution and Flood Control District Levy
High	Combs Road Channel. Partnership with Queen Creek to construct a structure to convey flows from Combs Rd to the Meridian Road Channel	Flood	$1M	FY24 (study)	PCFCD	Local agency contribution and Flood Control District Levy
High	San Tan West Flood Mitigation. Project to mitigate flooding in western San Tan Valley utilizing the FCDMC basin as an outfall	Flood	$700,000	FY27	PCFCD	Flood Control District Levy

Table 5-1: Mitigation Strategy for Unincorporated Pinal County

Priority Ranking	Description	Hazard(s) Mitigated	Estimated Cost	Anticipated Completion Date	Project Lead	Potential Funding Source(s)
Medium	Hidden Valley Flood Mitigation. Multi-phase project to construct infrastructure improvements to address flood prone areas in Hidden Valley	Flood	$500,000	Ongoing (multi-phase effort)	PCFCD	Flood Control District Levy
Medium	Bogart Wash Channel. Construction of a channel along the Bogart Wash alignment to reduce flooding risk to the adjacent community	Flood	$1M	FY29	PCFCD	Flood Control District Levy
High	Various Studies. Drainage assessments, flood risk assessments, and other studies to identify flood prone areas and provide guidance for mitigation	Flood	undetermined	Ongoing	PCFCD	Flood Control District Levy
High	Camino Alto Detention Basin. Design and construction of a retention basin in the area of Peralta Estates subdivision in Apache Junction	Flood	$500,000	FY27	PCFCD	Flood Control District Levy
High	Amarillo Valley Road Channel. Design and construction of a channel along Amarillo Valley Road to convey flows into the Amarillo Valley Road detention basin	Flood	$1M	FY29	PCFCD	Flood Control District Levy
Med	Green Road Channel. Design and construction of a channel along Green Road to convey flows into the Green Road detention basin	Flood	$1M	FY29	PCFCD	Flood Control District Levy
High	UPRR/Kinder Morgan at Eloy School Flood Mitigation. Study to identify flood source at historic school in Eloy	Flood	$75,000	FY26	PCFCD	Flood Control District Levy
High	Weeke's Wash Flood Remediation. Cooperative project with the City of Apache Junction for a regional solution to mitigate flooding along Weeke's Wash	Flood	$150,000 (study)	FY27	PCFCD	Local agency contribution and Flood Control District Levy

Table 5-1: Mitigation Strategy for Unincorporated Pinal County

Priority Ranking	Description	Hazard(s) Mitigated	Estimated Cost	Anticipated Completion Date	Project Lead	Potential Funding Source(s)
Medium	Develop IGAs with County dependent communities to define and clarify roles in implementing the NFIP program and managing the floodplains	Flood	$15,000+ Staff Time	Ongoing	PCFCD	Flood Control District Levy
High	Expand the Firewise program to other at-risk communities	Wildfires	$30,000+ Staff Time	Ongoing	PCOEM	Grant Funding
Medium	Conduct quarterly flood control Meetings with all districts, Indian Tribes, and Cities	Flood	Staff Time	2027	PCFCD	Flood Control District
Medium	All weather access analysis. Review County Transportation network and determine areas in need of stream crossing upgrades to improve public access	Flood	Staff Time	Ongoing	Pinal County Transportation Planner	Flood Control District Levy / HURF
Medium	Santa Cruz River Watercourse Master Plan. Develop a plan to design and construct the Eloy Levee identified in the original Watercourse Master Plan	Flood	$1.5M + Staff Time	FY28	USACE/ Pinal County Flood Control District	Federal Funding and Flood Control District Levy
Medium	Emergency Shelters/ Redundant Power. Develop Shelter Operations Plan along with appropriate contracts and agreements. Plan for ensuring shelter sites have permanent or access to back-up power.	Severe Wind	$30,000	2026	PCOEM	General Fund
Medium	ALERT gauges. Includes the maintenance of the existing ALERT system as well as yearly software and hardware upgrades.	Flood	$200,000 + Staff Time	2027	PCFCD	Flood Control District Levy
High	Update the zoning and building codes at the next revision cycle to reduce the effects of drought, flood, severe wind. And other hazards on new buildings and infrastructure.	Drought, Flood, Severe Wind	$20,000 / Staff Time	2024	Pinal County Community Development	Pinal County General Fund

Table 5-1: Mitigation Strategy for Unincorporated Pinal County

Priority Ranking	Description	Hazard(s) Mitigated	Estimated Cost	Anticipated Completion Date	Project Lead	Potential Funding Source(s)
High	Adopt a water conservation ordinance	Drought	$20,000 / Staff Time	2023	Pinal County Community Development	Pinal County General Fund
Medium	Coordinate efforts with public utilities to educate citizens regarding the dangers of extreme heat and the steps they can take to protect themselves when extreme temperatures occur, specifically in the summer.	Extreme Heat	Staff Time	2023	Pinal County Office of Emergency Management	Pinal County General Fund

Table 5-2: Mitigation Strategy for Apache Junction

Priority Ranking	Description	Hazard(s) Mitigated	Estimated Cost	Anticipated Completion Date	Project Lead	Potential Funding Source(s)
High	Optimize ground water recharge capability and continue to develop implementation strategies and standards for future operations.	Drought	$10,000 (staff time)	2025	AJWD, SMCFD, and Public Works Department	Local
Medium	Update City's Invasive Plant Management Plan	Wildfire	$60,000	2026	AJOEM	Local
High	Build a box culvert and related roadway improvements on 16th Avenue across Palm wash to mitigate flooding of the street and surrounding properties.	Flood	$750K	2025	Public Works	Grants
Medium	Implement Stormwater Master Plan Project No. 4 to design and construct a storm drain in Superstition Blvd from Meridian Dr. to Gold Dr. and a detention basin at Valley Dr. and Superstition Blvd.	Flood	$3.6M	2025	Public Works	Local & Grants

Table 5-2: Mitigation Strategy for Apache Junction

Priority Ranking	Description	Hazard(s) Mitigated	Estimated Cost	Anticipated Completion Date	Project Lead	Potential Funding Source(s)
Medium	Implement Stormwater Master Plan Project No. 4a to design and construct the Delaware Dr. and Pinal St. storm drains and a detention basin at Valley Dr. and Superstition Blvd.	Flood	$2.7M	2021	Public Works	Grants
High	Design and construct a detention and sedimentation basin on Weekes Wash north of Lost Dutchman Blvd. to reduce the downstream impact of sedimentation and attenuate peak discharges.	Flood	$9M	2026	Public Works, and Pinal County Flood Control District	Local, Pinal County
Medium	Update 2002 Stormwater Master Plan	Flood	$100K	2024	Public Works	Grants
High	Update Emergency Response and Recovery Plan	All Hazards	$20,000 (Staff time)	2023	Public Works and AJ Office of Emergency Management	HURF, Local
Medium	Emergency back-up power supply for select city buildings.	Severe Wind	$400K	2024	Public Works	General Fund

Table 5-3: Mitigation Strategy for Casa Grande

Priority Ranking	Description	Hazard(s) Mitigated	Estimated Cost	Anticipated Completion Date	Project Lead	Potential Funding Source(s)
High	Maintain N Branch Santa Cruz Wash drainage structures, and corridor from sediment build up and vegetation overgrowth.	Flood	$35,000	As needed basis	Public Works	General Fund/HURF
Medium	Enforce City Code regarding the drainage of basins within 36 hours.	Flood	$40,000	FY23	PW/Engineering	General Fund
High	Continue to enforce zoning and building codes through current site plan, subdivision, and building permit review processes to reduce the effects of drought, flood, thunderstorm/high wind, and other hazards on new buildings and infrastructure.	Flood, Severe Wind, Drought	Time devoted by staff	On Going	Planning & Development Dept	General Fund
Medium	Have new developers dedicate portions of the Santa Cruz Wash for open space.	Flood	$20,000	As Development occurs	Planning & Development Dept	General Fund/Developer Donation
Low	Acquire the Floodplain Certificates on all existing structures in the SFHA that have not been documented yet.	Flood	No cost to Municipality	FY 25	Planning & Development Dept	General Fund
Medium	Create water conservation effort "Save It" to reduce per capita water use in Casa Grande by 15% by year 2050	Drought	Time devoted by staff/Potential savings in the long run	2050	Planning and Development/City Manager	General Fund
Medium	Water Conservation Education and Awareness, publications, media outreach.	Drought	$50,000	On Going	Planning and Development/City Manager	General Fund
Medium	Establish and sign a truck route for hazardous materials to avoid residential areas.	HazMat	$35,000	FY25	Fire Dept	General Fund

Table 5-3: Mitigation Strategy for Casa Grande

Priority Ranking	Description	Hazard(s) Mitigated	Estimated Cost	Anticipated Completion Date	Project Lead	Potential Funding Source(s)
Medium	Develop a master plan to create and utilize open space along the Santa Cruz Wash. By preserving the channel as open space, we can reduce exposure from flooding.	Flood	$150,000	Ongoing	Parks & Recreation Dept	Development Impact Fees
High	Coordinate efforts with public utilities to educate citizens regarding the dangers of extreme heat and the steps they can take to protect themselves when extreme temperatures occur, specifically in the summer.	Extreme Heat	Staff Time	2023	Fire Department	Grants, General Fund

