

REGION 1 HAZARD MITIGATION PLAN

SHERIDAN COUNTY ANNEX

1 Mitigation Planning and Sheridan County Planning Team

This annex has been created during the development of the 2018 Region 1 Hazard Mitigation Plan (referred to as the Main Plan or Base Plan herein). This County Annex builds upon previous versions of the Sheridan County Multi-Hazard Mitigation Plan completed in 2014. The plan is the result of a collaborative effort between Sheridan County Government, municipal governments, citizens, public agencies, non-profit organizations and the private sector. The Local Emergency Planning Committee (LEPC) held responsibility for implementation and maintenance of the plan. Sheridan County Emergency Management was responsible for updating the plan in coordination with a multi-jurisdictional Hazard Mitigation Planning Committee (HMPC) which was formed for the creation of the 2018 Regional Plan. The following jurisdictions participated in the planning process:

- Sheridan County
- Town of Clearmont
- Town of Dayton
- Town of Ranchester
- City of Sheridan

More details on the planning process followed and how the counties, municipalities and stakeholders participated can be referenced in Chapter 3 of the base plan, as well as how the public was involved during the 2018 update.

2 Geography and Climate

The county of Sheridan covers about 2,524 square miles of land in north-central Wyoming, sharing a border with the State of Montana. The local geography includes high plains in the eastern portion, and high peaks from the Bighorn Mountains towards the western parts. The Tongue River is approximately 265 miles long and originates in the Big Horn Mountains west of Sheridan County. It flows northeast into Montana, finally merging into the Yellowstone River. Another major tributary of the Yellowstone River, the Powder River, encompasses three main forks originating also on the Big Horn Mountains, and flows north and east of Johnson County and into Sheridan. Major tributaries flowing into the Powder River include Crazy Woman Creek, Nine-mile Creek, Salt Creek, Clear Creek, and Buffalo Creek.

The only major river within the Big Horn River Basin is the Little Big Horn River, which originates northwest of Sheridan County in the Big Horn Mountains, then flows north to join the Big Horn River on the Montana side. The Little Big Horn River is approximately 138 miles long.

Interstate 90 runs through the county in a northwest-southeast fashion, traversing Ranchester and the City of Sheridan. State highway 14 and 16 connect to I-90, running then in an east-west and central-south fashion, respectively.

Table 2-1 Sheridan County Land Types (2006)

Land Type	Acres	Percent of Total
Total Acres	1,616,925	---
Grassland	1,083,340	67.0%
Forest	291,046	18.0%
Shrubland	97,016	6.0%
Mixed Cropland	97,016	6.0%
Water	0	0.0%
Urban	1,235	0.1%

Source: NASA MODIS Land Cover Type Yearly L3 Global 1km MOD12Q1, 2006.

Table 2-2 Sheridan County Land Ownership (2016)

Land Ownership	Acres	Percent of Total
Total Acres	1,616,925	---
Private Lands	1,050,563	65.0%
<i>Conservation Easement</i>	63,104	3.9%
Federal Lands	441,356	27.3%
<i>Forest Service</i>	389,750	24.1%
<i>BLM</i>	51,606	3.2%
<i>National Park Service</i>	0	0.0%
<i>Military</i>	0	0.0%
<i>Other Federal</i>	0	0.0%
State Lands	124,710	7.7%
<i>State Trust Lands*</i>	115,208	7.1%
<i>Other State</i>	9,502	0.6%
Tribal Lands	53	0.0%
City, County, Other	243	0.0%

Source: U.S. Geological Survey, Gap Analysis Program. 2016. Protected Areas Database of the United States (PADUS)

The climate of Sheridan County is mainly semi-arid. Precipitation is about 13.3 inches per year, with an average temperature of 50 degrees Fahrenheit. Winters average an annual low of 29.9 degrees, and summers can average 89.3 degrees. Although little to some precipitation falls in the warmer months for adequate natural growth of crops, a large amount of precipitation is accumulated in the mountains in the form of snow.

3 Population Trends

As of the July 2017 United States Census statistics, there were a total of 30,210 people living in Sheridan County. The population has remained relatively stable, as in 2016 the population was 30,200. There are 11.5 people per square mile. The county seat is the City of Sheridan.

Table 3-1 Sheridan County Population Distribution

Jurisdiction	2017 Estimated Population	% of County Total
Sheridan County Total	30,210	-----
City of Sheridan	17,860	59.1%
Town of Clearmont	147	0.5%
Town of Dayton	824	2.7%
Town of Ranchester	974	3.2%
Unincorporated	10,405	34.4%

Source: US Census Bureau

Table 3-2 Sheridan County Population Change, 2010-2017

Jurisdiction	2010 Census	2011	2012	2013	2014	2015	2016	2017	% change
Sheridan County Total	29,123	29,254	29,528	29,735	29,888	29,940	30,049	30,210	3.7%
City of Sheridan	17,451	17,484	17,653	17,767	17,818	17,822	17,840	17,860	2.3%
Town of Clearmont	141	143	142	144	145	144	146	147	4.3%
Town of Dayton	760	771	779	783	793	805	821	824	8.4%
Town of Ranchester	861	876	898	917	938	940	941	974	13.1%
Unincorporated	9,910	9,980	10,056	10,124	10,194	10,229	10,301	10,405	5.0%

Source: US Census Bureau

Select Census demographic and social characteristics for Sheridan County are shown in the table below. The county's average age is 44 years old (2 years above the State's average). The table also indicates some populations that may have special needs or prove vulnerable, such as the elderly or children under 5 years of age. About 9% of the total 65 years and below (i.e., workforce-aged adults) have a disability. The percentage of household renters in the county is 31.7%. Households contain an average of 2.28 persons. 4.2% of homes speak a language other than English.

Table 3.3 Sheridan County Demographic Profile

Population	
Population estimate, 2017	30,210
Population Growth, 1970-2016 (US average was 58.6%)	15.5%
Age and Sex	
Median Age (US median age is 37.7)	42.4
Percent of population under 18	21.6%
Percent of population 18-34	19.5%
Percent of population 35-44	11.7%
Percent of population 45-64	29.0%
Percent of population 65 and over	18.2%
Percent of population male	50%
Percent of population female	50%
Race and Hispanic Origin	
White alone	94.3%
White alone, not Hispanic or Latino	91.7%
Hispanic or Latino (of any race)	4.1%
Black or African American alone	0.9%
American Indian alone	1.4%
Asian alone	0.7%
Native Hawaiian & Other Pacific Is. alone	0.0%
Some other race alone	1.1%
Two or more races	1.6%
Education	
High school graduate or higher, age 25 years+	93.9%
Bachelor's degree or higher, age 25 years+	30.1%
Vulnerable Populations	
Percent of population under 5 years old	5.5%
Percent of population 80 years and older	2.7%
Percent of population that speak English "not well"	0.3%
Percent of population with disabilities	14.1%
Percent of population without health insurance	9.7%
Percent of population in poverty	8.2%
Percent of population in deep-poverty (<1/2 federal poverty level)	3.1%
Percent of population over 65 and in poverty	1.3%

Source: U.S. Census Bureau www.census.gov/

*Hispanic or Latino is considered to be an ethnicity and not a race. People who identify themselves as Hispanic or Latino can belong to one or more races. Therefore, the total percentage can be greater than 100%.

4 Development Trends

Development in Sheridan County over the past five years is characterized as being principally low-density single-family residential occurring mostly in the areas south of the City of Sheridan in the Big Horn/ Powder Horn Ranch vicinities. Limited numbers of very low density (ranchette) type development has also occurred through the central portion of the county chiefly between the Interstate 90 corridor and the foot of the Big Horn Mountains. The unincorporated county hosts very little in terms of commercial/industrial development due principally to the lack of central water or sewer services. 2016 and 2017 witnessed the construction of more dwellings than any time since the heyday of the Coal Bed Methane boom that peaked in 2007-2008.

From 2000-2016, most population growth has been due to net migration trends, particularly domestic, which accounts for 84.2% of the population change. All jurisdictions in the

county have positively grown since the 2010 census, which in turn has led to a slight growth in jobs and improvement in some industries and markets across the county (in terms of productivity, etc.). As of the last few years, Sheridan County has had the largest portion of Wildland-Urban Interface (WUI) developed (about 8% growth), and over 41% change in residential land area development compared to 2000 statistics. The median value of owner-occupied housing units is \$237,700.

The Sheridan County Comprehensive Plan provides for residential (both urban and low density) growth in and within closer proximity to Sheridan, Ranchester, Dayton and Story. The most significant growth in the county will be most likely be directed towards these areas, and more precisely where major central water and sewer services exist or are able to be extended. Limited areas of very low-density development will likely continue as well in the central I-90 corridor.

No significant levels of new development are expected in the 100-year floodplain. County subdivision regulations generally require restricting the placement of structures in the base flood area. Existing parcels are permitted, however, to build within the flood area with a floodplain development permit. No extensive new development is anticipated in other known hazard areas.

See potential/planned growth areas on Future Land Use Maps:

http://www.sheridancounty.com/wp-content/uploads/2014/08/sheridan_fig2_flup_dec08.pdf

http://www.sheridancounty.com/wp-content/uploads/dlm_uploads/2017/04/JPA_Land_Use_Plan.pdf

Table 4-1 Sheridan County Housing Characteristics

	# Units	% of Units	US Average
Total Housing Units	14,344	-----	134,054,899
Occupied	12,697	88.5%	87.8%
Rental Units	31.6%	31.6%	36.4%
Mobile Homes	9.4%	9.4%	5.7%
Vacant	1,647	11.5%	12.2%
For rent	156	1.1%	2.1%
Rented, not occupied	30	0.2%	0.5%
For sale only	20	0.1%	1.0%
Sold, not occupied	0	0.0%	0.5%
Seasonal, recreational, occasional use	978	6.8%	4.0%
For migrant workers	0	0.0%	0.0%
Other vacant	463	3.2%	4.1%
Year Built			
Built 2014 or later	47	0.3%	0.4%
Built 2010 to 2013	363	2.5%	1.9%
Built 2000 to 2009	2,100	14.6%	14.7%
Built 1990 to 1999	1,939	13.5%	14.0%
Built 1980 to 1989	1,970	13.7%	13.7%
Built 1970 to 1979	2,542	17.7%	15.6%

	# Units	% of Units	US Average
Built 1940 to 1969	2,792	19.5%	26.7%
Median year structure built	1977	-----	1977

Source: U.S. Department of Commerce; Census Bureau, American Community Survey

5 Economy

In 2016, Sheridan County had 20,698 total jobs, where 3,929 were non-services related, 3,700 were in government sectors, and almost an estimated 13,400 in service industries. In particular, retail trade alongside the health care and social assistance businesses were popular, while real estate and rental/leasing services, construction, accommodation and food services, and professional and technical services also contributed largely to the local economies. The three industry sectors with the largest earnings in 2016 were reported to be government, transportation and warehousing, and health care and social assistance. Sheridan County's unemployment rate has fluctuated from a 4.1% in 2000, to 7.3% in 2010, to the current 3.9% as of 2017. The lowest monthly unemployment rate was found in August of 2017. A total of 6,413 proprietors (self-employed jobs) were reported in 2016, which is a growth of over 2,100 jobs of this type since the year 2000. The table below summarizes the county's economic statistics based on the latest U.S. Census.

Table 5-1. Sheridan County Basic Economic Profile

Characteristic	Sheridan County
<u>EMPLOYMENT</u>	
Total Employment, 2016	20,698
Unemployment Rate, as of 2017 (US ave: 4.4%)	3.9%
Per capita income, 2016 (US ave: \$50,280)	\$53,384
Average earning per job, 2016 (US ave: \$59,598)	\$44,195
Population % change, 1970-2016 (US ave: 58.6%)	69.0%
Employment % change, 1970-2016 (US ave: 112.2%)	144.7%
Personal Income % change, 1970-2016 (US ave: 201.1%)	211.9%
Persons in poverty (US ave: 15.1%)	8.2%
Families in poverty (US ave: 11.0%)	5.1%
<u>EMPLOYERS</u>	
Total employer establishments, 2016	1,178
Total annual payroll, 2016	\$372,283
Paid employees	10,392
<u>EMPLOYMENT BY SECTOR/INDUSTRY</u>	
Total Private	73.9%
Non-Services	15.2%
Natural Resources and Mining	3.8%
Ag., Forestry, Fishing, Hunting	2.0%

Characteristic	Sheridan County
Mining	1.9%
Construction	8.1%
Manufacturing (Incl. Forest Prod.)	3.2%
Services	58.7%
Trade, Transportation, Utilities	17.6%
Information	1.3%
Financial Activities	4.4%
Professional and Business	6.9%
Education and Health	11.1%
Leisure and Hospitality	13.8%
Other Services	3.6%
Unclassified	0.0%
Government	26.2%
Federal Government	5.6%
State Government	2.5%
Local Government	18.0%
Travel & Tourism % of private emp., 2016 (US ave: 15.8%)	25.4%
HOUSEHOLD INCOME	
Total Households	12,697
Less than \$10,000	3.7%
\$10,000 to \$14,999	6.2%
\$15,000 to \$24,999	11.3%
\$25,000 to \$34,999	9.1%
\$35,000 to \$49,999	16.3%
\$50,000 to \$74,999	19.1%
\$75,000 to \$99,999	13.2%
\$100,000 to \$149,999	14.3%
\$150,000 to \$199,999	5.0%
\$200,000 or more	3.7%
Median household income (US ave: \$55,322)	\$53,914
Median monthly mortgage cost (US ave: \$1,491)	\$1,403
Median monthly rent (US ave: \$949)	\$758
Mean Annual Household Earnings by Source, 2016	
Labor earnings	76.8%
Social Security	36.5%
Retirement income	23.4%
Supplemental Security Income	3.3%
Cash public assistance income	1.4%
Food Stamp/SNAP	4.0%

Source: U.S. Census Bureau www.census.gov/

Visitors traveling to and throughout Wyoming represent an important component of the state's, including Sheridan County's, economy. Travel originating in domestic and international markets generates valuable business sales, payroll, employment and tax receipts for the state as well as for local jurisdictions.

Sheridan County's Chamber of Commerce website indicates the they pride themselves in their love for the outdoors and art. Their "fabled western history and dramatic mountain vistas meet new west comfort and the serenity of wide-open spaces," so the county's tourism and recreation industry is an important factor in the local economy. Outdoor areas such as the Tongue River Canyon, Sibley Lake, or the Bighorn National Forest bring in campers and anglers, for example, while Native American sites such as the Medicine Wheel National Historic Landmark and even urban sites of interest such as the Historic Main Street in Downtown Sheridan attract architecture, art, and history enthusiasts. Golfing and other sports also bring in visitors and contribute to the economy. Travel and tourism services overall provide 23.1% of the county's total private employment. (Sources: U.S. Census Bureau, 2018 Economic Profile System report by Headwaters Economics, Sheridan County Chamber of Commerce.)

6 Hazard Identification and Risk Assessment

6.1 Identified Hazards

The HMPC reviewed the hazards from the 2014 Sheridan County Hazard Mitigation Plan for inclusion in the 2018 Regional hazard mitigation plan. The hazards list was compared with the hazards list found in the State of Wyoming's Hazard Mitigation Plan, updated in 2016. Upon further review, the HMPC added expansive soils and high winds and downburst hazards to be more consistent with the State's plan and hazards in the Region. Furthermore, debris flow and rockfall hazards were considered as part of the Landslide section, to supplement said hazards as they are similar in nature and risk posed. The following table notes the summary of hazard significance for each jurisdiction in the County based on a combination of geographic extent, potential magnitude/severity and frequency/probability of occurrence as defined below. Hazard significance is rated as High, Medium or Low.

Table 6-1. Overall Hazard Significance Summary Table

Hazard	Sheridan County	Clearmont	Dayton	Ranchester	City of Sheridan
Dam Failure	M	M	M	M	M
Drought	H	H	H	H	H
Earthquake	L	M	L	L	L
Expansive Soil	L	L	L	L	L
Flood	H	M	H	H	H
Hail	M	M	L	L	M
Hazardous Materials	M	L	L	L	M
High Winds and Downbursts	M	M	M	M	M
Landslide/Rockfall/Debris Flow	M	L	L	L	M
Lightning	M	M	M	M	M
Mine and Land Subsidence	L	L	L	L	L
Severe Winter Weather	H	H	H	H	H
Tornado	M	L	L	L	M
Wildfire	H	H	M	M	H

Geographic Extent

Negligible: Less than 10 percent of planning area or isolated single-point occurrences

Limited: 10 to 25 percent of the planning area or limited single-point occurrences

Significant: 25 to 75 percent of planning area or frequent single-point occurrences

Extensive: 75 to 100 percent of planning area or consistent single-point occurrences

Potential Magnitude/Severity

Negligible: Less than 10 percent of property is severely damaged, facilities and services are unavailable for less than 24 hours, injuries and illnesses are treatable with first aid or within the response capability of the jurisdiction.

Limited: 10 to 25 percent of property is severely damaged, facilities and services are unavailable between 1 and 7 days, injuries and illnesses require sophisticated medical support that does not strain the response capability of the jurisdiction, or results in very few permanent disabilities.

Critical: 25 to 50 percent of property is severely damaged, facilities and services are unavailable or severely hindered for 1 to 2 weeks, injuries and illnesses overwhelm medical support for a brief period or result in many permanent disabilities and a few deaths.

Catastrophic: More than 50 percent of property is severely damaged, facilities and services are unavailable or hindered for more than 2 weeks, the medical response system is overwhelmed for an extended period of time or many deaths occur.

Probability of Future Occurrences

Unlikely: Less than 1 percent probability of occurrence in the next year or has a recurrence interval of greater than every 100 years.

Occasional: Between a 1 and 10 percent probability of occurrence in the next year or has a recurrence interval of 11 to 100 years.

Likely: Between 10 and 90 percent probability of occurrence in the next year, or has a recurrence interval of 1 to 10 years

Highly Likely: Between 90 and 100 percent probability of occurrence in the next year or has a recurrence interval of less than 1 year.

Overall Significance

Low: Two or more of the criteria fall in the lower classifications or the event has a minimal impact on the planning area. This rating is also sometimes used for hazards with a minimal or unknown record of occurrences/impacts or for hazards with minimal mitigation potential.

Medium: The criteria fall mostly in the middle ranges of classifications and the event's impacts on the planning area are noticeable but not devastating. This rating is also sometimes utilized for hazards with a high impact rating but an extremely low occurrence rating.

High: The criteria consistently fall along the high ranges of the classification and the event exerts significant and frequent impacts on the planning area. This rating is also sometimes utilized for hazards that the jurisdiction identifies as particularly relevant.

6.1.1 Hazards Considered but Not Profiled

Though noted in other relevant plans such as the Wyoming State Multi-Hazard Mitigation Plan from 2016, this plan does not further evaluate the following hazards:

- Avalanche
- Space weather
- Volcanism
- Windblown deposits

It is important to be aware of the probability of these events and the associated impacts for Sheridan County. However, the hazard identification described in Chapter 4 omits these hazards due to the limited relevance in the regional context of this plan or being sufficiently addressed in other planning mechanisms. Some of the above listed hazards are acknowledged to some degree under other hazard profiles, such as deposits carried by wind that could be part of a debris flow event.

6.2 Building Inventory and Assets

In addition to people, structures, and critical facilities and infrastructure, other important assets exist in Sheridan County that are potentially exposed to hazards identified in this plan. Table 6-2 summarizes the property inventory for the county and each participating jurisdiction, based on the improvement value and includes the building count and value grouped by parcel type and jurisdiction. This is an assessment of the overall property exposed within the county and by jurisdiction.

Assets inventoried to determine vulnerability include people, structures, critical facilities, and natural, historic, or cultural resources. For the regional planning process, locally available GIS databases were utilized. Parcel and assessor data was obtained through sources such as the Wyoming Property Tax Division's Assessor's Portal. This information provided the basis for building exposure and property types. The focus of the analysis was on "improved," or developed, parcels. These parcels were identified based on an improvement value greater than zero. Abstract Codes were used to identify occupancy type as shown in the following table, which includes summations of total improved value for the various property types and jurisdictions, and the population exposed in each.

