Section Nine—Safety Element

9.1 Introduction

Both natural- and human-caused disasters pose risks to the health and property of Yuma County residents. The best way to understand and prepare for future disasters is to understand what and where disasters have occurred in the past and where one is most likely to occur again in the future. The simplest way to reduce or avoid impact from a disaster is to avoid being where the disaster strikes. For this reason the Safety Element contains a detailed set of maps that detail the areas in Yuma County most at risk from a variety of disasters and where disasters have occurred in the past. The specific types of disasters that the Safety Element examines are flooding, earthquakes, storms, wildfires and airport-related hazards.

Yuma County recognizes that natural and human-caused hazards pose a significant threat at varying degrees of magnitude and frequency to the safety and economic stability of the county and its residents. For this reason numerous detailed plans, policies, and ordinances regarding hazards to public safety have been adopted by Yuma County. These documents include the *Yuma County Multi-Jurisdictional Hazard Mitigation Plan 2010, Yuma County Wildland Urban Interface Community Wildfire Protection Plan, Floodplain Regulations for Yuma County* and *Article VII—Airport District of the Yuma County Zoning Ordinance.* The intent of the Safety Element is to bring the most important goals, policies and objectives of these documents into one place to allow them be considered in a comprehensive manner together and with all the goals, policies and objectives contained within the Yuma County 2020 Comprehensive Plan.

Because distance and availability from existing public safety infrastructure needs to be a consideration in any future development, maps depicting this are included in the Safety Element. By including a clear set of maps depicting all this in the Safety Element, it helps ensure that such considerations are taken into account in all future development decisions. The Safety Element also identifies an area of the county where increased train traffic combined with limited railroad crossings makes access by emergency vehicles less reliable.

Public participation was the single-most vital element in the creation of the 2020 Yuma County Comprehensive Plan. Multiple public meetings were held by Planning staff at locations all across the County at which the Safety Element and public safety in general were discussed. At these meeting both long and short term issues regarding public safety that residents felt needed to be addressed were gathered. The concerns of residents brought up at these meetings are reflected in the policies and planned actions that are set forth in this element.

The safety policies and priorities section contains the policy positions and priorities of Yuma County regarding public safety within unincorporated Yuma County. The safety policies and priorities contained within Section 9.8 are derived from comments and feedback from residents from across the County, comments from stakeholders and from detailed plans, policies and ordinances regarding hazards to public safety. All official actions taken by Yuma County regarding public safety should be in harmony with these policies and priorities. Further, when other agencies request Yuma County's comments or recommendations on policy or projects that could impact public safety, Yuma County's response will reflect as much as possible these

policies and priorities. Yuma County will support the applications of grants projects and policy changes that will further advance these policies and priorities.

The safety actions section (Section 9.9) contains the specific actions that Yuma County makes in an effort to advance the adopted safety element's policies and priorities.

9.2 Flooding

Flooding or flood-related events are the primary hazard impacting Yuma County. Damaging floods in Yuma County can be primarily categorized as either riverine or local area flows.

Areas that have inadequate drainage can be subject to localized shallow flooding and ponding caused by local area flows. Typically this type of flooding occurs when locally heavy rainfall occurs in a developed area that has no or insufficient drainage infrastructure. With no effective means to be conveyed to a natural drainage way or drain, water may pond in locally low lying areas, potentially causing damage to homes, businesses or infrastructure. In a number of older neighborhoods this type of flooding can impede access to the neighborhood. Identifying areas that are troubled by this type of flooding is one of the duties of the Yuma County Flood Control District. Identification of proposed remedies for areas troubled by localized flooding can be found in the most current version of the Yuma County Flood Control District Annual Assessment Report. The Comprehensive Plan and all other activities should support the goals and projects contained within this document.

Riverine flooding occurs along the established watercourses within the area. The two primary regional watercourses are the Gila and Colorado Rivers. There are also numerous other ephemeral washes draining into either the Colorado or Gila Rivers. Extensive networks of dams and flood control structures upstream of Yuma County usually limit flooding events on the Colorado and Gila Rivers. Prior to construction of these dams, flooding on both rivers occurred seasonally. However, extreme tropical storm remnants, heavy winter storms or early spring rains coupled with snowmelt and full reservoirs can still cause damaging floods along the Colorado and Gila Rivers. The following are examples of recent flooding events that had significant impact on Yuma County.

In 1983, exceedingly large amounts of runoff caused by rapidly melting snow from record snowfalls and late rains resulted in an unusually high volume of melt off which required the upper basin reservoirs to release unprecedented volumes of water into the lower Colorado River system. The releases caused the Colorado River to flood low-lying areas, caused erosion of river banks and caused surface ponding due to groundwater seepage. Septic tank systems and water treatment systems were also damaged. Damage in Yuma County was estimated at $13 million.

In the winter of 1993, heavy rain fell over most of northern, central and southeastern Arizona causing water to begin spilling over the Painted Rock Dam just upstream from Yuma County on the Gila River. Downstream flows damaged crops and property on both sides of the Gila River. About 20,000 acres of farmland were flooded and huge losses were sustained in the lettuce crop and water flooded roads and closed bridges. Some 3,500 residents were evacuated from this area. All Gila River crossings were closed at one time or another during the flood. According to the United *States Army Corp of Engineers Flood Damages Report 21*, Yuma County had in excess of $130 million in public infrastructure, agricultural, private property, economic and environmental damages.

Floodplain Regulations for Yuma County

There are specific areas in Yuma County that have a high risk of damage from flood. Therefore, the Yuma County Flood Control District has adopted the *Floodplain Regulations for Yuma County* in order to:

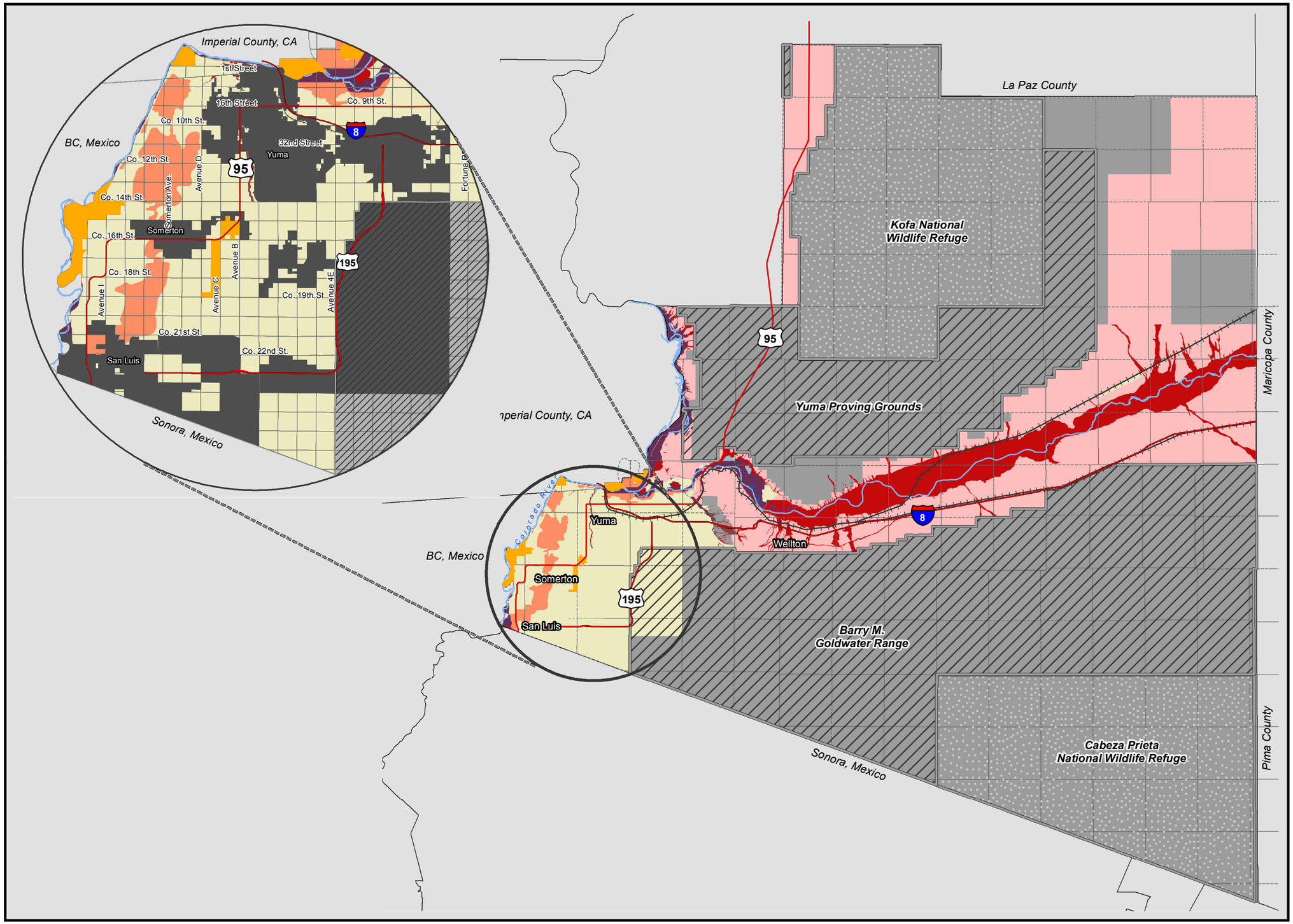
- Protect human life and health
- Minimize expenditure of public money for costly flood control projects
- Minimize damage to public facilities and utilities such as water, sewer and gas mains; electric, telephone and television lines; and streets and bridges located in areas of special
  flood hazard
- Maintain eligibility for State and Federal disaster relief