Table 5-4: Mitigation Strategy for Coolidge

Priority Ranking	Description	Hazard(s) Mitigated	Estimated Cost	Anticipated Completion Date	Project Lead	Potential Funding Source(s)
Medium	Low Water-Use Fixture Requirements - Continue to require the use and installation of low water-use fixtures in new residential and commercial developments.	Drought	Staff Time	Ongoing	Growth Management/Building Safety	General Fund
Low	Xeriscape Landscaping Recommendations - Continue to encourage the use of low water-use plants and xeriscape.	Drought	Staff Time	On-going	Growth Management/ Building Safety	General Fund
Medium	Thunderstorm Public Education Campaign - Require tie down/anchors for new manufactured homes, accessory buildings, carport awnings, and perimeter fences to mitigate damages due to high winds/microbursts.	Severe Wind	$5000	Ongoing	Growth Management, Building Safety, Fire, State of AZ	Grants, General Fund, Donations
Medium	Thunderstorm Public Education Campaign - Conduct a public awareness campaign to educate citizens about the hazards of high winds associated with thunderstorms.	Severe Wind	$5000	Annual	Growth Management, Building Safety, Fire, State of AZ	Grants, General Fund, Donations

Table 5-4: Mitigation Strategy for Coolidge

Priority Ranking	Description	Hazard(s) Mitigated	Estimated Cost	Anticipated Completion Date	Project Lead	Potential Funding Source(s)
Medium	Hazard Mitigation Awareness - Develop public service announcements for media releases to educate citizens about drought, flooding, thunderstorms/high winds, and other natural hazards	All Hazards	Staff Time	Ongoing	State of AZ, Pinal Co, Administration	Grants, General Fund, Donations
Medium	Update/Revise Dam Failure Inundation Mapping - Contact and coordinate with the Arizona Department of Water Resources, the San Carlos Irrigation Project, and the San Carlos Apache Tribe to obtain updated inundation mapping for Coolidge Dam	Dam Failure	Staff Time	Ongoing	ADWR, SCIP, Pinal Co Flood Control	Individual Agencies
High	Enforcement of Zoning and Building Code Ordinance - Continue To enforce zoning and building codes through current site plan, subdivision, and building permit review process to reduce the effects of drought, flood, thunderstorm/high wind, and other hazards on new buildings and infrastructure	All Hazards	$20,000	Ongoing	Growth Management Building Safety, Planning	General Fund, Permit Fees, Development Fees
High	Mutual aid/IGA's - Develop agreements with adjoining cities, tribes, and Pinal County for mitigation of hazards.	All Hazards	Staff Time	Ongoing	Administration, Police, Fire	General Fund
High	Coordinate efforts with public utilities to educate citizens regarding the dangers of extreme heat and the steps they can take to protect themselves when extreme temperatures occur, specifically in the summer.	Extreme Heat	Staff Time	Ongoing	Fire Department	Grants, General Fund

Table 5-5: Mitigation Strategy for Eloy

Priority Ranking	Description	Hazard(s) Mitigated	Estimated Cost	Anticipated Completion Date	Project Lead	Potential Funding Source(s)
High	Develop a McClellan Wash Watercourse Master Plan for the purposes of identifying drainage improvement alternatives, cost sharing options rules of development, and cumulative effects of existing and future development and encroachment into floodplain areas within study area.	Flood	Staff Time	FY 22/23	City Engineer, Pinal Co Flood Control and Study Consultants	Property owners within study area, Development, Grants, Funding Districts
Medium	Coordinate with Pinal Co Flood Control District regarding IGA to establish procedural guidelines for the implementation and enforcement of the NFIP floodplain management.	Flood	Staff Time	Ongoing	Pinal Co Flood Control District/Eloy City manager, Engineer, Building Official	General Fund
High	Reduce the effects of fissures, flooding, severe wind, and other hazards on buildings and infrastructure through the enforcement of zoning and building codes.	Fissure, Flood, and Severe Wind	Staff Time	On Going	Chief Building Official	General Fund
High	Eloy Industrial Park Drainage Mitigation Project to reduce the adverse effects of localized flooding on several properties within the industrial corridor.	Flood	$350,00	FY 26	Town of Eloy & Pinal Co Flood Control District	Pinal Co Flood Control District & Eloy General Fund
High	Coordinate efforts with public utilities to educate citizens regarding the dangers of extreme heat and the steps they can take to protect themselves when extreme temperatures occur, specifically in the summer.	Extreme Heat	Staff Time	On Going	Pinal County Office of Emergency Management and Town of Eloy	Grants and General Fund
High	Eloy Industrial Park Floodplain Delineation Study. Identify and accurately map flooding hazards within the industrial corridor within the City of Eloy	Floods	$500,000	FY 26	Pinal Co Flood Control District	Pinal Co Flood Control District

Table 5-6: Mitigation Strategy for Florence

Priority Ranking	Description	Hazard(s) Mitigated	Estimated Cost	Anticipated Completion Date	Project Lead	Potential Funding Source(s)
High	Community Awareness: Design and implement a comprehensive, concerted campaign for community awareness, education, and available resources regarding the hazards impacting the Town of Florence.	All	Staff Time	Jan 2024	Administration & Town Clerk	General Fund
Medium	Fire inspection: Develop an aggressive fire inspection program.	Wildfire	Staff Time	Ongoing	Fire Dept/Fire Chief	General Fund
High	Establish a stormwater management program to enhance/interface with Pinal County Stormwater Programs	Flood	Staff time	Ongoing	Public Works Director	HURF
Low	Drought Awareness: Initiate a drought awareness program as part of an existing water conservation campaign through town code and coordination with the Arizona Governors' Drought Task Force.	Drought	Staff Time	Ongoing	Public Works Director	Water & Utility Fund
Medium	Construct an alternate bridge across the Gila River to improve emergency access across the river	All	$6.5M	Ongoing	Planning & Public Works Director	Planning & HURF
High	Coordinate efforts with public utilities to educate citizens regarding the dangers of extreme heat and the steps they can take to protect themselves when extreme temperatures occur, specifically in the summer.	Extreme Heat	Staff Time	Ongoing	Fire Dept/Fire Chief	General Fund, Grants

Table 5-7: Mitigation Strategy for Kearny

Priority Ranking	Description	Hazard(s) Mitigated	Estimated Cost	Anticipated Completion Date	Project Lead	Potential Funding Source(s)
Medium	Ensure flood warning system is operation so the community is notified when a potential flood will occur. Install additional signage for wash crossings as well as sandbags to warn an discourage vehicular movements through these areas during flooding events.	Flood	Staff Time	2022	Town Manager	FEMA / Federal Funds
Medium	Review/update flood management plans and policies to ensure these documents help guide and limit development in hazard areas. Modify with additional guidelines, regulations, and land use techniques as necessary within the limits of state statutes, while also respecting private property rights.	Flood	Staff Time	2022	Town Manager	FEMA General Fund
High	Prioritize wildland fuel mitigation by establishing quarterly roadside vegetation control to mitigate wildfire within the right-of-way areas along roadways and highways. Identify potentially new recommendations in the types and methods for treatment and management necessary to mitigate the potential for catastrophic wildland fire.	Fire	Staff Time	2023	Town Manager	DFFM FEMA
High	Promote public education and outreach of preparedness and hazard mitigation concepts and techniques through community participation in planning, education, training and coordination with public and private sectors.	Flood & Fire	Staff Time	2023	Town Manager	DFFM FEMA
High	Coordinate efforts with public utilities to educate citizens regarding the dangers of extreme heat and the steps they can take to protect themselves when extreme temperatures occur, specifically in the summer.	Extreme Heat	Staff Time	On-going	Fire Chief	Grants, General Fund
Medium	Water Conservation Plan Review - Water conservation plan is currently under development and at draft stage.	Drought	Staff Time	2023	Town Manager	General Fund Utilities

Table 5-7: Mitigation Strategy for Kearny

Priority Ranking	Description	Hazard(s) Mitigated	Estimated Cost	Anticipated Completion Date	Project Lead	Potential Funding Source(s)
Medium	The emergency services coordinator will investigate repair, replacement or removal of non-functional flood warning siren.	Flood, Severe Wind	$50,000	2022	Police chief, Town Manager	General Fund, Bond
Medium	Flood Management - Include flood management issues in the annual review of Kearny's general plan, ordinances, codes and community emergency response plan to reduce the effects of flooding hazards on new buildings and infrastructure.	Flood	Staff Time	2023	Town Manager	General Fund
Medium	Zoning and Building Code - Continue enforcement of zoning ordinances and building codes through the Town's zoning clearance/site plan review process and IGA with Pinal County for building permits to reduce the effects of flooding hazards on new buildings and infrastructure	Flood	Staff Time	Ongoing	Town Manager	General Fund
High	Perform tree/bush thinning on Gila River.	Wildfire	$50,000	2022	Winkelman Nature Conservancy District	Grants