Table 6-2. Sheridan County Building Inventory and Value by Jurisdiction

Jurisdiction	Property Type	Parcel Count	Improved Value	Est. Content Value	Total Exposure	Population Exposure
Clearmont	Commercial	8	\$560,380	\$560,380	\$1,120,760	---
	Residential	49	\$3,683,529	\$1,841,765	\$5,525,294	134
	Total	57	\$4,243,909	\$2,402,145	\$6,646,054	134
Dayton	Commercial	24	\$2,100,403	\$2,100,403	\$4,200,806	---
	Exempt	1	\$193,091	\$193,091	\$386,182	---
	Residential	338	\$49,954,501	\$24,977,251	\$74,931,752	926
	Total	363	\$52,247,995	\$27,270,745	\$79,518,740	926
Ranchester	Commercial	26	\$4,674,786	\$4,674,786	\$9,349,572	---
	Residential	307	\$39,266,605	\$19,633,303	\$58,899,908	841
	Total	333	\$43,941,391	\$24,308,089	\$68,249,480	841
City of Sheridan	Agricultural	8	\$4,132,764	\$4,132,764	\$8,265,528	---
	Com Vacant Land	1	\$526,616	\$526,616	\$1,053,232	---
	Commercial	707	\$335,365,010	\$335,365,010	\$670,730,020	---
	Exempt	29	\$14,308,366	\$14,308,366	\$28,616,732	---
	Industrial	1	\$683,452	\$683,452	\$1,366,904	---
	Res Vacant Land	2	\$3,160	\$1,580	\$4,740	---
	Residential	6,303	\$984,738,402	\$492,369,201	\$1,477,107,603	17,270
	Total	7,051	\$1,339,757,770	\$847,386,989	\$2,187,144,759	17,270
Unincorporated	Agricultural	1,047	\$302,936,638	\$302,936,638	\$605,873,276	---
	Commercial	151	\$36,212,960	\$36,212,960	\$72,425,920	---
	Exempt	7	\$4,596,837	\$4,596,837	\$9,193,674	---
	Industrial	1	\$315,298	\$315,298	\$630,596	---
	Res Vacant Land	5	\$324,307	\$162,154	\$486,461	---
	Residential	3,327	\$736,478,357	\$368,239,179	\$1,104,717,536	9,116
	Total	4,538	\$1,080,864,397	\$712,463,065	\$1,793,327,462	9,116
	Grand Total	12,342	\$2,521,055,462	\$1,613,831,032	\$4,134,886,494	28,288

Source: Wyoming Property Tax Division

Total building exposure within Sheridan County based on the analysis of improved parcels is over \$4.1 billion, with over \$2.5 billion in improved value properties and over \$1.6 billion in estimated contents value. The unincorporated parts of the county have the greatest number of buildings followed by the City of Sheridan.

6.2.1 Critical Facilities, Infrastructure, and Other Important Community Assets

A critical facility (CF) may be defined as one that is essential in providing utility or direction either during the response to an emergency or during the recovery operation. FEMA's HAZUS-MH loss estimation software uses the following three categories of critical assets. Essential facilities are those that, if damaged, would have devastating

impacts on disaster response and/or recovery. High potential loss facilities are those that would have a high loss or impact on the community. Transportation and lifeline facilities are a third category of critical assets. Examples of each are provided below.

Essential Facilities	High Potential Loss Facilities	Transportation and Lifelines
<ul style="list-style-type: none"> Hospitals and other medical facilities Police stations Fire station Emergency Operations Centers 	<ul style="list-style-type: none"> Power plants Dams and levees Military installations Hazardous material sites Schools Shelters Day care centers Nursing homes Main government buildings 	<ul style="list-style-type: none"> Highways, bridges, tunnels Railroads and facilities Airports Water treatment facilities Natural gas and oil facilities and pipelines Communications facilities

Table 6-3 summarizes critical facility counts in Sheridan County, followed by Table 6-4 which examines the distribution of critical facilities across each individual jurisdiction. Critical facilities were based on the Homeland Security Infrastructure Program (HSIP) Freedom GIS databases and supplemented with input by the HMPC.

Table 6-3. Sheridan County Critical Facility Summary

Facility Type	Facility Count
AM Transmission Towers	2
BRS & EBS Transmitters	3
Cellular Towers	7
Colleges / Universities	1
Day Care Facilities	20
Electric Substations	7
EMS Stations	5
Fire Stations	10
FM Transmission Towers	22
Hospitals	2
Local Law Enforcement	5
Microwave Service Towers	104
Nursing Homes	4
Paging Transmission Towers	1
Private Schools	3
Public Schools	23
TV Analog Station Transmitters	7
TV Digital Transmitters	1
Urgent Care	1
VA Medical Facilities	1
WWTP	1
Total	230
VA Medical Facilities	1
WWTP	1
Total	230

Source: HSIP Freedom and HMPC

Table 6-4 Sheridan County Critical Facilities by Jurisdiction

Jurisdiction	CF Type	Count
Clearmont	Fire Stations	1
	Public Schools	3
	Total	4
Dayton	EMS Stations	1
	Fire Stations	1
	Microwave Service Towers	1
	Public Schools	1
	Total	4
Ranchester	Day Care Facilities	2
	Fire Stations	1
	Local Law Enforcement	1
	Public Schools	2
	Total	6
Sheridan City	AM Transmission Towers	2
	Cellular Towers	1
	Colleges / Universities	1
	Day Care Facilities	16
	Electric Substations	1
	EMS Stations	2
	Fire Stations	2
	FM Transmission Towers	5
	Hospitals	1
	Local Law Enforcement	3
	Microwave Service Towers	21
	Nursing Homes	4
	Private Schools	2
	Public Schools	9
	Urgent Care	1
	Total	71
Unincorporated	BRS & EBS Transmitters	3
	Cellular Towers	6
	Day Care Facilities	2
	Electric Substations	6
	EMS Stations	2
	Fire Stations	5
	FM Transmission Towers	17
	Hospitals	1
	Local Law Enforcement	1
	Microwave Service Towers	82
	Paging Transmission Towers	1

Jurisdiction	CF Type	Count
	Private Schools	1
	Public Schools	8
	TV Analog Station Transmitters	7
	TV Digital Transmitters	1
	VA Medical Facilities	1
	WWTP	1
	Total	145
	Grand Total	230

Source: HSIP Freedom and HMPC

6.2.2 Natural, Historic, and Cultural Assets

Assessing the vulnerability of Sheridan County to disasters also involves inventorying the natural, historical, and cultural assets of the area. This step is important for the following reasons:

- The community may decide that these types of resources warrant more protection due to their unique and irreplaceable nature as well as contribution to the overall economy.
- If these resources are impacted by a disaster, knowing so ahead of time allows for more prudent care in the immediate aftermath when the potential for additional impacts are higher.
- The rules for reconstruction, restoration, rehabilitation, and/or replacement are often different for these types of designated resources.
- Natural resources can have beneficial functions that reduce the impacts of natural hazards, such as wetlands and riparian habitat, which help absorb and attenuate floodwaters.

Historic and Cultural Resources

By definition, a historic property not only includes buildings of other types of structures, such as bridges and dams, but also includes prehistoric or Native American sites, roads, byways, historic landscapes, and many other features. Given the history of the County, these types of historic properties exist in the planning area.

Table 6-5 lists the properties and districts in Sheridan County that are on the National Register of Historic Places, which is the Nation's official list of cultural resources worthy of preservation. The National Register is part of a national program to coordinate and support public and private efforts to identify, evaluate, and protect historic and archeological resources. Properties listed include districts, sites, buildings, structures, and objects that are significant in American history, architecture, archeology, engineering, and culture. The National Register is administered by the National Park Service, which is part of the U.S. Department of the Interior.

Table 6-5 Sheridan County Historic Properties

City	Historic Name
Arvada	CKW Bridge over Powder River
	EAU Arvada Bridge
Big Horn	Johnson Street Historic District
	Odd Fellows Hall
	Quarter Circle A Ranch
Clermont	Clearmont Jail
Dayton	Dayton Community Hall
	Dayton Mercantile
	Wissler, Susan, House
Leiter	EBF Bridge over Powder River
Monarch	ECR Koi Bridge
Ranchester	Connor Battlefield
Sheridan	Big Goose Creek Buffalo Jump
	ECS Bridge over Big Goose Creek
	Fort MacKenzie
	Holy Name Catholic School
	Mount View
	Robinson--Smith House
	Sheridan County Courthouse
	Sheridan County Fairgrounds Historic District
	Sheridan Flouring Mills, Inc.
	Sheridan Inn
	Sheridan Main Street Historic District
	Sheridan Railroad Historic District
	St. Peter's Episcopal Church
	Trail End
Ucross	Big Red Ranch Complex

Sources: National Register of Historic Place Program, <https://www.nps.gov/Nr/research/>

Natural Resources

Natural resources are important to include in benefit-cost analyses for future projects and may be used to leverage additional funding for projects that also contribute to community goals for protecting sensitive natural resources. Awareness of natural assets can lead to opportunities for meeting multiple objectives. For instance, protecting wetlands areas protects sensitive habitat as well as attenuates and stores floodwaters.

Wetlands

Wetlands are a valuable natural resource for communities, due to their benefits to water quality, wildlife protection, recreation, and education, and play an important role in hazard

mitigation. Wetlands reduce flood peaks and slowly release floodwaters to downstream areas. When surface runoff is dampened, the erosive powers of the water are greatly diminished. Furthermore, the reduction in the velocity of inflowing water as it passes through a wetland helps remove sediment being transported by the water. They also provide drought relief in water-scarce areas where the relationship between water storage and streamflow regulation are vital.

Endangered Species

To further understand natural resources that may be particularly vulnerable to a hazard event, as well as those that need consideration when implementing mitigation activities, it is important to identify at-risk species (i.e., endangered species) in the planning area. An endangered species is any species of fish, plant life, or wildlife that is in danger of extinction throughout all or most of its range. A threatened species is a species that is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range. Both endangered and threatened species are protected by law and any future hazard mitigation projects are subject to these laws. Candidate species are plants and animals that have been proposed as endangered or threatened but are not currently listed.

There are five federally-recognized endangered, threatened, or candidate species present in Sheridan County according to the U.S. Fish and Wildlife Service. These species are listed in Table 6-6.

Table 6-6 Endangered and Threatened Species in Sheridan County

Common Name	Scientific Name	Type of Species	Status
Bald eagle	Haliaeetus leucocephalus	Birds	Recovery
Ute ladies'-tresses	Spiranthes diluvialis	Flowering Plants	Threatened
Gray wolf	Canis lupus	Mammals	Recovery
Canada Lynx	Lynx canadensis	Mammals	Threatened
North American wolverine	Gulo gulo luscus	Mammals	Proposed Threatened

Source: <http://www.fws.gov/endangered/>

6.3 Vulnerability to Specific Hazards

This section provides vulnerability to specific hazards, where quantifiable, to summarize the information of the Region and/or provide more detail at the county and jurisdictional level. The results of detailed GIS analyses used to estimate potential for future losses are presented here, in addition to maps of hazard areas and details by jurisdiction and building type in Sheridan County. For a discussion of the methodology used to develop the loss estimates refer to Chapter 4 of the base plan. In many cases, Chapter 4 contains information that differentiates the risk by county thus the information is not duplicated here. For most of the weather-related hazards the risk does not vary significantly enough from the rest of the Region and thus the reader should refer to Chapter 4.

6.3.1 Dam Failure

There are nine high hazard dams and one significant hazard dam located within close proximity to population centers in Sheridan County. These dams are listed in Table 6-7 and shown in Figure 6-1 below. There are also many other dams in the county rated as low hazard, which are not shown. There are also dams in adjacent Johnson County that could affect Sheridan County; these are also shown on Figure 6-1.

Table 6-7 High and Significant Level Dams in Sheridan County

Hazard Level	Dam Name	Normal Capacity (AF)	Nearby Jurisdiction/Populated Area
High	BEAR CLAW LOVE NO. 1	248	DAYTON
High	BIG GOOSE PARK MAIN DAM	10,362	BECKTON
High	DOMELAKE NO. 1	1,506	BECKTON
High	PADLOCK NO. 1 A FIVE MILE	536	RANCHESTER
High	SAWMILL	1,275	BECKTON
High	SIBLEY	379	DAYTON
High	WAGNER	3,411	RANCHESTER
High	TWIN LAKES NO. 1	884	SHERIDAN
High	WINDY DRAW	533	ACME
Significant	WESTON	370	BECKTON

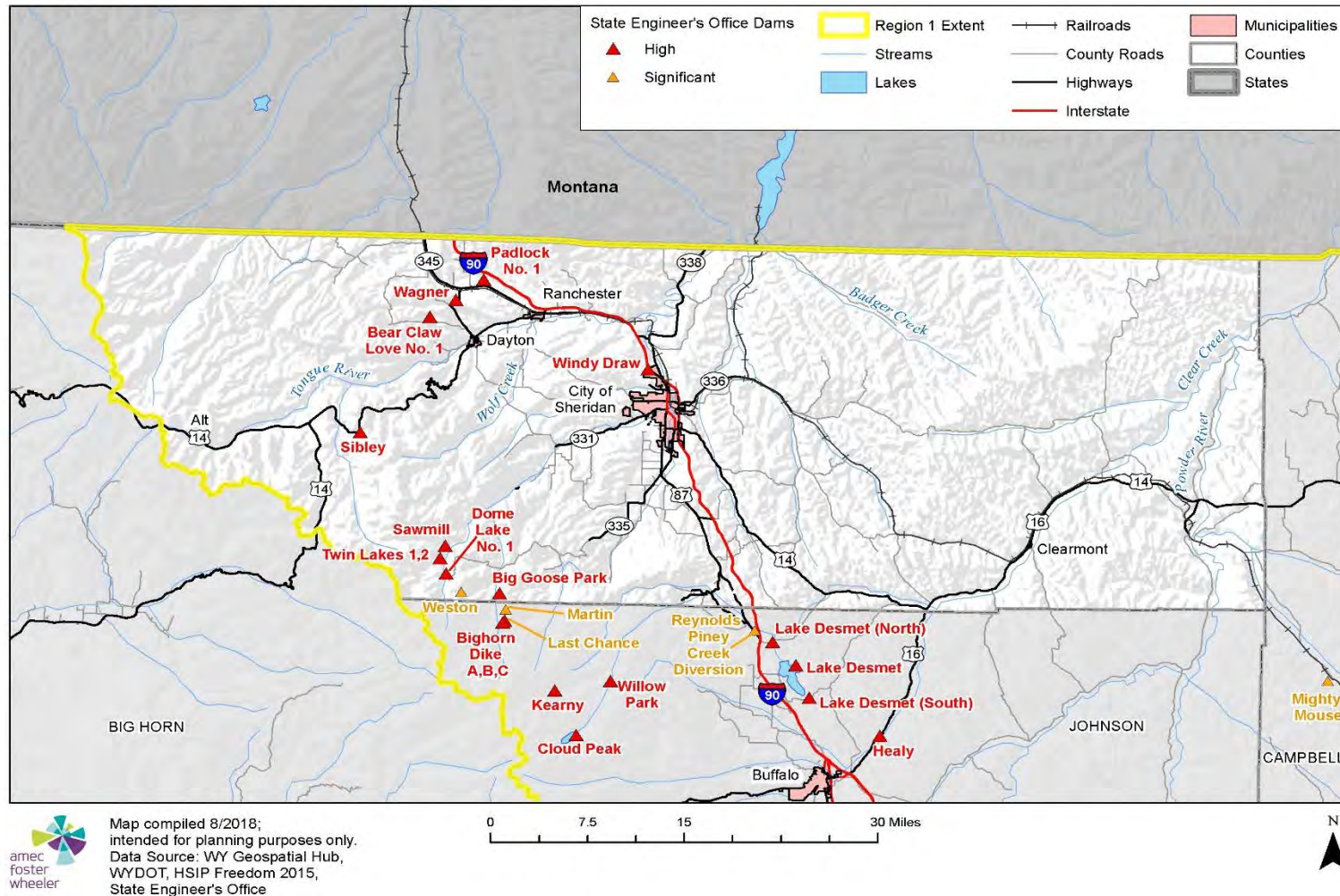
Source: Wyoming State Engineer, 2018

There has been one recorded dam failure in the county:

- In 1978 the Reynolds #1 Dam partially failed. Although this structure is rated as a Low hazard (and hence not summarized in the table above), the earthen dam had its base keyed into the foundation. The breach resulted from overtopping and subsequent erosion. There was no property damage or loss of life, however.

While it is not considered likely, there is a possibility of structure failure-based flooding in the future. The overall risk of dam failure across Sheridan County and its jurisdictions is **medium**. Each of the incorporated communities have risk to at least one High hazard dam.

Figure 6-1 High and Significant Hazard Dams in Sheridan County



6.3.2 Drought

Just like for the majority of the region, drought is a high significance hazard across the county. Drought-related impacts to the local economy can be extensive, affecting the water supply and quality, plants and wildlife, relief response efforts, and even the tourism and recreation industries (e.g., due to increased wildfire danger, forest closures, and fire bans). The most affected sector in Sheridan County, however, is agriculture, as crops cannot thrive during longer warmer seasons when there is a continued lack of precipitation, in turn causing farmers and growers to experience sales declines and increased management costs. The other highly affected sector impacts are to relief, response, and restrictions efforts, as the county and jurisdictional agencies see significantly increased management costs that prevent them from maintaining revenue flows. Since 1999, Sheridan County has received fifteen reports of countywide impacts to the various sectors due to drought. The overall significance of drought is again consistently high throughout Sheridan County and its jurisdictions.

The figure below summarizes the number and type of reports that have been made at the county level, from 1999 to the end of 2017. These reports were submitted to indicate negative effects to the economic sectors and local industries due to drought events. Refer to Chapter 4 in the Base Plan for additional discussion of drought risk related to the region and the county.

Figure 6.2 County-Level Drought Reports in Sheridan County, 1999-2017

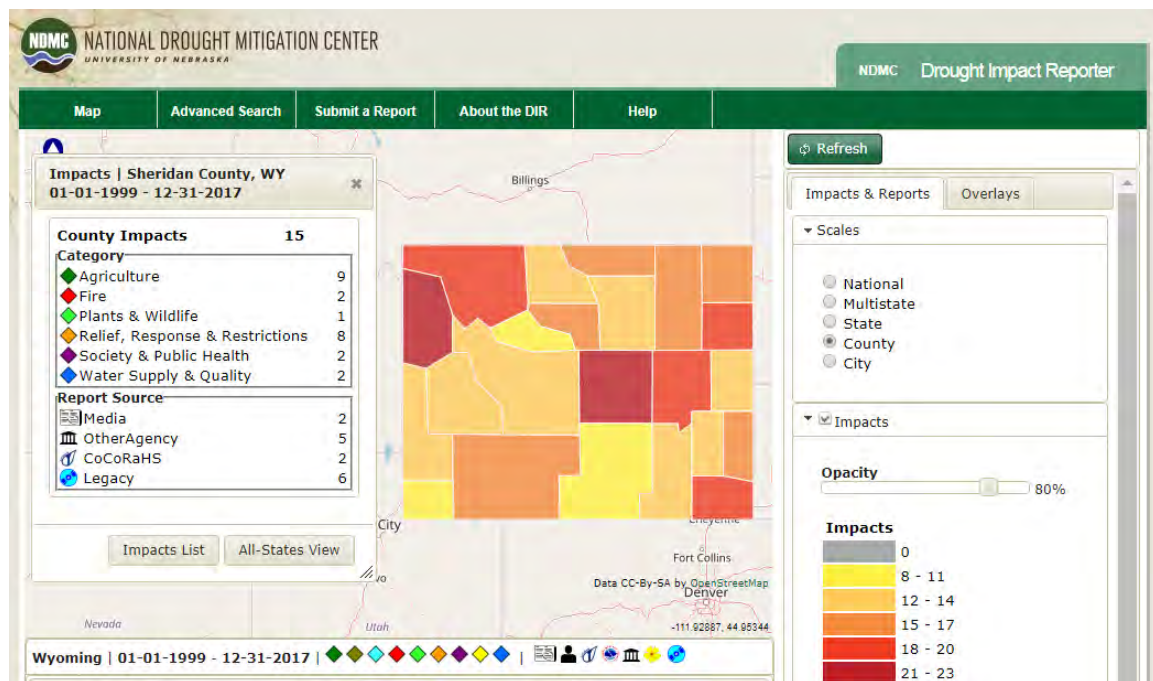


Table 6-8 takes the impacts of drought on crop production detailed in Table 4-17 of the base plan and breaks out the losses specific to Sheridan County.