The *Floodplain Regulations for Yuma County* require that a Floodplain Use Permit be obtained before any new construction, development, substantial improvement, manufactured home placement or prefabricated building placement begins within any Special Flood Hazard Areas that have been classified by the Federal Emergency Management Agency (FEMA) and shown on a Flood Insurance Rate Map as A, AO, A1-30, AR, A99, AH, or V (refer to Map 1 on page 6). In all Special Flood Hazard Areas, development shall comply with the standards and regulations set forth in A.R.S. §48-3601 et. seq. and the National Flood Insurance Program (44 CFR Part 59, 60, 65, & 70) and Section 5.0 of the *Floodplain Regulations for Yuma County.*

Zone D	Areas in which flood hazards are undetermined, but possible.
Zone X-Shaded	Areas of 0.2% annual chance flood, areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile, and areas protected by levees from 1% annual chance flood.
Zone X-Unshaded	Areas determined to be outside the 0.2% annual chance floodplain.
Zone X-Protected by Levee	Area protected from 1% annual chance flood by levee.
Zone A	Areas subject to inundation by the 1% annual chance flood. No depths or base flood elevations are shown within these zones.
Zone AE	Areas subject to the 1% annual chance flood where Base Flood Elevations are determined.
Zone AH	Areas subject to the 1% annual chance flood with flood depths of 1 to 3 feet (usually areas of ponding) and where Base Flood Elevations are determined.
Zone AO	Areas subject to the 1% annual chance flood with flood depths of 1 to 3 feet (usually sheet flow on sloping terrain) and where average depths are determined. For areas of alluvial fan flooding, velocities are also determined.

Table 1: FEMA Flood Zone Definitions

Safety Elements - Flood Zones



Flood Zones

- X Shaded
- A
- AE
- AH
- AO
- D
- X Unshaded
- X Protected By Levee
- Military Boundary
- Incorporated Areas
- Indian Reservations
- National Wildlife Refuge

For Information Only No Liability Assumed
Yuma County Dept. of Development Services
Source: Yuma County GIS Division &
Federal Emergency Management Agency

Date: June, 2011

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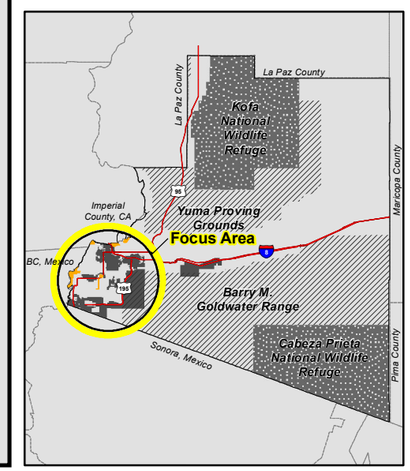


9.3 Earthquakes

The seismic hazard for the Yuma region is considered the highest in Arizona. Yuma County is located in relatively close proximity to several major geologic fault zones with historic seismic activity which are located to the west of Yuma County in Imperial County, California and in Mexico. These faults include the Imperial Fault (28 miles), Cerro Prieto Fault (45 miles), San Andreas Fault (65miles) and San Jacinto Fault (65 miles). The stretch of the San Andreas Fault nearest Yuma has not ruptured in over 300 years and is considered a likely area to experience an earthquake of a magnitude of 8.0 or higher. An earthquake of that magnitude could cause catastrophic damage to the area.[1]

Since 1973, these faults have produced over 5,000 earthquakes with an epicenter located within 250 kilometers of Yuma County (Map 2). The vast majority of these quakes were minor and only detectible with a seismograph. Only seven earthquakes had their epicenter within Yuma County and all of them extremely minor. However, there have been several earthquakes during the last 150 years that have caused damage within Yuma County due to ground shaking, and there is a reasonable probability that this will occur again. Table 2 shows some of the earthquakes that were most notably felt in Yuma County. Potential damage from ground shaking during an earthquake increases from east to west across Yuma County.

Liquefaction occurs when an earthquake causes ground shaking in an area that has shallow ground water and sandy soils. Liquefaction caused by an earthquake has a greater potential to cause widespread damage in Yuma County than does ground shaking. Liquefaction is the process wherein soils transform into a liquid state due to ground shaking from an earthquake. When the ground liquefies, sandy materials saturated with water can behave like a liquid instead of like solid ground. The ground may sink or even pull apart and sand boils or sand "volcanoes" can appear. In Yuma County, conditions such as sandy soils and high ground water are found in the Yuma and Gila Valleys, and put these areas at risk for liquefaction in the event of a strong enough earthquake. Map 3 depicts the areas deemed to be a high risk of liquefaction in Yuma County. After an earthquake in 1852, more than 100 mud volcanoes were found two weeks after the quakes in Yuma County. The volcanoes were still emitting steam and gases with the major one erupting every 10 to 15 minutes and throwing mud 60 to 70 feet in the air.[2]

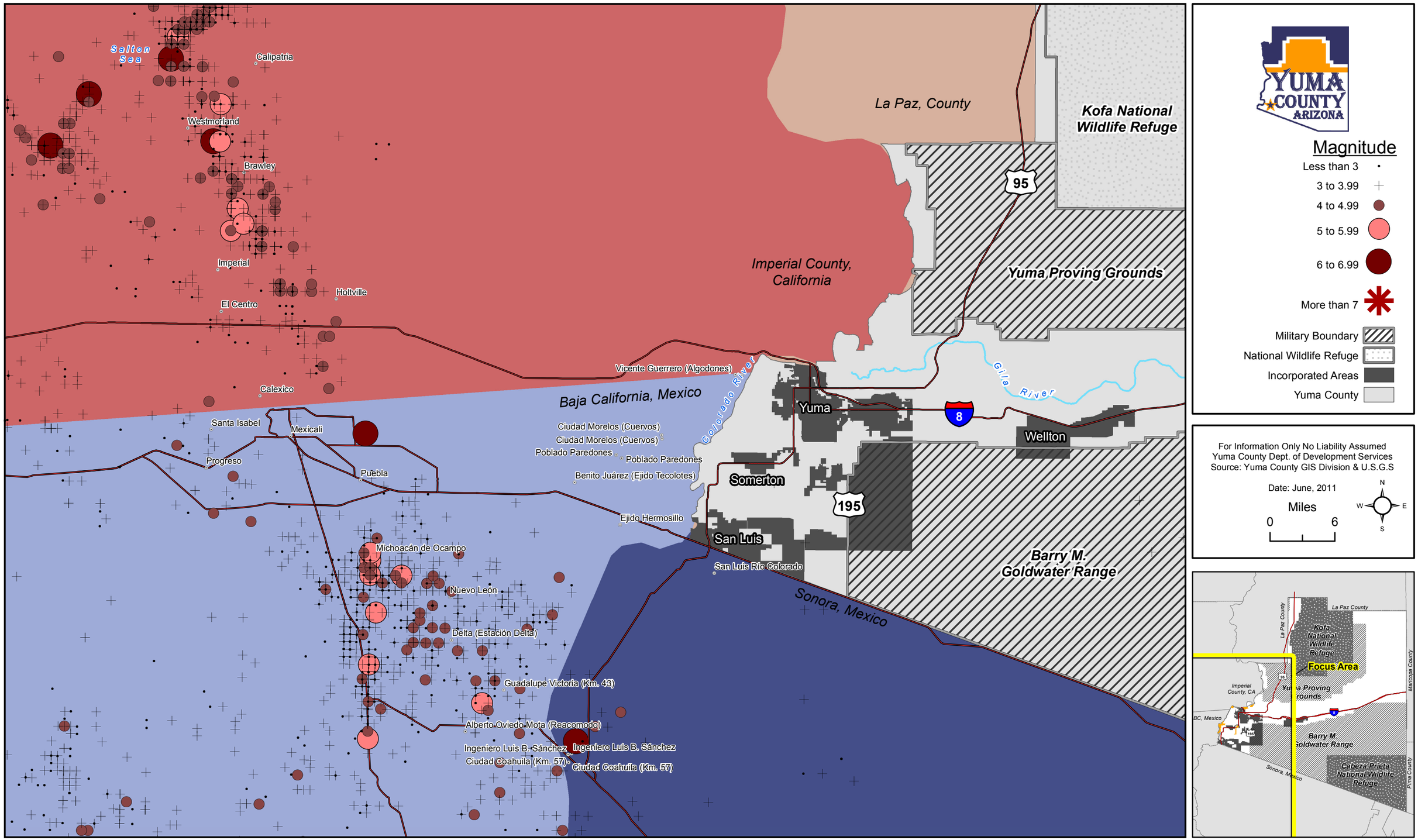
Liquefaction is especially damaging to in-ground infrastructure such as buried utilities and irrigation and drainage canals. An earthquake in 1940 that had its epicenter in Imperial County caused significant liquefaction to occur in the southern portion of the Yuma Valley. In Somerton, roads were buckled and bridges dislodged. Twenty flumes received heavy damage, as did bridges and culverts in the area. Canal banks shattered under the quake's force. Geysers of sand spewed from the cracks in the ground up to six feet in the air. The earthquake damaged sections of the levee railroad grade near Gadsden, four water services lines were broken and the irrigation system was badly damaged.