Table 5-8: Mitigation Strategy for Mammoth

Priority Ranking	Description	Hazard(s) Mitigated	Estimated Cost	Anticipated Completion Date	Project Lead	Potential Funding Source(s)
High	Coordinate efforts with public utilities to educate citizens regarding the dangers of extreme heat and the steps they can take to protect themselves when extreme temperatures occur, specifically in the summer.	Extreme Heat	Staff Time	On-going	Pinal County Office of Emergency Management	Grants, General Fund
Medium	Coordinate with ADOT to remove vegetation and improve the conveyance capacity for the roadside drainage channel on the west side of SR77 between ADOT milepost 15 and 16 (between Tucson Wash and San Pedro River)	Flood, Wildfire	Staff Time	2025	Public Works / Director	Wastewater Treatment Plant Enterprise
High	Construct curbs to direct street runoff in Main Street from SR 77 to approximately one mile north to reduce flooding of adjacent properties.	Flood	$80,000	2025	Public Works / Director	HURF, CDBG
Medium	Buy and install backup generators for government buildings and critical facilities in order to mitigate against power failures during hazard events.	All	$135,000	2026	Town Manager	CDBG, HSGP
Medium	Promote all-hazards awareness by distributing and publishing educational materials concerning the hazards in Mammoth and their associated risks.	All	Staff Time	2024	Town Manager	General Fund

Table 5-9: Mitigation Strategy for Maricopa

Priority Ranking	Description	Hazard(s) Mitigated	Estimated Cost	Anticipated Completion Date	Project Lead	Potential Funding Source(s)
High	SIP - Design and construct culvert, bridges, drainage improvements (retention/detention basins) near the Santa Cruz Wash and Santa Rosa Wash and for areas with potential threat from flooding to improve capacity and prevent flooding of adjacent residential and commercial areas.	Flood	$8-10M	Ongoing	Engineering Dept	Development Impact Fee (DIF)
High	SIP - Design and construct Santa Cruz Wash channelization (realignment) per the Regional Flood Control Solution.	Flood	$20M	Ongoing	City of Maricopa, Private	General Fund, public partnership, private
High	SIP - Porter Road / Santa Rosa Wash all weather crossing design and construction. The roadway crossing at Porter Road / Santa Rosa Wash has been identified as a critical access point for emergency services.	Flood	$1.5	FY 2023	City of Maricopa	City of Maricopa, general fund
Medium	SIP - Coordinate efforts with Pinal Co in implementing the NFIP program and managing the floodplain through projects such as CLOMR/LOMR; elevation certificates; adoption of a master drainage study; certification of levees, and project review and approval for construction within the floodplains.	Flood	Staff Time	Ongoing	Pinal Co Flood Control District/City of Maricopa Floodplain Administrator	Pinal Co Flood District, City of Maricopa General Fund
Medium	LPR - Continue the enforcement of zoning and building codes to reduce the effects of flooding, severe wind, and other hazards on new buildings and infrastructure.	Flood Severe Wind	Staff Time	Ongoing	City of Maricopa Development Services	General Fund
Low	LPR - Prepare and sign an IGA between City of Maricopa and Arizona Department of Transportation (ADOT) for bridge inspection and maintenance.	Flood Severe Wind	Staff Time	FY 2023	Engineering Dept Transportation Dept	City of Maricopa, ADOT
H	Coordinate efforts with public utilities to educate citizens regarding the dangers of extreme heat and the steps they can take to protect themselves when extreme temperatures occur, specifically in the summer.	Extreme Heat	Staff Time	On-going	City of Maricopa Emergency Management and Communication	Grants, General Fund

Table 5-10: Mitigation Strategy for Superior

Priority Ranking	Description	Hazard(s) Mitigated	Estimated Cost	Anticipated Completion Date	Project Lead	Potential Funding Source(s)
High	Construction of Culvert Bridge on Mary/Panther Drive will improve public safety, and emergency access from the flooded creek will reduce the road damage. The bridge will connect the North side with the South side of the Town. The Police department is located on the north side of the Town. The Fire station, ambulance, and school located on the south side of the Town.	All	$2.5 M	2022-2024	Town Engineer/Public Works	Flood Control Funds, General Funds
Medium	2022-2023 Flood control & stormwater management plan: Develop a drainage master plan for the entire Town; perform primary remediation drainage channels to reduce the effects of flooding.	Flood/Fire	$3M	2023-2025	Engineer/Flood Control Management Pinal Co	Flood Control Funds, General Fund, State Funds
Medium	Street Paving improves the access and usage of the roads. The last improvements on the town roads were provided eleven years ago.	Flood/ Fire	$500,000	2023	Town Engineer/Public Works	CDBG, HURF, Transportation Funds
Medium	Update Fire Department 5-year plan, provides a living management tool that provides a short-term direction that helps to reduce and eliminate the damage from fire disasters.	Wildfire & HazMat	$5000 Staff Time	2024 Annually	Fire Dept	General Fund
Medium	Abatement of Vacant or Abandoned Buildings "Revisions SDBG grant received."	Wildfire	$1.5 M	2023	Public Safety Dept & Building Safety Dept	CDBG
Medium	Initiate an all-hazards awareness and educational campaign through the distribution of published information. Being prepared can reduce fear, anxiety, and losses that accompany disasters. Provide knowledge among individuals and groups to take actions to reduce their vulnerability to disaster.	All	Staff Time	2024 Annually	Administration	General Fund

Table 5-10: Mitigation Strategy for Superior

Priority Ranking	Description	Hazard(s) Mitigated	Estimated Cost	Anticipated Completion Date	Project Lead	Potential Funding Source(s)
High	Reconstruct the low water crossing on Panther (Mary) Drive into an all-weather crossing.	Flood	$500,000 Staff Time	FY 2023	Public Works	CDBG, HURF, General Fund
High	Coordinate efforts with public utilities to educate citizens regarding the dangers of extreme heat and the steps they can take to protect themselves when extreme temperatures occur, specifically in the summer.	Extreme Heat	Staff Time	On-going	Town Manager	Grants, General Fund

SECTION 6: PLAN MAINTENANCE PROCEDURES

This section defines and documents the processes for maintaining and updating this Plan within the following areas:

Monitoring, Evaluating and Updating

Integration into Other Planning Mechanisms

Pinal County and the participating jurisdictions recognize that this hazard mitigation plan is intended to be a "living" document with regularly scheduled monitoring, evaluation, and updating.

Although the Plan was reviewed and referred to on several occasions, formal evaluations were not conducted. Reasons for the lack of formal evaluation are basically changes in staff and leadership and a lack of effectively communicating plan maintenance requirements and responsibilities.

The Planning Team discussed ways to make sure the Plan is appropriately maintained going forward, the results of those discussions are in the following sections and plan maintenance strategy.

6.1 Monitoring, Evaluating and Updating

The Planning Team established the following monitoring and evaluation procedures:

- **Schedule** – The Plan shall be reviewed on at least an annual basis or following a major disaster. The Pinal County Office of Emergency Management will lead the evaluation organization and completion. The evaluation target date will be annually in the fall.
- The Planning Team will review the Plan and assess the following areas:
    - **Hazard Identification:** Have the risks and hazards changed?
    - **Goal and objectives:** Are the goal and objectives still able to address current and expected conditions?
    - **Capability Assessment:** How have the capabilities changed?
    - **Mitigation Actions and Projects:** What is the status of the actions/projects?

Documentation of the evaluation will include notes on the results of the meeting as well as information on proposed changes to the Plan for the next update cycle.

The Plan updates will adhere to a set schedule using the following procedure:

- One year prior to the Plan expiration date, the Planning Team will re-convene to review and assess the Plan and the evaluation documentation.
- The Planning Team will update and/or revise the appropriate or affected portions of the Plan and produce an updated plan.
- The updated Plan will be submitted to DEMA and FEMA for review, comment and approval.
- The updated Plan will be presented before the respective councils and boards for an official concurrence/adoption.
- The signed resolutions from all the participating jurisdictions will be submitted to FEMA to prompt official approval.

