



YUMA COUNTY PLANNING ELEMENT

2014

Yuma County Planning Subcommittee and General Description

The following entities participated in the DMA planning process through the Yuma County Planning Subcommittee (CPS) both in 2004 and in 2009. More details on the planning process followed and how the County, municipalities and stakeholders participated can be referenced in Chapter 3 of the regional base plan. Additional details on which local government departments participated and who represented them are listed in Appendix B of the regional base plan.

Participating Jurisdictions	Stakeholders
Yuma County Office of Emergency Management (CPS lead)	Colorado State University – Golden Plains Extension Service Yuma County Law Enforcement agencies
Town of Eckley Administration	Yuma County EMS Agencies Yuma County Commissioners
City of Wray Administration	Yuma County Pest Control District Northeast Colorado Health Department
City of Yuma Administration	National Weather Service Goodland
Yuma County Fire Protection District	
Yuma Rural Fire Protection District	

The agencies listed above participated in the 2014 plan review and update.

County Profile

Yuma County is located in the northeastern region of the State and includes the incorporated communities of Yuma, Wray and Eckley. The land area of Yuma County is 2,370 square miles, and is located along the eastern border of Colorado. The population according to the 2010 U.S. Census for Yuma County was 10,043, with 4,439 housing units (2012). The 2012 population estimate according to the U.S. Census Bureau is 10,119. The 2014 population estimate is not available at this time. The average density of population is currently estimated at 4.2 people per square mile. Yuma County grew at a rate of 9.9% from 1990-2000. However, between 2000 and 2008 the County experiences a decline in population of -1.75%. From 2009 – 2012 the population increased by 0.8%. According to the 2000 Census, the median age in the County is 37.3 years. The 2010 census reveals that 7.6% of the population is under the age of 5 and 16.9% of the population is age 65 or older.

The average household size is 2.54 and the average family size is 3.13. 86.6% of the population (over the age of 25) is a high school graduate or higher and 17.4% of the County holds at least a bachelor's degree. 18.5% of the population (over the age of 5) claims some disability status and 15.9% of the population speaks a language other than English at home. 10.7% of all families in the County live below the poverty level, as do 12.9% of individuals. **The County is predominantly agricultural. According to the 2012 Census of Agriculture, there are 834 farms in the County, with a total farmland area of 1,353,401 acres. This accounts for 81% of the County's total land. The average size of a farm is 1,623 acres.**

Hazard Identification and Summary

Yuma County's planning team identified the hazards that affect the County and summarized their frequency of occurrence, spatial extent, potential magnitude, and significance specific to Yuma County. This information is presented in Table 1. A detailed description of each hazard can be found in Section 4.2 Hazard Profiles in the regional base plan.

Table 1. Yuma County Hazard Summary

Hazard	Geographic Extent	Probability of Future Occurrences	Magnitude/Severity	Significance
Biological Hazards				
Pestilence	Extensive	Occasional	Limited	Medium
Plague*	Limited	Likely	Limited	Medium
Blizzards & Severe Winter Storms	Extensive	Likely	Critical	High
Dam Failures & Levee Failures	Limited	Likely	Limited	Medium
Drought	Extensive	Likely	Critical	High
Earthquake	Limited	Occasional	Limited	Low
Flooding	Significant	Likely	Critical	High
Fog	Significant	Likely	Negligible	Low
Hailstorms	Extensive	Highly Likely	Limited	High
Land Subsidence	Limited	Likely	Negligible	Low
Landslides	Limited	Occasional	Negligible	Low
Lightning	Extensive	Highly Likely	Limited	Medium
Noxious Weeds	Extensive	Highly Likely	Negligible	Low
Straight-Line Winds	Extensive	Highly Likely	Limited	High
Dust Storms	Extensive	Likely	Limited	Medium
Temperature Extremes	Extensive	Highly Likely	Limited	Low
Tornados	Extensive	Likely	Critical	High
Wildland & Grassland Fires	Extensive	Highly Likely	Limited	High

* Some zoonotic hazards have higher or lower ratings than those reflected here, based on individual datasets.

Geographic Extent

Limited: Less than 10% of planning area
 Significant: 10-50% of planning area
 Extensive: 50-100% of planning area

Probability of Future Occurrences

Highly Likely: Near 100% chance of occurrence in next year, or happens every year.
 Likely: Between 10 and 100% chance of occurrence in next year, or has a recurrence interval of 10 years or less.
 Occasional: Between 1 and 10% chance of occurrence in the next year, or has a recurrence interval of 11 to 100 years.
 Unlikely: Less than 1% chance of occurrence in next 100 years, or has a recurrence interval of greater than every 100 years.

Magnitude/Severity

Catastrophic—More than 50 percent of property severely damaged; shutdown of facilities for more than 30 days; and/or multiple deaths
 Critical—25-50 percent of property severely damaged; shutdown of facilities for at least two weeks; and/or injuries and/or illnesses result in permanent disability
 Limited—10-25 percent of property severely damaged; shutdown of facilities for more than a week; and/or injuries/illnesses treatable do not result in permanent disability
 Negligible—Less than 10 percent of property severely damaged, shutdown of facilities and services for less than 24 hours; and/or injuries/illnesses treatable with first aid

Significance

Low: minimal potential impact
 Medium: moderate potential impact
 High: widespread potential impact

Yuma County History of Recorded Natural Hazard Losses

In the 2014 update to this CPE, the County Planning Subcommittee identified drought, flood, hail, high winds, severe winter storms, tornadoes and wildfires as the most significant natural hazards facing Yuma County. Yuma County is also the first County in the State to receive the Storm Ready designation from the National Weather Service. A summary of the past hazard events is captured in Table 2 and in the text that follows.