1 Arizona Division of Emergency Management "State of Arizona Multi-Hazard Mitigation Plan" November 2007

2 DuBois, Susan M & Ann W. Smith "Earthquakes Causing Damage in Arizona." *Bureau of Geology and Mineral Technology. September 1980.*

3 U.S. Bureau of Reclamation. "Yuma and Yuma Auxiliary Project History"

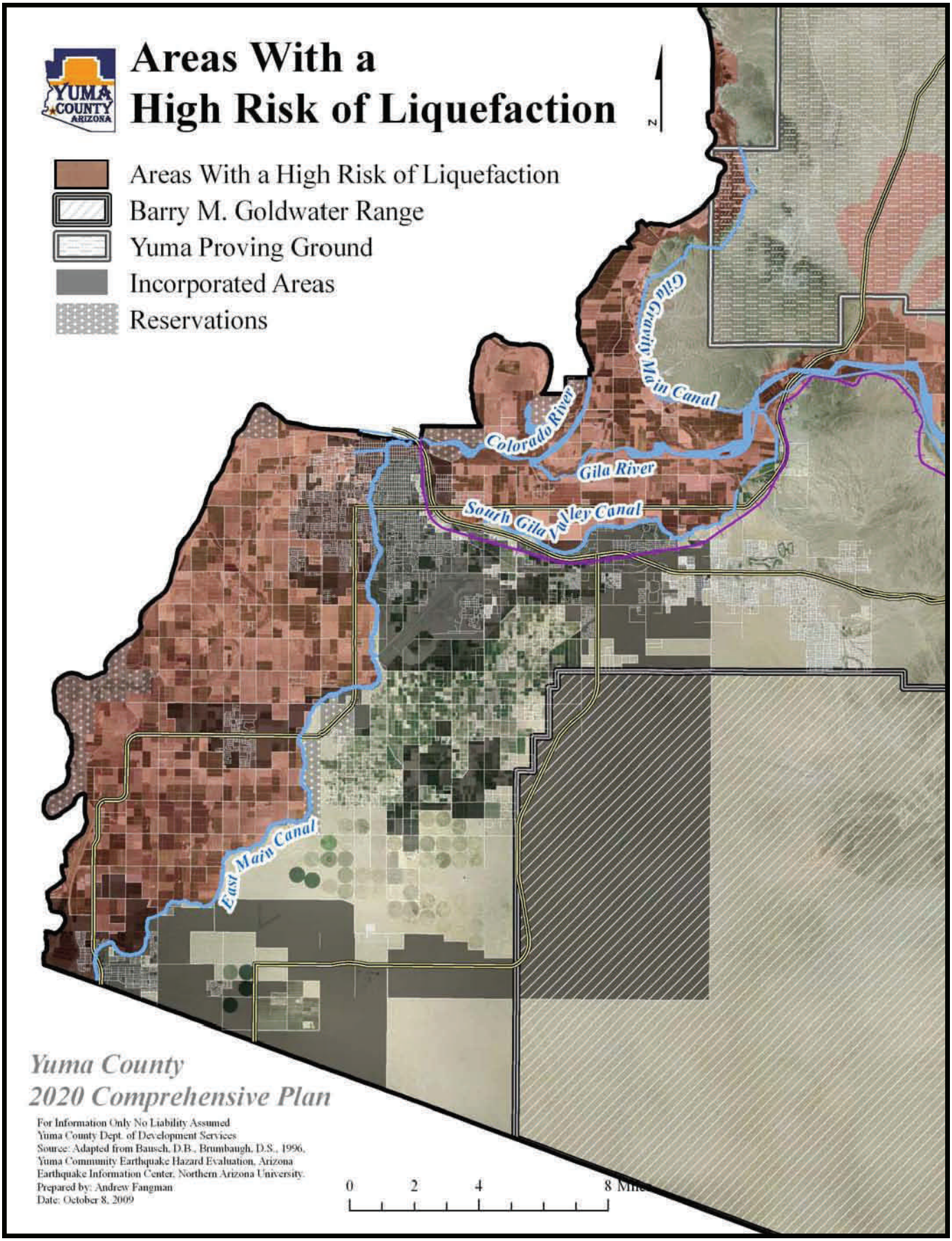
Safety Element - Earthquakes in the Yuma Vicinity 1973-2010



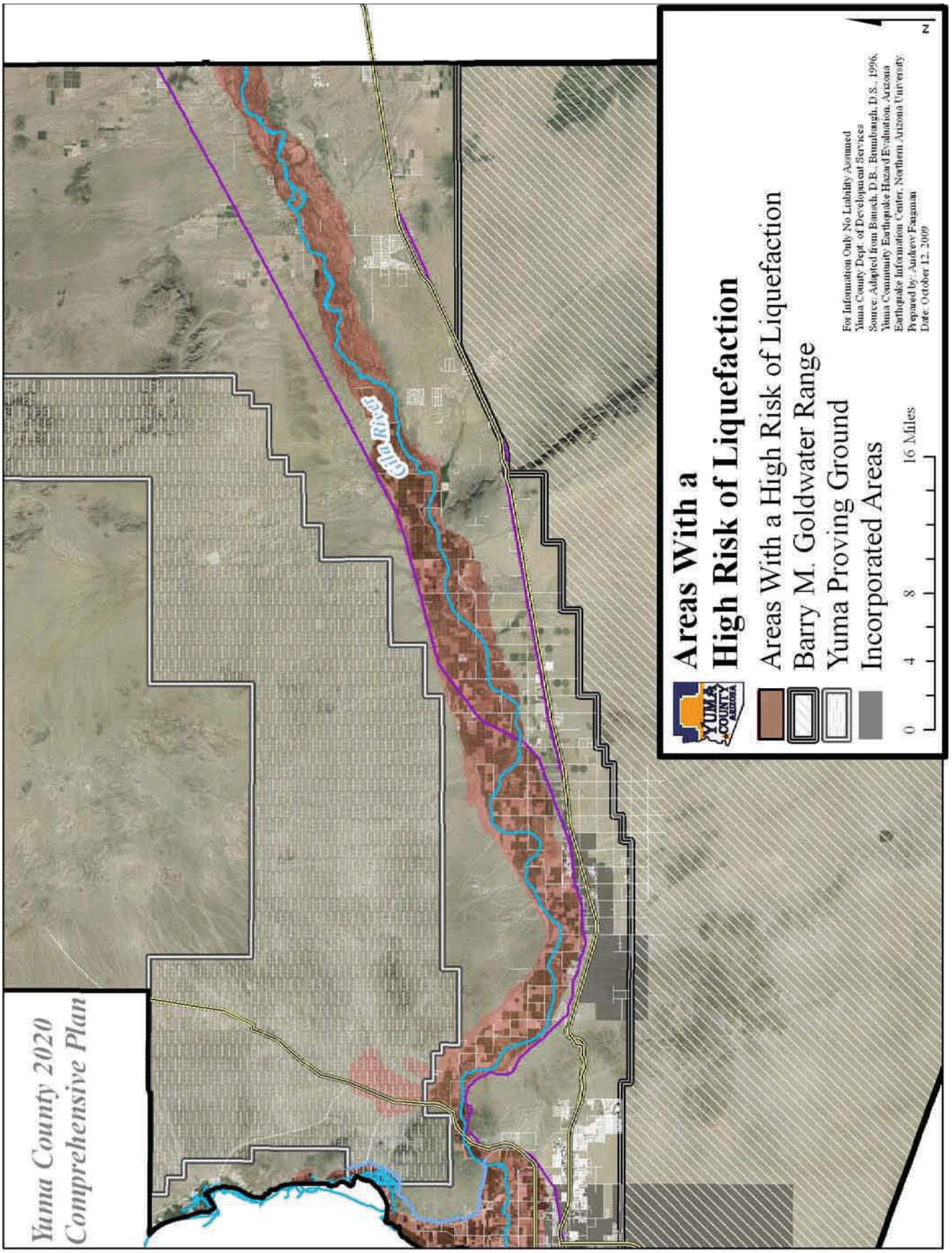
Date	Location	Intensity	Effects on Yuma County
November 30, 1852	20 to 30 miles southwest of Yuma	IX-XI	In the central area more than 100 mud volcanoes were found more than two weeks after the quakes. The volcanoes were still emitting steam and gases with the major one erupting every 10 to 15 minutes and throwing mud 60 to 70 feet in the air. The shock was violent at Fort Yuma. Much fissuring occurred in the Yuma area. In some places the Colorado River sank two feet and the riverbank caved in at many locations[4]
July 30, 1891	Lerdo, Mexico	IX-X	Large fissures opened up along the Colorado River in Mexico. In Yuma people rushed into the streets, some walls were cracked, and small objects were moved about.[4]
May 19, 1940	Imperial County, CA	X	Many sand boils were observed near Gadsden. Geysers spouting water several meters high also were reported. Canals, drainage channels, flumes and bridges were damaged near Gadsden. In Somerton roads were buckled and bridges dislodged. Four water services lines were broken and the irrigation system was badly damaged[4]
October 15, 1979	Near Brawley, CA	IX	Minor damage in Yuma[4]
June 9, 1980	South of Mexicali, Mexico	IX	Knocked groceries off the shelves in stores in Yuma[4]
February 9, 2008	12 Southeast of Mexicali	VI	Damaged the Gandolfo Annex in downtown Yuma [4]
April 4, 2010	39 Miles South-Southeast of Calexico, Co	IX	Second strongest earthquake with an epicenter in Baja California ever measured. Felt strongly in Yuma County. Numerous buildings, mostly in southern Yuma County reported some damage. Caused power outages effecting approximately 4,900 customers in Yuma County [4]

Table 2: Significant Earthquakes that Had an Impact in the Yuma Area[4]

4. DuBois, Susan M & Ann W. Smith "Earthquakes Causing Damage in Arizona." *Bureau of Geology and Mineral Technology. September 1980.* http://www.azgs.state.az.us/Hazards_ocr/earthquakes/Summary%20of%20Earthquakes%20Causing%20Damage%20in%20AZ.pdf



Map 3: Areas With a High Risk of Liquefaction: Western Yuma County



Map 4: Areas With a High Risk of Liquefaction: Eastern Yuma County

Power pole that has been broken by a thunderstorm

9.4 Storms

Yuma County is subject to three different types of storms that can pose a risk to life and property: Summer monsoons, winter rains and tropical storm remnants. These storm types vary by time of year they occur, frequency and the kind and severity of damage done by them.