Table 6-8 Indemnities Paid for Commodities that Suffered from Drought in Sheridan County, 2008-2017

Commodity	Acres Damaged	Indemnity Amount
Barley	14	\$ 399
Forage Production	263	\$ 8,280
Forage Seeding	0	0
Oats	0	0
Wheat	0	0
All Other Crops	3,302	\$ 169,495
Total	3,925	\$ 177,775

Source: USDA – Risk Management Agency

6.3.3 Earthquake

Sheridan County has experienced four seismic events since the early 1920s. The earthquakes occurring in the county are not usually felt by anyone due to the weakness of the events, and they also failed to cause any reportable damages or injure populations. Below are the four occurrence summaries:

- Only one earthquake occurred in Sheridan County during the 1920s. On January 17, 1923, an intensity III earthquake occurred 6.5 miles southwest of Sheridan. No damage was reported from this event.
- On April 26, 1953, an intensity IV earthquake was reported approximately 3 miles east-northeast of Sheridan. Area residents reported that some beds were rocked, dishes were rattled, and some electrical wires swayed (Murphy and Cloud, 1955).
- A magnitude 3.6, intensity IV earthquake was reported on March 24, 1977, approximately 6 miles south-southwest of Big Horn. No damage was associated with this event.
- More recently, a 3.9 magnitude earthquake occurred in northeastern Sheridan County on February 25, 1993. This earthquake was centered approximately 19 miles north-northeast of Arvada, and no damages were reported either.

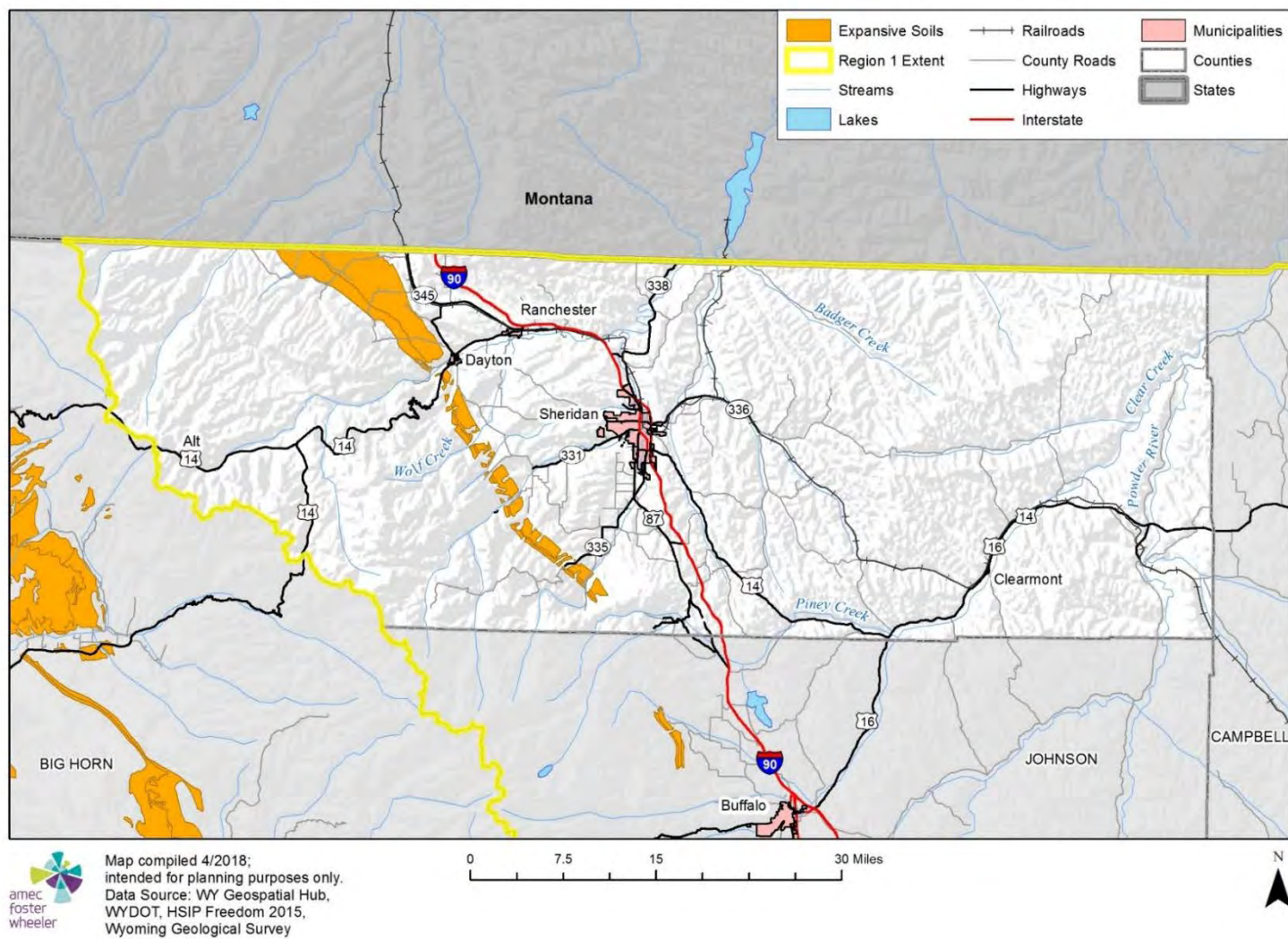
Overall earthquakes are a **low** significance hazard in the county.

6.3.4 Expansive Soils

State of Wyoming mapping data shows expansive soils area within Sheridan County, comprising 2.66% of the county's area; this is well below the regional average of 7.33%.

The figure below displays the areas known to be susceptible to expansive soils in Sheridan County.

Figure 6-2 Expansive Soils in Sheridan County



There were no known historic or current issues of expansive soils in Sheridan County, but based on the figure above there are areas where expansive soils are present. These areas are located along a northwest to central- and south-west corridor in the county, running parallel, but to the left of, Interstate 90. The approximate area of the county affected by expansive soils is estimated to be 2.66%. Potential for swelling is predominantly low for the County, and associated impacts negligible. Areas to the southwest of Dayton are slightly more vulnerable to this hazard, as shown in the map below. Chapter 4 of the Base Plan includes more information on the location of various soil types, probability of expansion, and exposed building values for both Sheridan County and Region 1.

Based on GIS analysis of parcels, buildings, building improved values, building contents, population, and critical facilities in Sheridan County it is estimated that there is some risk of exposure to expansive soils across unincorporated portions. The tables below summarize the findings of the analysis, including potential losses, population affected, and the type and number of parcels and facilities that could be affected by this hazard.

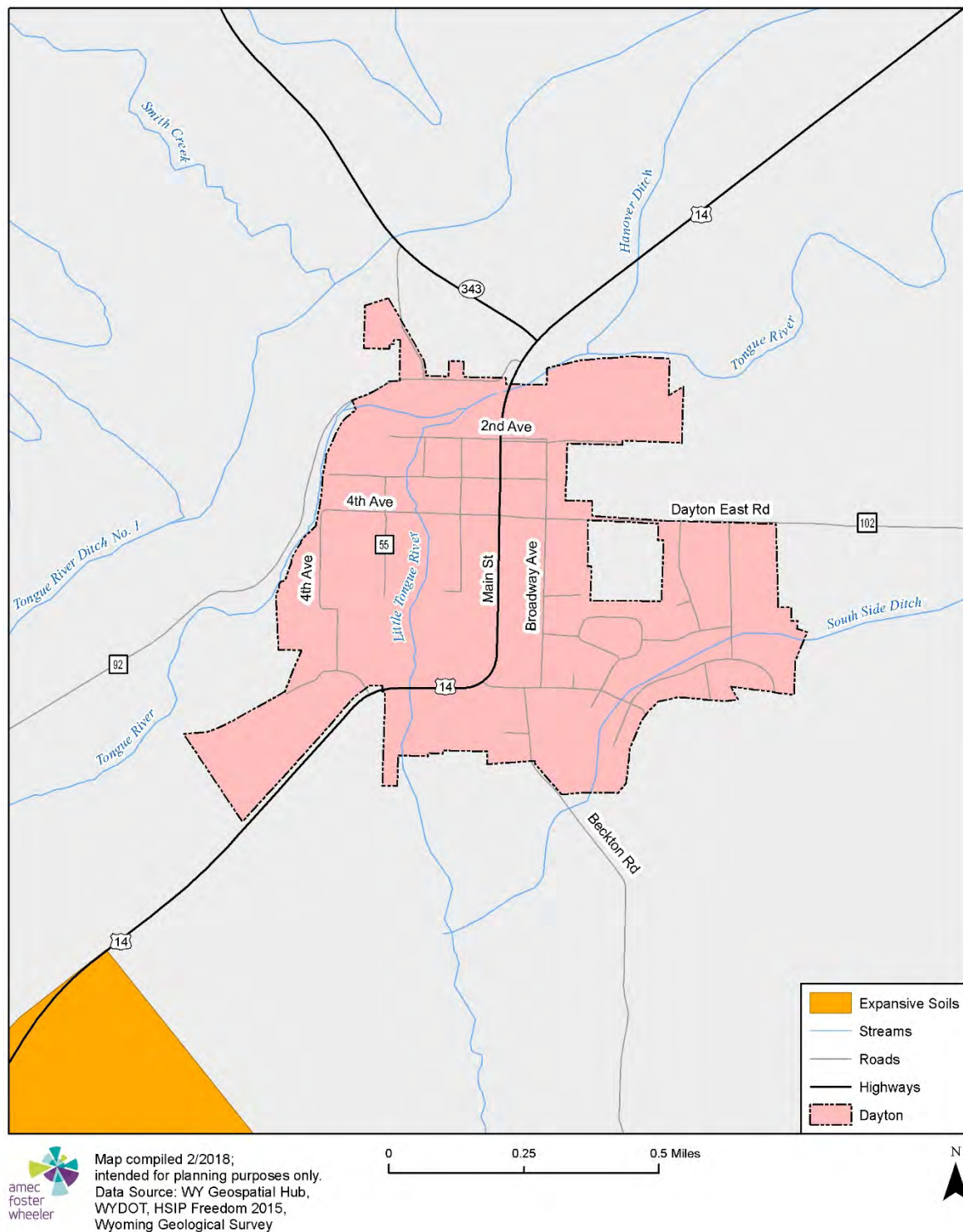
Table 6-9 Building/Structure and Population Exposure to Expansive Soils in Sheridan County

Jurisdiction	Property Type	Parcel Count	Improved Value	Est. Content Value	Total Exposure	Population
Unincorporated	Agricultural	30	\$23,723,905	\$23,723,905	\$47,447,810	
	Residential	28	\$5,666,965	\$2,833,483	\$8,500,448	64
	Total	58	\$29,390,870	\$26,557,388	\$55,948,258	64

Table 6-10 Exposure of Critical Facilities to Expansive Soils in Sheridan County

Jurisdiction	Facility Type	Facility Count
Unincorporated	Public School	1
Total		1

Figure 6-3 Expansive Soils near Dayton



6.3.5 Flood

Sheridan County has a long history of flooding that has resulted in financial losses and property destruction. Recently, in the summer of 2015, the jurisdictions experienced

flooding caused by warm temperatures and storm conditions which brought on flash flooding across the county and near Big Horn. While those 2015 flood events were not reported to cause property or crop damages, overall Sheridan County has lost over \$500,000 in damages just in reported events to NOAA's National Centers for Environmental Information (NCEI) system dating back to 1996.

The most devastating event in terms of losses began May 20th of 2011 near Parkman, when a Pacific low brought a round of heavy precipitation aided by a tap of Gulf of Mexico moisture. Another system passed to the south on the 23rd and 24th, continuing the precipitation across the area. This event was characterized by heavy rains of 3 to 5 inches in the Big Horn Mountains and Foothills, which caused local streams and creeks to rise and result in localized flooding. Small streams and creeks around Dayton were reported to be flooded. In addition, flooding was reported along the Tongue River and Little Goose Creek, as well as and on creeks in the Ranchester area. These floods resulted in the closing of some county roads. During the height of the heavy rainfall, Pass Creek Road, in the far northern Sheridan County area near the Montana border, flooded and was eventually washed out. Several culverts were also reported as washed out. This occurrence caused \$520,000 in property losses, but thankfully no injuries or loss of life.

Table 6-11 summarizes significant flood events that occurred between 1996 and 2017 in Sheridan County, as reported to the NOAA National Centers for Environmental Information (NCEI) system.

Table 6-11 Flood Events in Sheridan County, 1996-2017

Type	Location	Date	Property Damage	Crop Damage
Flash Flood	SHERIDAN	6/15/1996	\$0	\$0
Flood	SHERIDAN	8/19/1998	\$20,000	\$0
Flash Flood	SHERIDAN	7/14/2001	\$0	\$0
Flash Flood	SHERIDAN	8/21/2002	\$0	\$0
Flood	SHERIDAN FOOTHILLS (ZONE)	5/7/2005	\$0	\$0
Flood	SHERIDAN FOOTHILLS (ZONE)	5/8/2005	\$0	\$0
Flood	SHERIDAN FOOTHILLS (ZONE)	5/11/2005	\$0	\$0
Flash Flood	(SHR)SHERIDAN CO ARP	6/6/2007	\$0	\$0
Flood	(SHR)SHERIDAN CO ARP	6/6/2007	\$0	\$0
Flood	SHERIDAN	6/7/2007	\$0	\$0
Flash Flood	SHERIDAN	7/7/2007	\$0	\$0
Flash Flood	(SHR)SHERIDAN CO ARP	6/22/2010	\$0	\$0
Flood	PARKMAN	5/20/2011	\$520,000	\$0
Flash Flood	FT MACKENZIE	5/24/2011	\$0	\$0
Flash Flood	FT MACKENZIE	5/24/2011	\$0	\$0
Flood	DAYTON	5/25/2011	\$0	\$0
Flood	RANCHESTER	6/8/2011	\$0	\$0
Flood	CLEARMONT	2/22/2012	\$0	\$0
Flash Flood	FT MACKENZIE	6/11/2013	\$0	\$0
Flood	(SHR)SHERIDAN CO ARP	5/24/2015	\$0	\$0
Flash Flood	(SHR)SHERIDAN CO ARP	6/5/2015	\$0	\$0
Flash Flood	BIG HORN	6/10/2015	\$0	\$0
TOTAL			\$540,000	\$0

Source: NOAA NCEI

Based on GIS analysis, in the event of a 100-year flood (1% annual chance), the most impacted buildings would be in the unincorporated areas (75.3% of all the impacted buildings in the county), followed by the City of Sheridan (9.9%), Ranchester (8.0%), and Dayton (6.7%). This ratio changes when taking into consideration the improved value, content value, and total exposure of the properties at risk, as the unincorporated areas represent 83.2% of potential loss in the entire county (given higher value properties, more contents at risk, or other such factors). The total exposure value in Sheridan County is equal to \$130.9 million, with \$32.7 million of potential loss during a 100-year flood event. An estimated 684 people would be at risk of displacement during these floods.

For a 500-year flood event (0.2% annual chance flood), the estimated content value of properties at risk amounts to over \$48 million, with \$125.8 million of total exposure, and \$31.5 million in overall potential losses due to the 0.2% annual chance flood. 1,037 people would be at risk of displacement during these floods. These losses and displacement estimates would be added on top of those calculated for the 100-year flood event.

Below are maps of flood prone areas in Sheridan County and its jurisdictions, based on both FEMA's NFHL layers, which include the 1% (i.e. 100-year) and 0.2% (i.e. 500-year) annual chance flooding, and Hazus-derived floodplains calculated for a 1% annual chance flood event. Tables highlighting general properties at risk, vulnerable critical facilities, exposure values, potential losses, and overall population vulnerable to flooding are included under the Base Plan.

Sheridan County has three NFIP Repetitive Loss (RL) properties, which are all located in the unincorporated county. The properties account for a total of \$80,303 in RL payments across seven claims. A RL property is any insurable building for which two or more claims of more than \$1,000 were paid by the National Flood Insurance Program (NFIP) within any rolling ten-year period, since 1978. A RL property may or may not be currently insured by the NFIP.