Table 2. Yuma County Hazard History (events listed by the National Climatic Data Center, 1932-2014)

Date	Event	Location	Damages	Other Info	Data Source
July 21, 1932	Flood			3.5" of rain	Yuma County FIS
May 30, 1935	Flood	N. Fork of Republican R.		9" in 2 hrs. S. of Wray (led to Bonny Reservoir)	DOI/USGS
1930's	Drought	Dust Bowl	Farms abandoned		
July 11, 1941	Flood			1.6" in Yuma	Yuma County FIS
September 1-2, 1941	Flood			2.68" 5" in adjacent basins	Yuma County FIS
April 27, 1947	Flood	Wray	Buildings and crops downstream of Wray. Cars & homes in Wray	6.6", 6-8" of hail Water 5-6 feet deep in town	Yuma County FIS
May 14, 1951	Flood		Bridge @ Adams out Water over lower Main St. Mostly street damage	3.56" in 30 minutes	Yuma County FIS
September 7, 1951	Flood		1.25": Water reached buildings, but did not enter	6" west and south	NCDC
August 11, 1956				1.55"	NCDC
May 1, 1958				3.10"	NCDC
July 31, 1962			City park flooded	4.88"	NCDC
May 31, 1965	Flood	Arickaree R. S. County	Most damage in Kansas & Nebraska		NCDC
June 17, 1965	Flood		1.47"	Extreme 14" in basin to west	NCDC
July 29, 1966				3.61"	NCDC
May 8, 1969	Flood	S. Platte		Fed. Dec. 15 counties	NCDC

Date	Event	Location	Damages	Other Info	Data Source
Early '70's	Tornado				
1977	Blizzard		Highline & Y-W REA's Lost 5500 poles	(80% of poles in Yuma)	REA
1981	Grasshoppers			State Dec	CO-OEM
1982	Flood	Wray	Little impact.	Dams inspected and maintained	
July, 1990	Drought	20 counties	\$1 billion (USDA)		USDA
August 11, 1982	Tornado/Hail			Roof damage, 1 trailer	Planning Team
1999	Grass fire	BLM land	Some equipment burned	6,500 acres	Planning Team
2000	Drought		(USDA Dec)		Planning Team
Spring 2001	Wind		Grain Elevator/Sprinkler damage		Planning Team
April 2001	Winter Storm Fed #1374		Ice damage: HEA lost 262 power poles @ \$386,238	FEMA paid 75% of \$19K warning (Eckley siren)	CO-OEM FEMA
April 29, 2003	Hail	Wray		2.25"	NCDC
September 2005	Drought Wind & Hail	NE Colorado Counties	Crops, Livestock & feed	No Declaration	USDA DEM
April 20, 2005	Hail	Yuma Wray		4" 2.75"	NCDC
March 2006	Wildfire	Yuma County	Livestock ,Rangeland, Buildings	No Declaration	OEM
August 2006	Heat, Wind Drought	NE Colorado Counties	Crops Livestock Feed	No Declaration	OEM
December 2006	Blizzard	NE Colorado	Livestock, Road Maintenance	No Declaration	OEM
May 2007	Severe Weather	Yuma County	75,000 acres of crops suffered 25% damage	No Declaration	Crop Service Agency
June 2008	Severe Hailstorm & Flooding	Yuma County	Homes, crops & businesses, sustained over \$475K in damages	No Declaration	OEM
March 2009	Windstorm	Yuma City & County	Businesses, homes, Grain bins & farm outbuildings	No Declaration	OEM/Yuma City Yuma City had over \$11,000 in damages
Aug 15, 2008	Flood	Bonny Lake	\$150K	Observer reported 5.35 inches of rain in 90 minutes.	NCDC

Date	Event	Location	Damages	Other Info	Data Source
August 24, 2008	Fog	Entire County	\$200K	Dense fog was sites as playing a major factor in the crash of a single engine plane, resulting in three fatalities.	NCDC
March 22, 2009	T-Storm/Wind	City of Yuma	\$65K	Personal weather stations near the town of Yuma reported wind gusts of 66, 74 and 98 mph around midnight.	NCDC
June 21, 2010	Hail/Wind	South Central Yuma County	Crop :Loss Disaster Declaration 30% crop loss on Soybeans 7% Wheat 5% Corn	Baseball size hail 2 tornados Microbursts	Farm Service Agency
July 3, 2010	Rainstorm	Southeast Yuma County Idalia Area	County Road Damage \$30,000 +	5 to 10 inch rainfall in a two hour period	Yuma County Road & Bridge
June 14-19 2011	High winds Tornado Hail	Central Yuma County	Crop and Structure Damage	Declaration S-3173	SBA
March 18, 2012	Wildfire	West Central Yuma County	Crop & Structure Damage 2 homes lost. Seven million Dollars +	24,000 acres burned	CSU Extension and FSA
July 12, 2012	Drought	Yuma County	Dryland crops and non-irrigated pasture	All of Yuma County	USDA & Governor
January 11, 2013	Drought	Yuma County	Economic losses to Ag related businesses	Low interest loans from the SBA to help offset the economic loss due to the ongoing Drought.	SBA

April 2, 2013	Drought	Yuma County	Economic losses to dryland crops, non irrigated pasture and AG related businesses	All of Yuma County	USDA Secretarial for Nebraska, Yuma County is contiguous
June 19-20, 2013	Flash flooding	Yuma County	County Road Damage	Flooding occurred due rainfall of 5-7 inches in Logan County on June 19. The runoff reached Yuma County on June 20th	Yuima County Road & Bridge
May 13, 2014	Drought	Yuma County	Economic losses due to drought and AG related businesses.	All of Yuma County	USDA Yuma is a contiguous county to Dundy County Ne.
June 14, 2014	High Winds, Hail, Rain	South Central Yuma County	Economic losses due to high winds, heavy rainfall and hail.	All of Yuma County	USDA

(NCDC Filters Applied: Tornadoes ≥ F1; Hail ≥ 2"; Wind ≥ 75 MPH)

Other Hazards in Yuma County

Dams:

- 1 Class I (High Hazard) Dam
- 7 Class II (Significant Hazard) Dams
- Known Failures: 0
- All Class I dams in Colorado have emergency action plans in place.
- Levees: 2 near Wray

All events below have been updated and are current from January 2009 thru December 2013 unless otherwise noted.

Drought Incidents: 1 2012 -- September 2013

Dust storms: 0

Earthquake: No risk according to CGS Survey.²

Extreme Temperatures:

Highest Recorded Temperature in County: 108f

Lowest Recorded Temperature in County: -15f

Severe Cold Incidents: 3

Flood and Flash Floods: 7

Hailstorms: 101

Landslide: Suspected moderate hazard in ESE County; natural gas pipeline crosses area (based on OEM map)

This is primarily open land and no one is living there. There is an 18” high pressure, wrapped line, in the vicinity that is continuously monitored. In addition there is a “pipeline group” charged with notification and safety.

Lightning: Averages 10,400 strikes per year with 0 reported injuries and 0 reported deaths from 1980-2013.