The most frequent type of storms that occur in Yuma are those associated with the annual monsoon season which runs from July to September. Monsoon season occurs when the primary wind flow into Yuma County shifts from the west or northwest to the south or southeast. With this shift, winds blowing into Yuma County originate from over the Pacific Ocean and the Gulf of California, and as a result carry a great deal of moisture into the area. This moisture fuels frequent compact, swift-moving and powerful thunderstorms with winds of up to 80 miles per hour and rainfall rates exceeding an inch per hour. These storms are capable of unleashing violent flash floods, thousands of lightning strikes, crop-damaging hail and walls of blowing dust that can extend thousands of feet into the air and can lower visibility to just a few feet.[5]

Storms during the winter months tend to be much larger in area and longer in duration than monsoon storms; however, they are of a much lower intensity, particularly in regards to wind speed. Damage from these storms typically results from flooding. The storm that struck Yuma County on January 21, 2010, one the largest winter storms to ever strike the County, well illustrates the risks posed by this type of storm. This storm dropped nearly 2½ inches of rain causing wide-spread flooding of low spots, and closing numerous roads and schools. The City of Yuma received a Presidential Emergency Declaration to help pay for an estimated $300,000 in damages to roads, retention basins, parks and other public infrastructure. The National Climatic Data Center estimated property damage from this storm at $400,000. This storm was one of three winter storms to cause more than $10,000 in damage from 2005 through 2010 as illustrated in Table 3 on Page 14.

[5] NOAA/National Weather Service. "The North American Monsoon. Reports to the Nation on our Changing Planet." August 2004

The most potentially destructive type of storm that can hit Yuma County are tropical storms or remnants of a tropical storm or a hurricane. The northern end of the Gulf of California is located 40 to 50 miles south of the southern border of Yuma County. Under the right set of circumstances a hurricane coming ashore on the northern coast of the Gulf of California can reach Yuma County at tropical storm strength, as was the case in 1997 with Hurricane Nora, which hit with winds over 73 miles an hour.

More commonly, hurricanes or tropical storms come ashore on the northern coast of the Gulf of California and then reach Yuma County as remnants of tropical storms. These remnants, however, remain powerful storms, capable of producing more rainfall in 24 hours than is typically seen in a year. Strong winds are also part of these storms. The fact that these storms cover a much larger area than the typical thunderstorm increases the amount of damage that they can cause. The potential for widespread damage is well illustrated by the damage caused by the remnants of Hurricane Nora in 1997 where crop damage across Yuma County was estimated at $200 million. Table 4 on page 15 lists the six times in recorded history that Yuma County was significantly impacted by a tropical storm, hurricane or its remnants. While this type of storm is the most destructive to threaten Yuma County, they are a rare occurrence.

An additional hazard that storms pose to Yuma County is that they can make access to certain inhabited areas of the county during and immediately after heavy rainfall events difficult. In some subdivisions developed prior to Yuma County adopting subdivision regulations and in many wildcat subdivisions, access to homes are via unmaintained and unpaved roads. Many of these roads never included any provisions for drainage, or if they did, a lack of or inadequate informal maintenance rendered any provisions for drainage ineffective.

As a result, access to all or parts of these subdivisions can be impeded by significant amounts of standing water and mud during and after heavy rainfall events. Often, only high clearance four wheel drive vehicles have full access. This problem is amplified in areas of heavy clay soils where water percolates into the soil at a very slow rate, where areas of standing water can last for days. This thick clay soil forms a thick mud that can make passage for many vehicles difficult. The issue of lack of all-weather access to certain existing subdivisions and other residential areas and how this issue might be dealt with is covered in greater detail in the Circulation Element.

An unpaved and unmaintained street after a heavy rainfall

Date	Description	Reported
April 23, 2005	Winds associated with thunderstorms damaged roofs and carports. Power was knocked out in parts of the Yuma Foothills area. Small hail was also reported with these thunderstorms.	$ 20,000.00
July 29, 2005	Power poles down at Avenue 45E and County 5th Street.	$ 25,000.00
July 31, 2005	About 34 power poles down near County 13th Street leaving 1,000 customers without power.	$ 50,000.00
August 1, 2005	Power poles knocked down in Dome Valley.	$ 10,000.00
August 4, 2005	Trees and 30 utility power poles were blown down by storm winds.	$ 50,000.00
August 6, 2006	Car windows broken by hail at Martinez Lake.	$ 10,000.00
August 9, 2006	Power lines down and some equipment damaged by strong winds at YPG.	$ 20,000.00
September 6, 2006	A roof was damaged by very strong winds and heavy rain washed out some dirt roads at YPG. Small hail was also reported.	$ 20,000.00
September 2, 2007	Numerous trees and as many as 11 power poles reported down due to strong winds with peak gusts up to 84 mph. 600 people were left without power. Condos in the 100 block of West 27th Place had considerable roof damage with ceilings collapsing onto living rooms and dining rooms.	$ 1,500,000.00
November 30, 2007	About 1,000 APS customers were left without power after heavy rains triggered fires to equipment on 15 power poles.	$ 15,000.00
March 2, 2008	Peak wind gust measured at 46 mph at the airport in Yuma. Winds also damaged a roof of a bank	$ 20,000.00
July 20, 2008	Heavy rain caused some damage to a thrift store in Yuma. Several businesses at Southgate Mall reported damage due to standing water. A new daily rainfall record 0.74 inches was set.	$ 100,000.00
August 29, 2008	Trees were uprooted and a semi-trailer was turned over. A peak gust of 57 mph was measured. About 1,000 APS customers were left without power due to these thunderstorm winds.	$ 150,000.00
September 10, 2008	Somerton police reported power lines down due to very strong winds from thunderstorms. At the peak of the storm, between 2,500 and 3,000 APS customers were without power.	$ 150,000.00
September 11, 2008	Two power poles downed by strong winds at Avenue A and 3rd street in Yuma.	$ 10,000.00
July 18, 2009	Thunderstorm winds created a huge dust storm that affected much of the Yuma area with near zero visibility. Wind speeds were estimated to be over 60 mph with considerable damage to property. At least one home was damaged with trees and power lines downed by strong winds.	$ 100,000.00
July 24, 2009	Several power poles were downed due to strong thunderstorm winds.	$ 20,000.00
September 5, 2009	Heavy rain hit Tacna with one inch in 30 minutes. Minor street flooding was reported in town and Avenue 16E in the Dome Valley was washed out. At least one business in Wellton was damaged by flooding. The official amount at the Yuma airport was 1.62 inches. Power outage reported by Wellton Irrigation District lasted about 4 hours. Trees were uprooted and power poles were damaged. Lightning struck a home near highway 95 and Avenue 5E, resulting in a fire.	$ 70,000.00
October 27, 2009	Winds increased during the late afternoon hours and caused a power outage to the area of San Luis and Somerton. The outage initially affected 16,000 customers in southern Yuma County.	$ 10,000.00
December 7, 2009	Strong winds resulted in power outages and minor structural damage in Yuma.	$ 30,000.00
January 21, 2010	Four semi-trucks overturned on Interstate Highway 8 at milepost 42 and milepost 67 due to high winds. Flooded streets and low spots. Numerous reports of large trees blown down in Yuma.	$ 400,000.00

Table 3: Thunderstorms from 2005 to 2010 for which property damage was reported[6]

[6] National Climatic Data Center

Date	Storm	Effects on Yuma County
September 30, 1921	Unnamed Storm	Tropical storm crossed the Baja peninsula southwest of Yuma and moved up the Colorado River Valley. Several stations along the Colorado River reported an excess of three inches of rain including 3.65 inches at Yuma.
August 28, 1951	Unnamed Storm	A hurricane came ashore on the Baja peninsula southwest of Yuma. An excess of 5.00 inches of rain fell in southwest Arizona.
September 2, 1967	Hurricane Katrina	Hurricane Katrina comes up the Gulf of California and comes ashore south of Yuma. Over 2.00 inches of rain fell in southwest Arizona with lesser amounts elsewhere.
October 7, 1972	Hurricane Joanne	Tropical Storm Joanne (earlier a hurricane) moved across the Baja peninsula and came ashore in western Mexico south of Ajo. It was-the first "documented" time that a tropical storm reached Arizona with its cyclonic circulation intact. Heavy rains fell over much of the area with 2.21 inches falling in Yuma.
September 10, 1976	Hurricane Kathleen	After downgraded to tropical storm status, Kathleen lashed Yuma with sustained winds exceeding 50 mph and gusts as high as 76 mph. One man was killed as a 75 foot palm tree crashed onto his mobile home. This tropical storm inflicted over $2 million in dam-ages in Yuma and dropped half of the annual rainfall in one hour.
August 18, 1977	Hurricane Doreen	Severe flooding occurred in Yuma County. A weather station in the Yuma Valley recorded more than 7 inches of rain
September 25, 1997	Hurricane Nora	Yuma County was hit with the remnants of Hurricane Nora with 3.59 inches of rainfall recorded at the Yuma International Airport. The average "annual" rainfall in Yuma is 3.17 inches. The center of the storm passed directly over Yuma with wind gusts as high as 54 mph. Significant problems including downed trees, loss of electrical power, restricted access for emergency crews and severe flooding problems and wind damage were reported. In Somerton damage to mobile homes and flooding was reported. About 12,000 people lost power in Yuma. An estimated $150 to $200 million in damage was sustained throughout Yuma County due mainly to flooding crops. About $30 to $40 million of the damage was to lemon trees.