6.2 Integration into Existing Planning Mechanisms

Integration of the Plan into other planning mechanisms, either by content or reference, enhances the ability to perform hazard mitigation by expanding the scope of the Plan's influence. The jurisdictions revealed that success of integrating the 2016 Plan elements over the past planning cycle into other

planning programs, have varied. The ways the Plan has been integrated or referenced into other planning mechanisms are as follows:

Pinal County	• The Plan mitigation strategy was used by the Pinal County Flood Control District in the preparation and prioritization of flood control projects. • The Plan risk assessment data was incorporated into the revision of the County Emergency Operations Plan. • Used for the Community Rating System (CRS) certification. • Used for creating the Community Wildfire Protection Plan (CWPP). • Used for developing a Multi-Year Training and Exercise Plan (MYTEP) plan. • The plan was referenced during the development of a regional transportation plan.
Apache Junction	• The Plan was used for City's CIP planning. • The Plan's risk assessment data used for update of City's Emergency Operations Plan. • Used for creating the Community Wildfire Protection Plan. • Plan was referenced during development of City's Active Transportation Plan.
Casa Grande	• The Plan was used for the City of Casa Grande's General Plan. • The Plan was used for long range CIP projects. • The Plan was referenced for implementation of Building Code Ordinance updates. • The Plan was used to develop the MS4 program.
Coolidge	• The Plan has been used in the update to the city's comprehensive plan. • The Plan mitigation strategy was incorporated into the city's capital improvement planning. • The Plan mitigation strategy was used by the Pinal County Flood Control District in the preparation and prioritization of flood control projects in cooperation with the City. • The plan was referenced during the development of a regional transportation plan.
Eloy	• The Plan was used for long range CIP projects. • The Plan risk assessment data was incorporated into the revision of the Emergency Operations Plan. • The Plan was referenced during the development of a regional transportation plan.
Florence	• The Plan's mitigation strategy was used by the Pinal County Flood Control District in the preparation and prioritization of flood control projects in cooperation with the town. • The Plan was referenced for the development an economic plan. • The Plan was used for creating the Community Wildfire Protection Plan (CWPP). • The Plan was referenced during the development of a regional transportation plan.
Kearny	• The Plan was used to update the response and recovery plan. • The Plan was used to update the drought management plan. • The Plan was used to update the Town's Capital Improvement Program.
Mammoth	• The Plans mitigation strategy was used by the Pinal County Flood Control District in the preparation and prioritization of flood control projects in cooperation with the town.

	• The Plan was used for creating the Community Wildfire Protection Plan (CWPP). • The Plan was referenced during the development of a regional transportation plan.
Maricopa	• The Plan was used to update the emergency operations plan. • The Plan was used to update the floodplain management plan.
Superior	• The Plan was used for FEMA MAP. • The Plan was referenced for the maintenance of a flood control plan. • The Plan was used for creating the Community Wildfire Protection Plan (CWPP). • The Plan was used for street paving.

Typical ways the jurisdictions plan to incorporate the Plan over the next five-year planning cycle include:

Pinal County	• The preparation and prioritization of flood control projects. • To maintain and revise the Integrated Preparedness Plan. • For revising long range cap improvement plan. • To use risk assessment data to revise the Emergency Operations Plan. • To revise Community Wildfire Protection Plan (CWPP).
Apache Junction	• To update capital improvement plan. • The preparation and periodization of flood control projects. • To update emergency operations plan. • Reference for updates to General Plan and other planning studies. • To revise and maintain the Community Wildfire Protection Plan (CWPP).
Casa Grande	• The plan will be used for long range CIP projects.
Coolidge	• To update the capital improvement plan. • The preparation and prioritization of flood control projects. • To update the Emergency Operation Plan. • To revise and maintain the Community Wildfire Protection Plan (CWPP).
Eloy	• To update the capital improvement plan. • The preparation and prioritization of flood control projects. • To revise and maintain the Community Wildfire Protection Plan (CWPP).
Florence	• To update the capital improvement plan. • The preparation and prioritization of flood control projects. • To update the Emergency Operations Plan. • To Revise and maintain the Community Wildfire Protection Plan (CWPP).
Kearny	• To update the Kearny Flood Hazard Mitigation Plan. • To update the Kearny Multi-Hazard Mitigation Plan. • To update the Kearny Community Wildfire Mitigation Plan. • To update the Kearny Drought Management Plan. • To update the Town's Capital Improvement Program.
Mammoth	• To update the capital improvement plan. • The preparation and prioritization of flood control projects. • To update the Emergency Operations Plan. • To Revise and maintain the Community Wildfire Protection Plan (CWPP).
Maricopa	• To revise the City's emergency operations plan. • To update the economic development plan.

	• To update the general plan. • To update the capital improvement plan. • To update the floodplain management plan.
Superior	• To update capital improvement plan. • The preparation and prioritization of flood control projects. • To update emergency operations plan. • To revise and maintain the Community Wildfire Protection Plan (CWPP).
Plan integration for the smaller communities remains a challenge as some do not have a large amount of community plans, however they strive to find new ways to use the plan to benefit the community.	

The Plan will continue to function as a standalone document subject to its own review and revision. The Plan will also serve as a reference for other mitigation and land planning needs of the jurisdictions. Whenever possible, the jurisdictions will endeavor to integrate the risk assessment results and mitigation actions and projects identified in the Plan, into existing and future planning mechanisms. At a minimum, the responsible agencies/departments will review and reference the Plan and revise and/or update the legal and regulatory planning documents, manuals, codes, and ordinances, as appropriate. Specific integration of the Plan risk assessment elements into the natural resources and safety elements of the jurisdictions' general plans (county comprehensive plan) and development review processes, adding or revising building codes, adding or changing zoning and subdivision ordinances, and integrating mitigation goals and strategies into general and/or comprehensive plans, will help to ensure hazard mitigated future development.

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APPENDIX A: PREVIOUS MITIGATION STRATEGY STATUS

Table 5-22: Mitigation Strategy for Pinal County

Priority	Description	Hazard(s) Mitigated	Estimated Cost & Completion	Project Lead	Potential Funding Source(s)	Status	Explanation or brief description of work so far or reason for 'no progress'
M	Develop IGAs with County dependent communities to define and clarify roles in implementing the NFIP program and managing the floodplains.	Flood	$15,000+ Staff Time Jan 2018	Pinal Co Flood Control District / Section Chief	Flood Control District Levy	In Progress	This is an ongoing project. We have made some progress; however, we will need to commit more staff to this in the future.
H	Develop Wildfire Mitigation and Prevention program to include community awareness.	Wildfires	$30,000+ Staff Time 2017	Pinal Co Office of Emergency Mgt	Grant Funding	In Progress	This is an ongoing project. We have made some progress, holding community meetings in high-risk areas.
M	Conduct quarterly flood control Meetings with all districts, Indian Tribes, and Cities.	Flood	Staff Time Ongoing	Pinal Co Flood Control District	Flood Control District	In Progress	This is an ongoing project. We continue to hold quarterly meetings with these communities.
M	Fissure monitoring for state-wide mapping by AZGS and promote fissure awareness with the public	Subsidence, Fissure	$10,000/yr + Staff Time Ongoing	Pinal Co Office of Emergency Mgt	OEM Grant Funding	In Progress	The is an ongoing project and we continue to work with the AZGS and the ADWR (Land Subsidence mapping) teams
M	All Weather Access analysis. Review County transportation network and determine areas in need of stream crossing upgrades to improve public access.	Flood	$20,000+Staff Time June 2020	Pinal Co Transportation Planner	Flood Control District Levy/ HURF	In Progress	This effort has been incorporated into our Area Drainage Master Plans as well as Watershed Planning studies. Progress is being made with those studies.
M	Superior Flood Prone Property Plan. Develop a plan to address homes currently located in FEMA floodway. Plan to address feasibility of mitigation projects and potential property buy-outs.	Flood	$2M+ Staff Time June 2020	Pinal Co Flood Control District	Flood Control District Levy	No Progress	We have partnered with FEMA to do a Flood Risk Report which is the first step in achieving the goals of this project. The project just kicked off in March 2021.
H	Queen Valley Flood Mitigation Plan. Multi-phase project to address flooding in the community. Planned elements include construction of new culverts, improved channel segments, and removal of floodplain encroachments.	Flood	$1.5M + Staff Time Dec 2017	Pinal Co Flood Control District	Flood Control District Levy	In Progress	Much of the planned improvements have been constructed to date. The next phase, which will begin in FY21-22 is to evaluate the middle section of the Queen Creek Wash at the Queen Valley Dr bridge.

Table 5-22: Mitigation Strategy for Pinal County

Priority	Description	Hazard(s) Mitigated	Estimated Cost & Completion	Project Lead	Potential Funding Source(s)	Status	Explanation or brief description of work so far or reason for 'no progress'
M	Santa Cruz River Watercourse Master Plan. Develop a reconnaissance study to determine possible flood mitigation alternatives.	Flood	$1.5M+StaffTime June 2018	USACE/Pinal Co Flood Control District	Federal Funding	In Progress	The LSCR Feasibility study has been completed. The next phase will begin in October 2021 where the USACE will focus their study effort on the Eloy Levee/Channel project which was identified in the feasibility study as a viable project.
M	Emergency Shelters/Redundant Power. Develop Shelter Operations Plan along with appropriate contracts & agreements. Plan for ensuring shelter sites have permanent or access to back-up power.	Severe Wind	$30,000	Pinal Co Office of Emergency Mgt	General Fund	In progress	This is an ongoing project. Shelter operations plans are in development. Grant applications for back-up power continue to be submitted, but funding has not been awarded.
M	ALERT Gauges. Includes the maintenance of the existing ALERT system as well as yearly software and hardware upgrades.	Flood	$200,000+ Staff Time Ongoing	Pinal Co Flood Control District	Flood Control District Levy	In Progress	This is an ongoing project. We are constantly adding to and improving our ALERT system. We also have an ALERT system 5-year plan that we follow.
H	Provide all-weather and emergency access on Sunland Gin Road at the Greene Canal. Improvements to increase conveyance will consist of culverts, grading, and erosion protection.	Flood	$1.6M + Staff Time April 2020	Pinal Co Flood Control District	FEMA PDM Grant	In Progress	Plans are completed. We are waiting for the FEMA grant award to come through.
M	Develop educational materials to disseminate and coordinate public effort to mitigate damage and losses due to drought.	Drought	Staff Time Ongoing	Pinal Co Office of Emergency Mgt	AZDWR and USDA	No Progress	This project is not viable due to a lack of funding and grant opportunities.
H	Continue the enforcement of zoning and building codes to reduce the effects of drought, flood, severe wind, and other hazards on new buildings and infrastructure.	Drought, Flood, Severe Wind	Staff Time Ongoing	Pinal Co Building Safety	General Fund	In Progress	This is an ongoing project. We are currently working on revising the drainage ordinance to make improvements to the code.
M	Research landscaping alternatives for use in reducing wind velocity in high-risk areas of the county (e.g., tree lines)	Severe Wind	Staff Time Dec 2018	Pinal Co Public Works	General Fund	No Progress	Staff retirements and movement has stalled work on this project