Severe Windstorms: 15 Straight line wind events 48

Severe Winter Weather: 10

Tornadoes: any size 1 F1 or higher 1

Wildfires: Wildfires responded to by County Fire Department from 2009 through 2013 (in some cases many departments responded to a fire, so this number is not reflective of a true total):

• Armel Fire Dept.	24
• Kirk Fire Dept.	47
• Yuma Fire Dept.	229
• Wauneta Fire Dept	65
• Wages Fire Dept	60
• Wray Fire Dept	150
• Vernon Fire Dept	74
• Joes Fire Dept	44
• Hale Fire Dept	31
• Eckley Fire Dept	46
• Idalia Fire Dept	57
• Total	827

West Nile Virus: 26 human illnesses, 0 human fatalities as of 2008 (there were no reported West Nile Cases from 2009 thru 2013).

Yuma County Vulnerability Assessment

The intent of this section is to assess Yuma County’s vulnerability separate from that of the planning area as a whole, which has already been assessed in Section 4.3 Vulnerability Assessment in the main plan. This vulnerability assessment analyzes the population, property, and other assets at risk to hazards ranked of medium or high significance that may vary from other parts of the planning area. For more information about how hazards affect the region as a whole, see Chapter 4 Risk Assessment in the main plan.

Assets at Risk

This section identifies Yuma County's assets at risk, including values at risk, critical facilities and infrastructure, historic assets, economic assets, and growth and development trends.

Total Values at Risk from Hazards

Table 3. County Parcel Exposure Thru 2013

	Schedules	*	Residence	Assessed	Assessed
Type	Parcel Count	Value:	Improved Parcel Count	Improved Value	Total Value \$)
Residential*	2872	30,484,511	4281	26,560,570	262,747,847
Commercial*	442	12,412,409	442	16,158,350	67,044,929
Industrial *	14	183,924	14	3,411,090	14,369,405
Agricultural*	7205	106,670,382	1,434,993 Acres	15,534,300	252,465,844
Vacant Land	2514	25,631,104	46	214,660	4,806,620
Severed Min	4767	2,739,345	324,280 Acres	0	2,739,345
Prod gas/Prim	3842	6490	3716 Wells	71,490	163,755
Political Subdivisions	518	0	Residential 6	30,916,060	34,769,801
Religious/Charitable	75	0	Residential 15	Included above	Included above
Total	22,249	178,128,165	1,767,793	928,665,200	639,107,546

Yuma County Assessor 2013

Table 4. Jurisdiction Parcel Exposure Thru 2013

Type of Valuation	Eckley	Wray	Yuma	Total Value
Residential	335,700	6,358,900	8,851,410	15,460,010
Commercial	158,59	7,676,930	9,959,090	17,794,610
Vacant Land	40,040	222,600	402,050	664,690
Industrial	N/A	24,320	18,080	42,400
Jurisdiction Total :	534,330	14,282,750	19,230,680	n/a

Source: Yuma County Assessor 2013

- These values are "Total Value" less the "Improved Value" These values are not calculated for 2012

Table 5. Building Exposure

City	Population	Building Count	Building Exposure (\$)	Building Content (\$)	Total Exposure (\$)
Eckley	257	202	11,840,000	7,527,000	19,367,000
Wray	2,342	1,769	156,559,000	117,303,000	273,862,000
Yuma	3,524	2,188	207,080,000	146,094,000	353,174,000
Unincorporated	3,920	3,352	233,188,000	155,878,000	389,066,000
Total	10,043	7,511	608,667,000	426,802,000	1,035,469,000

Source: HAZUS MH MR3

Critical Facilities and Infrastructure

An inventory of critical facilities in Yuma County is provided below in Table 6. The table includes data from available statewide GIS resources (locations are illustrated in Figure 1) supplemented with information from the Yuma County CPS.

Table 6. Critical Facilities Inventory

Facility Type	Number of Sites	Est. Replacement Value	Capacity or Enrollment	Additional Information
Essential Infrastructure				
Airports (paved)	2	17,170,000	N/A	1 in Yuma, 1 in Wray
Communications Towers	22	1,320,000	N/A	Towers only
Correctional Facilities	1	1,650,000	42	
Electrical Generation/Distribution	15	45,450,000	N/A	
Media Outlets	4	Unknown	N/A	South YW Star has ceased publication
National Guard	0			
Public Safety Communications Centers	1	2,750,000	N/A	
Public Safety Facilities				
Police Stations	5	2,650,000	N/A	
EMS/Ambulance Stations	4	2,200,000	N/A	
Fire Stations	11	4,840,000	N/A	1 in Yuma, 1 in Eckley, 1 in Wray, 8 unincorporated

Facility Type	Number of Sites	Est. Replacement Value	Capacity or Enrollment	Additional Information
EOCs	1	220,000	N/A	
Town/City Halls	3	1,650,000	N/A	
Wastewater Treatment	3	4,950,000	N/A	
Water Utilities/Treatment	3	1,650,000	N/A	
Childcare Centers	28	N/A	296	Daycare Homes only/Yuma Children's Academy
Schools	7	27,700,000	1,759	3 in Yuma, 2 in Wray, 0 in Eckley, 2 unincorporated
Shelters	4	440,000	125	
Hospitals	2	21,210,000	30	
Clinics	2	2,090,000	N/A	
Nursing Homes/Assisted Living Centers	3	5,757,000	N/A	
Natural, Cultural and Historic Resources	1	1,104,000	N/A	
Community Centers	4	3,300,000	N/A	
Historic Properties	5	N/A	N/A	
Hazardous Materials				
Extremely Hazardous Substances	0			
Hazardous Chemicals storage	28	N/A	N/A	Tier II Facilities only

Cultural and Historic Sites in Yuma County:

- Boggs Lumber & Hardware Building, Eckley
- Vernon School
- Lett Hotel, Yuma (The “Tumbleweed”)
- Yuma Public Library (Now a residence)
- Beecher Island Battleground, Wray
- Zion, Walter and Anna Homestead, Idalia

The following is a list of farms in Yuma County that have been awarded the “CENTENNIAL FARMS DESIGNATION:”