Table 4: Tropical Storms and Hurricanes that Significantly Impacted Yuma County[7]

[7] National Weather Service. " Top Arizona Hurricane/Tropical Storm Events."

9.5 Wildfires

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 develop into an emergency. Even small fires can threaten lives and resources and destroy improved properties. The indirect effects of wildfires can also be catastrophic. In addition to stripping the land of vegetation and personal property, large, intense fires can harm the soil and waterways. Soil exposed to intense heat may temporarily lose its capability to absorb moisture and support life. Exposed soils can then erode quickly and be transported to nearby rivers, harming aquatic life, increasing flood risks and degrading water quality.[8]

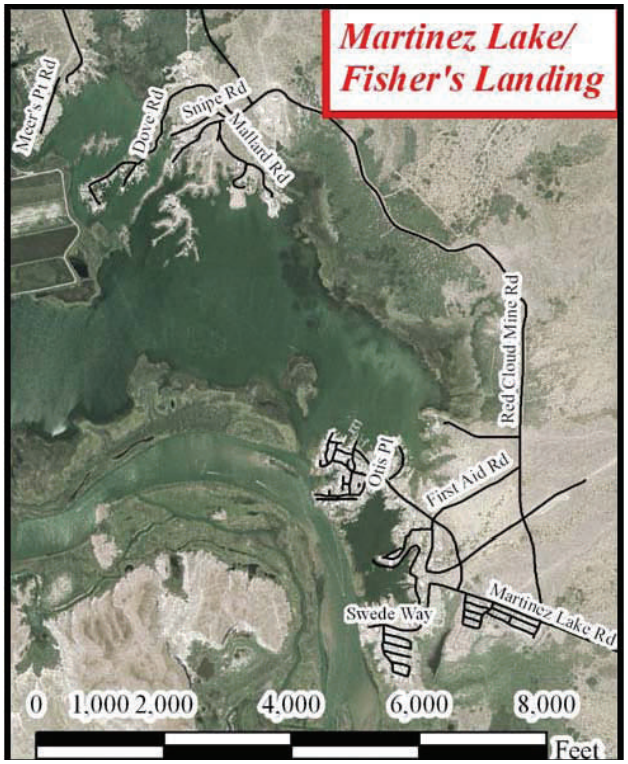
Wildfire hazards within Yuma County are typically limited to the Colorado and Gila River floodplains and the more densely vegetated areas adjacent to some of the larger washes. Fires burning through the heavily vegetated floodplain areas can be very difficult to fight, especially in areas where water is not readily available. Areas where development has occurred directly adjacent to these vegetated floodplains, such as Martinez Lake, have the greatest risk of danger to lives and properties from wildfires in Yuma County.

Map 8 displays the location and size of wildfires larger than one acre that occurred between 1980 and 2009. This map also depicts the areas of Yuma County that are heavily vegetated based on the United States Geological Survey Gap Analysis Program which, in a detailed manner, classifies and maps vegetation coverage. The areas depicted on this map as heavily vegetated are areas in which dense types of vegetation is prominent. As this map clearly illustrates there is a very strong coloration between these areas of heavy vegetation and the location of wildfires. For any development to occur in or directly adjacent to these heavily vegetated areas the mitigation of the risk posed by wildfires must be considered.

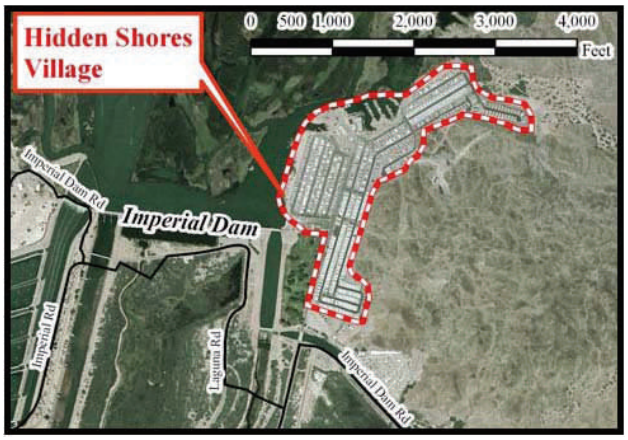
August 2009 Wildfire in the Martinez Lake Area[8]

The Sonoran desert vegetation typically found in Yuma County is less dense than in other areas of the state. This sparse vegetation, combined with relative density of urban areas, makes wildfire risk within the County relatively low when compared to the more densely forested areas of the state. However $5,685,793 has been expended through the Arizona Division of Emergency Management on responding to 19 declared wildfire events that included Yuma County between April of 1973 and September 2010.[9]

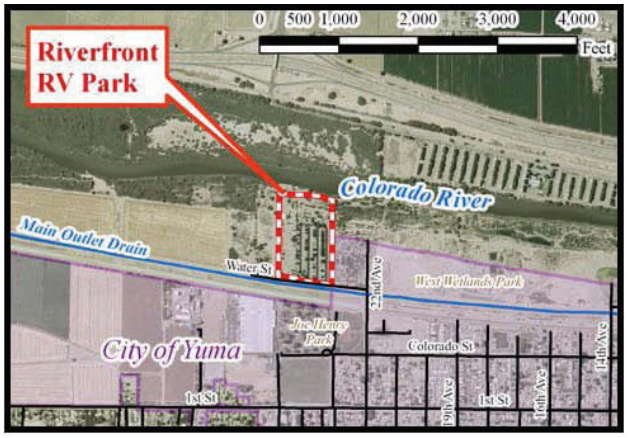
[8] Yuma County Wildland Urban Interface Community Wildfire Protection Plan
[9] Yuma County Multi-Jurisdictional Hazard Mitigation Plan



Map 5: Martinez Lake/Fisher's Landing



Map 6: Hidden Shores Village



Map 7: Riverfront RV Park

In September of 2010, the Yuma County Board of Supervisors adopted the Yuma County Community Wildfire Protection Plan (CWPP). The CWPP provides a comprehensive, scientifically-based analysis of wildfire related hazards and risks in areas where structures and other human development meet with undeveloped wildland (wildland urban interface). Three communities in Yuma County were identified as being within the wildland urban interface: Martinez Lake/Fisher's Landing, Hidden Shores Village and Riverfront RV Park. The CWPP also makes very specific recommendations on the risk from wildfires that can be mitigated in these areas. All new development in these areas should only occur in a manner that is consistent with these recommendations. Existing development should be encouraged to adopt as many of these recommendations as practical.

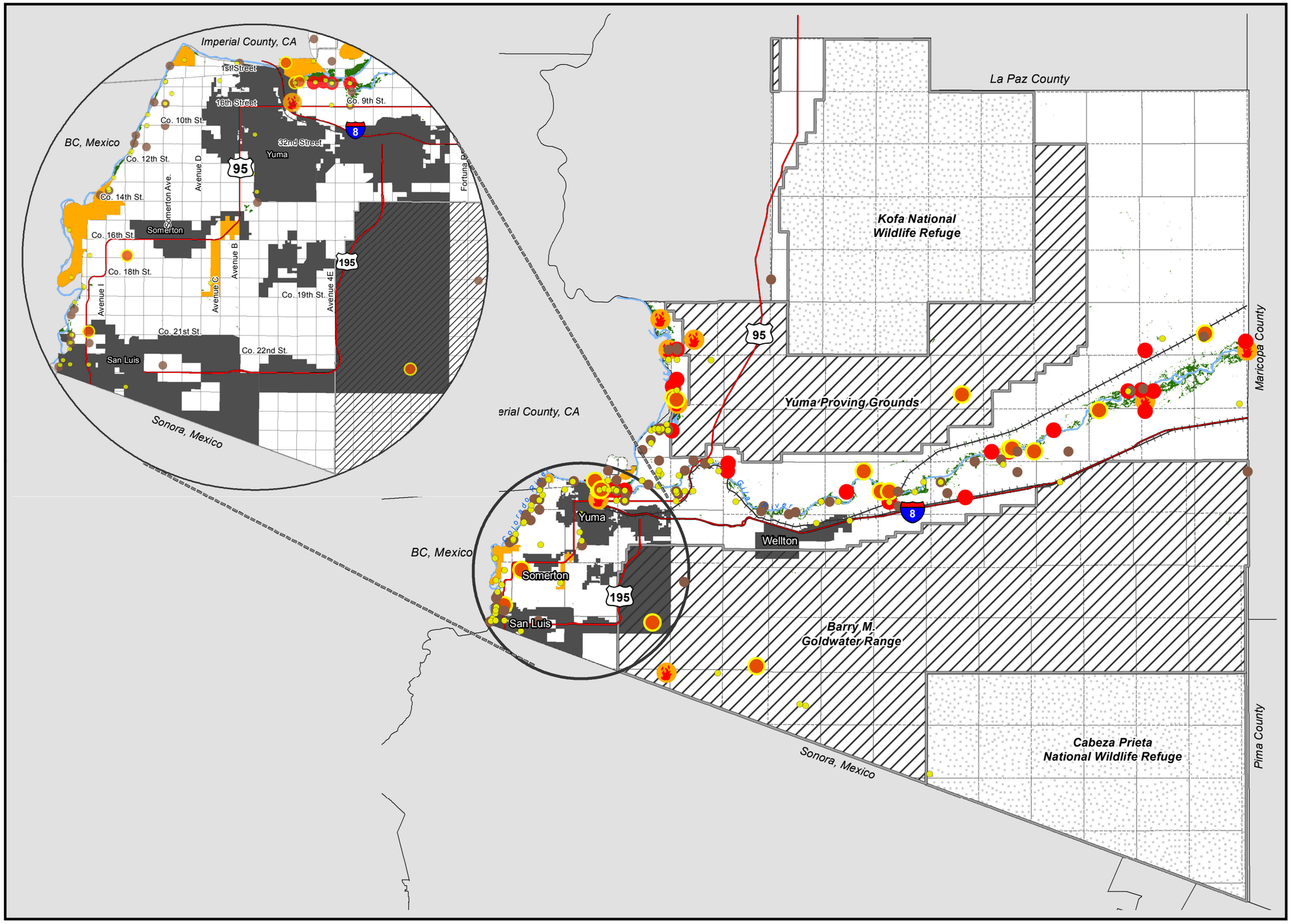
The Martinez Lake/Fisher's Landing area was rated as the residential area in Yuma County with the highest risk of damage from wildfires. This is due to the abundance of easily burnable fuels in the steep banked riparian areas lends itself to fast rates of spread and flame lengths greater than 11 feet. One of the largest local fires in recent memory occurred in the area in August 2009 when 70 acres burned and many structures were threatened.[10]