Figure 6-4 Sheridan County 100-year and 500-year Flood Hazards

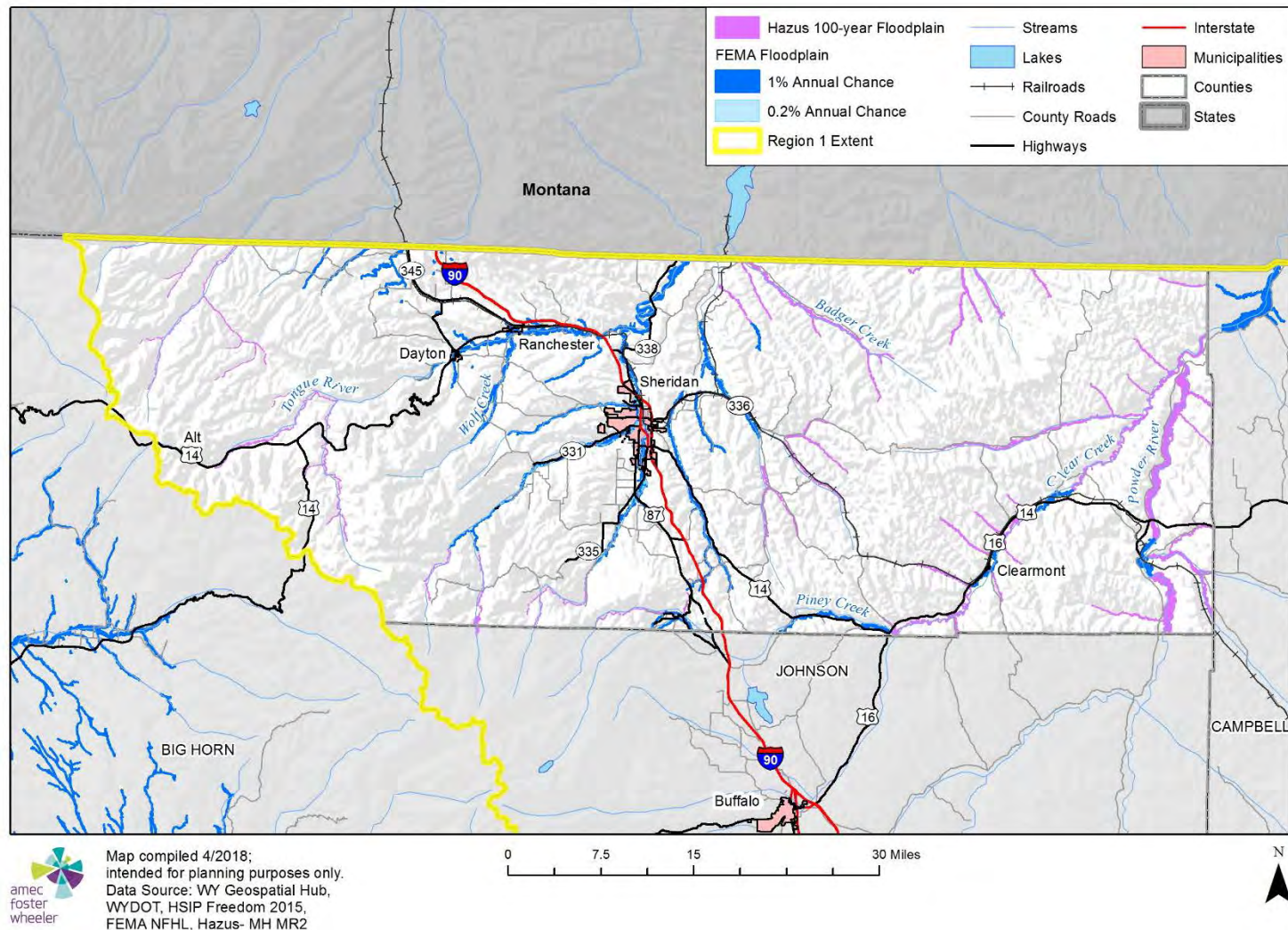


Figure 6-5 Town of Clearmont 100-year and 500-year Flood Hazards

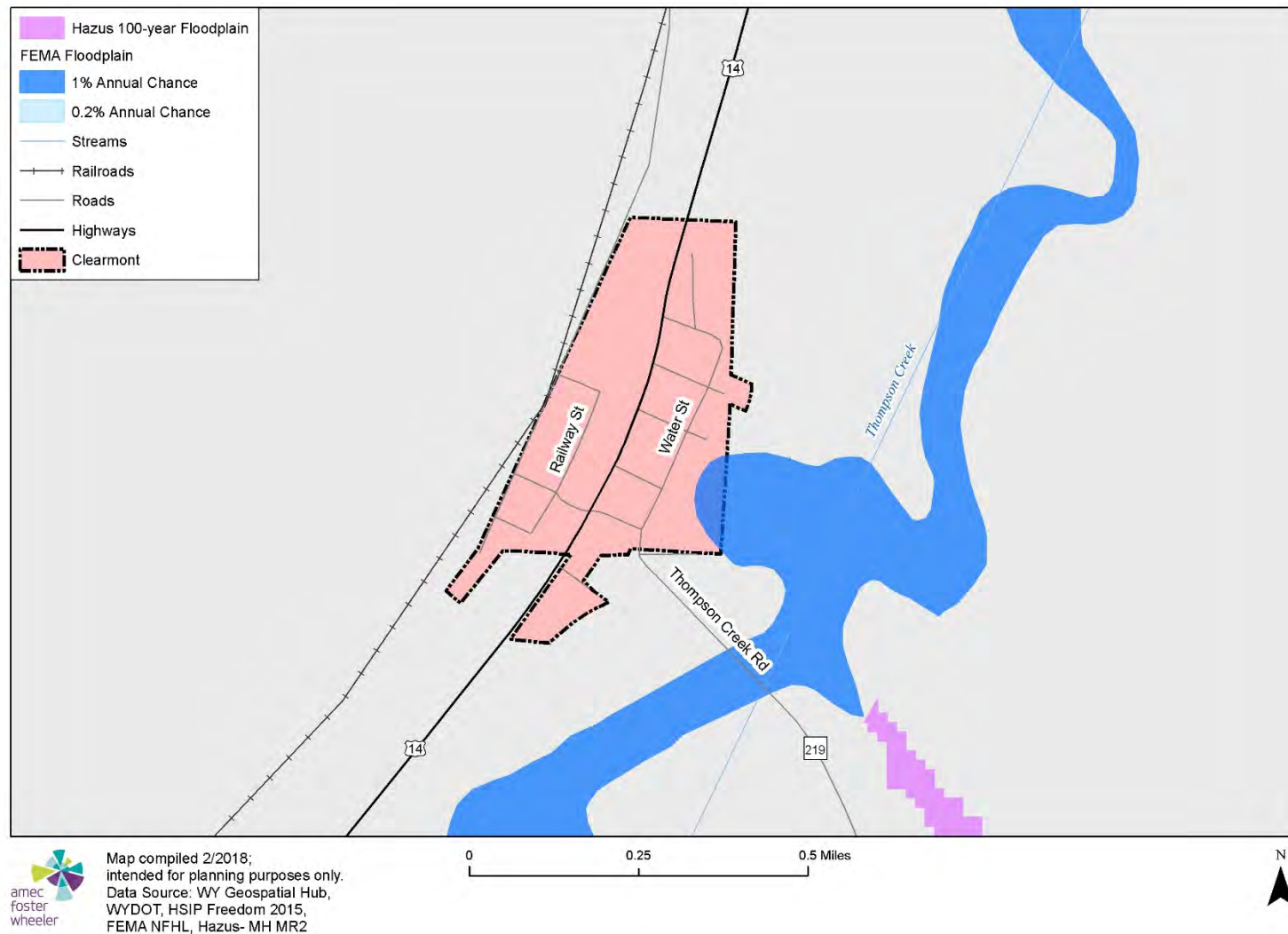


Figure 6-6 Town of Dayton 100-year and 500-year Flood Hazards

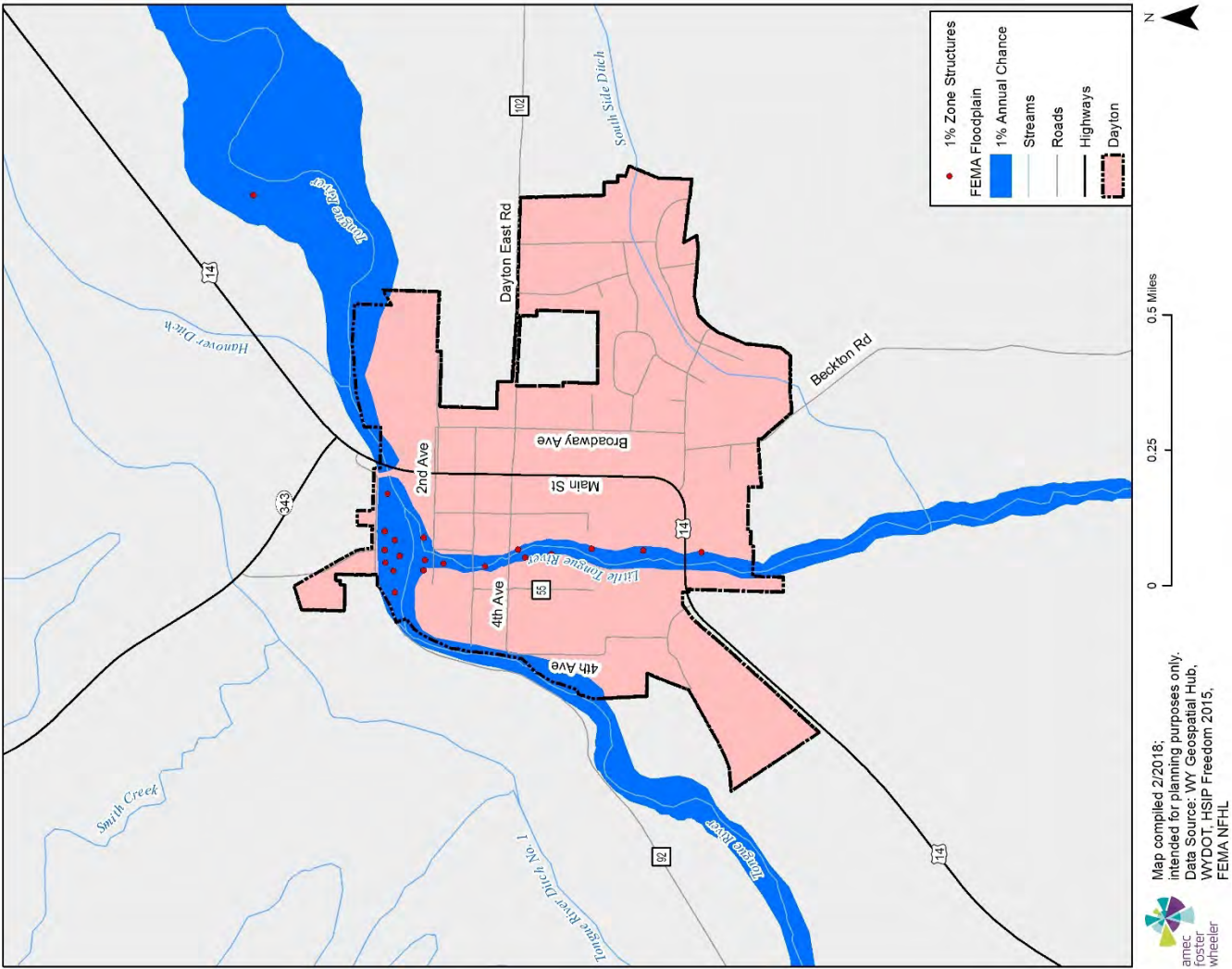


Figure 6-7 Town of Ranchester 100-year and 500-year Flood Hazards

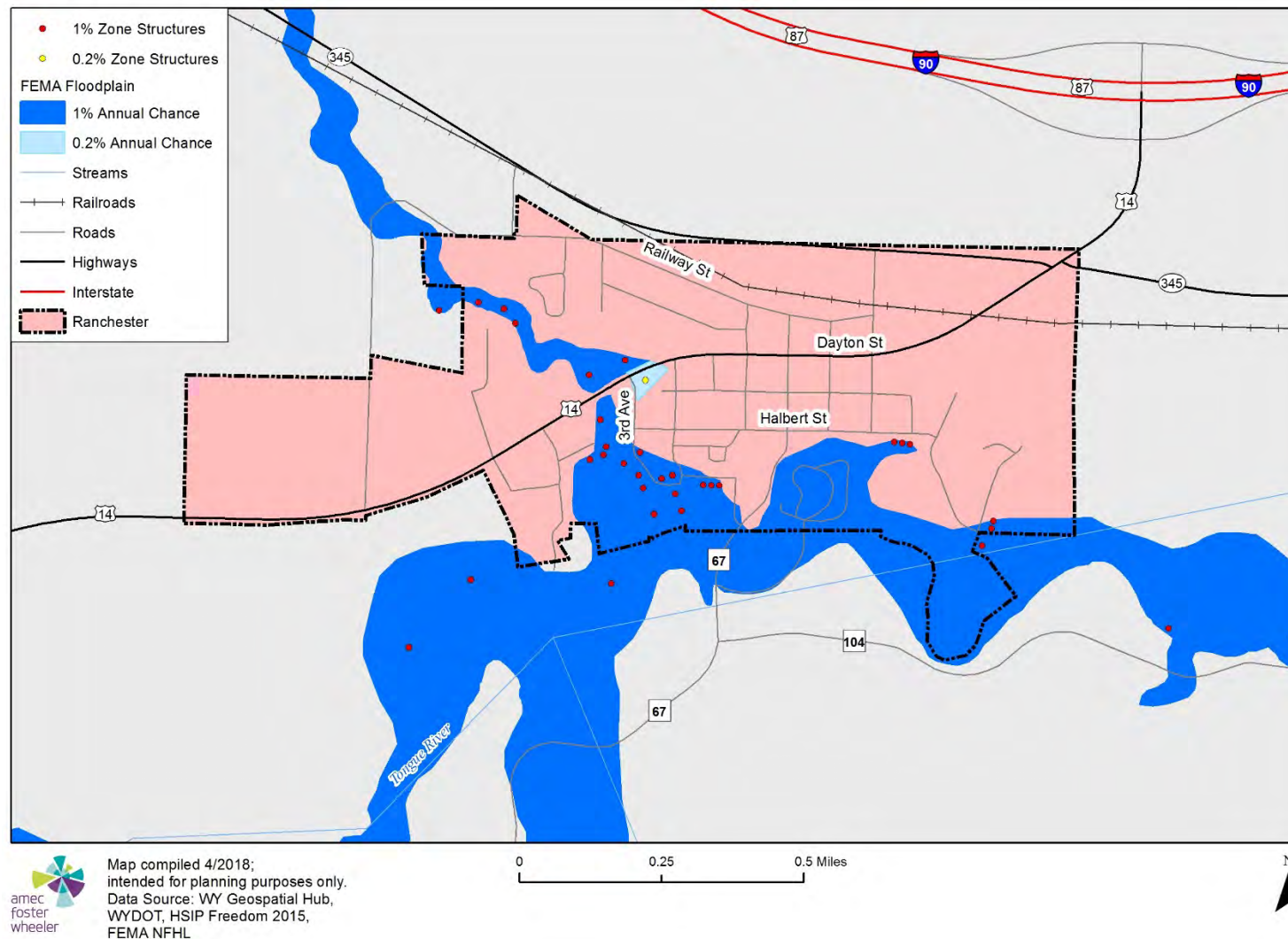
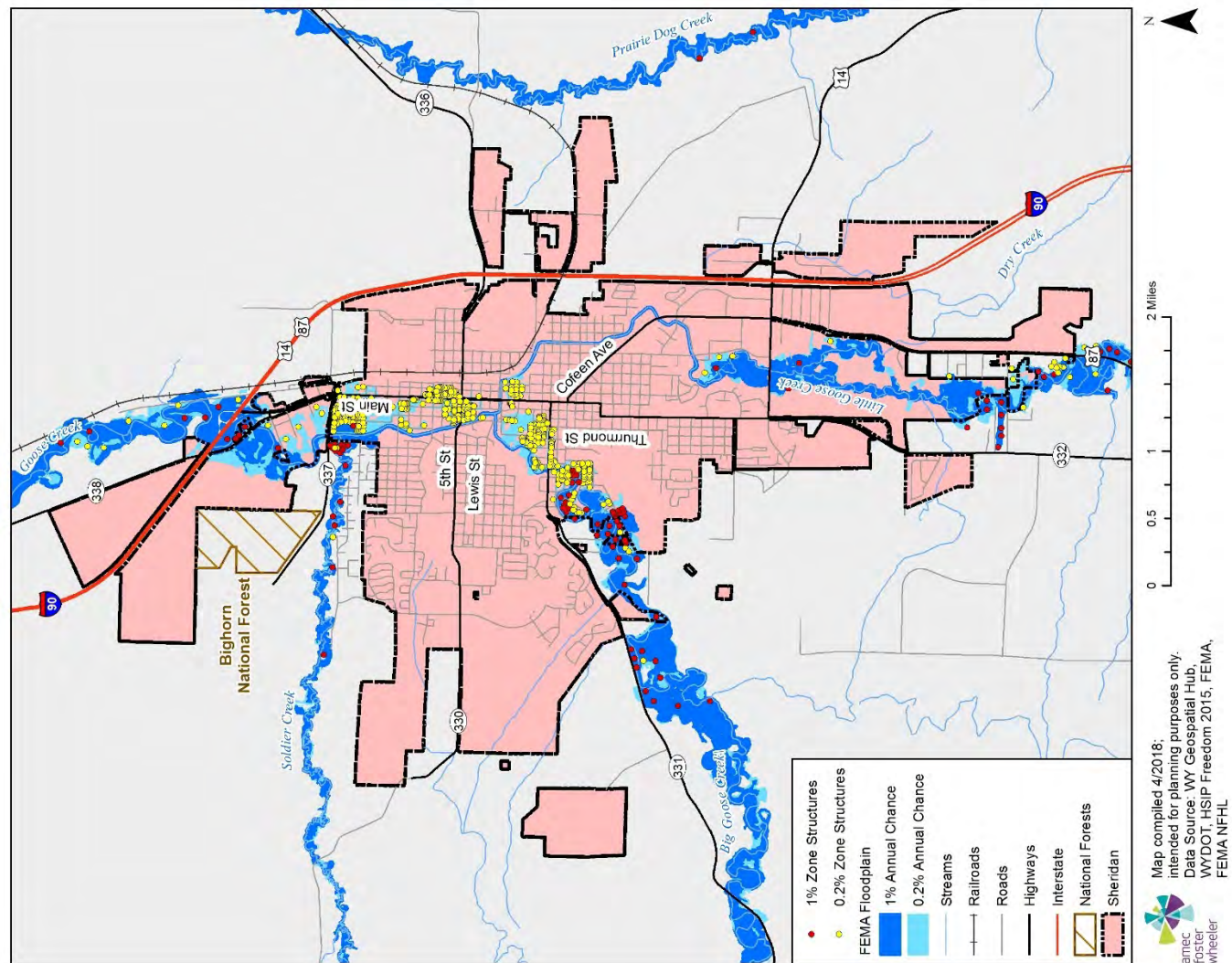


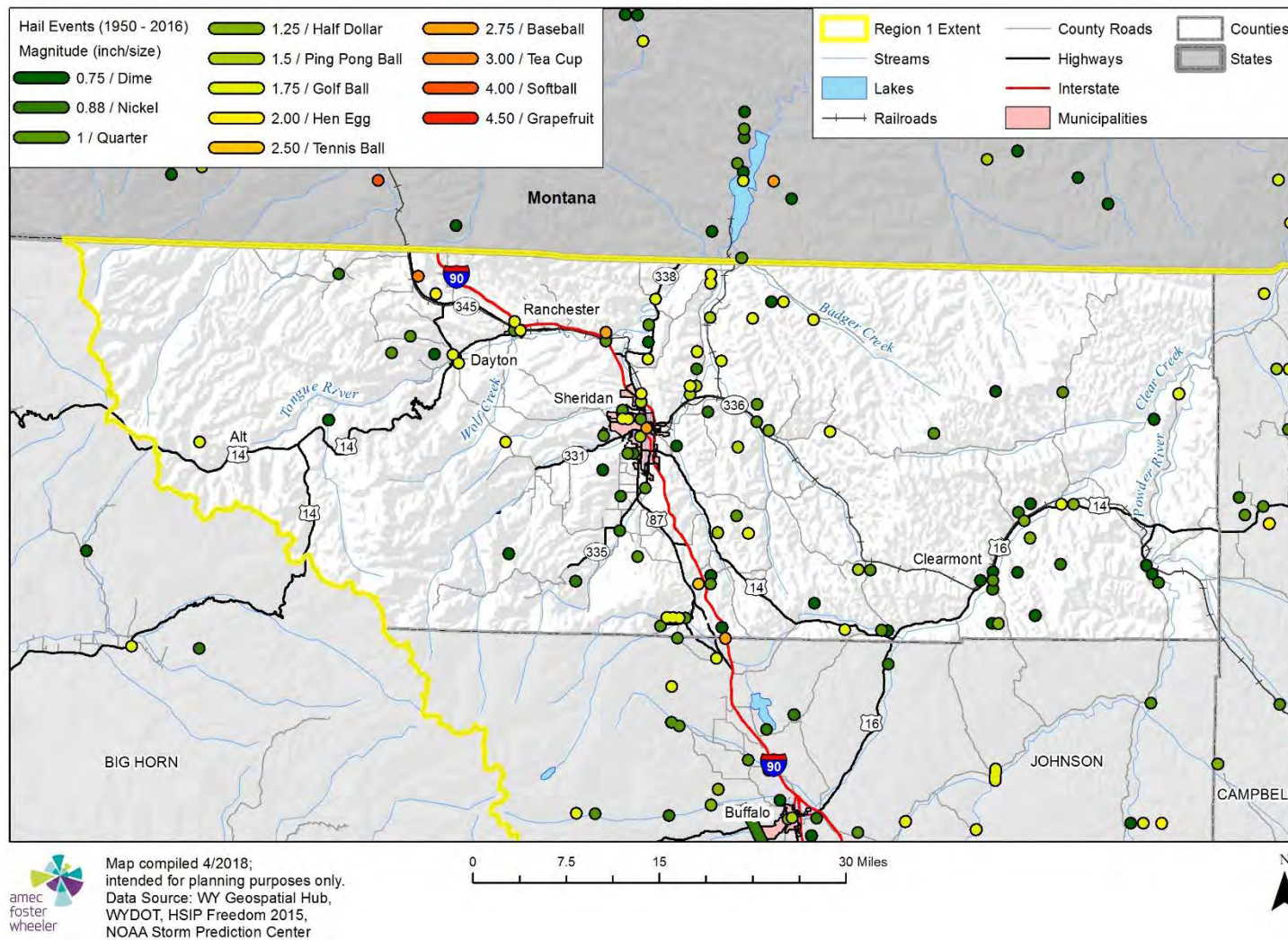
Figure 6-8 City of Sheridan 100-year and 500-year Flood Hazards



6.3.6 Hail

Hail storms occur sporadically throughout Region 1 and are often associated with severe summer storms; these events primarily impact buildings and agriculture. Most of the damages affect crops, though there is potential for significant structural destruction from particularly large hailstones. The probability of future occurrence for this event in Sheridan County is likely, but the magnitude of these events is rather negligible. Overall, hail poses a moderate threat across the County and does not vary between the jurisdictions. Though it should be noted that property damages will be higher in the municipalities (due to exposed infrastructure, cars, etc.), potential crop and livestock damages would be concentrated in the more rural and unincorporated areas. See Section 4.2.7 for more information on the previously recorded hail events and associated damages, and to revisit the hail map found on Figure 4-37. The total property damage recorded for the County since 1950 due to this hazard is \$50,000, with no crop damages on file. (Source: NOAA's NCEI database.) The map below displays where NOAA-reported hail events took place in Sheridan County, from 1950-2016:

Figure 6-9 NOAA Reported Hail Events in Sheridan County



6.3.7 Hazardous Materials

As further discussed at a regional level in the Base Plan, since 2007 Sheridan County has been exposed to at least 10 hazardous materials incidents that were significant enough to be recorded in the U.S. Coast Guard's National Response Center (NRC) database and Risk Management Plans (RMP) network; more information can be obtained at <http://www.rtk.net/#rmp>. Sheridan County contains 2 RMP facilities: The Big Goose Water Treatment Plant and the Sheridan Water Treatment Plant, both of which handle and treat chlorine. The table below summarizes the number of hazardous materials events that have occurred from 2007-2016 in Sheridan County.