Yuma **Lengel Ranch** Burlington 1886 1990

Yuma **Pfeiler Farm** Idalia 1886 1986
Yuma **C. Henry Moellenberg Farm** Idalia 1887 1987
Yuma **Helling Farm** Idalia 1887 1987
Yuma **Fleer Ranch** Idalia 1886 1988
Yuma **Helling Brothers Farm** Idalia 1907 2007
Yuma **Shaw Ranch** Joes 1887 1987
Yuma **National Homestead** Kirk 1887 1987
Yuma **Idler Farm** Kirk 1887 1988
Yuma **Greene/Hill Farm** Kirk 1887 1989
Yuma **Davisson Farm** Kirk 1899 2000
Yuma **The S Lazy Ranch** Vernon 1886 1986
Yuma **Wingfield Farm & Ranch** Vernon 1886 1988
Yuma **Yount Ranch** Vernon 1888 1988
Yuma **Dean & Barbara Witte Farm** Vernon 1892 1992
Yuma **Mc Coy Ranch** Vernon 1906 2009
Yuma **George L. Akey Farm** Wray 1886 1987
Yuma **Godsey Family Farm** Wray 1887 1987
Yuma **Bradford Ranch** Wray 1888 1988
Yuma **Busby Farm** Wray 1888 1989
Yuma **Wilson Ranch** Wray 1907 2007
Yuma **Osmus Farm** Wray 1893 1997/8
Yuma **State Line Ranch** Wray 1898 1997/8
Yuma **Wenger Farm** Wray 1894 1997/8
Yuma **KW - Korf Homestead** Yuma 1886 1986
Yuma **Blachburg Ranch** Yuma 1887 1987
Yuma **Hanson Farm** Yuma 1887 1999
Yuma **Wagon Wheel Ranch** Yuma 1899 1999
Yuma **Lindgren Homestead** Yuma 1905 2006
Yuma **Harper Dairy** Yuma 1910 2010

Development Trends in Yuma County:

- There has been scattered residential growth across County in the past decade, but not in any specific concentrated area.
- There has been some recent growth just west of Yuma, and in the Robb Hill area.

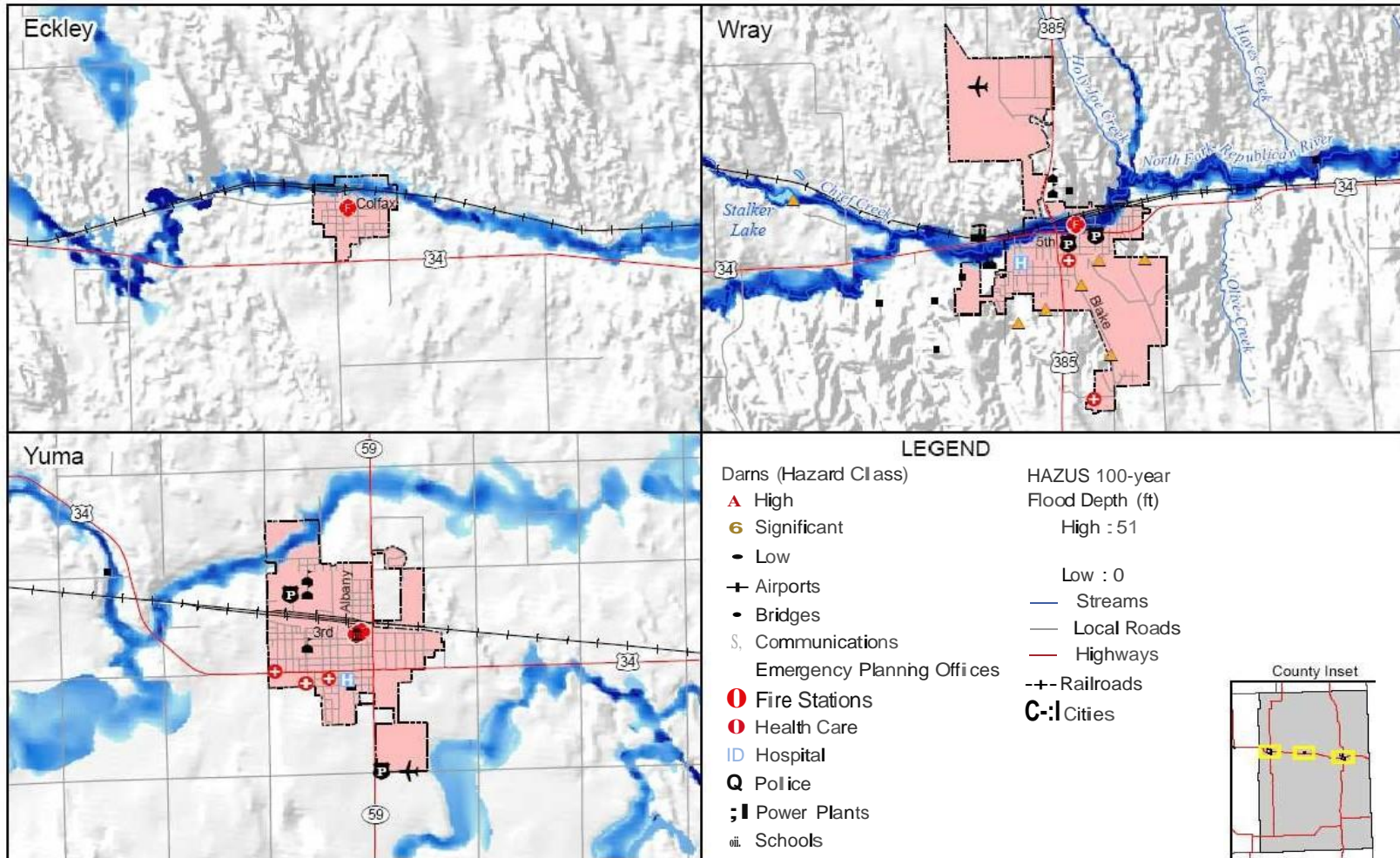
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- If there is one trend in development, it is in Commercial Hog Farms. There are currently four companies operating in Yuma County where there was none 15 years ago. The number of sites has increased from 27 to 39 through 2013. This number includes facilities for Sows, Boars, nursery's, and finishing.

Floodplain Vulnerability Assessment

The best available flood data for Yuma County was generated by HAZUS-MH MR3, FEMA's software program for estimating potential losses from disasters. See the base plan vulnerability assessment for a description of the HAZUS methodology. The 100-year floodplain generated with HAZUS-MH is shown countywide in Figure 1 and at municipal scales in Figure 2. Both maps indicate the location of critical facilities as well.

The current flood maps for Yuma County were published in 1985. FEMA has no plans to update any Yuma County Flood Plan maps in the foreseeable future.