The risk from wildfires at Hidden Shores Village is rated as moderate. Vegetation has been cleared all the way around the park as well as between the permanent structures. While the vegetation has been cleared around the Village, there are house boats and fishing boats docked close to the riparian vegetation. A fire spreading from the riparian vegetation to the boats, and as a result into the community, poses the largest threat to Hidden Shores. The other major risk factor is the distance from continuously manned fire stations. [10]

The risk from wildfires at Riverfront RV Park is also rated as moderate. There is little vegetation within the Riverfront RV Park itself, but the riparian vegetation surrounding the park is dense and prone to burning. Evacuation is the largest issue as there is only one ingress/egress. Soft soil and dense vegetation impedes the ability of apparatus to operate outside of the park.[10]

[10] Yuma County Wildland Urban Interface Community Wildfire Protection Plan

Safety Elements - Wildfires



Wildfires

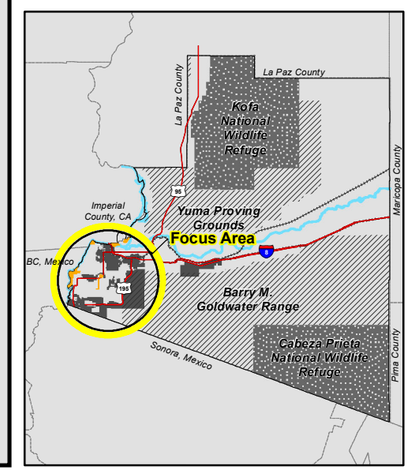
- 1 to 5 Acres
- 5 to 50 Acres
- 50 to 100 Acres
- 100 to 500 Acres
- Over 500 Acres
- Heavily Vegetated Area
- Indian Reservations
- Military Boundary
- Incorporated Areas
- National Wildlife Refuge

For Information Only No Liability Assumed
Yuma County Dept. of Development Services
Source: Yuma County GIS Division &
Federal Emergency Management Agency

Date: June, 2011

Miles
0 3 6

N W E S



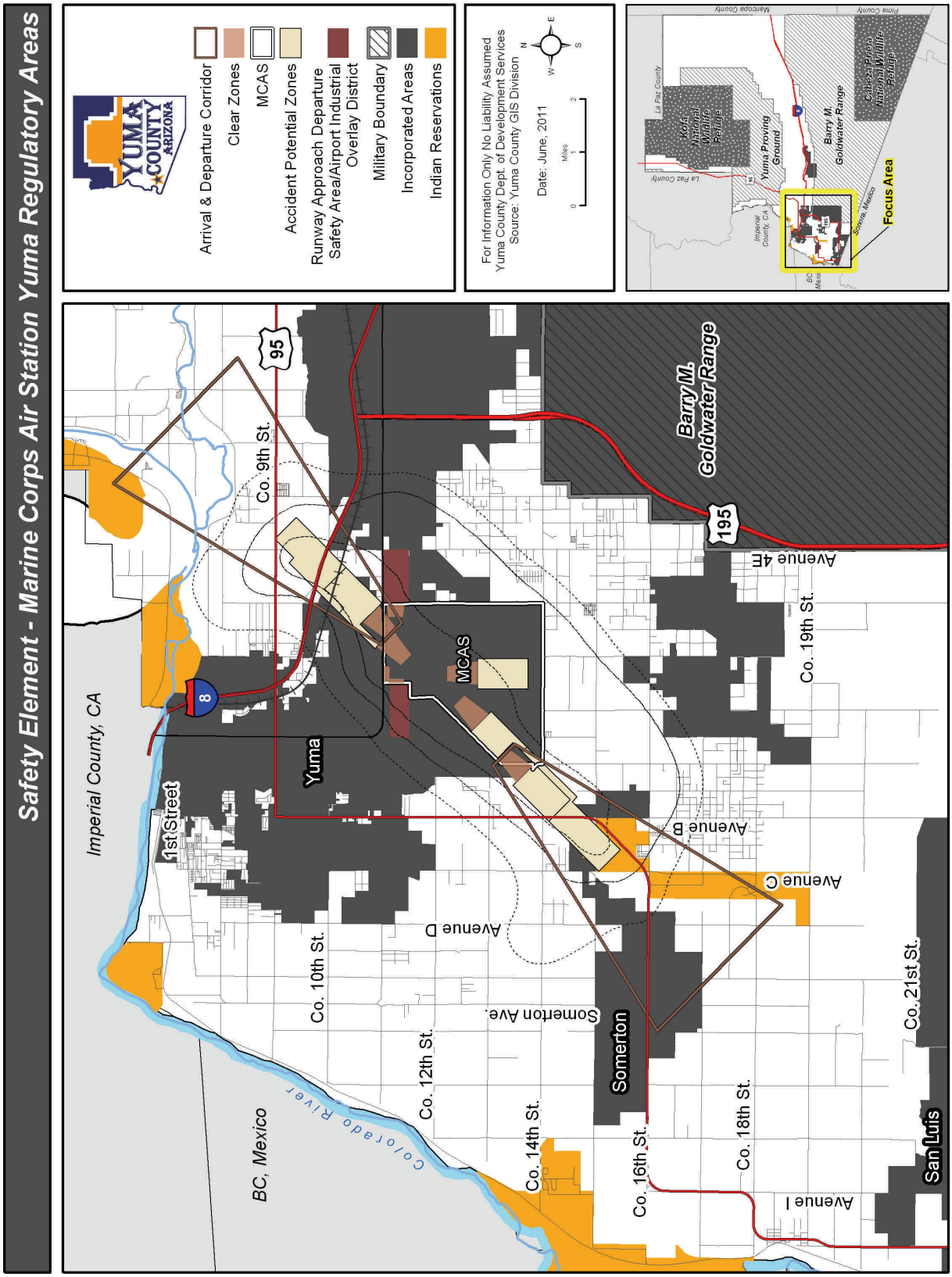
9.6 Aviation Safety

Aviation is a major industry in Yuma County and is centered around the Marine Corps Air Station-Yuma/Yuma International Airport. Marine Corps Air Station-Yuma (MCAS-Yuma) supports 80 percent of the Marine Corps' aviation training making it the busiest air station in the Marine Corps. In 2009 the Marine Corps reported 186,899 airfield operations at MCAS-Yuma. Yuma International Airport shares runways with MCAS-Yuma and serves both scheduled passenger service and general aviation. In 2009 there were 8,250 passenger aircraft and 36,887 general aviation operations. The large number of aviation operations being conducted out of MCAS-Yuma/Yuma International Airport increases the risk of plane crashes that could jeopardize the safety and property of Yuma County residents.