Table 5-23: Mitigation Strategy for Apache Junction

Priority	Description	Hazard(s) Mitigated	Estimated Cost & Completion	Project Lead	Potential Funding Source(s)	Status	Explanation or brief description of work so far or reason for 'no progress'
H	Perform public outreach and education regarding the negative impacts of improper development within the floodplain and especially the floodway.	Flood	$10,000 (Staff Time) Ongoing	AJPW, DSD	Local	In progress	On-going; included in administrative practice/procedure in any permit/plan reviews in addition to working with our PIO to disseminate information to the public.
H	Build a box culvert and related roadway improvements on 16th Avenue across Palm wash to mitigate flooding of the street and surrounding properties.	Flood	$750K 2020	AJPW	MAG or PCFCD	In progress	Pre-design planned for fiscal year 2022-23.
M	Research reclaimed water use strategies and develop implementation guidelines for future developments.	Drought	$10,000 (Staff Time) 2018	AJWD/DSD	Local	In progress	On-going; included in administrative practice/procedure both for research and in working with developments.
M	Implement Stormwater Master Plan Project No. 4 to design and construct a storm drain in Superstition Blvd from Meridian Dr. to Gold Dr. and a detention basin at Valley Dr. and Superstition Blvd.	Flood	$3.6M 2017	AJPW	None	In progress	Some pre-design work has been started. Working currently to acquire needed property(s) for basin(s).
M	Implement Stormwater Master Plan Project No. 4a to design and construct the Delaware Dr. and Pinal St. storm drains and a detention basin at Valley Dr. and Superstition Blvd.	Flood	$2.7M 2020	AJPW	CDBG	In progress	Full design for Delaware Dr. has been started. Some pre-design has been started for basins along Superstition Blvd.
L	Implement Stormwater Master Plan Project No. 11 to design and construct a culvert on Palm Wash at the Junction Dr. crossing.	Flood	$93K 2019	AJPW	None	No progress	Awaiting need for the street's pavement to be reconstructed which is estimated around 2025-26 as opportune time for this project.
M	Design and construct a detention and sedimentation basin on Weekes Wash north of Lost Dutchman Blvd. to reduce the downstream impact of sedimentation and attenuate peak discharges.	Flood	$9M 2020	AJPW	CAC	No progress	Discussions have occurred on feasibility and aspects of scope. Continue to look for opportunities for grant assistance.
M	Update 2002 Stormwater Master Plan.	Flood	$100K 2017	AJPW	None	In progress	Planned for fiscal year 2022-23.

Table 5-23: Mitigation Strategy for Apache Junction

Priority	Description	Hazard(s) Mitigated	Estimated Cost & Completion	Project Lead	Potential Funding Source(s)	Status	Explanation or brief description of work so far or reason for 'no progress'
H	Update Emergency Response and Recovery Plan	All	$20,000 (Staff Time) 2016	AJPW, AJPD, SFMD	Various	In progress	Still in draft edit stage. Challenge has been necessary staffing resources to move update along faster.
M	Emergency back-up power supply for select city buildings and water facilities.	Severe Wind	$400K 2018	AJPW, AJPD, AJWD	General Fund	In progress	Several water facilities completed with backup power improvements in fiscal years 2019 and 2020 with Apache Junction Water District general revenues. City buildings are in progress with improvements to its Public Safety building recently completed in 2021 with General Fund allocations.

Table 5-24: Mitigation Strategy for Casa Grande

Priority	Description	Hazard(s) Mitigated	Estimated Cost & Completion	Project Lead	Potential Funding Source(s)	Status	Explanation or brief description of work so far or reason for 'no progress'
M	Create Storm water Management program to identify, design and implement drainage and flood control related projects within the city.	Flood	$500,000 plus Staff Time FY 2018	Public Works	General Fund/ Storm water Utility	In Progress	Using the current MS4 program as a base we are in the process of developing a storm water program.
L	Acquire the Floodplain Certificates on all existing structures in the SFHA that have not been documented yet.	Flood	No cost to Municipality Jan 2019	Planning & Development Dept	General Fund	In Progress	Hired a surveyor to complete 9 elevation certificates (EC) for existing structures without an EC in 2020

Table 5-24: Mitigation Strategy for Casa Grande

Priority	Description	Hazard(s) Mitigated	Estimated Cost & Completion	Project Lead	Potential Funding Source(s)	Status	Explanation or brief description of work so far or reason for 'no progress'
M	Have new developers dedicate portions of the Santa Cruz Wash for open space.	Flood	$15,000 FY 2020	Planning & Development Dept/Community Services Dept	General Fund/ Developer Donation	In Progress	Worked with a landowner in 2017 to dedicate 5 lots along Yucca St. that were located within the floodway of the Santa Cruz Wash to the City for open space
M	Develop a master plan to create and utilize open space along the Santa Cruz Wash. By preserving the channel as open space, we can reduce exposure from flooding.	Flood	$150,000 FY 2020	Parks & Recreation Dept	Development impact fees	In Progress	One mile section from Trekell to Peart is being developed as a Community Trail. Construction expected in fall 2021. More miles planned in future fiscal year
H	Continue to enforce zoning and building codes through current site plan, subdivision, and building permit review processes to reduce the effects of drought, flood, thunderstorm/high wind, and other hazards on new buildings and infrastructure.	Flood, Severe Wind, Drought	On-going	Planning & Development Dept	General Fund	In Progress	All new land development proposals and building permits for new construction reviewed for conformance with City adopted Special Flood Hazard Area Regulations.
L	Establish and sign a truck route for hazardous materials to avoid residential areas.	HazMat	$150,000 On-going	Public Works/Engineering Division	General Fund/ HURF	No Progress	Will develop a route contingent on database of HAZMAT business locations within the city.
M	Develop a Database of HAZMAT locations of businesses.	HazMat	$30,000 FY 2017	Fire Dept	General Fund	In Progress	Currently implementing a program that will track HAZ-MAT storage and use, etc.

Table 5-24: Mitigation Strategy for Casa Grande

Priority	Description	Hazard(s) Mitigated	Estimated Cost & Completion	Project Lead	Potential Funding Source(s)	Status	Explanation or brief description of work so far or reason for 'no progress'
M	Enforce City Code regarding the drainage of basins within 36 hours	Flood	$60,000 FY 2017	Public Works/ Engineering Division	General Fund/HURF/Storm water Utility	In Progress	Our MS4 program Manager inspects drainage basins for compliance after rain events. Non-compliant basins are turned over to code enforcement

Table 5-25: Mitigation Strategy for Coolidge

Priority	Description	Hazard(s) Mitigated	Estimated Cost & Completion	Project Lead	Potential Funding Source(s)	Status	Explanation or brief description of work so far or reason for 'no progress'
M	Low Water-Use Fixture Requirements - Continue to require the use and installation of low water-use fixtures in new residential and commercial developments	Drought	Staff Time On-going	Growth Management/ Building Safety	General Fund	In Progress	Slow but continuous growth, modify as technology improves
L	Xeriscape Landscaping Recommendations - Continue to encourage the use of low water-use plants and xeriscape	Drought	Staff Time On-going	Growth Management/ Building Safety	General Fund	In Progress	Ongoing, modify as technology improves
M	Thunderstorm Public Education Campaign - Conduct a public awareness campaign to educate citizens about the hazards of high winds associated with thunderstorms	Severe Wind	$5,000 Annual	Growth Management, Building Safety, Fire, State of AZ	Grants, General Fund, Donations	In Progress	Need additional material and training supplies to enhance program
M	Thunderstorm Damage Reduction - Continue to require tie downs/anchors for new manufactured homes, accessory buildings, carport awnings, and perimeter fences to mitigate damages due to high winds/microbursts.	Severe Wind	$5,000 On-going	Growth Management, Building Safety, Fire, State of AZ	Grants, General Fund, Donations	In Progress	Ongoing, modify as technology improves
M	Hazard Mitigation Awareness - Develop public service announcements for media releases to educate citizens about drought, flooding, thunderstorms/high winds, and other natural hazards	All Hazards	Staff Time On-going, at least annual	State of AZ, Pinal Co, Administration	Grants, General Fund, Donations	In Progress	Need additional materials, training supplies and technology to enhance program
M	Update/Revise Dam Failure Inundation Mapping - Contact and coordinate with the Arizona Department of Water Resources, the San Carlos Irrigation Project, and the San Carlos Apache Tribe to obtain updated inundation mapping for Coolidge Dam	Dam Failure	Staff Time As Available	ADWR, SCIP, Pinal Co Flood Control	Individual Agencies	In Progress	Ongoing, modify as technology improves
L	HAZMAT Route Establishment - Investigate and develop a plan that defines allowable HAZMAT corridors and prepare and adopt municipal codes for the signage and enforcement of the defined routes	HAZMAT	$10,000 Jan 2018	Police & Fire	General Fund, Grants, Donations	In Progress	Recent annexation, road studies, development and general plan will change routes