Figure 1. Yuma County Cities HAZUS 100-year Floodplain and Critical Facilities Map

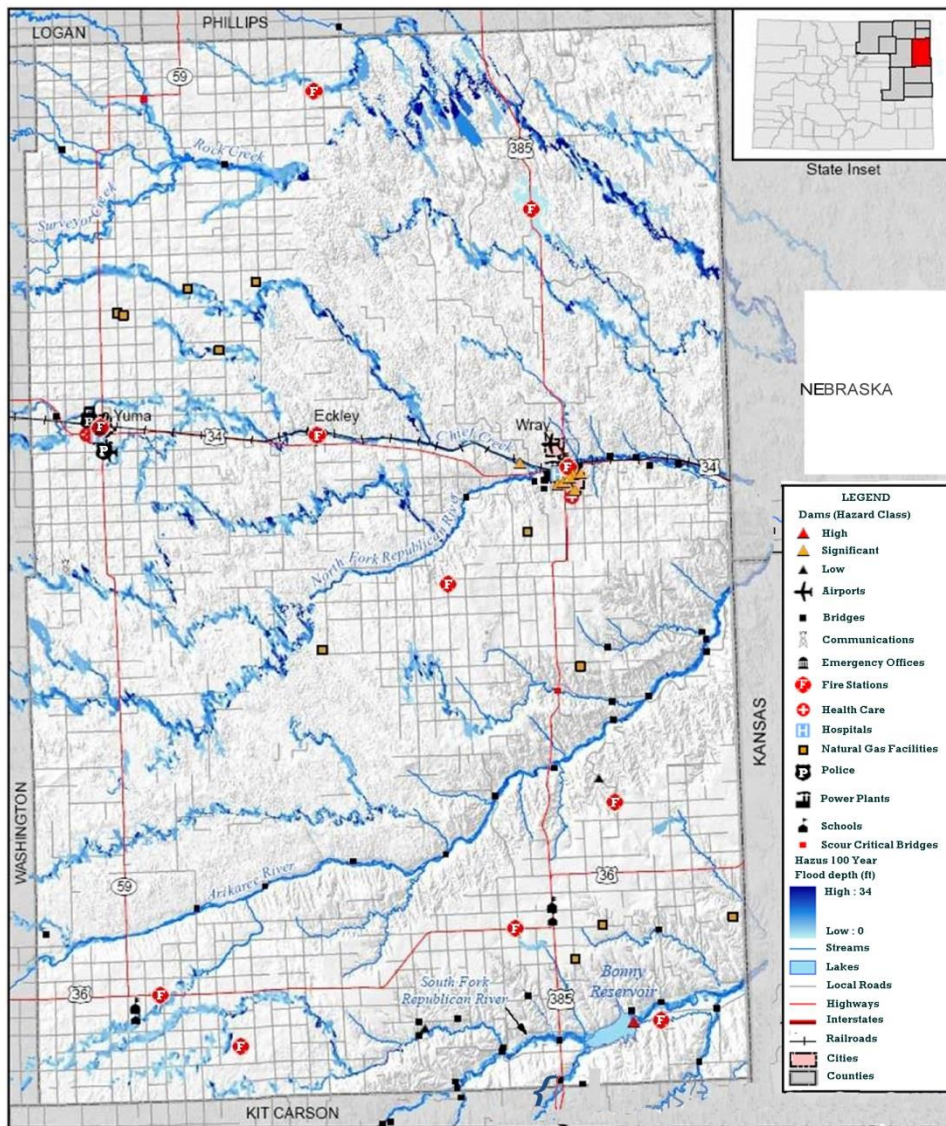


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Map compiled 4/2009; intended for planning purposes only.
 Data Source: State of Colorado, CDOT, CODWR, HAZUS-MH MR3

2 Miles

N
A



Map compiled 4/2009; intended for planning purposes only
 Data Source: State of Colorado, CDOT, CODWR, HAZUS-MH3

Table 7. Estimated Economic Losses from Flooding

Jurisdiction	Cost Building Damage (\$)	Cost Contents Damage (\$)	Inventory Loss (\$)	Relocation Loss (\$)	Capital Related Loss (\$)	Rental Income Loss (\$)	Wage Loss (\$)	Total Loss (\$)	Percent of Total Loss	Loss Ratio
Eckley	173,000	116,000	-	-	-	-	7,000	296,000	1%	1%
Wray	3,996,000	8,615,000	343,000	19,000	38,000	6,000	51,000	13,068,000	44%	6%
Yuma	123,000	114,000	12,000	-	-	-	1,000	250,000	1%	0.1%
Unincorporated	6,763,000	8,266,000	766,000	11,000	27,000	3,000	93,000	15,929,000	54%	3.5%
Total	11,055,000	17,111,000	1,121,000	30,000	65,000	9,000	152,000	29,543,000	100%	2.8%

The building damage loss ratio in Table 7 is an indication of the community's ability to recover after an event. Building Damage Loss Ratio percent is calculated by taking the Building Structural Damage divided by Building Structural Value and then multiplying by 100. Loss ratio exceeding 10% are considered significant by FEMA. The city with the highest building damage loss ratio is Wray. Wray has the highest loss ratio of 6% with a potential building damage loss of \$8,615,000. The other communities have a loss ratio of less than 1%. The HAZUS model closely matches the FIRMs for the City of Wray. HAZUS and the FIRM show similar damage and area estimates.

Floodplain Population Information

Yuma County is at a moderate risk of flooding, based upon the floodplain population, the number of structures at risk, and the number of dams. The displaced population and shelter needs estimated by HAZUS are shown in Table 8.

Table 8. Population Displaced by Flooding

Jurisdiction	Displaced Population	Population Needing Shelter
Eckley	18	2
Wray	75	11
Yuma	17	4
Yuma County	461	75
Total	571	92

Critical Facilities

Critical facilities in the floodplain were determined using GIS, by selecting all critical facilities that fell within the floodplain. These

are listed in Table 9 and 10 and shown on the maps in Figures 2 and 3. The Wray Fire Department is located in a floodplain.

Table 9. Critical Facilities in the Floodplain

Flooded Critical Facility	Name	Near City
Fire Station	Wray Fire Department	Wray
Natural Gas Facility	Bitter Creek Pipelines Shout Gas GCS	Eckley/Wray
Natural Gas Facility	WBI Interstate Gas Transmission Whisper	Eckley/Wray
Schools	Wray Elementary School	Wray
Schools	Wray High School	Wray

Table 10. Critical Facilities in the Floodplain Summary Table

Facility Type	Facility Count
Bridges	24
Dams	1
Fire Stations	1
Natural Gas Facility	2
Schools	2
Scour Critical Bridges	3
Fire Stations	1
Total	32

Yuma County Scour Critical Bridges

Included with HAZUS-MH is a database of bridges called the National Bridge Inventory developed by the Federal Highway Administration. One of the database items is a “scour index,” which is used to quantify the vulnerability of a bridge to scour during a flood. Bridges with scour index between 1 and 3 are considered “scour critical,” or a bridge with a foundation element determined to be unstable for the observed or evaluated scour condition.