Table 6-12 NRC-Reported Incidents in Sheridan County: 2007-2016

Year	Sheridan County
2007	2
2008	0
2009	3
2010	0
2011	0
2012	2
2013	1
2014	2
2015	2
2016	1
Yearly Average	1.3
Total	13

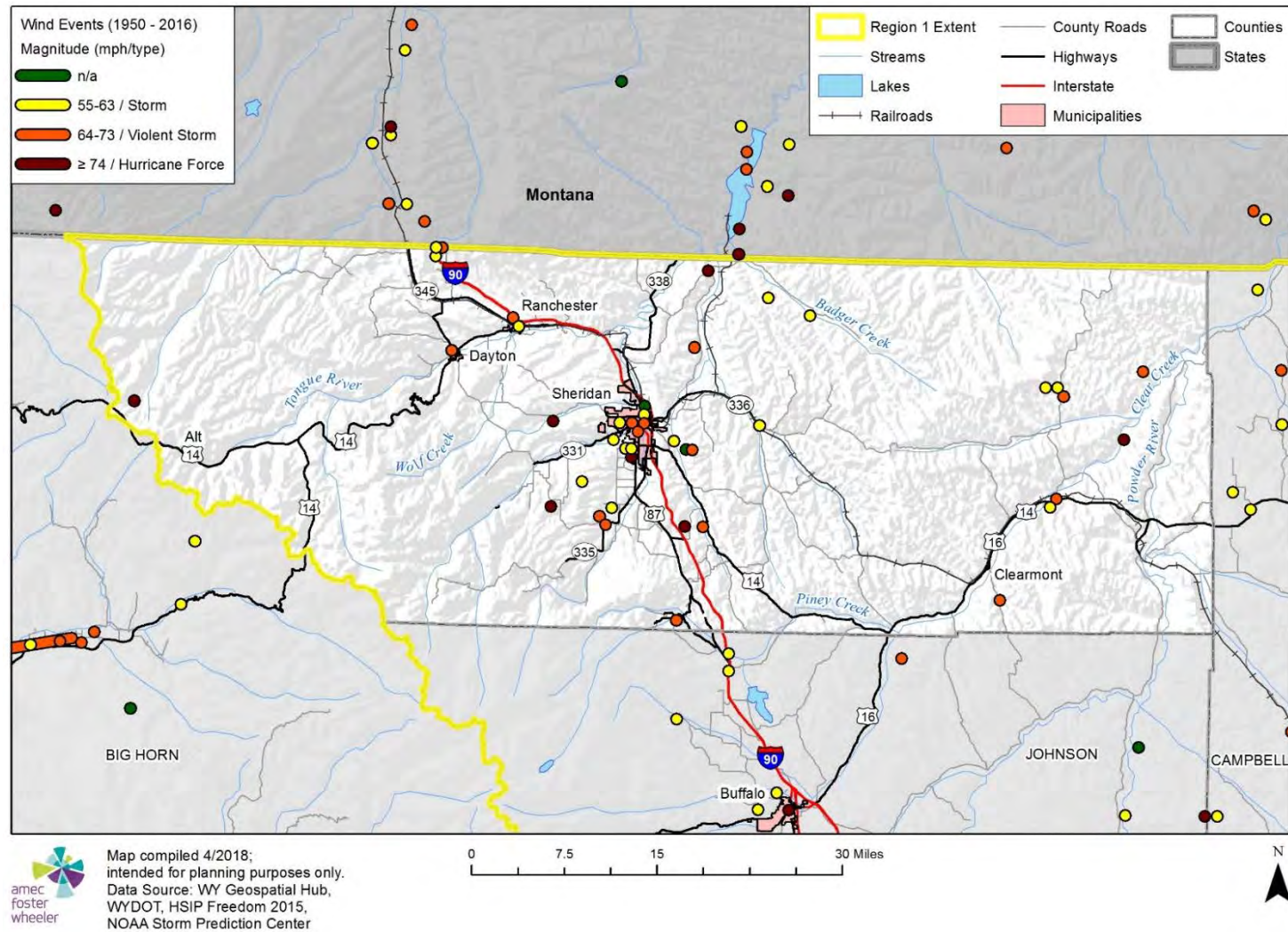
Source: <http://www.rtk.net/#rmp>

The 2013 Local Emergency Response Planning Team for Sheridan County indicated a general observation of increased transport of hazardous materials by train through the County. The Burlington Northern Santa Fe railroad is a heavy rail line that runs through much of Sheridan County, and serves principally as a coal-hauling route. The railroad links Sheridan County directly with Billings (Montana) and Gillette (Campbell County); it also indirectly links to both the Denver and Salt Lake City major metropolitan areas. There is a concern regarding the potential increase hazardous materials through the county and population centers and the potential of dangerous and harmful spills. The overall significance of this hazard to the county is medium.

6.3.8 High Winds and Downbursts

Wind is a constant presence in Wyoming but can be often overlooked. It is difficult to assess vulnerability as it relates to location because damaging winds have occurred everywhere in the County. The main risks associated with high wind events are related to poorly constructed buildings, flying debris, car accidents, and damages to infrastructure.

Figure 6-10 NOAA Wind Events in Sheridan County



High wind events are usually somewhat random and damages from high winds are often described in a regional context, though downbursts occur in smaller extents. From 1950-2016, a total of 82 wind weather events have caused \$515,000 in property damages, with a maximum recorded wind speed of 83 mph (source: NOAA's NCEI). The map below displays the locations of the NOAA-reported wind events in Sheridan County and near its jurisdictions, from 1950-2016. Overall, high winds pose a moderate threat across the County and does not vary between the jurisdictions. See Section 4.2.9 of the Base Plan for more information on wind zones, events, and impacts.

6.3.9 Landslide/Debris Flow/Rockfall

The geologic history and unique conditions of Wyoming make landslides one of the most common hazards. In Sheridan, landslide deposits are highly concentrated in the northwestern portion of the county. Areas of prevalent complex slope movement, in particular, are located to the west and sprinkled throughout the middle of the county, along with some minor slump areas. Some slump and debris/earth flow areas can also be found nearing the edges of the Bighorn National Forest, running through the county in a northwest-southwest fashion. Some unstable rock areas can be seen near Highway 14, near the central-west portion of the county, on the boundary with the Bighorn National Forest, as well as Jim Creek Hill and the Soldier Creek drainage. The HMPC noted impacts on I-90 often leading to closures, particularly between Buffalo and Sheridan. The City of Sheridan has had several landslides in the city, particularly near the Junior High School; a retaining wall was constructed to mitigate this, but continued problems with slope stability have occurred. The City is seeking consultant assistance to assess additional mitigation options in 2018. The geospatial distribution of landslide susceptibility can be seen in the figures below.

Figure 6-11 Sheridan County Landslide Hazard

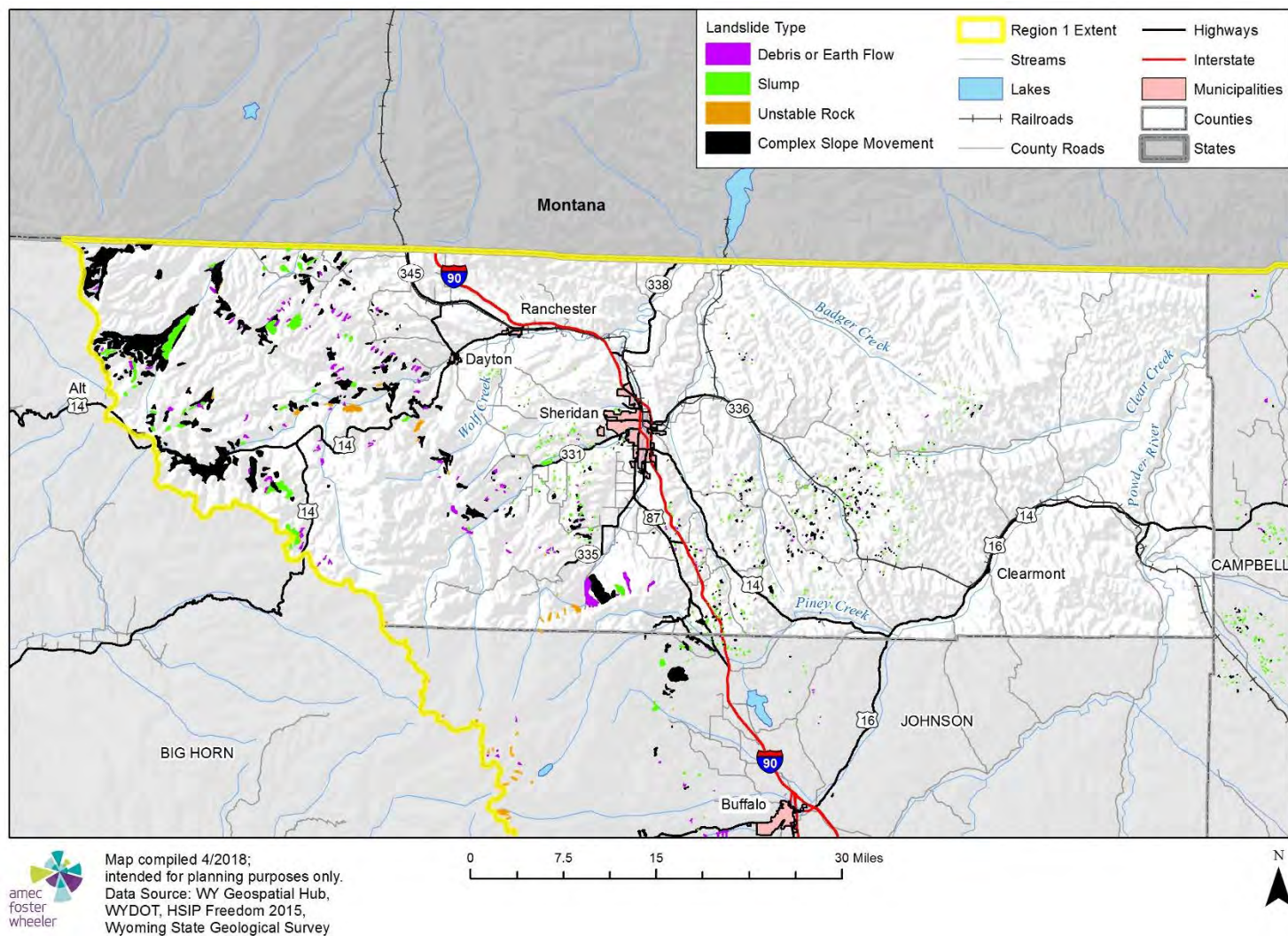
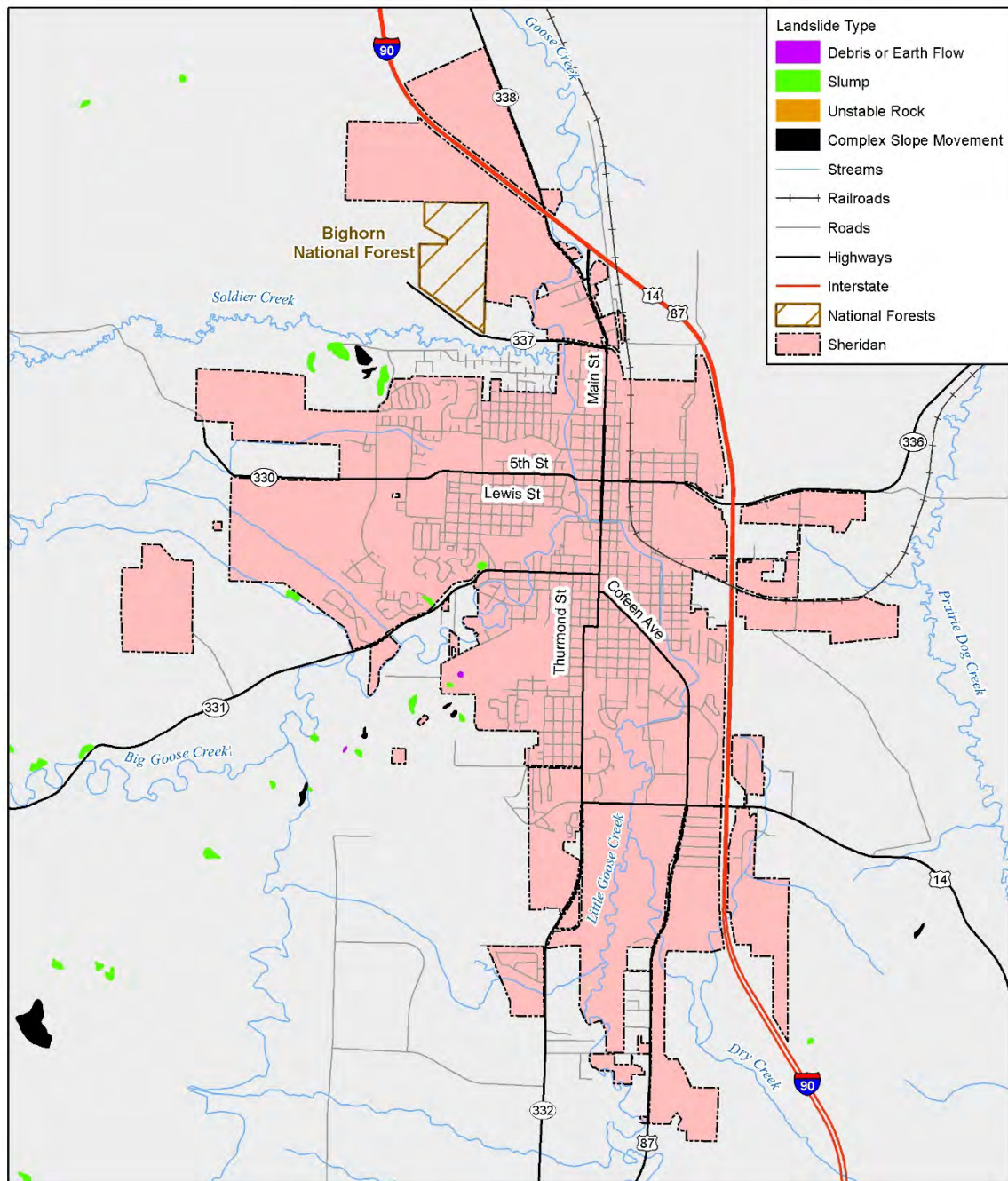


Figure 6-12 City of Sheridan Landslide Hazard



Map compiled 2/2018;
intended for planning purposes only.
Data Source: WY Geospatial Hub,
WYDOT, HSIP Freedom 2015, FEMA,
Wyoming State Geological Survey

0 0.5 1 2 Miles



In terms of significance, landslides, debris flow, and rockfall vary based on the magnitude and the location. There is also a possibility that creeks or rivers within the county could become dammed by landslide activity, resulting in a flash flood hazard downstream if the landslide dam fails or is overtopped, or flood nearby developed areas as pooling behind the landslide dam occurs. While some events are small and have limited impact on people and infrastructure, other occurrences can involve large sections of earth and may obstruct major roadways, power line corridors, or gas lines.

On July 22, 2011, President Obama declared a major disaster for the State of Wyoming for emergency work and the repair or replacement of facilities damaged by the severe storms, flooding, and landslides in Albany, Big Horn, Carbon, Crook, Fremont, Goshen, Johnson, Lincoln, Platte, Sheridan, Sublette, Teton, Uinta, Washakie, and Weston Counties. This declaration made Public Assistance funding available.

During the development of this regional plan, a GIS analysis of exposure to landslide hazard areas and potential property losses was performed, with the results detailed for all the Region 1 counties in Section 4.2.10 of the Base Plan. To summarize Sheridan County's results, the table below is included. The population column highlights the potential number of people that would be displaced and/or affected by a landslide event, based on the average household size per property.

Table 6-13 Landslide Hazards by Jurisdiction and Property Type in Sheridan County

Jurisdiction	Property Type	Parcel Count	Improved Value	Est. Content Value	Total Exposure	Population
City of Sheridan	Residential	4	\$431,828	\$215,914	\$647,742	9
	Total	4	\$431,828	\$215,914	\$647,742	9
Unincorporated	Agricultural	2	\$513,351	\$513,351	\$1,026,702	
	Residential	5	\$1,924,231	\$962,116	\$2,886,347	11
	Total	7	\$2,437,582	\$1,475,467	\$3,913,049	11
	Grand Total	11	\$2,869,410	\$1,691,381	\$4,560,791	21

Source: Amec Foster Wheeler analysis of WGS and Wyoming Department of Revenue data

Sheridan County has a moderate degree of landslide vulnerability, with 21 buildings exposed to complex slope movement, debris or earth flow, and/or slump landslides. These structures are mostly located in unincorporated areas, with 9 of them falling in the City of Sheridan. Future impacts are likely to affect transportation corridors, rivers, lakes and reservoirs, transmission lines, campgrounds and the occasional structure or property in the county.

6.3.10 Lightning

All areas in western Wyoming are susceptible to lightning strikes. Impacts to persons and property are likely to remain isolated. Outdoor workers and outdoor enthusiasts and

livestock will remain susceptible to lightning strikes. In Sheridan County, higher elevation/mountainous areas remain more susceptible. Seven lightning events have been recorded in Sheridan County from 1950-2015, with over \$30,000 in total damages accrued from the various events (in the form of property losses). Lightning caused wildland fires may result in more extensive and compound/secondary damages as well. The table below summarizes the recorded events from this hazard, as available in the 2016 Wyoming Multi-Hazard Mitigation Plan. Overall, lightning poses a medium significance hazard.

Table 6-14 Lightning Events in Sheridan County, 1950-2015

County	Number of Events	Injuries	Fatalities	Property Damage	Crop Damage	Total Damage
Sheridan	5	2	1	\$ 31,739	\$ 0	\$ 31,739

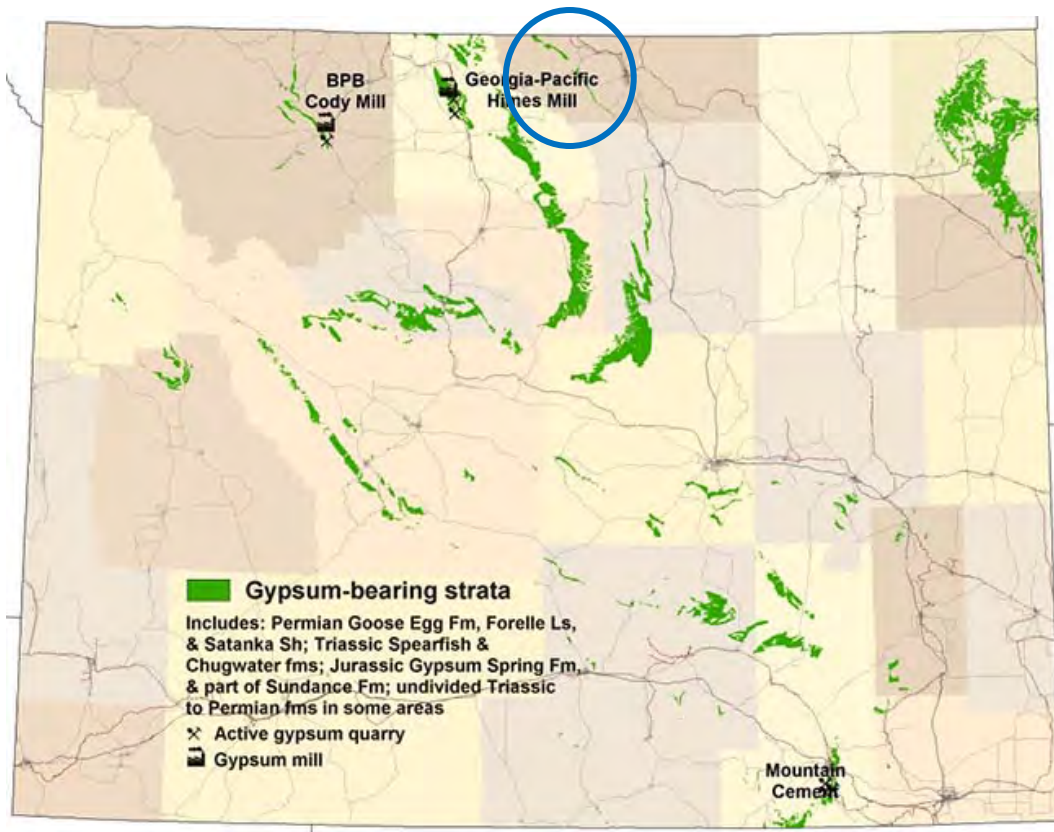
Source: 2016 Wyoming State Multi-Hazard Mitigation Plan

6.3.11 Mine and Land Subsidence

There are numerous abandoned mine sites with subsidence-prone underground workings in Sheridan County, especially areas close to Interstate 90 and other major highways. Mines across the county have been identified and there are mitigation projects designed to reduce the impacts from underground mining and subsidence, and to remove the threat they pose to the surrounding area. The unmitigated identified mines pose little to no threat to infrastructure in the surrounding area. Mine and general land subsidence events occur occasionally, and the degree of risk and impact varies based on the characteristics of each area. There have been events near the City of Sheridan, such as a fire at an underground coal mine in the Powder River Basin north of Sheridan. There has been property and infrastructure damage associated with coal-mine and general land subsidence in Sheridan communities too, but the dollar amounts of the damage are not readily available.