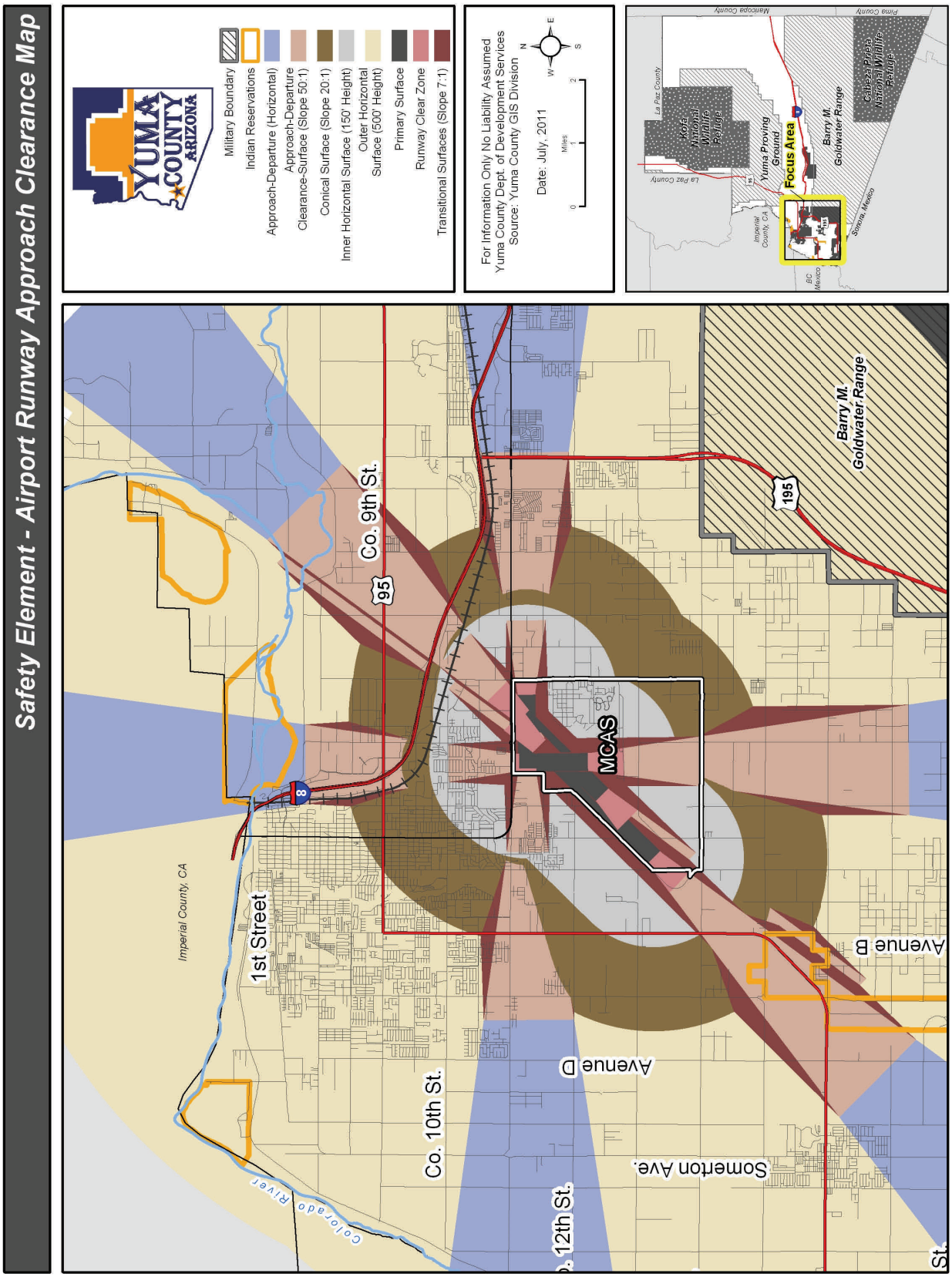
Since 1990 the National Transportation Safety Board has recorded 21 crashes of civil aircraft in Yuma County. Additionally there have been at least sixteen crashes of military aircraft in the same period of time in Yuma County. If these crashes occur over inhabited areas they can pose a significant risk to public safety. The most spectacular example of the danger the aircraft can pose to people and property on the ground occurred on June 15, 2005 when a Marine Corps AV -8B Harrier carrying four 500-pound bombs and 300 rounds of 25-millimeter ammunition crashed into the backyard of a home just north of MCAS-Yuma. Fortunately, damages were limited to structural damage to two homes and there were no serious injuries. In the immediate aftermath of the crash approximately 1,300 homes were evacuated.

The avoidance of incidents such as the one that occurred in June 2005 is why both the State of Arizona and Yuma County have adopted regulations that limit the type of development that can occur in areas near MCAS Yuma/Yuma International Airport that have a high risk of an aircraft crash. Different areas have different risks of damage from an aircraft crash. Article VII of the Yuma County Zoning Ordinance and Title 28, Chapter 25 of the Arizona Revised Statutes define, map and restrict how land may be used in these areas. Map 9 shows these areas.

Placement of structures in the wrong location can also pose a serious risk to aircraft. The risk is most acute near the end of runways where aircraft are at very low altitude as they begin their climb or end their descent. A tall structure constructed in these areas could create a significant hazard to aircraft. To address this risk, restrictions have been placed on the height of structures near MCAS Yuma/Yuma International Airport. Map 10 depicts these restrictions. No new structures are allowed within runway clear zones. In other areas the maximum height of structures is determined by a slope formula based on distance from the nearest runway. Some areas have a simple maximum height. It should be noted that when the maximum height of these areas conflict with that allowed by a location's zoning district, the more restrictive standard applies.



Map 9: Airport Noise & Accident Potential Zones



Map 10: Airport Runway Approach Clearance Map

9.7 Law Enforcement and Emergency Services

Law enforcement in unincorporated Yuma County is provided by the Patrol Bureau of the Yuma County Sheriff's Office. The Sheriff's Office has five substations throughout Yuma County. Six squads patrol the portion of the County west of Araby Road. Deputies assigned to the Foothills substation patrol Yuma County east of Araby Road to Telegraph Pass. Deputies assigned to the Wellton substation patrol Yuma County east of Telegraph Pass. Water Safety Deputies patrol the Martinez Lake area and the Colorado River from the southern end of Yuma County to the northern border of Yuma County at the La Paz County line. The Criminal Investigations unit responds to all major crimes and investigates commercial and residential burglaries in the unincorporated areas of the County. Map 11 depicts the distance to the nearest Sheriff's Office facility for unincorporated Yuma County.

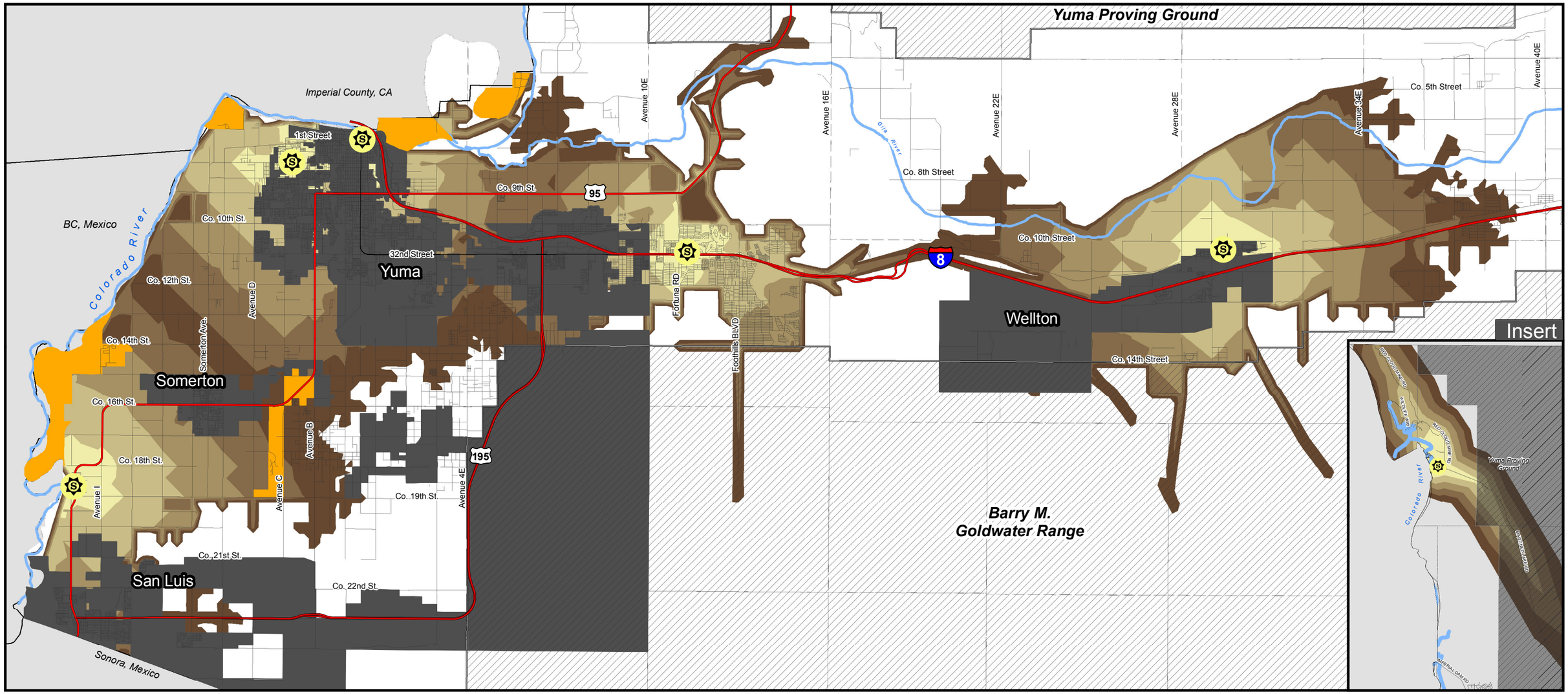
West of the Gila Mountains, fire/emergency medical services for unincorporated Yuma County are provided by the Rural/Metro Corporation and are funded by property owners and businesses through annual subscription fees paid directly to Rural/Metro. Rural/Metro has seven stations, all located west of the Gila Mountains, that respond to emergency calls in unincorporated Yuma County. Map 12 depicts the distance to the nearest Rural/Metro station for unincorporated Yuma County west of the Gila Mountains.

East of the Gila Mountains the Tacna Fire Department is the primary fire fighting agency for unincorporated Yuma County. The Tacna Fire Department is a volunteer fire department with a station located in the Tacna community on Avenue 40E. Ambulance service east of the Gila Mountains is provided by Tri-Valley Ambulance Service, Inc. which has a station located in the town of Wellton. Map 12 depicts the distance to the Tacna Fire Department and Tri-Valley Ambulance stations for unincorporated Yuma County east of the Gila Mountains.