There are 3 scour critical bridges in Yuma County, two indicated in the National Bridge Inventory and one noted by the County. They are all located on the highways that travel through Yuma County. One scour critical bridge is located north of Yuma on State Highway 59 at the intersection of Coyote Creek. The other bridge is on US 385 at the intersection of Black Wolf Creek. The County Road and Bridge Department indicated the bridge on US 385 west of Bonny Reservoir has scour and deposition problems, and is

overtopped by a 10-25 year flood event. If these or other bridges are taken out by flood or fire the detours can be significant, and could result in delayed emergency response. The location of these bridges is shown in Figure 1, and described in detail in Table 11.

Table 11. Scour Critical Bridges

Name	Road Type	Stream	Near City
US 385	Rural Regional Highway	Black Wolf Creek	Wray
State Highway 59	Rural Highway	Coyote Creek	Yuma
US 385	Rural Regional Highway	South Fork Republican River	West of Bonny Reservoir

NFIP Claims Analysis

There are 16 policies in force in Yuma County as of January 2, 2014. Detail is shown in Table 12. The majority of policy holders are in the 100-year floodplain (A-Zone).

Table 12. Policies and Claims Information

CID	Community Name	Total Premium	A-Zone	No. Policies	Total Coverage	Total Claims since 1978	Total Paid since 1978
80191	Wray, City of	\$6,691	12	12	\$1,712,700	1	\$0
80291	Yuma County	\$4,607	4	4	\$927,200	1	\$1,848
	County Total	\$11,298	16	16	\$2,639,900	2	\$1,848

Dam and Levee Failure Vulnerability Assessment

According to HAZUS MR3, there is 1 high hazard and 6 significant hazard dams in Yuma County. The impacts from Bonny Dam would be outside of the County and in Kansas, were it to fail. The dams near Wray are dry and provide flood protection for the City. Table 13 indicates how dam failure risk varies among communities in Yuma County. The locations of these dams are shown in Figure 1. According to the current FEMA FIRMS, there are levees that provide flood protection from the Republican River to the Town of Wray. The previous HAZUS-MH flood assessment does not account for levees and essentially models impacts from levee failure or overtopping.

Table 13. Hazardous Dams in Yuma County

Dam Name	County	Max Storage (acre ft)	Dam Hazard	Downstream Community	Miles to Community	Relative Downstream Impacts
Bonny	Yuma	348,390	High	Hale	2	Limited
Chief Creek #4	Yuma	291	Significant	Wray	2	Limited
Wray Watershed District #1	Yuma	88	Significant	Wray	1	Limited
Wray Watershed District #2	Yuma	88	Significant	Wray	1	Limited
Wray Watershed District #3	Yuma	47	Significant	Wray	1	Limited
Wray Watershed District #4	Yuma	124	Significant	Wray	1	Limited
Wray Watershed District #5	Yuma	40	Significant	Wray	1	Limited

Source: HAZUS MR3

Wildfire Vulnerability Assessment

Yuma County Wildland Urban Interface

The Wildland Urban Interface map for Yuma County shows Low to High fire hazard risk values. The majority of the County has low values with the higher values around the communities of Eckley, Yuma and Wray. Eckley and Wray have the highest fire risk in the County with values between moderate and high with the higher values within the city limits. Yuma has a mixture of low to moderate fire values. The moderate values are out by the city limits and surrounding unincorporated County.

Critical Facilities

A GIS overlay was used to identify certain facilities in the moderate to high fire risk areas. The facilities identified within a moderate to high wildfire risk area are summarized in Table 14. The following narrative describes each community and potentially at risk critical facilities. There are 99 Critical Facilities in a moderate to high fire hazard in Yuma County. Eckley has one fire station in a fire hazard. Wray has 17 facilities in a moderate to high fire hazard: one airport, two bridges, five dams, one fire station, five health care facilities, one hospital and two police stations. Yuma has 14 facilities in a fire hazard: one emergency planning office, two fire stations, five health care facilities, one hospital, two police stations and five schools. The unincorporated County has 67 critical facilities in the fire hazard: one airport, 30 bridges, three scour critical bridges, one communication tower, four dams, eight fire stations, nine natural gas facilities, one police station, and seven schools.

Table 14. Critical Facilities Subject to Fire Hazard (by type)

Facility Type	Facility Count
Airports	2
Bridges	32
Communications	1
Dams	9
Emergency Planning Offices	1
Fire Stations	11
Health Care	10
Hospital	2
Communications Towers	24
Natural Gas Facility	9
Police	5
Substations	15
Schools	12
Ethanol Plant	1
Scour Critical Bridges	3
Total	100

Agricultural Vulnerability Assessment

Agriculture is an important aspect of the County's economy. The following discussion analyzes the potential losses from floods using HAZUS and multiple hazards from federal crop insurance records.

HAZUS Methodology for Agriculture Economic Losses

The agriculture component of the HAZUS Flood Model estimated a range of losses to barley, corn, corn silage, oats and wheat. These crops were the only crops identified by the HAZUS model to have loss within the region of study. The model assumes a short duration and slow rise flood when estimating losses and does not account for high velocity flash floods. Loss estimates are based on United States Army Corp of Engineers (USACE) damage modifiers. The HAZUS-MH impact analysis predicts a loss estimate value by crop for flow time intervals. The first is a loss estimate for the day of the fixed event; the remaining three are for 3, 7 and 14 days following the event.

The agricultural products in Yuma County that show economic loss are corn, corn silage, and wheat. Corn's total loss is \$71,459,809, corn silage's total loss is \$199,370,341 and wheat's total loss is \$44,403,799. Yuma County has the highest estimated economic total loss in the region for agriculture products with \$315,233,949. More detail is given in Table 15.

Table 15. Yuma County Direct Economic Loss for Agriculture Products

Agriculture Product	Crop Loss Day 0 (\$)	Crop Loss Day 3 (\$)	Crop Loss Day 7 (\$)	Crop Loss Day 14 (\$)	Total Loss (\$)
Corn	0	19,489,039	25,985,385	25,985,385	71,459,809
Corn Silage	0	54,373,729	72,498,306	72,498,306	199,370,341
Wheat	0	12,110,127	16,146,836	16,146,836	44,403,799
Total	0	85,972,895	114,630,527	114,630,527	315,233,949

Source: HAZUS MH MR3

Crop Insurance Analysis

Federal Crop Insurance Data represents losses from multiple hazards that could include: biological hazards, flooding, drought, hailstorms, noxious weeds, temperature extremes, tornados, wildfires and straight-line winds. Average annual claims payout amount to \$2.5 million in the County. More details are provided in Tables 16 -- 18.