A layer of prehistoric rock known as the Triassic Spearfish Formation lies underneath part of Sheridan County. The formation is abundant with gypsum, a soluble mineral that dissolves as water infiltrates the ground. As the gypsum dissolves, caves form underground; sinkholes appear on the ground surface when the roof of an underground cave collapses. This type of landscape is referred to as “karst,” identified by the dissolution of layers of soluble minerals and bedrock. Karst landscapes may be marked by caves, sinkholes, cenotes, and other surface features. Figure 6-13 depicts known locations of gypsum-bearing strata in the State. Note the strands of gypsum in Sheridan County (circled in blue).

Figure 6-13 Gypsum-Bearing Strata in Wyoming



Source: Wyoming State Geological Survey, "Gypsum," accessed December 13, 2012.

The overall significance of this hazard is low across the County but does not largely vary between the jurisdictions. Refer to Section 4.2.12 from the Base Plan for a more detailed vulnerability assessment and location of abandoned mine sites, mine reclamation and abandonment programs, land subsidence information, and other details relevant to Sheridan County and Region 1.

6.3.12 Severe Winter Weather

Winter storms are a yearly feature of the Wyoming climate and may occur anywhere in the state. Blizzard conditions bring the triple threat of heavy snowfall, strong winds, and low temperatures. Poor visibility and huge snowdrifts are major hazards caused by blowing snow. These storms disrupt work, make travel difficult or impossible, isolate communities, kill livestock by the hundreds or thousands, and sometimes leave human fatalities in their wake. Higher elevation and mountainous areas tend to be more susceptible to severe winter weather events, but in Sheridan County there have only been \$1,000 worth of property damage since 1996 and until 2017. In this time period, 152 winter storms, with no reported ice storms or extreme cold events took place (Source: NOAA's NCEI database.)

The HMPCs reported that Interstate closures are common during winter storm events, which leads to the need to shelter stranded motorists, can create economic impacts, and can cause problems due to diverted semi-trucks on city and town streets. Access to rural homes can also become an issue, especially during prolonged storms; residents are encouraged to keep a 3-day supply of food, medication, and oxygen. Impacts on livestock and wildlife are also a major concern. The Sheridan County HMPC reported that the county averages 73” of snowfall annually. Building collapses are common, especially during Fall and Spring snow storms. In addition, ice jams pose a problem across the county; there was a major ice jam event near Dayton in 2016, for example.

6.3.13 Tornado

Many documented tornadoes occurring in the counties in Region 1 are given low ratings on the Fujita Scale (F0s and F1s) simply because these tornadoes are often formed over open land and result in little or no damage. Sheridan County, however, has the least number of reported incidents of this kind from 1923-2016. The table below summarizes the tornado events in this time period:

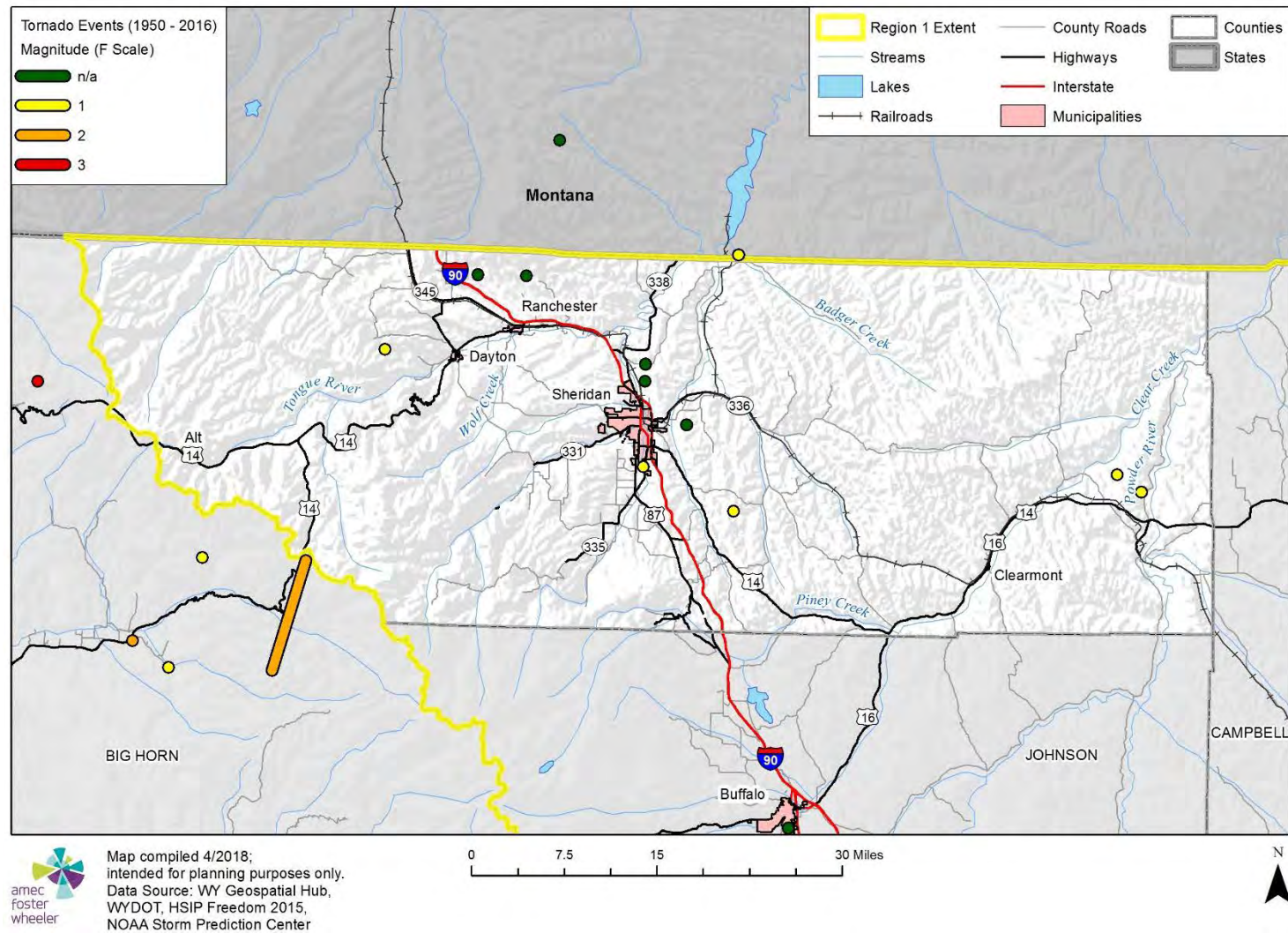
Table 6-15 Tornado History in Sheridan County, 1923-2016

County	Total Incidents	Magnitude	Damage-Causing Incidents	Fatalities	Injuries	Property Damage	Crop Damage
Sheridan	12	0-1	6	1	0	\$ 101,350	\$2,750

Source: NOAA's NCEI, Sheridan County Multi-Hazard Mitigation Plan

The overall significance is medium. Since 1923 there have been 12 recorded tornadoes, and of these events, there was only one fatality and relatively low property and crop damages. Region 1 tornado events are very small in terms of magnitude, with limited associated impacts, and the significance of this event does not largely vary across jurisdictions. The map below geospatially displays the locations of NOAA-reported tornadoes across Sheridan County, though only focusing on events from 1950-2016.

Figure 6-14 NOAA Tornado Events



6.3.14 Wildfire

Large wildland fires become increasingly damaging as the population expands into the more rural areas. The statewide Wildland Urban Interface (WUI) Hazard Assessment and its resultant outputs serve two primary purposes: assisting in prioritizing and planning mitigation projects and creating a communications tool to which agencies can relate to common information and data. With the mapping analysis evaluating areas of varying wildfire vulnerability, the final output will result in a Risk, Hazard, and Value (RHV) map displaying areas of concern (Redzones) for catastrophic wildland fires. These results provide vulnerability and potential risk assessment tools.

Another method of estimating potential future impacts from wildfires is to determine the value of structures that are located within Redzones, or wildland fire building exposure values. Wildland fire building exposure value is the value of buildings that can be potentially damaged by wildland fire in an area. Building exposure values are based on Census Block level data from the U.S. Census Bureau. The methodology utilized is like the one used to model flood exposure described in the flood chapter of the Base Plan. Based on GIS analysis performed, Sheridan County has over \$278.9 million in total property exposure potentially at risk to wildland fires, and there are 1,573 people living in the Redzones (at risk of wildfires, displacement, etc.). Though it is not likely that the areas at risk will simultaneously face a completely destructive event, this figure provides the upper end of what could be affected. Future wildfires could face compound losses such as damaged crops and watersheds within the County, and the fires could contribute to soil erosion and deposition problems. The tables below summarize Sheridan County's risk to wildfires:

Table 6-16 Wildfire Risk in Sheridan County based on Redzone Analysis

Jurisdiction	Property Type	Parcel Count	Improved Value	Est. Content Value	Total Exposure	Population
City of Sheridan	Commercial	7	\$7,269,885	\$7,269,885	\$14,539,770	
	Residential	44	\$8,363,145	\$4,181,573	\$12,544,718	100
	Total	51	\$15,633,030	\$11,451,458	\$27,084,488	100
Unincorporated	Agricultural	114	\$25,115,092	\$25,115,092	\$50,230,184	
	Commercial	19	\$3,263,577	\$3,263,577	\$6,527,154	
	Exempt	1	\$121,115	\$121,115	\$242,230	
	Res Vacant Land	1	\$4,553	\$2,277	\$6,830	
	Residential	646	\$129,902,103	\$64,951,052	\$194,853,155	1,473
	Total	781	\$158,406,440	\$93,453,112	\$251,859,552	1,473
	Grand Total	832	\$174,039,470	\$104,904,570	\$278,944,040	1,573

Source: Wyoming Assessor's Office, Redzone data, U.S. Census

Table 6-17 Sheridan County Critical Facility Exposure within the Redzone

Jurisdiction	Facility Type	Facility Count
City of Sheridan	EMS Stations	1
Sheridan County (Unincorporated)	Cellular Towers	1
	Electric Substations	1
	FM Transmission Towers	3
	Microwave Service Towers	16
TOTAL		22

Source: Homeland Infrastructure Foundation-Level Data (HIFLD)

Resources for wildfire planning and management for Sheridan County include the following:

- The Sheridan County Wildland Fire Mitigation Plan – updated in 2018
- Community Wildfire Protection Plan – updated 2005
- Wyoming Statewide Forest Resource Assessment – 2009
- Wyoming Fire Report – 2011
- Wyoming Wildland Urban Interface Hazard Assessment – 2002
- Front Range Redzone Project

Below are the maps, first for Sheridan County and then for the affected jurisdictions, of Redzone vulnerability (where red colors mean high risk of fires, and the oranges are the areas immediately adjacent and hence slightly less vulnerable but still at risk). A fire history map of fire locations and their magnitudes is included last, for Sheridan County.

Overall, the significance of wildfires to the county is high, with around 55,062 acres burned just in the human- and natural-caused fires of over 1,000 acres in size that took place from 1980-2016. However, overall, there have been 84 fires reported. Refer to Section 4.2.15 of the Base Plan for additional analysis and information pertaining to Sheridan County and Region 1, including further statistics, summaries, and details.