Table 5-25: Mitigation Strategy for Coolidge

Priority	Description	Hazard(s) Mitigated	Estimated Cost & Completion	Project Lead	Potential Funding Source(s)	Status	Explanation or brief description of work so far or reason for 'no progress'
M	Flood Control Structures Maintenance - Perform regular maintenance on existing City owned storm drains, drainage ditches, and retention/detention basins	Flood	$30,000 On-going	Public Works, Parks	General Fund , Enterprise Funds	In Progress	Ongoing with expansion of new development and growth
H	Enforcement of Zoning and Building Code Ordinances - Continue to enforce zoning and building codes through current site plan, subdivision, and building permit review processes to reduce the effects of drought, flood, thunderstorm/high wind, and other hazards on new buildings and infrastructure	All Hazards	$20,000 On-going	Growth Management, Building Safety, Planning	General Fund, Permit Fees, Development Fees	In Progress	Ongoing with new development
H	Mutual Aid/IGA's - Develop agreements with adjoining cities, tribes, and Pinal County for mitigation of hazards	All Hazards	Staff Time On-going	Administration, Police, Fire	General Fund	Complete	Need to maintain and update as growth progresses and new resources become available

Table 5-26: Mitigation Strategy for Eloy

Priority	Description	Hazard(s) Mitigated	Estimated Cost & Completion	Project Lead	Potential Funding Source(s)	Status	Explanation or brief description of work so far or reason for 'no progress'
H	McClellan Wash Watercourse Master Plan (in progress) for the purposes of identifying drainage improvement alternatives, cost sharing options rules of development, and cumulative effects of existing and future development and encroachment into floodplain areas within study area.	Flood	Reimburse developer by area property owners. Under review	City Engineer, Pinal Co Flood Control and Study Consultants.	Property owners within study area and development	In-progress	Study is awaiting funding options between County and City for design and construction.

Table 5-26: Mitigation Strategy for Eloy

Priority	Description	Hazard(s) Mitigated	Estimated Cost & Completion	Project Lead	Potential Funding Source(s)	Status	Explanation or brief description of work so far or reason for 'no progress'
M	Maintain IGA with Pinal Co Flood Control District for establishing procedural guidelines for the implementation and enforcement of the NFIP floodplain management.	Flood	Time devoted by staff. On-going	Pinal Co Flood Control District/Eloy City Manager, Engineer, Building Official	General Fund	In-Progress	Working with Arizona Dept. of Water Resources to update CAC's.
H	Continue the enforcement of zoning and building codes to reduce the effects of fissures, flooding, severe wind, and other hazards on buildings and infrastructure.	Fissure, Flood, Severe Wind	Time devoted by staff. On-going	Chief Building Official	General Fund	In-Progress	Staff identifying properties that contain infrastructure issues and presenting recommendations for remediation.
H	Eloy Industrial Park Floodplain Delineation Study. Identify and accurately map flooding hazards within the industrial corridor within the City of Eloy.	Flood	$500,000	Pinal Co Flood Control District	Pinal Co Flood Control District	In Progress	City staff working
H	Eloy Industrial Park Drainage Mitigation Project to reduce the adverse effects of localized flooding on several properties within the industrial corridor.	Flood	$350,000 FY 2019	Town of Eloy / Pinal Co Flood Control District	Pinal Co Flood Control District / Eloy General Fund	No Progress	Work identified in the study exceeded Eloy's budget. Will re-explore with Eloy to determine desire to move forward.

Table 5-27: Mitigation Strategy for Florence

Priority	Description	Hazard(s) Mitigated	Estimated Cost & Completion	Project Lead	Potential Funding Source(s)	Status	Explanation or brief description of work so far or reason for 'no progress'
M	Update building code to IBC 2007 or better to ensure adequate design of new or remodeled facilities	Flood, Severe Wind, Drought,	$5,000 plus Staff Time 2017	Development Services / Building Official	General Fund	Complete	2012 adopted, working on 2018 adoption in 2021
H	Develop IGAs with county dependent communities to define and clarify roles in implementing the NFIP program and managing the floodplains	Flood	Staff Time 2017	Pinal Co Flood Control District / Section Chief	Flood Control District Levy	Not applicable	Town is own Flood Plain Administrator
H	Community Awareness: Design and implement a comprehensive, concerted campaign for community awareness and education regarding hazards impacting the Town of Florence	All	Staff Time Jan 2018	Administration/ Town Clerk	General Fund	No progress	Low Staffing Levels
M	Volunteer Force: Continue to recruit and train volunteers to provide support in safeguarding Florence before, during, and after any Man made or Natural Disasters.	All	Staff Time On-going	Police Dept/ Police Chief	General Fund	In Progress	Low Staffing Levels
M	Fire Inspection: Continue to undertake an aggressive fire inspection program	Wildfire	Staff Time On-going	Fire Dept/ Fire Chief	General Fund	In Progress	Low Staffing Levels
H	Stormwater Management: Establish Florence Stormwater Management Program and enhance/interface with Pinal County Stormwater Programs	Flood	Staff Time On-going	Public Works Director	HURF	No progress	Low Staffing Levels
M	Heat Exhaustion Plan: Provide prevention and relief to high-risk groups through updates/revisions to the Town of Emergency Operation Plan. Plan would include setting up heat shelters, providing news releases, transportation to shelters, and fans, and monitoring high-risk groups.	Drought	Staff Time	Administration/ Town Clerk	General Fund	No progress	Low Staffing Levels
L	Drought Awareness: Initiate a drought awareness program as part of an existing water conservation campaign through existing town code and coordination with the Arizona Governor's Drought Task Force.	Drought	Staff Time On-going	Public Works Director	Water Utility Fund	In progress	Staff researching
M	Bridge over Gila: Construct an alternate bridge across the Gila River to improve emergency access across the river.	All	$6.5M On-going	Planning / Public Works Director	Planning / HURF	No progress	Lack of funding for project.

Table 5-28: Mitigation Strategy for Kearny

Priority	Description	Hazard(s) Mitigated	Estimated Cost & Completion	Project Lead	Potential Funding Source(s)	Status	Explanation or brief description of work so far or reason for 'no progress'
M	Water Conservation Plan Review - Water conservation plan is currently under development and at draft stage.	Drought	Staff Time 2017	Town Manager	General Fund, Utilities	No progress	Cannot find previous files. Roll into new plan
M	The Emergency Services Coordinator will investigate repair, replacement or removal of non-functional flood warning siren and funding for same.	Flood, Severe Wind	$0- $50,000 June 2020	Town Manager, Police Chief	General Fund, Bond	No progress	The warning siren is still non-operational. Roll into new plan
M	Flood Management - Town Manager will include flood management issues in annual review of Kearny's general plan, ordinances, codes, and Community Emergency Response Plan to reduce the effects of flooding hazards on new buildings and infrastructure.	Flood	Staff Time June 2018	Town Manager	General Fund	In-Progress	Cannot find previous files. Roll into new plan
M	Zoning and Building Code - Continue enforcement of zoning ordinances and building codes through the Town's zoning clearance/site plan review process and IGA with Pinal County for building permits to reduce the effects of flooding hazards on new buildings and infrastructure	Flood	Staff Time On-going	Town Manager	General Fund	In-progress	Continual enforcement. Roll into new plan
L	Dispatch Review - Police Chief will review existing policies and procedures in the police dispatch area with respect to community power/phone outages on an annual basis	Flood, Severe Wind	$50,000 On-going	Police Chief	Grants, Bonds	Complete	Complete, Generator acquired for PSAP.
L	Evaluation - A survey of a random sampling of households and businesses will be conducted to evaluate the effectiveness of the education program and recommended mitigation measures.	Flood, Severe Wind, Drought	Staff Time On-going	Town Manager	General Fund	No Progress	Cannot find previous files. Not currently funded delete
H	Design and build storm drainage system on Tilbury Drive.	Flood	$450,000 2020	Town Manager	Bonds	Complete	Street has been repaved. Drainage added.