Table 16. Yuma County Premium and Loss Data for Federal Crop Insurance from 1980 through 2007

Liability(Amount of Coverage)	Total Premium	Federal Premium Subsidy	Farmer-paid Premium	Amount Paid in Claims	Average Amt. Paid Annually in Claims
1,182,065,828	106,230,967	53,551,935	52,679,032	71,872,922	2,566,890

Source: Federal Crop Insurance Services

Table 17. Crop Insurance Data, 2008 – 2013

Year	Liability	Total Premium	Federal Premium Subsidy	Farmer Paid Premium	Amount Paid Claims
YUMA COUNTY					
2008	\$177,135,619	\$23,763,177	\$13,742,737	\$10,020,440	\$16,897,567
2009	\$156,190,634	\$23,705,712	\$13,975,172	\$9,730,540	\$11,110,780
2010	\$147,688,604	\$18,163,375	\$10,675,921	\$7,487,454	\$4,998,427
2011	\$219,347,585	\$25,095,108	\$15,117,474	\$9,977,634	\$13,254,810
2012	\$215,927,256	\$21,716,955	\$12,935,081	\$8,781,874	\$16,330,687
2013	\$215,840,926	\$21,076,941	\$12,446,213	\$8,630,728	\$18,024,477
Total	\$1,132,130,624	\$133,521,268	\$78,952,598	\$54,628,670	\$80,616,748

Source: USDA Risk Management Agency

Table 18. 2014 Provisional Data

Liability(Amount of Coverage)	Total Premium	Federal Premium Subsidy	Farmer-paid Premium
131,452,282	12,956,328	7,371,474	5,584,474

Source: Federal Crop Insurance Services

Yuma County Capability Assessment

Capabilities are the programs and policies currently in use to reduce hazard impacts or that could be used to implement hazard mitigation activities. The capabilities assessment is divided two sections: regulatory mitigation capabilities and additional mitigation projects and capabilities. The regulatory mitigation capabilities for the County and its municipalities are summarized in Table 19. Refer to the Introduction to the County Elements for an explanation of the capability assessment matrix.

Table 19. Regulatory Mitigation Capabilities

	Yuma County	Eckley	Wray	Yuma
Comp Plan	Y	Y	N	Y
Land Use Plan	Y	N	N-building codes and zoning	Y
Subdivision Ord	Y	Y-with Comp Plan	N	Y
Zoning Ord	N	Y-with Comp Plan	Y	Y
NFIP/FPM Ord	Y	N	Y	Y
- Map Date	6/85-7 FIRMS	Never Mapped	6/85-FIRM	NSFHA
- Sub.Damage?	?	N/A	N	N/A
- Administrator?	Y	N/A	Y	N/A
- # of FP Bldgs?	Did not inventory	N/A	36	N/A

	Yuma County	Eckley	Wray	Yuma
- # of policies	4	N/A	12	N/A
- # of RL's?	0	N/A	N	N/A
CRS Rating	N/A	N/A	N/A	N/A
Stormwater Prgm	N	N	N	N
Building Code	N	N	Y	Y
Building Official.	N	N	N	N
- Inspections?	N	Y	N	N
BCEGS Rating	N	N	N	N
LEOP	Y	County	County (N)	County
HM Plan	Y	County	Regional	County
Warning	Y	Y	Y	Y
Storm Ready?	Y	County	County	County
Weather Radio?	Y	Y	Y	Y
Sirens	Y	Y-1	Y	Y-2 new in 2008, rotating units w/ full area coverage
Emergency Warning	Y	Y	Y	Y
Other?	Y-	Y	N	CMAS County wide
GIS System	Y	N	Y	Y accurate maps of utility systems and roadways
Structural Projects	Y	N	N	Y
Property Protection	Y	N	N	Y
Crit.Fac. Protection	N	N	N	N
Natural Res. Inv.	Y	Y	N	Y
Cultural Res. Inv.	Y	Y	N	Y
Erosion Control	Y – soil conservation district	N	N	Y
Sediment Control	Y – soil conservation district	N	N	Y
Pub. Info Prgm	Y	Y	N	Y
Env. Ed Prgm	Y	Y	N	Y

Other Existing Mitigation Capabilities:

- Certified as Storm-Ready by National Weather Service
- Current cadre of weather spotters
 - o The most recent training was in March 2014.
 - o Currently 130 + trained weather spotters.
- 6 dry flood-control dams above Wray, in Wray Watershed District
- Emergency Action Plans in place for Bonny Dam and 6 flood control dams (dated 1-22-03) These were reviewed in 2013.
- County Land-Use Code updated April 2003
- Created a debris management plan with Northeast Health Department in 2009 that involved all the jurisdictions.

Yuma County Mitigation Goals and Recommendations

Action Item #1: Promote the benefits of tornado shelters, particularly in manufactured housing parks.

Issue Statement: On average, over the past 47 years, Yuma County has experienced at least one tornado each year. While damage has been minimal to date, it is merely a matter of time before a more serious event occurs. Manufactured housing is the most vulnerable type of structure to tornado and other wind damage, as well as to flood and fire. A public education effort should be undertaken to publicize and emphasize the value of constructing tornado or multi-hazard shelters on-site within manufactured housing parks – whether they are individual “safe-rooms” or group shelters.

Implementation Manager and strategy: County Emergency Manager, in conjunction with the NWS, CO-OEM and FEMA.

Priority: High

Cost Estimate: None brochures are provided by FEMA at no cost.

Cost-Effectiveness: There would be no cost other than the time spent personally contacting the trailer parks.

2009 Update: Brochures printed in both English and Spanish have been distributed to the at-risk populations in the jurisdiction. These efforts have been concentrated on the residents of the mobile home parks. No tornado shelters have been built. Efforts publicizing the hazards for mobile home owners during severe weather are ongoing and are repeated every storm season. Public education regarding these hazards should be included in the plan. Liability and other legal concerns are the main reason no tornado shelters have been built. Wray cites a need of additional funding for implementation.

This has been continued through 2013. This information is also being made available electronically Through Yuma County OEM and on the “Ready Northeast” website.

Action Item #2: The County, Cities of Wray and Yuma will continue to comply with the NFIP through enforcement of the local floodplain ordinance. The communities should provide “Refresher Training” for local lenders and insurance agents regarding the NFIP, publicize the NFIP, and promote the purchase of insurance for structures in the floodplain.

Issue Statement: 75% percent of the structures in the floodplain in Wray are not insured against flood losses. Statistically, there is a 1% chance in any given year of incurring \$600K in damages. Property owners should be afforded the opportunity to protect against these losses if they so choose.