Figure 6-15 Sheridan County Redzone Areas

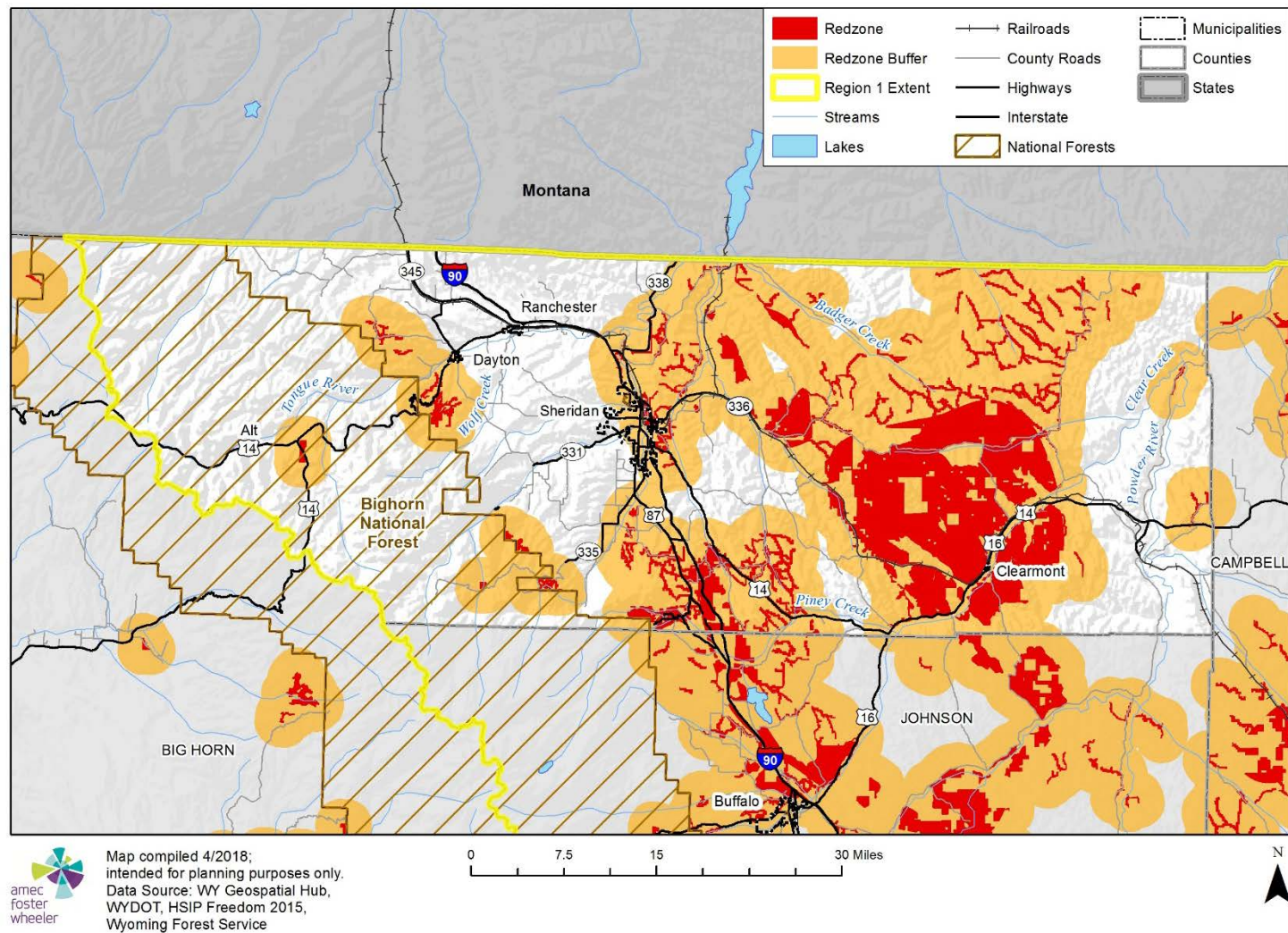


Figure 6-16 Clearmont Redzone Areas

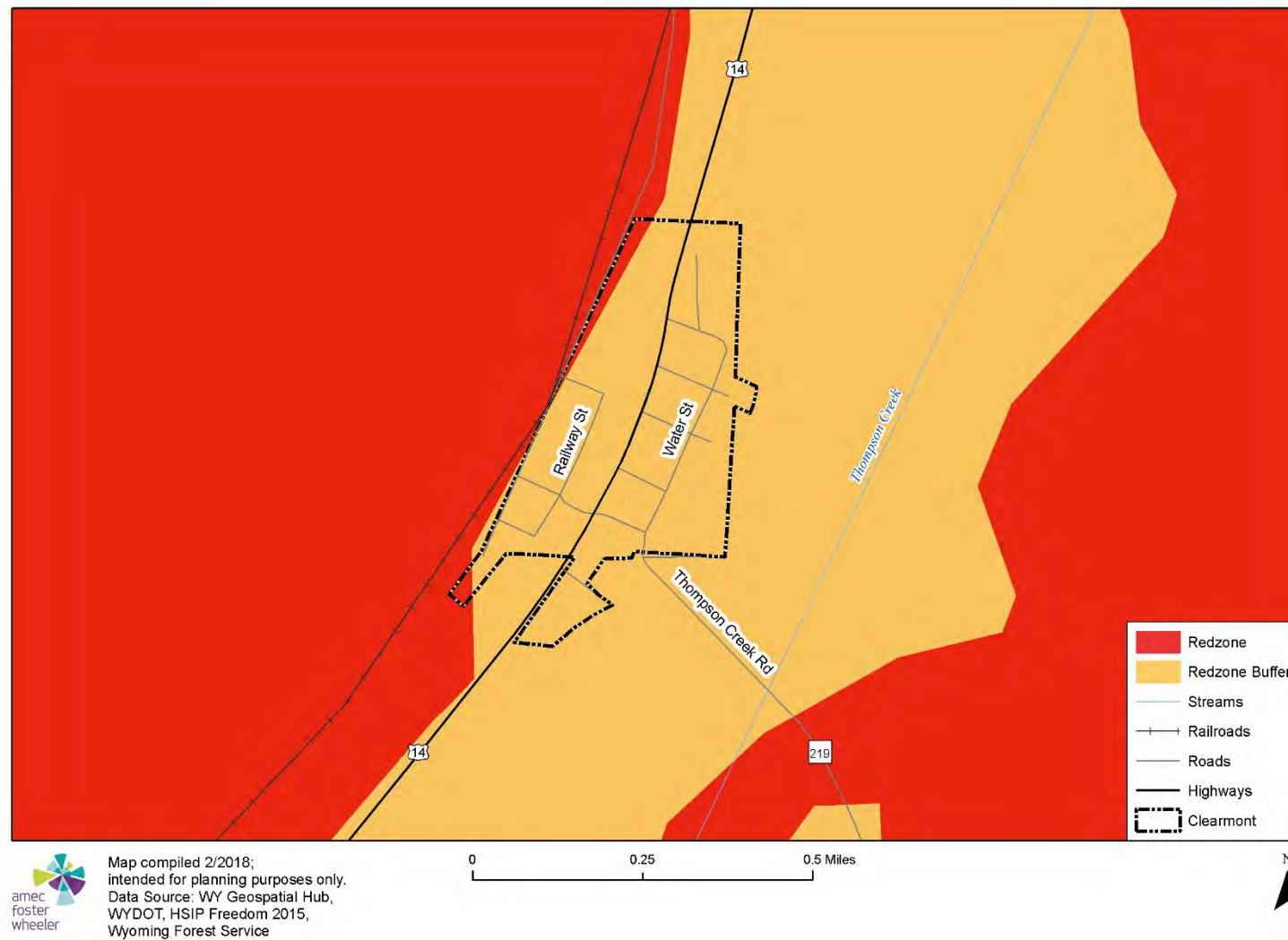


Figure 6-17 Dayton Redzone Areas

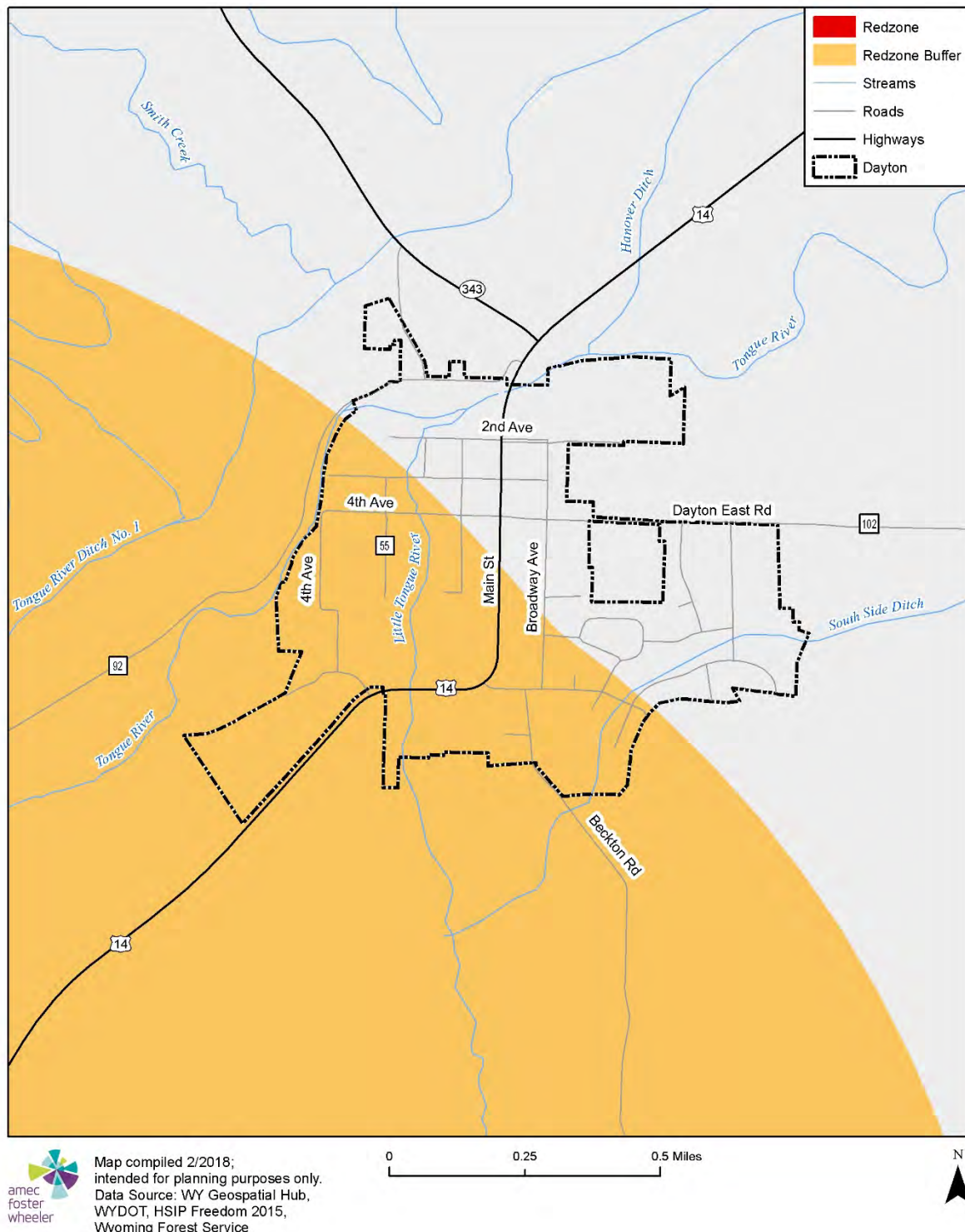


Figure 6-18 City of Sheridan Redzone Areas

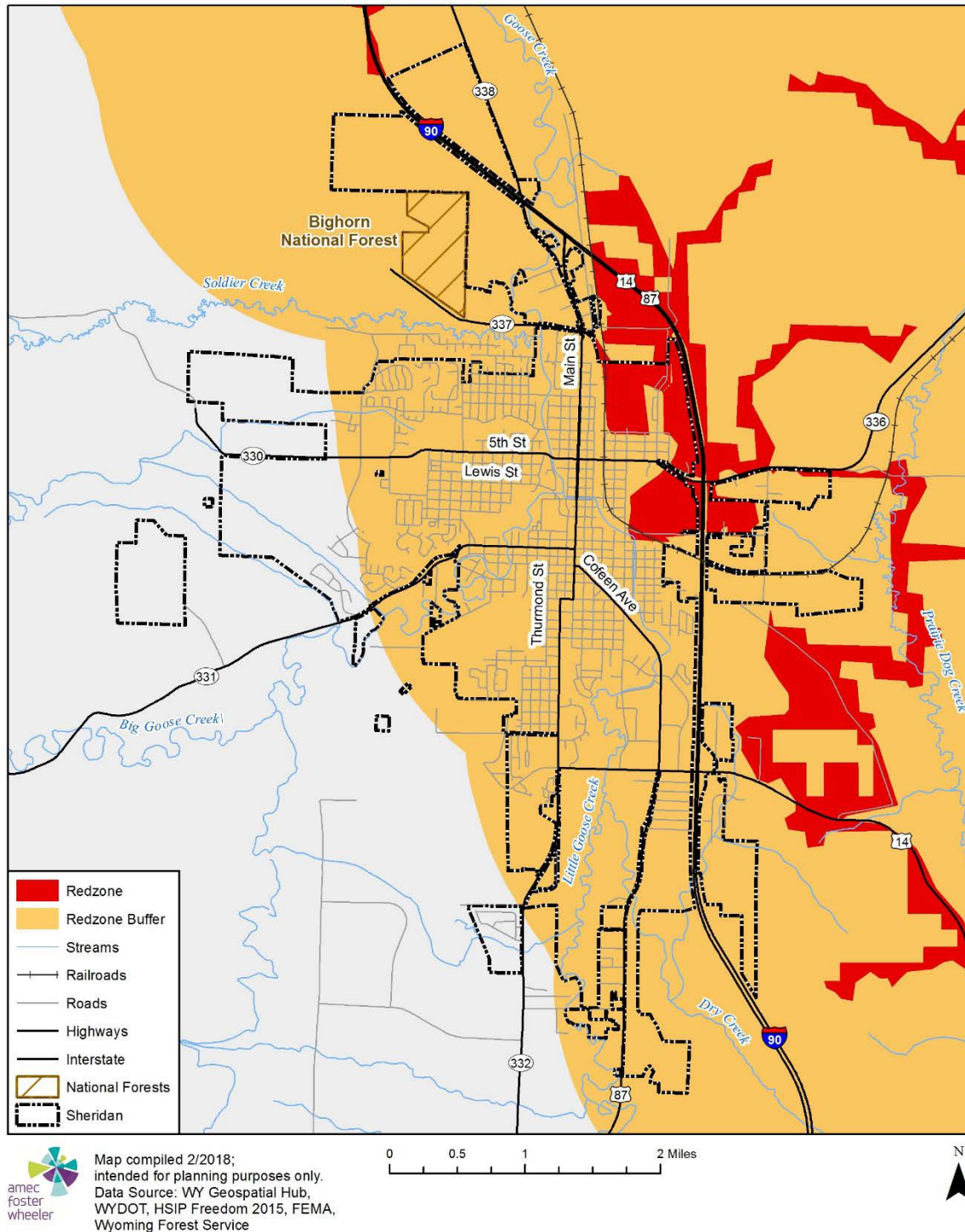
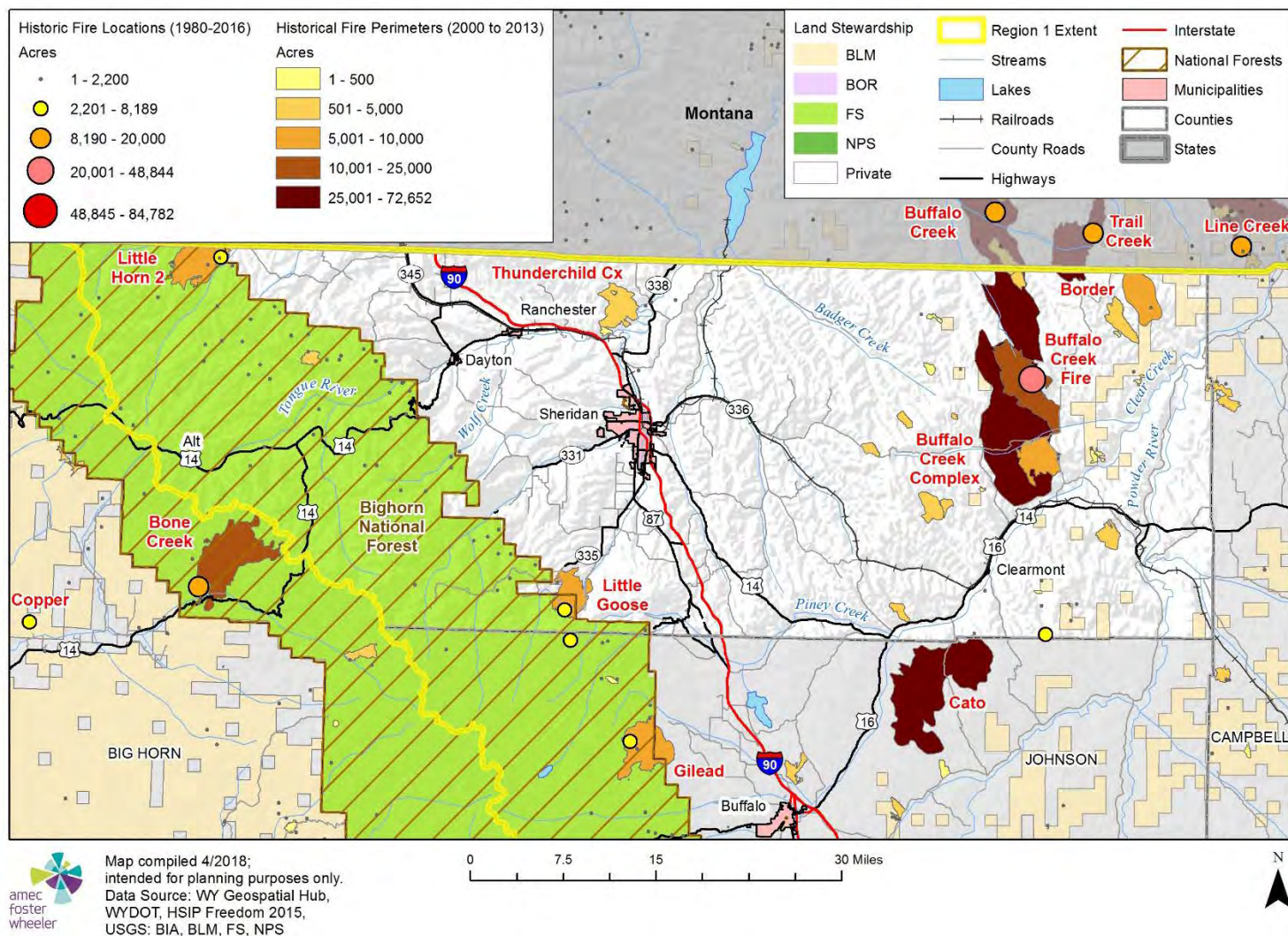


Figure 6-19 Wildfire Occurrences in Sheridan County from 1980-2016



7 Mitigation Capabilities Assessment

As part of the regional plan development, Region 1 and participating jurisdictions developed a mitigation capability assessment. Capabilities are those plans, policies and procedures that are currently in place and contribute to reducing hazard losses. Capabilities also include staffing and financial considerations, including the ability to leverage funding for mitigation projects. Combining the risk assessment with the mitigation capability assessment results in “net vulnerability” to disasters and more accurately focuses the goals, objectives, and proposed actions of this plan. The purpose of this effort was to identify policies and programs that were either in place or could be undertaken, if appropriate. Second, the HMPC conducted an inventory and review of existing policies, regulations, plans, projects, and programs to determine if they contribute to reducing hazard related losses. Opportunities to expand or improve upon these capabilities were considered during the development of the Regional Plan in 2018 and noted in the mitigation strategy where applicable.

7.1 Capability Summary

The 2016 Wyoming State Multi-Hazard Mitigation Plan summarizes existing mitigation capabilities of each county and some of their incorporated cities. The information was derived from county websites and through completed worksheets from the County Coordinators. Table 7-1 presents an overview of Sheridan County’s mitigation capabilities as captured in the 2016 Wyoming State Mitigation Plan.

Table 7-1 Sheridan County Mitigation Capabilities Overview

Building Codes	Comprehensive Planning	Floodplain Management	GIS & Planning	Land Use Regulations	Mitigation Plan	Additional Capabilities
County enforces building codes	2009 Comprehensive Plan includes Future Land Use Plan that shows landslide areas, floodplain, and groundwater vulnerability areas.	Risk MAP FIRM: 01/16/14	GIS Coordinator and interactive website Planning Dept. City of Sheridan has a GIS Division and GIS Web Viewer that includes DFIRM layer	Zoning and Division of Land Rules and Regulations	Approved; Expires 5/13/19	Comp. Plan emphasis on land conservation and open space priorities. City of Sheridan has extensive Planning capabilities 2009 Sheridan County Wildland Fire Mitigation Plan

Source: Wyoming Multi-Hazard Mitigation Plan 2016

Table 7-2 provides an assessment of Sheridan County's mitigation capabilities, based on input collected from the HMPC via data collection guides.

Table 7-2 Sheridan County Capability Assessment

Element	Sheridan County	Clearmont	Dayton	Ranchester	City of Sheridan
Planning Capabilities					
Comprehensive Plan	Yes – 2008	No – County Plan	Yes – 2016	No	Yes – 2017
Capital Improvement Plan	Yes	No – County Plan	Yes	Yes – 1/14	Yes
Emergency Operations Plan	Yes – 2016	No – County Plan	No	Yes – 1/17	Yes – 2017 ERM + Co. Plan
Recovery Plan	No	No – County Plan	No	No	No
Mitigation Plan	Yes - 2014	No – County Plan	No	No	No
Debris Management Plan	No	No – County Plan	Yes. Town provides service	Yes. Town provides service	Yes, City provides service
Economic Development Plan	Yes – 2015	No – County Plan	Yes	Yes – 2/2009	Yes
Transportation Plan	Yes – 2008	No – County Plan	No	No	Yes
Land-use Plan	Yes – 2008	No – County Plan	Yes	Yes – 1998. Zoning	Yes
Flood Mitigation Assistance (FMA) Plan	No	No – County Plan	No	No	Yes
Watershed Plan	Yes – 2015	No – County Plan	No	No	Follow Co. Plan
Community Wildfire Protection Plan or other fire mitigation plan	Yes – 2009	No – County Plan	No	No	Follow Co. Plan
Critical Facilities Plan (Mitigation/ Response/ Recovery)	N/A	No – County Plan	Yes	Yes – 1/17. Response	Yes, in the ERM + internal handbook
Policies/Ordinance					
Zoning Ordinance	Yes – 2017	Yes	Yes	Yes	Yes
Building Code	ICC 2015	107 – 2014	No	Version 1997 UBC. Fire, electrical, plumbing codes	Building permit system in place
Floodplain Ordinance	12/17/2013	1/13/2014	Yes	1/2014	Yes
Subdivision Ordinance	6/7/2016	No	Yes	Yes	Yes
Tree Trimming Ordinance	No	No	No	No	Yes
Nuisance Ordinance	No	No	Yes	Yes	Yes

Element	Sheridan County	Clearmont	Dayton	Ranchester	City of Sheridan
Storm Water Ordinance	No	No	Have a water/ wastewater department	No	Yes
Drainage Ordinance	No	No	No	Yes	Yes
Site Plan Review Requirements	Yes	No	Yes	Yes	Yes
Historic Preservation Ordinance	No	No	No	No	Yes – rail and national/state
Landscape Ordinance	No	No	No	Yes	In primary corridors only
Program					
Zoning/Land-use Restrictions	Yes	No	Yes	Yes	Yes
Codes Building Site/Design	Yes	No	No	Yes	Yes
Hazard Awareness Program	Yes – fuels reduction and hazard awareness	No	No	No	Tier 2 reports
National Flood Insurance Program	Yes	Yes	Yes	Yes	Yes
Community Rating System (CRS)	No	No	Yes	Yes	No
National Weather Service (NWS) Storm Ready Certification	Yes	No	No	No	Yes
Firewise Community Certification	Yes	No	No	No	No
Building Code Effectiveness Grading (BCEGs)	No	No	No	No	Yes
ISO Fire Rating		9	pending	5	3
Economic Development Program	Yes	No	No	No	Yes - SEEDA
Land-use Program	Yes	No	No	No	Yes - SCLT
Public Education/ Awareness	No	No	No	Yes	Yes
Property Acquisition	No	No	No	No	Yes
Planning/ Zoning Boards	Yes	No	Yes	Yes	Yes
Stream Maintenance Program	Yes	No	No	No	Yes
Tree Trimming Program	County trims tree in county ROWs	No	No	No	Yes

Element	Sheridan County	Clearmont	Dayton	Ranchester	City of Sheridan
Engineering Studies for Streams (Local)	No	No	No	Yes	Yes
Mutual Aid Agreements	WOHS & WAHA, Co/Fire Districts Mutual Aid agreements	No	Yes	Yes	Yes
Studies/Reports/Maps					
Flood Insurance Rate Maps (FIRM)	Yes – 1/16/14	Yes – 1/16/14	Yes – 1/16/14	Yes. 1/16/14	Yes – 1/16/14
Hazard Analysis/Risk Assessment	Yes in HMP, THIRA	Yes in HMP	Yes in HMP	Yes in HMP	Yes in HMP
Evacuation Route Map	No – however, routes that can be used for evac. are described in EOP	No	No	No	No
Critical Facilities Inventory	No - Virtually all CIKRs are private sector; SAWS water system is a joint powers board between city and county. City manages that operation.	No	No	No	Yes- ERM
Vulnerable Population Inventory	Yes - Via public health & DFS licensed day care provider listing	No	No	N/A	Yes
Land-use Map	Yes	Yes	Yes	Yes	Land Use Plan in place - 2017
Staff/Department					
Building Code Official	Yes	No	No	Yes	Yes
Building Inspector	Yes	Yes	No	Yes	Yes
Mapping Specialist (GIS)	Yes	No	Yes – GIS capabilities	Yes	Have GIS capabilities under City Engineering Department
Engineer	Yes	No	No	Yes	Yes
Development Planner	Yes	No	No	Yes	Yes

Element	Sheridan County	Clearmont	Dayton	Ranchester	City of Sheridan
Public Works Official	Yes	Yes	Have a Maintenance department	Yes	Yes
Emergency Management Coordinator	Yes	No		No	No (County only)
NFIP Floodplain Administrator	Yes	No	Yes	Yes	Yes
Bomb and/or Arson Squad	Not a resident resource; available from adjoining jurisdiction(s) via mutual aid	No	No	No	Arson only
Emergency Response Team	Not a resident resource; available from adjoining jurisdiction(s) via mutual aid	No	No	No	Yes
Hazardous Materials Expert	Not a resident resource; available from adjoining jurisdiction(s) via mutual aid	No	No	No	Yes
Local Emergency Planning Committee	Yes	No	No	No	Yes, regional
Emergency Management Commissions	Yes - LEPC & Co. Commissioners	No	No	No	LEPC
Sanitation Department	No	Yes	Yes	Yes	Yes
Transportation Department	Yes- County Road & Bridge Department	No	No	Yes	Yes
Economic Development Department	Yes	No	No	Yes	Yes - SEEDA
Housing Department	No	No	No	N/A	Yes - Planning
Historic Preservation	No	No	No	N/A	No
Non-Governmental Organizations (NGOs)					
American Red Cross	No - Chapter is in Gillette	No	No	No	No
Salvation Army	Yes	No	No	Yes	Yes
Veterans Groups	Yes	No	No	No	Yes
Local Environmental Organization	Yes	No	No	No	Yes, DEQ

Element	Sheridan County	Clearmont	Dayton	Ranchester	City of Sheridan
Homeowner Associations	Yes	No	Yes	Yes	Yes
Neighborhood Associations	Yes - Community or topic-specific associations	No	No	No	Yes
Chamber of Commerce	Yes	No	Yes	Yes	Yes
Community Organizations (Lions, Kiwanis, etc.)	Yes	No	Yes	Yes	Yes
Financial Resources					
Apply for Community Development Block Grants	Yes	Yes	Yes	Yes	Yes
Fund projects through Capital Improvements funding	Yes	Yes	Yes	Yes	Yes
Authority to levy taxes for specific purposes	Yes	Yes	Yes	Yes	Yes
Fees for water, sewer, gas, or electric services	Yes - Sheridan Area Water Supply joint powers board	Yes	Yes	Yes	Yes
Impact fees for new development	Yes	Yes	Yes	Yes	Yes
Incur debt through general obligation bonds	Yes	Yes	No	Yes	Yes
Incur debt through special tax bonds	Yes	Yes	No	Yes	Yes
Incur debt through private activities	No	Yes	No	No	No
Withhold spending in hazard prone areas	No	Yes	No	Yes	No
Additional Information					
Public education/information programs	Sheridan Area Water Supply joint powers board (SAWS), Community Wildfire Protection Plan (CWPP).	None	None	None	Yes - SCCD
Past or ongoing programs to reduce disaster losses	CWPP - WUI and fire prone areas fuel mitigation/thinning	None	None	None	Yes, pipeline training, grass ordinance, dam break plans

Element	Sheridan County	Clearmont	Dayton	Ranchester	City of Sheridan
Projects or issues related to people with Access and Functional Needs	Westview nursing home and Normative Services Academy are in or near floodplain	None	None	None	Yes, dementia friendly WY
Outdoor warning sirens	No	No	No	No	No
Other public warning systems	Code Red	No	No	No	Code Red
Designated public tornado shelters/saferooms	No	No	No	No	No
General development trends in the last 5 years	See Section 4	N/A	Residential	Residential and schools	ED, Building Permits, res. growth
Future development plans and expected growth, especially in the 100-year floodplain or known hazard areas	See Section 4	None	None	No	N/A
New facilities or infrastructure planned in the next 5 years	None planned	None planned	None	None	Yes, CIP

Source: Data provided by jurisdictions

7.1.1 NFIP Participation and Continued Compliance

The National Flood Insurance Program (NFIP) Community Status Book outlines participation and flood map status for counties and jurisdictions across the country. All of the Sheridan County jurisdictions are mapped and participate in the NFIP.