Table 5-28: Mitigation Strategy for Kearny

Priority	Description	Hazard(s) Mitigated	Estimated Cost & Completion	Project Lead	Potential Funding Source(s)	Status	Explanation or brief description of work so far or reason for 'no progress'
H	Perform tree/brush thinning on Gila River.	Wildfire	$50,000 On-going	Fire Chief	Grants	In-progress	On-going. Thinning performed on Lake and Riverbed

Table 5-29: Mitigation Strategy for Mammoth

Priority	Description	Hazard(s) Mitigated	Estimated Cost & Completion	Project Lead	Potential Funding Source(s)	Status	Explanation or brief description of work so far or reason for 'no progress'
M	Coordinate with ADOT to remove vegetation and improve the conveyance capacity for the roadside drainage channel on the west side of SR77 between ADOT milepost 15 and 16 (between Tucson Wash and San Pedro River)	Flood, Wildfire	Staff Time Dec 2017	Public Works / Director	Wastewater Treatment Plant Enterprise	In Progress	This project is ongoing and is currently in process.
M	Maintain current IGA with Pinal County Flood Control District for coordination of floodplain management duties per the NFIP program.	Flood	Staff Time Ongoing	Public Works / Director	General Fund	In Progress	We are actively working with Pinal County Flood Control to mitigate flooding
H	Construct curbs to direct street runoff in Main Street from SR 77 to approximately one mile north to reduce flooding of adjacent properties.	Flood	$80,000 Dec 2018	Public Works / Director	HURF, CDBG	No Progress	Due to deteriorating infrastructure this project has been postponed until such time as we can repave the roadway
M	Buy and install backup generators for government buildings and critical facilities to mitigate against power failures during hazard events.	All	$135,000 Dec 2019	Town Manager	CDBG, HSGP	Complete	A back up generator was purchased and installed.
M	Promote all-hazards awareness by distributing and publishing educational materials concerning the hazards in Mammoth and their associated risks.	All	Staff Time On-Going	Administration	General Fund	In progress	The town routinely distributes educational material on our website, in our library and in our local newspaper.

Table 5-30: Mitigation Strategy for Maricopa

Priority	Description	Hazard(s) Mitigated	Estimated Cost & Completion	Project Lead	Potential Funding Source(s)	Status	Explanation or brief description of work so far or reason for 'no progress'
H	Design and construct culvert, bridges, drainage improvements (retention/detention basins) near the Santa Cruz Wash and Santa Rosa Wash and for areas with potential threat from flooding to improve capacity and prevent flooding of adjacent residential and commercial areas.	Flood	$8-10M On-going	Engineering Dept	Development Impact Fee (DIF)	In Progress	30% plans and CLOMR has been completed and is under review by Floodplain Administrator from Pinal County.
H	Design and construct Santa Cruz Wash Channelization (realignment) per the Regional Flood Control Solution	Flood	$20M On-going	City of Maricopa/ private	General Fund, Private/ Public Partnership	In Progress	30% plans and CLOMR has been completed and is under review by Floodplain Administrator from Pinal County
M	Design and Construct channel and culvert crossing improvements along the Casa Blanca Canal from Hartman Road to the Santa Cruz Wash.	Flood	$500,000 On-going	City of Maricopa / Pinal Co Flood Control District	Pinal Co. Flood District, City of Maricopa General Fund, Private	No progress	Not a priority at this time. The area has not been developed and properties and transit within the area are minimal.
M	Conduct floodplain analysis for Heritage District North of the Union Pacific Railroad and West of Roosevelt Road. The goal would be to accurately map flooding risks in order to understand impacts to the City's Fire Station and nearby Public Works Facility. The results of the study would be used to support future flood mitigation efforts.	Flood	$150,000 FY 2018	City of Maricopa	City of Maricopa General Fund	Complete	The study conducted during 2018 and 2021. The study concluded the floodplain areas have changed considerably. The City submitted the request for map revision to FEMA and has been approved to become effective at the end of 2021. The City has sent letters to all residents and property owners that have been affected by the changes proposed by the study and provided a guide on how to proceed if their property is now on the floodplain or removed from it.

Table 5-30: Mitigation Strategy for Maricopa

Priority	Description	Hazard(s) Mitigated	Estimated Cost & Completion	Project Lead	Potential Funding Source(s)	Status	Explanation or brief description of work so far or reason for 'no progress'
H	Porter Road / Santa Rosa Wash all weather crossing design and construction. The roadway crossing at Porter Road / Santa Rosa Wash has been identified as a critical access point for emergency services.	Flood	$1.5M FY 2020	City of Maricopa	City of Maricopa General Fund	In Progress	90% Construction plans for Porter Rd. Bridge has been completed. Construction of crossing will start first quarter of 2022
M	Coordinate efforts with Pinal Co in implementing the NFIP program and managing the floodplain through projects such as CLOMR/LOMR; elevation certificates; adoption of a master drainage study; certification of levees, and project review and approval for construction within the floodplains	Flood	Staff time On-going	Pinal Co Flood Control District / City of Maricopa Floodplain Administrator	Pinal Co Flood District, City of Maricopa General Fund	In Progress	A master drainage study was completed by the City of Maricopa. 30% plans for CLOMR has been submitted for review and further approval by FEMA.
M	Continue the enforcement of zoning and building codes to reduce the effects of flooding, severe wind, and other hazards on new buildings and infrastructure.	Flood Severe Wind	Time devoted by staff. On-going	City of Maricopa Development Services	General Fund	In Progress	The City has full time code enforcement officers and building inspectors that ensure compliance with codes and ordinances.
L	Prepare and sign an IGA between City of Maricopa and Arizona Department of Transportation (ADOT) for bridge inspection and maintenance	Flood Severe Wind	Staff time On-going	Engineering Dept Transportation Dept	City of Maricopa, ADOT	No Progress	Negotiations with ADOT have not yet started. This task will be evaluated and restarted by the City on second quarter of 2022.

Table 5-31: Mitigation Strategy for Superior

Priority	Description	Hazard(s) Mitigated	Estimated Cost & Completion	Project Lead	Potential Funding Source(s)	Status	Explanation or brief description of work so far or reason for 'no progress'
M	Update Fire Department 5-year plan, provides a living management tool that provides a short-term direction that helps to reduce and eliminate the damage from fire disasters.	Fire & HazMat	$5,000 Staff Time Annually	Fire Dept	General Fund	In-going	Staff training on fire suppression, emergency medical response, hazardous materials response, fire prevention, and computer equipment and management system education
M	Abatement of Vacant or Abandoned Buildings "Revisions SDBG grant received."	Fire, Crime & Public Nuisance	$1,5 mln 2023	Public Safety Dept & Building Safety Dept	CDBG	On-going	This is rolled in the New CDBG Grant for 2022. estimated cost increased moved to 2023
M	Initiate an all-hazards awareness and educational campaign through the distribution of published information. Being prepared can reduce fear, anxiety, and losses that accompany disasters. Provide knowledge among individuals and groups to take actions to reduce their vulnerability to disaster.	All	Staff Time Annually	Administration	General Fund	On-going	Training and lessons mostly provided through Social media: short video lessons, articles from the National Forest Fire management and Pinal County.
H	Reconstruct the low water crossing on Panther (Mary) Drive into an all-weather crossing.	Flood	$500,000 Staff Time FY 2023	Public Works	CDBG, HURF, General Fund	No Progress	Multiple attempts to secure funding have not been successful. This is planned to include in finding funds and resources for the next year.
I	Paving the Part of Porphyry Street, Rainbow Avenue, Molina Avenue, Western Street, and Part of Valentine Street.	All	$400,000	Town Engineer/Public Works	HURF	Complete	Constructed 2-inch Rubberized asphaltic pavement.

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APPENDIX B: REPETITIVE FLOOD AREA LETTER

Andrew Smith
Public Works Director

Joe Ortiz
Deputy Director

Christopher Wanamaker
County Engineer

PINAL COUNTY

Leo Lew
County Manager

April 26, 2021

Dear Sir or Madam:

You are receiving this letter because your property is located in or near an area that has flooded several times. This area is known as a "Repetitive Loss Area" which is defined as an area including structures that have filed two or more flood insurance claims of more than $1,000 within the last ten years. There is a long documented history of flooding within Arizona City. Records from the Federal Emergency Management Agency (FEMA), the National Oceanic and Atmospheric Administration (NOAA), The U.S. Army Corps of Engineers (USACE), and various other media sources indicate that significant flooding has occurred in this area at least 24 times since 1887. The most recent significant flooding to impact Arizona City occurred in July of 2012.

Pinal County is concerned about repetitive flooding in Arizona City and has established programs and policies aimed at reducing future flooding. In 2010 Pinal County commissioned a study to investigate the cause of the flooding and define recommended finished floor elevations to protect future buildings from flooding. In 2015 Pinal County completed a detention basin project which was designed to reduce the frequency and severity of flooding within the repetitive loss area. However, even with the completion of this project, a residual flood risk still remains as the area may be subject to flooding from storm events that exceed the basin's design capacity.

As a property owner or renter, there are also several steps that you can take to protect your property:

1. Check with the Pinal County Flood Control District on the extent of past flooding in your area. Department staff can tell you about the causes of repetitive flooding, what the County is doing about it, and what options are available and appropriate for flood protection. Department staff can also visit your property to discuss past flooding and your flood protection alternatives.