In addition to the Rural/Metro and the Tacna Fire Department the municipalities and entities listed below have their own fire department or have significant fire fighting resources:

- City of Yuma
- City of San Luis
- Town of Wellton
- City of Somerton/Cocopah Reservation
- Bureau of Land Management
- Arizona State Land Department
- Marine Corps Air Station Yuma
- Yuma Proving Ground
- Imperial Wildlife Refuge

Safety Element - Law Enforcement



Sheriffs Station

Less than 2 Miles

2 to 4 Miles

4 to 6 Miles

6 to 8 Miles

8 to 10 Miles

Military Boundary

Incorporated Areas

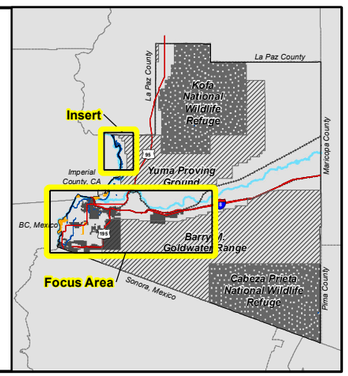
Indian Reservations

For Information Only No Liability Assumed
Yuma County Dept. of Development Services
Source: Yuma County GIS Division

Date: July, 2011

N W E S

0 3 6 Miles



Safety Element - Fire/EMS Services

Yuma Proving Ground
Imperial County, CA
BC, Mexico
Colorado River
Gila River
Yuma
Somerton
San Luis
Wellton
Barry M. Goldwater Range
Sonora, Mexico
1st Street
32nd Street
Co. 9th St.
Co. 10th St.
Co. 12th St.
Co. 14th St.
Co. 16th St.
Co. 18th St.
Co. 19th St.
Co. 21st St.
Co. 22nd St.
Co. 5th Street
Co. 10th Street
Co. 14th Street
Avenue 10E
Avenue 16E
Avenue 22E
Avenue 28E
Avenue 34E
Avenue 40E
Somerton Ave.
Avenue B
Avenue C
Avenue D
Avenue I
Avenue 4E
Fortuna RD
Foothills BLVD
95
8
195
Insert
RED CLOUD MINE RD
WILDLIFE WAY
Yuma Proving Ground
Colorado River
MARTINEZ LAKE RD

- Fire/EMS Station Serving Unincorporated Yuma County
- Other Fire Stations
- EMS Station Serving Unincorporated Yuma County

- Less than 1 Mile
- 1 to 2 Miles
- 2 to 3 Miles
- 3 to 4 Miles
- 4 to 5 Miles

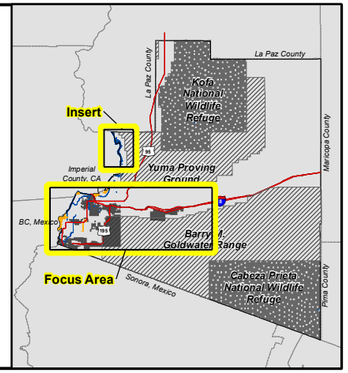
- Incorporated Areas
- Military Boundary
- Indian Reservations

For Information Only No Liability Assumed
Yuma County Dept. of Development Services
Source: Yuma County GIS Division

Date: July, 2011

N W E S

0 3 6 Miles



Railroad Crossings

An area of Yuma County where accessibility by emergency vehicles is a growing concern is the area located between the Gila and Mohawk Mountains and south of the Union Pacific Railroad tracks. There are seven railroad crossings in this area; six of them at grade. All emergency services in this area are located north of the railroad tracks. Two major trends in this area have been residential growth south of the railroad tracks, particularly in the Town of Wellton, and increasing train traffic, averaging around 49 trains a day in 2010. This could potentially double as Union Pacific completes its double-tracking project in Yuma County.

Concerns for this area are rooted in the fact that any emergency vehicle responding to a call south of the railroad track, with the only grade-separated crossing located at Avenue 33E, is very likely to have to cross an at grade railroad crossing. The chances of these crossings being blocked by a train have increased and will increase even further once the second track is completed allowing for 80 to 100 trains a day. Rail crossings are widely spaced in this area; usually there is a couple of miles between them with the only connection between these crossings being on unpaved roads. Therefore, if one crossing is blocked, the only alternative to waiting out the train is a several mile detour with much of it over unpaved roads. This could potentially pose a danger to public safety, particularly in times of bad weather. The increasing population and train traffic in this area increases the risk posed by this uncertain access. Area residents identified this as an important concern during the drafting of the Plan. To address this issue planning should begin for the construction of additional grade separated crossings or create paved connections of roads with crossings on the south side of the railroad tracks.

Safety Element - Railroad Crossings

Yuma Proving Ground

95

Avenue 16E

Avenue 22E

Avenue 28E

Avenue 34E

Avenue 40E

Avenue 46E

Avenue 52E

Co. 2nd Street

Co. 5th Street

Co. 8th Street

Co. 10th Street

Co. 14th Street

Gila River

8

Tri-Valley Ambulance Service
Town of Wellton Fire Department

Yuma County
Sherriff Substation

Tacna Volunteer
Fire Department

Wellton

Barry M.
Goldwater Range

Grade Separated Crossing

At Grade Railroad Crossing

McElhaney Cattle Company

Wellton Brach (Inactive)

Union Pacific Sunset Route

PavedRoadsSouthRR

Military Boundary

Incorporated Areas

For Information Only No Liability Assumed
Yuma County Dept. of Development Services
Source: Yuma County GIS Division

Date: July, 2011

N
W E
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Miles
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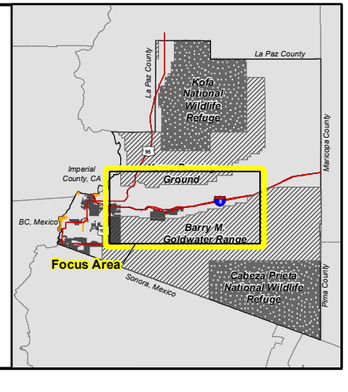

9.8 Safety Policies and Priorities

SPP.1: Promote disaster-resistant future development.

SPP.2: Increase public understanding, support and involvement in hazard mitigation and emergency response.

SPP.3: Increase Local capacity and commitment to become less vulnerable to hazards.

SPP.4: Improve hazard mitigation coordination and communication with federal, state, local and tribal governments.

SPP.5: Reduce level of human loss and damage and losses to existing and future critic cal facilities/infrastructure and other community assets due to floods.

SPP.6: Decrease vulnerability of community assets, especially critical facilities, located in the 100-year floodplain.

SPP.7: Reduce levels of human loss and damage and losses to existing and future criti cal facilities/infrastructure and other community assets due to wildland fires.

SPP.8: Reduce levels of human loss and damage and losses to existing and future criti cal facilities/infrastructure and other community assets due to earthquake.

SPP.9: Reduce levels of human loss and damage and losses to existing and future criti cal facilities/infrastructure and other community assets due to transportation in cidents.

SPP.10: Reduce levels of human loss and damage and losses to existing and future criti cal facilities/infrastructure and other community assets due to other natural/ hu man caused hazards.

SPP.11: All inhabited areas should be able to be accessed in as direct manner as possible by emergency vehicles in all weather and have the signage and addressing needed to direct emergency vehicles.

SPP.12: Reduce the long distances to the nearest health and emergency services for the those living in Dateland and far Eastern Yuma County.

SPP.13: Promote effective animal control in all areas of the County.

9.9 Safety Actions

SA.1: Update, develop and support general plans, ordinances and codes in accordance with state and federal regulations to limit development in hazard areas or build to standards that will prevent or reduce damage.

SA.2: Adopt and support local, state and federal codes that protect assets and new development in hazard areas.

SA.3: Educate the public to increase awareness of hazards and opportunities for mitigation actions.

SA.4: Promote partnerships among the federal, state, counties, local and tribal governments to identify, prioritize and implement mitigation actions.

SA.5: Monitor and publicize the effectiveness of mitigation actions implemented community wide.

SA.6: Improve existing capabilities to warn the public of emergency situations.

SA.7: Develop mitigation programs to enhance the safety of the residents of each community during an emergency.

SA.8: Continue commitment to research, development and training of stakeholders in new technologies and hazard mitigation techniques.

SA.9: Establish and maintain closer working relationships with federal, state, local and tribal governments and agencies.

SA.10: Implement policies, procedures and regulations which reduce the exposure to flood hazards.

SA.11: Maintain coordination with state and federal flood-related agencies.

SA.12: Maintain compliance with the National Flood Insurance Program (NFIP) requirements.

SA.13: Develop a comprehensive approach to reducing the level of damage and losses due to wildland fires.

SA.14: Improve local, state, federal and tribal coordination and support existing efforts to mitigate wildland fire hazards.

SA.15: Educate the public about wildland fire dangers and mitigation measures.

9.9 Safety Actions (continued)

SA.16: Develop a comprehensive approach to reducing the level of damage and losses due to earthquakes.

SA.17: Adopt and support local, state and federal codes that protect assets and new development in earthquake hazard areas.

SA.18: Coordinate with rail, aviation, waterways, highway stakeholders, military, tribal, federal, state, county and local transportation agencies to develop transportation incident mitigation cooperatives and agreements.

SA.19: Adopt and support local, state and federal codes to protect life, property and natural resources from natural/ human caused hazards.

SA.20: Construction of additional grade separated rail crossings to provide better emergency vehicle access to the area between the Gila and Mohawk Mountains south of the railroad tracks.

SA.21: Identify, map and list hazardous material storage facilities.

SA.22: Enhance efforts to recruit and train local resident as volunteer firefighters and emergency medical technicians, particularly in eastern Yuma County.

SA.23: Increase animal control in areas such as Dateland and the South Mesa where area residents have identified feral dogs as a growing problem.

SA.24: Work to bring a mobile medical clinic to the Dateland area on a regular basis as currently the nearest medical facility is in Wellton.

SA.25: Thin overly-dense vegetation along riparian ecosystems, particularly when within 30 feet of buildings or structures.

SA.26: Use the existing fire district in the Martinez Lake area as a mechanism to better equip the fire station located there.

SA.27: Amend the Zoning Ordinance to prohibit the storage of combustible materials in areas that have been cleared as fuel breaks.