Table 7-3. NFIP Status in Sheridan County

Jurisdiction	Effective Map Status	Date Joined	Comments
Sheridan County	01/16/14	08/01/86	
Town of Clearmont	01/16/14	02/10/14	
Town of Dayton	01/16/14	08/1/08	No elevation determined – all zone A, C, X
Town of Ranchester	01/16/14	04/15/88	
City of Sheridan	01/16/14	09/01/78	

Source: NFIP Community Status Book

As participants since 1978 or later, the county and its jurisdictions continue to comply with the NFIP to reduce flood losses and increase flood resiliency. Continued compliance with the NFIP includes continuing to adopt floodplain maps when updated as well as

implementing, maintaining and updating floodplain ordinances. Actions related to continued compliance are summarized below:

- Continued designation of a local floodplain manager whose responsibilities include reviewing floodplain development permits to ensure compliance with the local floodplain management ordinances and rules;
- Suggest changes to improve enforcement of and compliance with regulations and programs;
- Participate in Flood Insurance Rate Map updates by adopting new maps or amendments to maps;
- Utilize Digital Flood Insurance Rate maps in conjunction with GIS to improve floodplain management, such as improved risk assessment and tracking of floodplain permits;
- Promote and disperse information on the benefits of flood insurance.

Also to be considered are the flood mitigation actions contained in the base Regional Plan and this annex, to support the ongoing efforts by participating counties to minimize the risk and vulnerability of communities to flood hazards, and to enhance their overall floodplain management programs.

8 Mitigation Strategy

This section describes the mitigation strategy and mitigation action plan for Sheridan County. See Chapter 5 of the Base Plan for more details on the process used to develop and update the mitigation strategy.

8.1 Mitigation Goals

As part of the 2018 planning process, Sheridan County reviewed and updated mitigation goals to guide the development of the Hazard Mitigation Strategy. The potential hazards, risks and vulnerabilities were also considered in the update of the goals. Sheridan County identified four main goals to guide the development of the Hazard Mitigation Strategy. The first three are carried forward from the 2014 Plan, with only minor modifications to the language in goals one and two. The fourth goal was added in 2018 to emphasize the personal responsibility aspects of hazard mitigation. This goal was influenced by a similar goal in Campbell County, and was embraced by all the other counties in the Region during the 2018 update.

Goal 1: Mitigate the effects of hazards through education, ordinances, resolutions, and clear definition and implementation of mitigation projects to reduce the loss of property and enhance life-safety.

Goal 2: Coordinate mitigation activities with all entities and stakeholders of Sheridan County to assess the hazards and take various actions to reduce or eliminate the risk factors of those hazards.

Goal 3: Reduce the economic impact on the local economy caused by the effects of hazards in the communities.

Goal 4: Increase the resilience of citizens by embracing their personal responsibility to be prepared and involved through education and volunteering.

8.2 Mitigation Actions

This section provides updates on the actions identified in the 2013 Sheridan County Multi-Hazard Mitigation Plan and new actions identified during the 2018 Regional Plan development.

8.2.1 Identification and Implementation of Mitigation Measures

Sheridan County has identified several potential hazard mitigation projects that would benefit the County and reduce potential risks and vulnerabilities. These projects were originally developed with input from the HMPC, LEPC, and from the past public meetings and a public survey. See also Chapter 5 in the Base Plan for additional information on the development and update of the mitigation strategy. The action plans were shared amongst the regional plan participants to stimulate ideas amongst the respective planning committees in each county. Table 8-1 lists the actions ongoing from the 2014 planning effort to address and mitigate hazards, including information related projects, priorities, responsible agency(ies), the goal/s the project supports, and possible funding sources. Table 8-2 lists new mitigation actions identified in the 2018 planning process.

The County and its communities are making progress toward meeting the Plan's goals through implementation of individual mitigation actions or projects. Table 8-3 summarizes the completed mitigation actions. Seven projects have been completed in the 2014-2017 timeframe. The County was successful in obtaining \$75k in FEMA Hazard Mitigation Grant Program funding (federal share) for the implementation of the Tongue River stream stabilization project in FY 2013. The project armored approximately 215 feet of bank to prevent future damage to County Rd 92 and was completed in mid-2015. Over time other completed actions will be added to this table to document progress towards mitigation implementation.

Table 8-1 Ongoing Mitigation Actions

Hazards	Project Description	Priority	Lead	Jurisdictions	Comments
All Hazards, Winter Storms	Winter storm and hazardous weather awareness and warning	Medium	County Emergency Management Coordinator	County-wide	Continuing – Original (2014 plan) description encouraged individuals and business to obtain NOAA weather radios. There was a DHS grant program which furnished radios, at no costs, to eligible recipients; that program has long since expired. Social media and smart phones/smart phone apps have superseded or supplemented conventional news media-driven weather alerts. Status for update: completed but on-going. SC Emergency Mgt. Coordinator will continue to expand use of social media and outreach to media outlets, as warranted, to increase awareness of hazardous weather and conditions.
All-Hazards, Winter Storms, Mine Subsidence	Public awareness program to include promotion of 3-day kits (for home, work, and car), and distribution of hazard information to residents and businesses (including emergency facilities, public buildings and campgrounds) via information booths, talks, videos, brochures, and telephone books.	Medium	County Emergency Management Coordinator	County-wide	Continuing – completed activities include media briefings, interviews, 3-day preparedness and Stormready activities; Minimize/avoid injury to humans, provide cover/sheltering, minimize property damage, minimize or avoid risks associated with rescue efforts in hazardous weather conditions. WOHS EMPG program funding which supports part of County's emergency mgt. program
Droughts	Education/Public awareness campaign for drought	High	NOAA, USDA, NRCS, NWS	County-wide	Continuing/ongoing
Droughts	Water conservation projects and studies	High	Conservation district. NRCS	County-wide	Continuing/ongoing. Various projects in progress, including moving away from flood irrigation.
Droughts	Enhanced forecasting and data distribution.	High	County, NOAA, NWS, NRCS, USGS	County-wide	Continuing/Ongoing. Need hardware, software, 6-stream gages county and city owned
Floods	Little Goose Creek (Levee, widening channel)	Medium	City of Sheridan/US Army Corps of Engineers	City of Sheridan	Continuing/ongoing. Waiting on Corp approval

Hazards	Project Description	Priority	Lead	Jurisdictions	Comments
Floods	Piney Creek	Medium	County of Sheridan/US army Corps of Engineers	Story, County	Continuing, not completed
Floods	Powder River stream stabilization	Medium	County of Sheridan	Sheridan County	Continuing County road washed out. Moved road. Meandering stream Healy and Lane Demet dam failure EAP
Floods	Clear Creek – stream stabilization	Low	County of Sheridan/US army Corps of Engineers	Sheridan County, Clearmont	Continuing County road damaged by erosion, but not many impacts. Healy and Lane Demet dam failure EAP
Floods	North Sheridan Interchange	Medium	City of Sheridan	City of Sheridan	Ongoing, will be complete in 2019
Floods	Loucks Street and Utility Project	Medium	City of Sheridan	City of Sheridan	Ongoing, will be complete in 2018
Floods	Colony South Water Line Replacement	Medium	City of Sheridan	City of Sheridan	Continuing/deferred. Planned for 2023-2024
Floods	West Downtown Phase IV	Medium	City of Sheridan	City of Sheridan	Ongoing. Will be finished in 2018
Floods	Big Goose Creek Sewer Upsize	Medium	City of Sheridan	City of Sheridan	Continuing/deferred
Floods	East Downtown Phase I	Medium	City of Sheridan	City of Sheridan	Continuing/In progress
Hail	Weather Spotter Training	High	County EM; Cloud Peak ham. Radio Club	County-wide	Continuing. Done annually
Wildland Fires	Hazard awareness for residents of Story	High	Sheridan County Fire Warden, BLM, US Forest Service	County of Sheridan	Ongoing as part of CWPP. Fuel break work in progress for several years since 2003
Wildland Fires	Countywide Fuels Reduction and Hazard Awareness through CWPP implementation	High	County Fire Warden	County-wide State Forestry	Ongoing. State Forestry has lands and funding. CWPP updated in 2018.

Hazards	Project Description	Priority	Lead	Jurisdictions	Comments
Hazardous Materials	Commodity Flow Study and multiple projects identified at the State-Level	High		County-wide	Ongoing. New state Haz Mat reporting implemented in 2017. County has put in for Commodity Flow Study but not completed yet.

Table 8-2. New Mitigation Actions Identified in 2018

ID	Hazard(s)	Related Goal(s)	Action Title	Description/ Background/ Benefits	Jurisdictions Involved	Lead Agency and Partners	Cost Estimate & Potential Funding	Priority	Timeline, Status, Implementation Notes
MH-1	Multi-hazard: hail, lightning, wind, tornado, winter storm	Goals 1 and 4	Weather Spotter Training - education	Expand education & participation of public - school system, etc., of storm ready/wx spotter activities (logistics & timing, unnecessary travel of school buses, -2 hr delay)	Sheridan County	Sheridan County Emergency Management, National Weather Service-Billings, MT, first responders, law enforcement, EMS, fire services, Sheridan Media, Sheridan Press, Cloud Peak Radio Group (local HAM club)	Staff time	High	Annually over next five years
MH-2	Multi-hazard: hail, lightning, wind, tornado, winter storm	Goals 1, 2, 4	Weather spotter training – public awareness and program promotion	Public awareness program, as resources permit, to include promotion of annual weather spotters/weather-ready/weather-wise community training each Spring. Conduct outreach to local media outlets, post training date to County's web site, social media, etc. Status for update: completed each year but continual	Sheridan County	Sheridan County Emergency Management and related stakeholders.	Staff time	High	Annually over next five years

ID	Hazard(s)	Related Goal(s)	Action Title	Description/ Background/ Benefits	Jurisdictions Involved	Lead Agency and Partners	Cost Estimate & Potential Funding	Priority	Timeline, Status, Implementation Notes
				refresher process. Benefits include: minimize/avoid injury to humans, provide cover/sheltering, minimize property damage. Potential funding sources: WOHS EMPG program which supports part of the County's emergency mgt. program. Project partners and related stakeholders: National Weather Service-Billings, MT, first responders, law enforcement, EMS, fire services, Sheridan Media, Sheridan Press, Cloud Peak Radio Group (local HAM club).					
D-1	Flood, dam failure	Goal 3	Emergency Action Plan Inventory for Dams	Uncertainty exists regarding emergency action plans or dam failures and an updated inventory is needed, particularly for major reservoirs affecting drainages in Sheridan County.	Sheridan County	County EM, State Engineer, private dam owners/operators	Staff time	Low	2 years
F-1	Flood	Goal 1 and 3	New Story Area Floodplain Mapping	Existing FEMA floodplain maps are not sufficiently accurate to properly manage the local floodplain program. Flood elevations are needed to depict true field conditions. Includes North, South Piney and Spring Creeks. Current maps (1990's) are inaccurate, incomplete and lack base flood elevations. Today, properties may be wrongly shown in special flood hazard areas that can result in burdensome technical studies or needless flood insurance requirements. Other properties may be developed assuming they are outside floodplains resulting in hazard exposure. Additional benefits of this project include avoiding placement of property	Sheridan County	County Public Works; Sheridan County Commissioners, WYOHS	\$100k; WOHS-FEMA RiskMAP	Medium	5 years

ID	Hazard(s)	Related Goal(s)	Action Title	Description/ Background/ Benefits	Jurisdictions Involved	Lead Agency and Partners	Cost Estimate & Potential Funding	Priority	Timeline, Status, Implementation Notes
				and lives in the flood prone areas. More accurate FIRM determinations would assist.					
F-2	Flood, dam failure	Goals 3 and 4	Acquisition of flood-prone homes in Ranchester	Removal of trailers and houses in Tongue River floodplain within Town of Ranchester. Investigate blighted property grants and acquisition of properties.	Ranchester	Town of Ranchester	\$500,000	Low	5 years
F-3	Flood	Goals 2, 3, 4	Tongue River Canyon Road Stream Stabilization - continuation	Tongue River Canyon Road – prepare a river bank/roadway bank stabilization project just upstream from where the shoulder washout is currently. As the river makes the big bend alongside the road in this area (local favorite fishing hole), a slope rebuild and bank stabilization project could be done here.	Sheridan County	County, NRCS	\$75,000	Medium	2 years NRCS planning more stream stabilization and diversion dam above Dayton
H-1	Haz-mat	Goal 1	Commodity flow study	Commodity flow study to understand types of materials being transported through county.	Sheridan County	County EM, LEPC, State	State, University of WY	High	2 years
G-1	Geohazards: landslide, expansive soils, earthquake, subsidence	Goals 1, 3	New landslide hazard mapping	Sheridan County regulates development in landslide areas. Existing maps referenced in the county's zoning regulations, prepared by the Wyoming Geological Survey in the 1980's, are out of date. Development today is moving into vulnerable areas.	Sheridan County	County Public Works	\$50,000	Low	3-5 years

ID	Hazard(s)	Related Goal(s)	Action Title	Description/ Background/ Benefits	Jurisdictions Involved	Lead Agency and Partners	Cost Estimate & Potential Funding	Priority	Timeline, Status, Implementation Notes
G-2	Geohazards: landslide, expansive soils, earthquake, subsidence	Goals 3, 4	Lewis Street/Jr. High landslide mitigation	Lewis Street/Jr. High landslide mitigation engineering strategies	City of Sheridan	City of Sheridan & SCSD #2	\$5,000,000	Low	2 years
WF-1	Wildfire	Goal 2	Fire break maintenance and enhancement	Expand buy-in awareness of stakeholders regarding fire break maintenance and enhancement	County	County Fire Warden/County EM	\$175,000 Fire Mitigation Grant	High	2 years
WF-2	Wildfire	Goal 2 and 4	landscape level fuels reduction projects technical assistance	Expand landowner and community buy-in through education and on the ground technical assistance to encourage landscape level fuels reduction projects	County, Ranchester, Dayton	County Fire Warden	\$30,000 Fire Mitigation Grant	Low	2 years

Table 8-3. Completed Mitigation Actions

Hazards	Project Description	Priority	Lead	Jurisdictions	Comments
Floods	Lewis Street Bridge	Medium	City of Sheridan	City of Sheridan	Complete
Floods	Illinois Neighborhood Reconstruction	Medium	City of Sheridan	City of Sheridan	Complete
Floods	Wyoming Park Phase III	Medium	City of Sheridan	City of Sheridan	Complete
Floods	Tongue River stream stabilization	Medium	City of Ranchester & Dayton /US Army Corps of Engineers/NRCS	Ranchester, Dayton/ Sheridan County	Complete. County did work utilizing a FEMA HMGP grant that included channel modification and rip rap after 2012 flood.
Landslides	City of Sheridan, Cemetery Slide Remediation	Medium	City Public Works	City of Sheridan	Complete
Hazardous Materials	Water Treatment Plant Improvements	High	City Public Works	City of Sheridan	Complete
Hazardous Materials	Sanitary Sewer Creek Crossings	Medium	City Public Works	City of Sheridan	Completed as part of the Lewis St. Bridge flood mitigation project
Floods	Champion Drive Drainage Project	Medium	City Public Works	City of Sheridan	Completed

9 Implementation

Moving forward, the Sheridan County HMPC and LEPC will use the mitigation action tables in the previous section to track progress on implementation of each project. Implementation of the plan overall is discussed in more detail under Chapter 6 of the Regional (Base) Plan.

9.1 Incorporation into Existing Planning Mechanisms

To determine if this plan is consistent with goals identified in other community plans, the members of the Sheridan County Emergency Management Agency, along with the Hazard Mitigation Planning Committee and LEPC, will meet with other agencies who have plans that address such issues as economic development, subdivision resolutions/ordinances, capital improvement, building permits, growth management, sustainability, environmental preservation, historic preservation, redevelopment, health and/or safety, recreation, or transportation. The process will provide an opportunity to integrate and/or correlate plans for the purpose of:

- Determining if the mitigation plan is compatible with goals stated in other plans.
- Identifying mitigation initiatives or proposed projects which serve multiple objectives for the communities and could be included in multiple plans.
- Identifying needs for revision or updating to the mitigation plan, or other plans, to provide a more comprehensive approach to hazard mitigation (including addition of new mitigation measures).

During the 2018 planning process, the HMPC discussed the importance of coordinating the mitigation plan with other planning processes, and vice versa. To date the plan has been integrated with other planning efforts that include:

- Cross referenced in update of Emergency Operations Plan
- Risk Assessment informed Threat and Hazard Identification and Risk Assessments (THIRA)

The group discussed opportunities to cross reference the hazard mitigation plan in other upcoming planning efforts. As described in the capability assessment, the County and municipalities already implement policies and programs to reduce losses to life and property from hazards. This plan builds upon the momentum developed through previous and related planning efforts and mitigation programs and recommends implementing actions, where possible, through these other program mechanisms. Where applicable, these existing mechanisms could include:

- County or community comprehensive or land use plans
- County or community development codes

- County or community Emergency Operations Plans
- Community Wildfire Protection Plan (CWPP)
- Transportation plan
- Capital improvement plans and budgets including County Road/Bridge projects
- Recovery planning efforts
- Watershed planning efforts
- Wildfire planning efforts on adjacent public lands
- Firewise planning
- Master planning efforts
- River corridor and greenway planning efforts
- WYDOT rockfall and landslide mitigation efforts
- Other plans, regulations, and practices with a mitigation aspect

9.2 Funding Sources

Funding for mitigation projects may come from a variety of sources. Below is a partial list of possible sources of funding that could help fund the actions identified in Section 8.

Local Government

- General revenues in the form of matches
- One Percent Sales Tax
- County and Municipal Utility Authorities

State of Wyoming

- Community Development Block Grant Program
- Federal Mineral Royalty Capital Construction Account
- Wyoming Water Development Program
- State and Community Highway Safety, Department of Transportation
- State Lands and Investments Board (SLIB) Grants and Loans
- Transportation Enhancement Activities Local (TEAL)
- Wildfire Mitigation Grant (State Forestry Division)

Federal Government Programs

- Federal Emergency Management Agency Hazard Mitigation Assistance Grants including:
 - Pre-Disaster Mitigation (PDM)
 - Flood Mitigation Assistance Program (FMA)
 - Hazard Mitigation Grant Program (HMGP)
 - Notice of funding availability typically released in June with applications due in October/November of each year.
 - HMGP is dependent on federally declared disasters within the state and funding amount is based on a percentage of disaster relief costs.

- FEMA Fire Management Assistance Grants - As of June 8, 2018 FEMA is making HMPG funds available for states, territories, and federally-recognized tribes that have a Fire Management Assistance Grant (FMAG) declaration between October 1, 2016 and September 30, 2018. The HMGP post fire amount available for eligible applicants with standard state or tribal hazard mitigation plans is \$425,008 per declaration
- USDA Environmental Quality Incentive Program
- USDA Conservation Reserve and Conservation Reserve Enhancement Program
- USDA Small Watersheds (NRCS)

There are many more potential funding opportunities available to the municipalities and county. Table 96 of the 2016 Wyoming State Mitigation Plan lists several other sources of federal funding.

Funding research will be done during the scoping process for each project to determine what funding mechanisms are available and appropriate for that project. Funding cycles will be monitored to ensure there is adequate time to prepare grant applications.

9.3 Monitoring, Evaluating and Updating the Plan

Sheridan County will follow the procedures to review and update this plan in accordance with Region 1 as outlined in Chapter 6 of the Base Plan. Sheridan County realizes it is important to review and update this plan regularly. This is especially important as the County receives additional information, which might change the risk analysis and resulting mitigation projects list.