2. Prepare for flooding by doing the following:
   - Place insurance policies, valuable documents, medicine, etc. in a safe, accessible place.
   - Collect and place cleaning supplies, a camera, waterproof boots, etc. in a safe accessible location.
   - Develop a disaster response plan - refer to the Red Cross website here: http://www.redcross.org/images/MEDIA_CustomProductCatalog/m4240190_Be_Red_Cross_Ready.pdf
   - Obtain a copy of "Repairing Your Flooded Home", also available from the Red Cross: http://www.redcross.org/images/MEDIA_CustomProductCatalog/m4340135_file_cont333_lang0_150.pdf
   - Consider storing sand bags at your property.

3. Consider permanent flood protection measures:
   - Mark your fuse breaker box to show the circuits that are susceptible to flooding. Turning off power to those circuits can reduce property damage and save lives.
   - If practical, consider elevating your home above flood levels.
   - Check your building for water entry points. These can be doors, crawlspaces, vents, etc. which can be retrofitted or floodproofed to prevent water from entering.
   - If practical, install floor drains, sump pumps, or stand pipes to drain flood water quickly.
   - Install a sewer backflow preventer to stop floodwaters from entering your home through the drains.
   - More detailed information is available in the "Homeowner's Guide to Retrofitting: Six Ways to Protect Your House from Flooding" which is available from FEMA here: http://www.fema.gov/media-library/assets/documents/480
   - Note that some flood protection measures may require a Floodplain Use Permit and others may not be safe or practical for your type of building.

4. Talk to County staff for information about financial assistance.
   - There may be some financial assistance available through FEMA for the purpose of property protection measures. Contact the Pinal County Flood Control District to discuss current funding availability.
   - The County does not currently have any funding available for private flood protection purposes.

5. Obtain a flood insurance policy.
   - Homeowners' insurance policies do not cover damage from floods. However, because of Pinal County's participation in the National Flood Insurance Program, homeowners can purchase a separate flood insurance policy which is backed by the federal government and is available to everyone, even properties that have flooded in the past. Also consider insuring your building's contents as well.
   - If you don't already have flood insurance, don't wait until the next flood to buy insurance protection. In most cases, there is a 30-day waiting period before the National Flood Insurance Program coverage takes effect.
   - Because your area is not currently mapped as a FEMA Special Flood Hazard Area, you may qualify for a lower-cost Preferred Risk Policy.
   - Contact your insurance agent for more information on coverage and rates.

Please feel free to contact the Pinal County Flood Control District at 520-866-6411 or at floodcontrol@pinalcountyaz.gov for additional information.

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Andrew Smith
Public Works Director

Joe Ortiz
Deputy Director

Christopher Wanamaker
County Engineer

PINAL COUNTY
WIDE OPEN OPPORTUNITY

Leo Lew
County Manager

April 26, 2021

Estimados (as) señores (as):

Nos estamos comunicando con usted mediante esta carta debido a que su propiedad se encuentra ubicada dentro, o cerca de un área que se ha inundado en varias ocasiones. Esta zona es conocida como "Área de Pérdidas Repetitivas" que se define como áreas que contienen edificaciones que han presentado dos o más reclamaciones de seguros de inundación de más de mil ($1,000) dólares en los últimos diez años. Hay una larga historia de inundaciones documentadas en la Ciudad de Arizona City. Los registros de la Agencia Federal de Manejo de Emergencias (FEMA), de la Administración Oceánica y Atmosférica Nacional (NOAA), del Cuerpo de Ingenieros del ejército (USACE), y otras fuentes de información indican que esta zona ha sufrido notables inundaciones por lo menos 24 veces desde el año 1887. La inundación más reciente que ocasionó un impacto significativo a la ciudad de Arizona City ocurrió en el mes de Julio de 2012.

La agencia del Condado de Pinal está tomando precaución para tratar de aliviar las inundaciones repetitivas en la ciudad de Arizona City y ha establecido programas y normas destinadas a reducirlas en el futuro; en el año 2010 realizó un estudio para investigar las causas de las inundaciones y determinar la mínima elevación de pisos en nueva construcciones de viviendas o edificaciones. En el 2015 el Condado también finalizo un proyecto para reducir la frecuencia y severidad de inundaciones en la cuenca de detención en la zona "Área de Pérdidas Repetitivas." Sin embargo, incluso con la realización de este proyecto, el riesgo de inundación continúa afectando la área debido a que puede estar sujeta a inundaciones provocadas por tormentas de agua que exceden la capacidad del diseño de la cuenca.

Como dueño o inquilino de estos inmuebles, hay varios recursos que usted puede utilizar para proteger su propiedad:

1. Puede comprobar con el Distrito de Control de Inundaciones del Condado de Pinal la magnitud de las inundaciones que han ocurrido en su área. El personal del departamento puede informarle acerca de las causas que han ocasionado frecuentes inundaciones; lo que el Condado está haciendo al respecto; y qué opciones están disponibles y son adecuadas para su protección; también el Condado puede visitar su propiedad para discutir las inundaciones pasadas y las alternativas que existen para protegerse.

2. También puede prepárese para las inundaciones de la siguiente manera :
   - Ponga pólizas de seguros, documentos de valor, medicamentos, etc. en un lugar seguro y accesible.
   - Consiga y coloque productos de limpieza, una cámara, botas impermeables, etc. en un lugar seguro y accesible.
   - Desarrolle un plan de respuesta a desastres - consulte la página web de la Cruz Roja Americana aquí http://www.redcross.org/images/MEDIA_CustomProductCatalog/m4240190_Be_Red_Cross_Ready.pdf
   - Obtenga una copia del "Reparar su Hogar Inundado" (Repairing Your Flooded Home), también disponible en la página de la Cruz Roja Americana http://www.redcross.org/images/MEDIA_CustomProductCatalog/m4340135_file_cont333_lang0_150.pdf
   - Considere la posibilidad de almacenar bolsas de arena en su propiedad.

3. Considere medidas permanentes de protección contra inundaciones:
   - Marque su caja de fusibles mostrando los circuitos que son susceptibles a las inundaciones. Desactivación de esos circuitos puede reducir daños a la propiedad y salvar vidas.
   - Si es posible, considere la posibilidad de elevar su casa por encima de los niveles de inundación.
   - Revise su edificación para localizar los puntos de entrada de agua. Estos pueden ser puertas, espacios de acceso, rejillas de ventilación, etc., los cuales se pueden reequipar o proteger para prevenir la entrada de agua.
   - Si es posible, instale desagües de piso, bombas de succión, o tubos abiertos para drenar la agua rápidamente.
   - Instale una válvula anti flujo en el alcantarillado para prevenir la entrada de agua de inundación a su casa a través de los desagües.
   - En caso de requerirse encontrará información más detallada en la "Guía de Propietarios de reequipamiento : Seis maneras de proteger su casa contra las inundaciones ". (Homeowner's Guide to Retrofitting: Six Ways to Protect Your House from Flooding) que está disponible en la página web de FEMA : http://www.fema.gov/media-library/assets/documents/480
   - Tenga en cuenta que algunas de las medidas de protección contra inundaciones pueden requerir un permiso de uso de valles de inundación y otros pueden no ser seguros o prácticos para su tipo de estructura.

4. Hable con el personal del Condado para obtener información sobre la asistencia financiera.
   - Es posible que haya algún tipo de asistencia financiera disponible a través de FEMA para poner en efecto medidas de protección a su propiedad. Póngase en contacto con el Distrito de Control de Inundaciones del Condado Pinal para discutir la disponibilidad de financiación (a través de FEMA).
   - El Condado no cuenta en este momento con ninguna financiación directa disponible para construcción de protección contra inundaciones en propiedad privadas.

5. Obtenga una póliza de seguro contra inundaciones.
   - Tenga en cuenta que las pólizas de seguros de viviendas no cubren daños por inundaciones; sin embargo, debido a la participación del Condado de Pinal en el Programa Nacional de Seguros contra Inundaciones, los propietarios de inmuebles en el condado (incluso de las propiedades que han sido inundadas en el pasado), pueden comprar una póliza de seguro contra inundaciones por separado que está respaldado por el gobierno federal. Es muy importante que también considere una póliza para asegurar los contenidos de su vivienda.
   - Si en la actualidad usted no cuenta con este seguro contra inundaciones, no espere hasta la próxima inundación para adquirir la póliza, en la mayoría de los casos, hay un periodo de espera de 30 días antes de que la cobertura del Programa Nacional de Seguros contra Inundaciones entre en vigor.
   - Debido a que su área no está actualmente clasificada por FEMA como una Área Especial de Riesgo de Inundación, usted puede calificar para una póliza de Riesgo Preferida para inundaciones la cual es de menor costo.
   - Póngase en contacto con su agente de seguros para obtener más información sobre la cobertura y las tarifas de estas pólizas.

Para mayor información contacte el Distrito de Control de Inundaciones del Condado Pinal al 520-866-6411 o en floodcontrol@pinalcountyaz.gov para obtener mas detalles.

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APPENDIX C: OFFICIAL RESOLUTION OF ADOPTION