Implementation Manager and strategy: County Emergency Manager, in conjunction with the Wray Manager and City Council should invite the CWCB to conduct “Refresher Training” for both lenders and insurance agents. CWCB and FEMA can also provide public information brochures describing the benefits of purchasing flood insurance. The city should annually notify flood prone occupants of their location and of the availability of flood insurance. As part of continued compliance with the NFIP the County and cities will periodically update their ordinance and continue to enforce the ordinance regarding proposed development in the floodplain.

Priority: High

Cost Estimate: Can be accomplished within existing budgets or with minimal expense.

Cost-Effectiveness Explanation: There is little or no increased cost to the Town. The benefits are to flood prone building owners who choose to insure against flood losses, and to taxpayers who no longer would be faced with subsidizing those potential losses.

2009 Update: Insurers in Wray are advising clients that live in the mapped flood plain to purchase insurance. Lenders require the purchase of insurance when properties are located in the flood plain. The last significant flooding in the city of Wray occurred in 1952. The six Wray Watershed dams were constructed in the late '50s and no significant flooding has occurred there since. Wray indicates the effort was not organized at a county level.

Action Item #3: Wray should conduct the one-day flood and tornado recovery & mitigation exercise as an awareness tool for local officials

Issue Statement: The Town of Wray is built in and around the floodplain, and a flood would cause considerable damage and hardship within the community. In addition, on average, over the past 47 years, Yuma County has experienced at least one tornado each year. While damage has been minimal to date, it is merely a matter of time before a more serious event occurs. Conducting this FEMA-developed, one-day flood/tornado exercise would allow local officials to identify and react to the many problems they would likely encounter, thus providing a pre-flood/tornado “to-do” list, as well as an increased awareness of what emergency actions to take in an actual post-flood/tornado situation. This also would reinforce existing policies and procedures within the community, which would support the basic ideas of the Yuma County Planning Subcommittee.

Implementation Manager and strategy: County Emergency Manager and City of Wray Manager in conjunction with CWCB and FEMA.

Priority: Medium

Cost Estimate: Can be accomplished within existing budgets

Cost-Effectiveness Explanation: There is little cost associated with this project. The benefits are to the community in being more prepared to realistically address the emergency management concerns of a flood/tornado in their community.

Action Item #4: Education regarding cellular reverse 911 calls. All of Yuma County.

Issue Statement: Citizens need to be informed about reverse 911. Citizens must sign up for the service at readynortheast.org or wycomm.org. Citizens will be educated to sign up at these sites. Citizens are encouraged to download the application on their smartphones to enable them to receive C-MAS Alerts.

Other Alternatives: Only Yuma, Washington, and Logan County currently use this service. All counties should be brought on board.

Responsible Office: WY Communications Center

Priority: High

Cost Estimate: Low. County would pay for phone calls.

Benefits (Avoided Losses): Immediate notification of any emergency or hazard directly to cell phone recipients allows for rapid and broad distribution of emergency information to people who may not be next to, or even own, a land line phone. Customers must be signed up to use this program to enjoy the benefits of it.

Potential Funding: N/A

Schedule: Ongoing/year round.

Action Item #5: Discourage Controlled Burns County Wide on Red Flag Warning days - Continue to emphasize the importance of reporting Agricultural Burns to the W/Y Communications Center.

Issue/Background: Current practice encourages rural residents to report controlled burns to the W/Y Communications Center.

Responsible Office: Yuma County.

Priority: High

Cost Estimate: N/A.

Benefits (Avoided Losses): There is little cost to this project. This combined with the reduced costs of wildfire damages to people and property, both public and private, along with the reduced costs of battling a wildfire ensure a low cost/high benefit ratio.

Potential Funding: N/A

Action Item #6: Flood Mitigation – Strengthen Development Planning Policies – City of Wray.

Issue/Background: The city of Wray is located close to the Republican River. Major drainage channels need to be protected. New developments are planned to improve drainage. Drainage ditches require high maintenance and care throughout the year. Improvements on drainage ditches would reduce annual maintenance costs and manpower and ensure the ditches are in a prepared state in case of a flood event.

Other Alternatives: None. Stormwater drainage needs to always be planned and accounted for.

Responsible Office: City of Wray Planning – James DePue City Manager.

Priority: High

Action Item #7: Emergency Backup Power Infrastructure for Shelters

Issue Statement: Completing electrical pre-wiring (i.e., hook-ups, switchover panels) at designated public shelters so that portable generators can be plugged in to provide backup power to facilities is more cost-effective than purchasing and installing dedicated generators at each shelter. Conduct a cost estimate for pre-wiring of designated shelters and evaluate cost-effectiveness relative to other alternatives, including dedicated generators at each facility.

Other Alternatives: Dedicated emergency generators for each designated shelter.

Responsible Office: Yuma County Office of Emergency Management

Priority: High

Cost Estimate: To be determined as part of this benefit-cost analysis.

Benefits (Avoided Losses): Promotes public health and safety by increasing the number of shelter options available to emergency officials and by optimizing the amount of space available to protect local residents.

Potential Funding: DHS, PDM, HMGP

Schedule: TBD by Yuma County Planning Subcommittee

Action Item #8: Communications Improvements

Issue Statement: Technological advances like GIS software can improve emergency coordination and response efforts. This project involves evaluating opportunities for improving local and inter-agency capabilities through the acquisition of equipment and software like GIS and corresponding planning for utilizing and sharing information in cooperation with local, state, federal and private sector partners.

Other Alternatives: Status quo.

Responsible Office: Yuma County GIS

Priority: High

Cost Estimate: To be determined as part of this effort to evaluate available resources.

Benefits (Avoided Losses): Reduce hazard losses; improve efficiencies; improve response teams; provide real-time information; strengthen partnerships.

Potential Funding: DHS, EMPG, PDM, HMGP

Schedule: To be determined by Yuma County Planning Subcommittee.

Action Item #9: EMS Multi-Agency Training and Exercise

Issue Statement: Develop a training program and exercise plan to enhance coordination between local ambulance crews and surrounding EMS agencies in mass-casualty events. Develop plans for local and regional Task Forces and Strike Teams that can be dispatched to events in Yuma County and throughout northeastern Colorado. Coordinate efforts with local, state and federal EMS organizations.

Responsible Office: Northeast Colorado All-Hazards Emergency Management Region

Priority: High

Cost Estimate: To be prepared by Yuma County Planning Subcommittee

Benefits (Avoided Losses): Training; improvements in multi-agency coordination.

Potential Funding: DHS, EMPG, CDC and CDHPE Grant Programs

Schedule: To be determined by Yuma County Planning Subcommittee.

